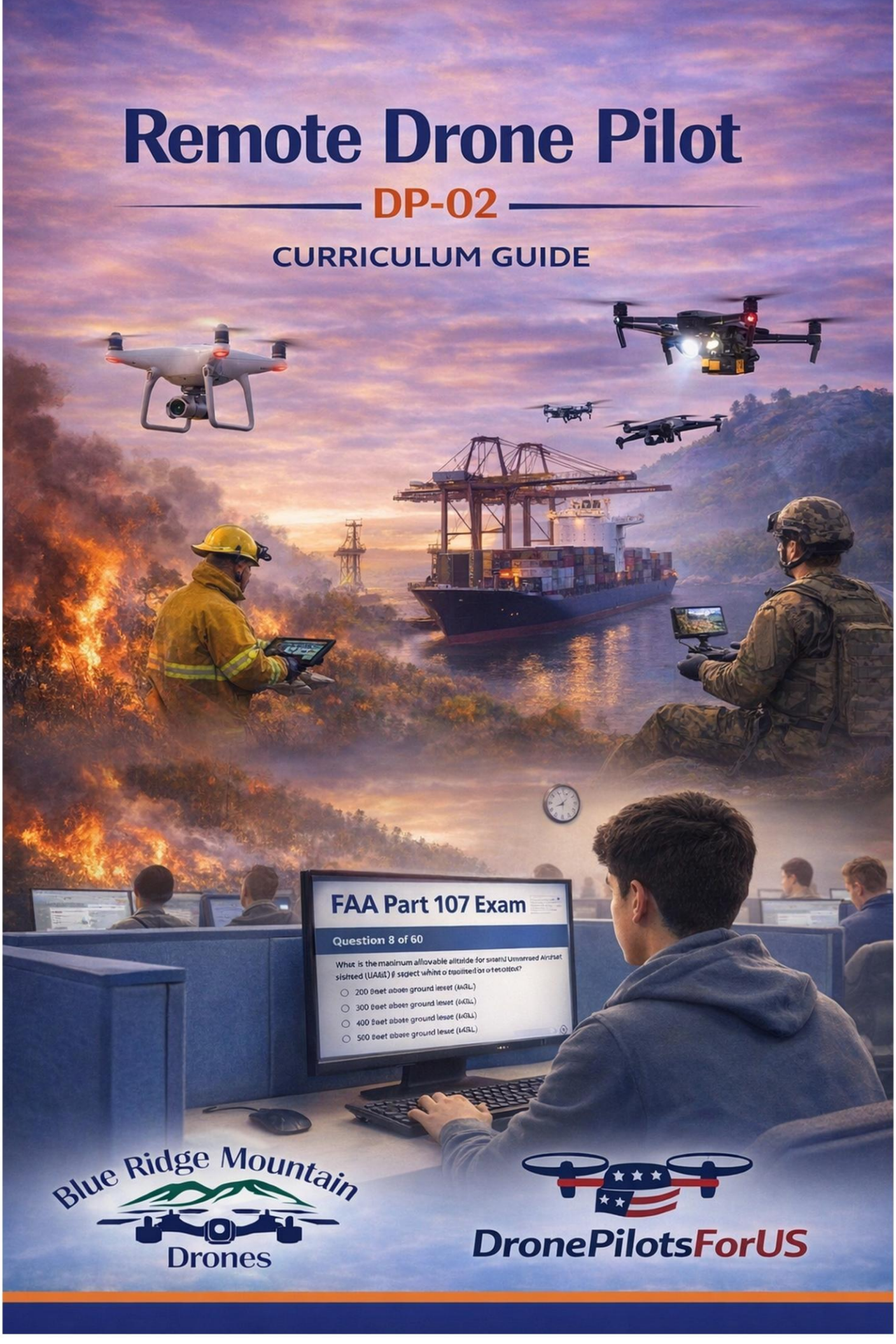
Remote Drone Pilot

DP-02

CURRICULUM GUIDE



Blue Ridge Mountain Drones

DronePilotsForUS

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Remote Drone Pilot (DP-02)
Course Introduction & Orientation Guide

Course Description
The Remote Drone Pilot (DP-02) course is a comprehensive, standards-based program designed to prepare students for the **FAA Part 107 Remote Pilot Certification**. This course provides students with the foundational knowledge, technical skills, and decision-making abilities required to safely and legally operate small Unmanned Aircraft Systems (sUAS) in the National Airspace System.

Students will study and apply concepts including:

- FAA regulations (14 CFR Part 107)
- Airspace classification and sectional charts
- Weather interpretation (METARs and TAFs)
- Aircraft loading and performance
- Aeronautical Decision-Making (ADM)
- Airport operations and safety procedures

In addition to academic instruction, students will participate in structured hands-on flight activities designed to reinforce safe drone operation and professional responsibility.
This course prepares students not only to **pass the FAA Part 107 Knowledge Test (minimum 70%)** but also to operate as responsible and professional remote pilots.

Course Purpose
The purpose of this course is to:

- Prepare students for **FAA Part 107 certification**
- Develop **safe and responsible drone operators**
- Build **real-world aviation knowledge and skills**
- Introduce students to **career pathways in the drone industry**
- Reinforce **professionalism, accountability, and decision-making**

Course Outcomes
By the end of this 18-week course, students will be able to:

- Explain and apply FAA Part 107 regulations
- Interpret sectional charts and identify airspace classifications
- Analyze weather reports and determine flight safety
- Evaluate aircraft performance and operational limitations
- Apply Aeronautical Decision-Making (ADM) in real-world scenarios
- Demonstrate safe drone operation and preflight procedures
- Successfully complete FAA-style assessments at or above a **70% passing level**

Students completing this course will be prepared to:

- Schedule and pass the FAA Part 107 Knowledge Test
- Operate drones safely in professional environments
- Continue into advanced drone applications and certifications

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Course Structure (18 Weeks Overview)

This course is organized into two major instructional phases:

Weeks 1–9: Foundational Knowledge & Skill Development

- FAA regulations and certification requirements
- Remote Pilot in Command responsibilities
- Airspace classification and sectional charts
- Weather theory and interpretation
- Basic flight operations and safety procedures

Weeks 10–18: Application, Integration & Test Readiness

- Scenario-based decision-making
- Advanced airspace and weather analysis
- Risk management and emergency procedures
- FAA-style practice assessments
- Full-length practice exams
- Final comprehensive review and certification readiness

By the end of Week 18, students demonstrate:

- Strong FAA knowledge mastery
- Consistent passing test scores
- Confidence and readiness for certification

Instructional Approach

This course uses a **blended instructional model** that includes:

- Direct instruction (teacher-led content)
- Guided note-taking and discussion
- Scenario-based learning
- Hands-on flight labs
- FAA-style assessments
- Reflection and performance evaluation

Each lesson includes:

- Bellringer / Warm-up
- Vocabulary development
- Instructional content
- Hands-on activity
- Flight activity (when appropriate)
- Performance rubric
- Assessment items

Materials Required

Students will need access to:

- Student notebook or guided notes sheets
- FAA Part 107 study materials
- Sectional charts
- Weather data samples (METAR/TAF)
- Drone and controller (school-provided)
- Fully charged batteries

- Designated flight area

Assessment & Grading

Student performance will be evaluated through:

1. Knowledge Assessments

- Daily formative questions
- FAA-style quizzes
- Practice exams

2. Performance-Based Assessments

- Flight skills
- Scenario analysis
- Decision-making activities

3. Final Readiness Indicators

- Practice exam scores (target: 70%–85%+)
- Demonstrated understanding of all FAA domains
- Ability to apply knowledge in real-world scenarios

FAA Certification Overview

To earn a Remote Pilot Certificate, students must:

- Be at least 16 years old
- Pass the FAA Aeronautical Knowledge Test
- Complete TSA security vetting
- Apply through the FAA IACRA system

This course directly prepares students for all tested knowledge areas, including:

- Regulations
- Airspace
- Weather
- Performance
- Emergency procedures
- Aeronautical Decision-Making

Student Expectations

Students are expected to:

- Act professionally at all times
- Follow all safety procedures
- Participate actively in all activities
- Complete all assignments and assessments
- Demonstrate responsibility when operating drones
- Maintain focus and effort toward certification readiness

Safety Expectations

Safety is the top priority in all course activities.

Students must:

- Follow instructor directions at all times
- Maintain visual line of sight (VLOS) during flight
- Avoid unsafe or hazardous operations
- Respect equipment and surroundings
- Understand that the Remote Pilot in Command (PIC) is fully responsible for flight operations

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Career Connections

The drone industry is rapidly expanding across multiple sectors, including:

- Public safety (fire, law enforcement, emergency management)
- Construction and infrastructure inspection
- Agriculture and precision farming
- Real estate and media production
- Mapping and surveying
- Environmental monitoring

This course provides the **first step toward these high-demand careers**.

Course Essential Question

How can I safely, legally, and professionally operate a drone while preparing for FAA certification?

Remote Drone Pilot Core Course Standards

Standard ID	Standard Description	RBT Level	% of Course
201.00	Students will explain FAA Part 107 regulations and operational requirements governing small UAS operations.	B2	15%
202.00	Students will apply airspace classifications using sectional charts and UAS facility maps to determine legal flight operations.	C3	20%
203.00	Students will interpret aviation weather data and apply it to safe sUAS operations.	C3	20%
204.00	Students will explain how loading and environmental factors affect sUAS performance.	B2	5%
205.00	Students will interpret airport operations and apply right-of-way rules for safe integration into airspace.	B2	5%
206.00	Students will apply aeronautical decision-making (ADM) principles to assess risk and ensure safe operations.	C3	5%
207.00	Students will perform preflight inspection procedures and evaluate aircraft readiness for safe operation.	C3	10%
208.00	Students will demonstrate manual flight control of a drone using coordinated control inputs.	C3	15%
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).	C3	5%
210.00	Students will apply mission planning principles to professional drone operations.	C3	5%

Remote Drone Pilot Course Standards

Course Alignment: 80% FAA Part 107 Knowledge | 20% Flight Skills

Standard ID	Standard Description Cognitive 80%	RBT Level	% of Course
201.00	Students will explain FAA Part 107 regulations and operational requirements governing small UAS operations.	B2	15%
201.01	Students will identify eligibility requirements and certification steps for obtaining a Remote Pilot Certificate.	A1	—
201.02	Students will interpret operational limitations, including altitude, speed, visibility, and daylight restrictions.	B2	—
201.03	Students will explain Remote Pilot in Command (PIC) responsibilities and legal accountability.	B2	—
201.04	Students will recognize situations requiring waivers or FAA authorization.	B2	—
201.05	Students will apply rules related to airport operations.	C3	
201.06	Students will identify when waivers are required under Part 107.	A1	
202.00	Students will apply airspace classifications using sectional charts and UAS facility maps to determine legal flight operations.	C3	20%
202.01	Students will identify airspace classes (B, C, D, E, G) and their characteristics.	A1	—
202.02	Students will interpret sectional chart symbols and legends.	B2	—
202.03	Students will differentiate between controlled and uncontrolled airspace.	B2	—
202.04	Students will apply airspace knowledge to determine authorization requirements.	C3	—
202.05	Students will evaluate flight scenarios to determine safe and legal operating locations.	C3	—
203.00	Students will interpret aviation weather data and apply it to safe sUAS operations.	C3	20%
203.01	Students will identify basic weather concepts, including wind, pressure, and stability.	A1	—
203.02	Students will decode METAR and TAF reports.	B2	—
203.03	Students will explain how weather conditions affect drone performance.	B2	—
203.04	Students will apply weather data to make go/no-go flight decisions.	C3	—
204.00	Students will explain how loading and environmental factors affect sUAS performance.	B2	5%
204.01	Students will identify factors affecting performance, such as weight and balance.	A1	—
204.02	Students will explain the impact of density altitude on flight performance.	B2	—

204.03	Students will interpret environmental effects such as wind and temperature on operations.	B2	—
204.04	Students will evaluate the impact of density altitude on drone operations.	B2	
204.05	Students will apply performance concepts to real-world flight conditions.	C3	
204.06	Students will define the four forces of flight: lift, weight, thrust, and drag.	A1	
204.07	Students will explain how aerodynamic forces affect drone control and stability.	B2	
204.08	Students will apply aerodynamic principles to flight operations.	C3	
204.09	Students will identify operational limitations affecting safe drone performance.	A1	
204.10	Students will evaluate emergency situations and appropriate pilot responses.	B2	
205.00	Students will interpret airport operations and apply right-of-way rules for safe integration into airspace.	B2	5%
205.01	Students will identify airport layouts and traffic patterns.	A1	—
205.02	Students will explain right-of-way rules between aircraft and drones.	B2	—
205.03	Students will recognize basic radio communication procedures and terminology.	B2	—
205.04	Students will explain communication and operational procedures at airports.	B2	
205.05	Students will identify airport markings and lighting systems.	A1	
205.06	Students will evaluate airport hazards and operational risks.	B2	
206.00	Students will apply aeronautical decision-making (ADM) principles to assess risk and ensure safe operations.	C3	5%
206.01	Students will identify hazards related to the environment, equipment, and human factors.	A1	—
206.02	Students will explain risk management models used in aviation.	B2	—
206.03	Students will apply ADM principles to real-world flight scenarios.	C3	—
207.00	Students will perform preflight inspection procedures and evaluate aircraft readiness for safe operation.	C3	10%
207.01	Students will identify required preflight inspection components.	A1	—
207.02	Students will explain maintenance requirements and system checks.	B2	—
207.03	Students will apply preflight procedures to determine flight readiness.	C3	—

Standard ID	Standard Description Practical – 20%	RBT Level	% of Course
208.00	Students will demonstrate manual flight control of a drone using coordinated control inputs.	C3	15%
208.01	Students will identify basic control inputs (throttle, yaw, pitch, roll).	A1	—
208.02	Students will demonstrate stable hover and controlled takeoff and landing.	C3	—
208.03	Students will execute basic flight patterns (square, circle, orientation control).	C3	—
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).	C3	3%
209.01	Students will identify FAA safety requirements, including VLOS.	A1	—
209.02	Students will demonstrate safe flight operations in controlled environments.	C3	—
209.03	Students will apply emergency procedures to maintain safe flight operations.	C3	
209.04	Students will evaluate human factors that impact safe flight decisions.	B2	
209.05	Students will identify hazardous attitudes and apply mitigation strategies.	B2	
210.00	Students will apply mission planning principles to professional drone operations.	C3	2%
210.01	Students will identify FAA safety requirements, including VLOS.	A1	—
210.02	Students will demonstrate safe flight operations in controlled environments.	C3	—
210.03	Students will conduct site surveys to identify hazards and constraints.	C3	
210.04	Students will apply risk management strategies to drone operations.	C3	

Revised Bloom's Taxonomy Key

- A1 – Remember / Recall
- B2 – Understand Concepts
- C3 – Apply Procedures

Week 1 – Day 1

Course Introduction & FAA Part 107 Certification Overview

Standards

Standard	Description
201.00	Students will explain FAA Part 107 regulations and operational requirements governing small UAS operations.
201.01	Students will identify eligibility requirements and certification steps for obtaining a Remote Pilot Certificate.
201.02	Students will apply operational rules to determine legal drone operations.
201.03	Students will explain Remote Pilot in Command (PIC) responsibilities and legal accountability.

Objective
Students will explain the requirements and process for obtaining an FAA Part 107 Remote Pilot Certificate, including eligibility, testing, certification steps, and regulatory responsibility.

Essential Question
What knowledge, responsibilities, and requirements are necessary to legally operate a drone under FAA Part 107?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What are some rules you think exist for flying drones?
- Who do you think creates and enforces those rules?
- Should someone need a license to fly a drone? Why or why not?

Teacher will briefly review responses to gauge prior knowledge and introduce the role of the FAA.

Vocabulary

- **FAA (Federal Aviation Administration)** – The government agency responsible for regulating all airspace in the United States
- **Part 107** – The section of federal regulations governing small unmanned aircraft systems (sUAS)
- **Remote Pilot Certificate** – FAA certification required to operate a drone for commercial or non-recreational purposes
- **Remote Pilot in Command (PIC)** – The individual responsible for the operation and safety of the drone
- **sUAS (Small Unmanned Aircraft System)** – A drone weighing less than 55 pounds and its associated components
- **IACRA** – Online system used to apply for FAA certification
- **TSA Vetting** – Security background check required for certification

- **VLOS (Visual Line of Sight)** – Requirement that the drone must be visible to the pilot at all times
- **AGL (Above Ground Level)** – Measurement of altitude from the ground

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Materials

- Student notebook or guided notes sheet
- Whiteboard / presentation slides
- Internet access (FAA/IACRA reference if available)
- Sample FAA Part 107 testing outline
- Drone (for demonstration)
- Batteries (fully charged)
- Safety cones or designated flight area markers

Instruction Content

The Federal Aviation Administration (FAA) regulates all airspace within the United States under Title 14 of the Code of Federal Regulations (14 CFR). Small unmanned aircraft systems (sUAS) operated for commercial or non-recreational purposes fall under **14 CFR Part 107**.
A Remote Pilot Certificate is required for any operation that is not strictly recreational. This includes business use, public safety operations, and educational applications tied to structured coursework.

To be eligible for certification, an individual must:

- Be at least 16 years of age
- Be able to read, speak, write, and understand English
- Be in a physical and mental condition to safely operate a drone
- Pass the FAA Aeronautical Knowledge Test
- Complete TSA security vetting

The certification process includes:

1. Creating an account in IACRA
2. Scheduling and completing the FAA Knowledge Test
3. Achieving a minimum passing score of 70%
4. Completing FAA Form 8710-13
5. Passing TSA vetting
6. Receiving a temporary certificate followed by a permanent certificate

The FAA knowledge test evaluates:

- Regulations (Part 107 rules)
- Airspace classification and requirements
- Weather and its effects on operations
- Loading and aircraft performance
- Emergency procedures
- Aeronautical decision-making (ADM)
- Preflight inspection procedures

The Remote Pilot in Command (PIC) is directly responsible for the operation and safety of the drone and must ensure all FAA regulations are followed.

Key operational limitations include:

- Maximum altitude of 400 feet AGL
- Maximum speed of 100 mph
- Maintaining visual line of sight (VLOS)
- Daylight or civil twilight operations only
- Yielding right-of-way to manned aircraft

Teacher Emphasis

- Emphasize that Part 107 is federal aviation law
- Reinforce that commercial = any non-recreational use
- Highlight that the FAA exam requires aviation-level knowledge
- Stress that the PIC holds full legal responsibility
- Connect certification requirements to real-world applications and careers
- Reinforce that safety and risk management are core expectations
- Set expectation that students are preparing for a real FAA certification exam

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Activity Procedure

Activity: Certification Pathway Breakdown

1. Students take structured notes during instruction
2. Students create a step-by-step flowchart including:
    - Eligibility requirements
    - Testing process
    - Certification steps
3. Teacher will use the following Formative Assessment questions:
    - Why does the FAA require certification for drone operations?
    - Which knowledge areas will require the most study?
    - How does certification improve safety in the airspace?
4. Instructor reviews responses and clarifies misconceptions

Flight Activity (Basic Introduction)

1. Identify drone components
2. Demonstrate safe handling procedures
3. Perform controlled startup and shutdown
4. Execute a low hover (3–5 feet)
5. Maintain position control for 10 seconds
6. Perform a controlled landing

Instructor emphasis: safety, control, and awareness

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Certification Understanding	Limited or incorrect	Partial understanding	Accurate explanation	Detailed and complete understanding
Knowledge of FAA Requirements	Minimal recall	Basic recall	Correct identification	Comprehensive understanding
Flowchart Accuracy	Incomplete	Partial	Mostly correct	Fully accurate and organized
Flight Safety Execution	Unsafe	Basic control	Safe	Precise and confident

---

Assessment Items

1. What is the minimum age required to obtain a Remote Pilot Certificate?
   A. 14
   B. 16
   C. 18
   D. 21
2. What is the minimum passing score for the FAA Part 107 Knowledge Test?
   A. 60%
   B. 65%
   C. 70%
   D. 75%
3. Who is responsible for the operation of the drone?
   A. Observer
   B. FAA
   C. Remote Pilot in Command
   D. Manufacturer
4. Which operation requires certification?
   A. Recreational flying
   B. School-related drone project
   C. Indoor flying
   D. Flying under 100 feet recreationally
5. Scenario:
   A student is flying for a business without certification. Is this legal? Explain.

Answer Key

1. B
2. C
3. C
4. B
5. No — certification is required for commercial operations

Closure

- Review certification steps
- Ask students to identify one new concept learned
- Reinforce that this course prepares them for FAA certification

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Teacher Notes

- Establish expectations for professionalism and accountability
- Reinforce that students are learning real aviation regulations
- Use this lesson to set tone for safety and responsibility

Week 1 – Day 2

Remote Pilot Responsibilities & Operational Limitations

Standards

Standard	Description
201.00	Students will explain FAA Part 107 regulations and operational requirements governing small UAS operations.
201.02	Students will apply operational rules to determine legal drone operations.
201.03	Students will explain Remote Pilot in Command (PIC) responsibilities and legal accountability.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.01	Students will identify FAA safety requirements, including VLOS.

Objective
Students will explain the responsibilities of the Remote Pilot in Command and apply FAA operational limitations to determine safe and legal drone operations.

Essential Question
What responsibilities does the Remote Pilot in Command have, and how do operational limitations ensure safe drone operations?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- Who should be responsible if a drone causes damage or injury?
- What limits should exist when flying a drone?
- Why might the FAA restrict how and where drones can fly?

Teacher will review responses to connect student thinking to FAA safety expectations.

Vocabulary

- **Remote Pilot in Command (PIC)** – The individual responsible for the operation and safety of the drone
- **Operational Limitations** – FAA rules that define how a drone may be flown
- **VLOS (Visual Line of Sight)** – Requirement to maintain unaided visual contact with the drone
- **Right-of-Way** – Rule requiring drones to yield to all manned aircraft
- **Civil Twilight** – The period before sunrise and after sunset when limited operations are allowed with lighting
- **Anti-Collision Lighting** – Lighting visible for at least 3 statute miles used during twilight operations
- **Groundspeed** – The speed of the drone relative to the ground
- **Hazardous Operation** – Any operation that creates risk to people, property, or other aircraft

Materials

- Student notebook or guided notes sheet
- Whiteboard / presentation slides
- FAA Part 107 reference materials
- Drone and controller
- Batteries (fully charged)
- Safety cones or designated flight boundaries

Instruction Content

Under FAA Part 107, the Remote Pilot in Command (PIC) is directly responsible for, and is the final authority as to, the operation of the small unmanned aircraft. The PIC is accountable for ensuring all operations are conducted safely and in compliance with federal regulations.

The Remote Pilot in Command must:

- Conduct a preflight inspection to ensure the aircraft is safe for operation
- Assess weather conditions and environmental factors
- Determine airspace classification and obtain authorization if required
- Maintain visual line of sight (VLOS) at all times
- Avoid hazardous operations
- Yield the right-of-way to all manned aircraft

Key operational limitations under Part 107 include:

- Maximum altitude of 400 feet AGL (or within 400 feet of a structure)
- Maximum groundspeed of 100 mph (87 knots)
- Operations must remain within visual line of sight (VLOS)
- Operations are limited to daylight or civil twilight with anti-collision lighting
- No operation over people unless allowed under specific categories
- No operation from a moving vehicle unless in a sparsely populated area

These operational limitations are designed to protect the National Airspace System (NAS), reduce risk, and ensure safe integration of drones with manned aircraft operations.
Failure to comply with these regulations may result in civil penalties, certificate suspension, or revocation.

Teacher Emphasis

- Reinforce that the PIC is legally responsible for every aspect of the flight
- Emphasize that operational limitations exist to reduce risk and prevent accidents
- Ensure students understand that VLOS is a strict requirement
- Highlight that drones must always yield to manned aircraft
- Connect limitations to real-world consequences and safety risks
- Reinforce the importance of situational awareness at all times

Activity Procedure

Activity: Legal vs. Illegal Flight Scenarios

1. Students take structured notes during instruction

2. Students analyze provided flight scenarios and determine:
    - Whether the operation is legal or illegal
    - Which FAA rule applies
3. Teacher will use the following Formative Assessment questions:
    - Why is VLOS critical to safe operation?
    - What risks are reduced by altitude limits?
    - Why must drones yield to manned aircraft?
4. Instructor reviews responses and explains correct reasoning

---

Flight Activity (Control & Awareness Focus)

1. Perform controlled takeoff to hover
2. Maintain stable hover at a fixed altitude
3. Practice directional movement (forward, backward, left, right)
4. Maintain visual orientation of the drone at all times
5. Perform controlled landing within designated area

Instructor emphasis: control, orientation, and maintaining visual contact

---

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
PIC Responsibility Understanding	Limited or incorrect	Partial understanding	Accurate explanation	Detailed and applied understanding
Operational Limit Knowledge	Minimal recall	Basic understanding	Correct application	Comprehensive and precise understanding
Scenario Analysis	Incorrect or incomplete	Partial accuracy	Mostly correct	Fully accurate with clear reasoning
Flight Control & Awareness	Unsafe or inconsistent	Basic control	Safe and controlled	Highly precise and consistent

---

Assessment Items

1. What is the maximum altitude allowed under Part 107?
   A. 200 feet
   B. 300 feet
   C. 400 feet
   D. 500 feet

2. What must a remote pilot maintain at all times during flight?
   A. GPS connection
   B. Visual Line of Sight
   C. Internet signal
   D. Camera feed

3. Who has the right-of-way in all situations?
   A. Drone pilot
   B. Ground vehicles
   C. Manned aircraft
   D. Observer

4. When can a drone be flown during civil twilight?
   A. Never
   B. Only with anti-collision lighting
   C. Only indoors
   D. Without restriction

5. Scenario:
   A drone is flown beyond visual line of sight using only a camera feed.
   Is this operation compliant with Part 107? Explain.

Answer Key

1. C
2. B
3. C
4. B
5. No — the pilot must maintain visual line of sight at all times

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Closure

- Review key operational limitations
- Ask students to identify the most important safety rule discussed
- Reinforce that all rules exist to protect people and airspace

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Teacher Notes

- Continue reinforcing pilot responsibility and accountability
- Emphasize safety as the foundation of all drone operations
- Begin building consistent safe operating habits

Week 1 – Day 3

Introduction to Airspace & FAA Classification System

Standards

Standard	Description
202.00	Students will apply airspace classifications using sectional charts and UAS facility maps to determine legal flight operations.
202.01	Students will identify airspace classes (B, C, D, E, G) and their characteristics.
202.02	Students will interpret sectional chart symbols and legends.
202.03	Students will differentiate between controlled and uncontrolled airspace.

Objective
Students will identify FAA airspace classifications and determine where drone operations are permitted under Part 107.

Essential Question
How does airspace classification affect where and how drones can be legally operated?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- Where do you think airplanes are allowed to fly?
- Do you think drones can fly anywhere? Why or why not?
- What might happen if drones and airplanes share the same space without rules?

Teacher will connect responses to the need for structured airspace systems.

Vocabulary

- **Airspace** – The portion of the atmosphere controlled by a country
- **Controlled Airspace** – Airspace that requires FAA authorization (Classes B, C, D, E)
- **Uncontrolled Airspace** – Airspace that does not require authorization (Class G)
- **Class B Airspace** – Airspace surrounding the busiest airports
- **Class C Airspace** – Airspace around medium-sized airports
- **Class D Airspace** – Airspace around smaller airports with control towers
- **Class E Airspace** – Controlled airspace not classified as B, C, or D
- **Class G Airspace** – Uncontrolled airspace
- **LAANC** – Low Altitude Authorization and Notification Capability system
- **Sectional Chart** – Aeronautical chart used to visualize airspace and aviation features

Materials

- Student notebook or guided notes sheet
- Whiteboard / presentation slides
- Printed or digital sectional charts
- FAA airspace reference chart
- Drone (for demonstration)

- Batteries (fully charged)
- Projector or screen for visual examples

Instruction Content

The National Airspace System (NAS) is divided into different classifications to ensure safe and efficient operation of aircraft. These classifications determine where drones can legally operate and whether authorization is required.

There are five primary classes of airspace:

- Class B
- Class C
- Class D
- Class E
- Class G

Controlled airspace includes:

- Class B
- Class C
- Class D
- Class E

Operations in controlled airspace require FAA authorization, typically obtained through the LAANC system.

Uncontrolled airspace includes:

- Class G

In Class G airspace, drone operations are generally allowed without prior authorization, provided all Part 107 rules are followed.

Key concepts for drone operations:

- Airspace determines where you can fly legally
- Authorization is required before entering controlled airspace
- Altitude restrictions may vary depending on location
- Sectional charts provide a visual representation of airspace boundaries

Examples of airspace use:

- Class B: Large international airports (highly restricted)
- Class C/D: Regional and local airports (moderately restricted)
- Class G: Rural or low-traffic areas (least restricted)

Understanding airspace is essential for safe and legal drone operations and is heavily tested on the FAA Part 107 exam.

Teacher Emphasis

- Emphasize that airspace determines where drones can legally fly
- Reinforce that controlled airspace always requires authorization
- Highlight that Class G is the most flexible for drone operations
- Connect airspace knowledge directly to FAA test success
- Stress that misunderstanding airspace can lead to violations and safety risks
- Begin introducing sectional charts as essential tools

Activity Procedure

Activity: Airspace Classification Identification

1. Students take structured notes during instruction
2. Students classify different airspace examples provided by the instructor:
    - Identify whether the airspace is controlled or uncontrolled
    - Determine if authorization is required
3. Teacher will use the following Formative Assessment questions:
    - Which airspace types require FAA authorization?
    - Why is Class B airspace more restrictive than Class G?
    - How does airspace classification improve safety?
4. Instructor reviews responses and clarifies misunderstandings

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Flight Activity (Airspace Awareness Simulation)

1. Review designated flight area boundaries
2. Identify “safe” vs “restricted” zones in the field (simulated)
3. Perform controlled takeoff and hover
4. Navigate within designated “approved” area
5. Maintain awareness of boundaries during flight
6. Perform controlled landing

Instructor emphasis: awareness, boundaries, and controlled movement

---

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Airspace Identification	Incorrect or minimal	Partial understanding	Correct identification	Comprehensive understanding
Authorization Knowledge	Limited recall	Basic understanding	Correct application	Detailed and accurate understanding
Scenario Classification	Incorrect	Partially correct	Mostly correct	Fully accurate with reasoning
Flight Boundary Awareness	Unsafe or unaware	Basic awareness	Maintains boundaries	Precise and consistent control

---

Assessment Items

1. Which airspace class does NOT require FAA authorization?
   A. Class B
   B. Class C
   C. Class D
   D. Class G

2. What system is used to obtain airspace authorization?
   A. METAR
   B. LAANC
   C. NOTAM
   D. ADS-B
3. Which airspace surrounds the busiest airports?
   A. Class D
   B. Class E
   C. Class B
   D. Class G
4. What type of airspace is Class E?
   A. Uncontrolled
   B. Military
   C. Controlled
   D. Restricted
5. Scenario:
   A pilot wants to fly near a large international airport.
   What must they do before flying?

Answer Key

1. D
2. B
3. C
4. C
5. Obtain FAA authorization (LAANC) before operating in controlled airspace

---

Closure

- Review differences between controlled and uncontrolled airspace
- Ask students to identify which airspace they would prefer to fly in and why
- Reinforce that airspace knowledge is critical for safe and legal operations

---

Teacher Notes

- Begin reinforcing sectional chart familiarity daily
- Use visual aids frequently for airspace concepts
- Prepare students for deeper chart interpretation in upcoming lessons

Week 1 – Day 4

Sectional Charts & Airspace Interpretation

Standards

Standard	Description
202.00	Students will apply airspace classifications using sectional charts and UAS facility maps to determine legal flight operations.
202.03	Students will differentiate between controlled and uncontrolled airspace.
202.04	Students will apply airspace knowledge to determine authorization requirements.

Objective
Students will interpret FAA sectional charts to identify airspace classifications, altitude limits, and authorization requirements for drone operations.

Essential Question
How do sectional charts help a remote pilot determine where and how to safely and legally fly?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- How would a pilot know where it is safe to fly?
- What kind of map would be needed for aircraft instead of cars?
- Why might different colors and symbols be used on a flight map?

Teacher will introduce sectional charts as the primary navigation tool for pilots.

Vocabulary

- **Sectional Chart** – A map used by pilots to navigate and identify airspace and hazards
- **Airspace Boundary** – A defined area of airspace with specific rules
- **MSL (Mean Sea Level)** – Altitude measured from sea level
- **AGL (Above Ground Level)** – Altitude measured from the ground
- **Latitude/Longitude** – Geographic coordinate system used for navigation
- **Isogonic Line** – Line showing variation between true north and magnetic north
- **Obstacle** – Any structure that may pose a hazard to flight
- **Ceiling** – The height of the lowest cloud layer
- **Visibility** – Distance a pilot can see clearly

Materials

- Student notebook or guided notes sheet
- Printed sectional charts (local area preferred)
- Digital chart display (optional)
- Whiteboard / presentation slides
- FAA legend reference chart
- Highlighters or colored pencils
- Drone (for demonstration)

Instruction Content
Sectional charts are aeronautical maps used by pilots to navigate and understand the National Airspace System. These charts provide critical information needed to determine where flight is permitted and what restrictions apply.

Sectional charts display:
- Airspace classifications (B, C, D, E, G)
- Airports and runways
- Obstructions such as towers and buildings
- Terrain features
- Latitude and longitude lines
- Special use airspace

Airspace is identified using colors and symbols:
- Solid blue lines indicate Class B airspace
- Solid magenta lines indicate Class C airspace
- Dashed blue lines indicate Class D airspace
- Dashed magenta lines indicate Class E airspace

Altitude information is often displayed in fractional format:
Example:
100 / 40

This means:
- 10,000 feet MSL (top of airspace)
- 4,000 feet MSL (floor of airspace)

Drone pilots must interpret these values to determine if operations are allowed and whether authorization is required.

Key interpretation skills include:
- Identifying airspace class using color and shape
- Determining altitude limits
- Recognizing proximity to airports
- Identifying hazards and obstacles

Understanding sectional charts is one of the most heavily tested areas on the FAA Part 107 exam and is essential for real-world flight planning.

Teacher Emphasis
- Emphasize that sectional charts are required knowledge for the FAA exam
- Reinforce that colors and symbols communicate critical safety information
- Highlight the importance of understanding altitude in MSL vs AGL
- Connect chart interpretation to real flight planning decisions
- Encourage students to become comfortable reading charts daily
- Reinforce that misreading charts can lead to unsafe or illegal operations

---

Activity Procedure

Activity: Sectional Chart Analysis

1. Students take structured notes during instruction
2. Students analyze a provided sectional chart and identify:
    - Airspace classifications
    - Nearby airports
    - Altitude limits
3. Teacher will use the following Formative Assessment questions:
    - What do dashed vs solid lines indicate?
    - How do you determine altitude limits from the chart?
    - Why is it important to identify nearby airports?
4. Instructor reviews responses and provides guided corrections

---

Flight Activity (Chart to Field Connection)

1. Identify current location on a sectional chart
2. Discuss what airspace the class is operating in
3. Perform controlled takeoff
4. Maintain a consistent hover
5. Execute controlled directional movements
6. Perform a safe landing

Instructor emphasis: connecting chart knowledge to real-world location awareness

---

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Chart Interpretation	Incorrect or minimal	Partial understanding	Accurate identification	Detailed and confident interpretation
Airspace Identification	Incorrect	Partially correct	Mostly correct	Fully accurate
Altitude Understanding	Limited	Basic understanding	Correct interpretation	Advanced understanding
Flight Awareness	Unsafe or unaware	Basic awareness	Controlled flight	Precise and situationally aware

---

Assessment Items

1. What do dashed blue lines represent on a sectional chart?
   A. Class B airspace
   B. Class C airspace
   C. Class D airspace
   D. Class G airspace

2. What does a solid magenta line indicate?
   A. Class B
   B. Class C
   C. Class D
   D. Class E

3. What does the number “100” represent in 100 / 40?
   A. 1,000 feet AGL
   B. 10,000 feet MSL
   C. 100 feet AGL
   D. 1,000 feet MSL
4. What does MSL stand for?
   A. Maximum Safety Limit
   B. Mean Sea Level
   C. Minimum Safe Level
   D. Measured Surface Level
5. Scenario:
   A drone pilot sees dashed magenta lines around their location.
   What airspace are they in, and what must they consider before flying?

Answer Key

1. C
2. B
3. B
4. B
5. Class E airspace — must determine altitude and whether authorization is required

---

Closure

- Review key chart symbols and colors
- Ask students what part of chart reading was most challenging
- Reinforce that chart interpretation is essential for FAA exam success

---

Teacher Notes

- Use local charts whenever possible for relevance
- Encourage repeated exposure to charts for retention
- Prepare students for more advanced chart interpretation next lesson

Week 1 – Day 5

Airspace & Sectional Chart Application + Week 1 Assessment

Standards

Standard	Description
202.00	Students will apply airspace classifications using sectional charts and UAS facility maps to determine legal flight operations.
202.02	Students will interpret sectional chart symbols and legends.
202.03	Students will differentiate between controlled and uncontrolled airspace.
202.04	Students will apply airspace knowledge to determine authorization requirements.

Objective
Students will apply knowledge of airspace and sectional charts to determine whether drone operations are safe and compliant with FAA Part 107 regulations.

Essential Question
How can a remote pilot use airspace knowledge and sectional charts to make safe and legal flight decisions?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What is the most important thing a pilot must check before flying?
- Why might two different locations have different flight rules?
- How confident are you in reading a sectional chart?

Teacher will use responses to review key Week 1 concepts.

Vocabulary

- **Airspace Authorization** – FAA approval required to operate in controlled airspace
- **LAANC** – System used to request near real-time authorization
- **Controlled Airspace** – Airspace requiring FAA authorization
- **Uncontrolled Airspace** – Airspace not requiring prior authorization
- **Sectional Chart Symbol** – Visual representation of airspace or aviation feature
- **Altitude Restriction** – Limit on how high an aircraft may fly
- **Flight Planning** – Process of preparing for safe and legal drone operations

---

Materials

- Student notebook or guided notes sheet
- Printed sectional charts (local area preferred)
- Scenario worksheets
- Whiteboard / presentation slides
- FAA reference materials
- Drone and controller
- Batteries (fully charged)

- Flight area markers

Instruction Content
Safe and legal drone operation requires the ability to apply airspace knowledge and interpret sectional charts accurately. Remote pilots must evaluate their environment before every flight to determine compliance with FAA regulations.

Before any flight, a remote pilot must:
- Identify the airspace classification
- Determine if FAA authorization is required
- Check altitude limitations
- Identify nearby airports or hazards
- Evaluate environmental conditions

Flight planning decisions must include:
- Whether the location is in controlled or uncontrolled airspace
- Whether LAANC authorization is required
- Whether altitude restrictions impact the operation
- Whether hazards or obstacles are present

Key decision-making process includes:
1. Identify location on sectional chart
2. Determine airspace classification
3. Check altitude limitations
4. Determine if authorization is required
5. Evaluate safety risks

This process is critical for both FAA Part 107 exam success and real-world drone operations.

Teacher Emphasis
- Reinforce that every flight begins with airspace evaluation
- Emphasize that chart interpretation is a required skill, not optional
- Highlight the importance of combining multiple pieces of information
- Connect decision-making process to FAA test questions
- Reinforce that safe operations require planning before takeoff

---

Activity Procedure
Activity: Flight Planning Scenarios
1. Students take structured notes during instruction
2. Students analyze flight scenarios and determine:
    - Airspace classification
    - Whether authorization is required
    - Maximum allowable altitude
    - Whether the operation is safe and legal
3. Teacher will use the following Formative Assessment questions:
    - What steps must be completed before every flight?
    - How do you determine if authorization is required?
    - Why is flight planning critical to safety?
4. Instructor reviews responses and explains correct reasoning

Flight Activity (Applied Awareness)

1. Identify current location on a sectional chart
2. Determine airspace classification
3. Establish safe flight boundaries
4. Perform controlled takeoff
5. Maintain controlled movement within boundaries
6. Execute safe landing

Instructor emphasis: applying planning knowledge to real flight

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Airspace Application	Incorrect or incomplete	Partial understanding	Correct application	Accurate and consistent application
Chart Interpretation	Minimal accuracy	Basic understanding	Mostly correct	Fully accurate
Scenario Decision-Making	Incorrect decisions	Partially correct	Mostly correct	Fully correct with reasoning
Flight Execution	Unsafe	Basic control	Safe	Precise and controlled

Assessment Items (Week 1 Quiz)

1. Which airspace requires FAA authorization?
   A. Class G
   B. Class B
   C. Uncontrolled
   D. Rural
2. What system is used to request airspace authorization?
   A. METAR
   B. LAANC
   C. GPS
   D. ADS-B
3. What is the maximum altitude under Part 107?
   A. 200 feet
   B. 300 feet
   C. 400 feet
   D. 500 feet
4. What must a pilot check before flying?
   A. Battery only
   B. Airspace only
   C. Airspace, altitude, and hazards
   D. Camera settings

5. What do dashed magenta lines represent?
   A. Class B
   B. Class C
   C. Class D
   D. Class E
6. Scenario:
   A pilot plans to fly in Class C airspace.
   What must they do before flying?

Answer Key

1. B
2. B
3. C
4. C
5. D
6. Obtain FAA authorization (LAANC) before flight

Closure

- Review key Week 1 concepts
- Ask students to explain the flight planning process
- Reinforce that all flights require preparation and awareness

---

Teacher Notes

- Use this day to assess readiness for deeper FAA content
- Reinforce weak areas before moving forward
- Ensure students are comfortable with airspace basics

Week 1 COMPLETE

You now have:

- Full FAA-aligned progression
- Strong foundation in:
  - Certification
  - Responsibilities
  - Airspace
  - Charts
  - Application

Week 2 – Day 1

Introduction to Weather & Its Impact on Drone Operations

Standards

Standard	Description
203.00	Students will interpret aviation weather data and apply it to safe sUAS operations.
203.01	Students will identify basic weather concepts, including wind, pressure, and stability.
203.02	Students will decode METAR and TAF reports.
203.03	Students will evaluate weather-related risks prior to flight operations.

Objective
Students will identify key weather elements and explain how weather conditions affect drone performance and operational safety.

Essential Question
How do weather conditions influence the safety and performance of drone operations?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What types of weather would make flying a drone dangerous?
- How might wind affect a drone in flight?
- Why do pilots need to understand weather before flying?

Teacher will connect responses to aviation safety and FAA requirements.

Vocabulary

- **Weather** – The state of the atmosphere at a specific time and place
- **Wind Speed** – The rate at which air is moving
- **Wind Direction** – The direction from which the wind is coming
- **Visibility** – The distance at which objects can be clearly seen
- **Ceiling** – The height of the lowest cloud layer covering more than half the sky
- **Temperature** – The measure of heat in the atmosphere
- **Density Altitude** – The altitude corrected for temperature and pressure affecting aircraft performance
- **Gusts** – Sudden increases in wind speed
- **Precipitation** – Any form of water falling from the atmosphere

Materials

- Student notebook or guided notes sheet
- Whiteboard / presentation slides
- Weather visuals (images/videos)
- Internet access for live weather data (optional)
- Drone and controller
- Batteries (fully charged)

- Wind indicator (flag or ribbon)

Instruction Content

Weather is one of the most critical factors affecting safe drone operations. Remote pilots must evaluate weather conditions before and during every flight to ensure safety and compliance with FAA regulations.

Key weather elements include:

- Wind
- Visibility
- Cloud cover
- Temperature
- Precipitation

Wind is the most significant factor for drone operations:

- High winds can cause loss of control
- Gusts can destabilize the aircraft
- Wind direction affects flight path and battery usage

Visibility requirements under Part 107:

- Minimum of 3 statute miles visibility
- Must maintain visual line of sight (VLOS) at all times

Cloud clearance requirements:

- 500 feet below clouds
- 2,000 feet horizontally from clouds

Temperature and density altitude impact:

- High temperatures reduce air density
- Reduced air density decreases lift and performance
- Motors must work harder, reducing battery efficiency

Precipitation risks include:

- Damage to electrical components
- Reduced visibility
- Increased risk of system failure

Remote pilots must continuously assess weather conditions and determine if it is safe to operate. Weather-related questions are heavily represented on the FAA Part 107 exam.

Teacher Emphasis

- Emphasize that weather is a primary cause of drone accidents
- Reinforce that pilots must check weather before every flight
- Highlight that wind is the most immediate operational risk
- Connect weather knowledge directly to FAA exam questions
- Stress that unsafe weather conditions require cancelling the flight
- Reinforce that safety decisions are the pilot’s responsibility

---

Activity Procedure

Activity: Weather Impact Analysis

1. Students take structured notes during instruction
2. Students evaluate different weather scenarios and determine:
    - Whether conditions are safe for flight
    - Which weather factors present risks
3. Teacher will use the following Formative Assessment questions:
    - Why is wind more dangerous than it may appear?
    - How does temperature affect drone performance?
    - What weather conditions would prevent safe flight?
4. Instructor reviews responses and explains reasoning

Flight Activity (Wind Awareness)

1. Observe wind direction using visual indicators
2. Perform controlled takeoff
3. Maintain stable hover
4. Observe drift caused by wind
5. Practice correcting for wind movement
6. Execute controlled landing

Instructor emphasis: awareness of environmental impact on flight

---

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Weather Knowledge	Limited or incorrect	Basic understanding	Accurate identification	Detailed and applied understanding
Risk Evaluation	Incorrect decisions	Partial understanding	Mostly correct	Fully accurate with reasoning
Scenario Analysis	Minimal accuracy	Partial accuracy	Mostly correct	Fully accurate
Flight Control in Wind	Unsafe	Basic control	Controlled flight	Precise and adaptive

---

Assessment Items

1. What is the minimum visibility required under Part 107?
   A. 1 mile
   B. 2 miles
   C. 3 miles
   D. 5 miles

2. How far below clouds must a drone operate?
   A. 100 feet
   B. 300 feet
   C. 500 feet
   D. 1,000 feet

3. Which weather factor most directly affects drone control?
   A. Temperature
   B. Wind
   C. Humidity
   D. Pressure
4. What is a wind gust?
   A. Constant wind speed
   B. Sudden increase in wind speed
   C. Change in temperature
   D. Air pressure drop
5. Scenario:
   A pilot observes strong, gusty winds before flight.
   Should they proceed? Why or why not?

Answer Key

1. C
2. C
3. B
4. B
5. No — gusty winds create unsafe flight conditions

Closure

- Review key weather factors
- Ask students which weather condition they think is most dangerous
- Reinforce that weather evaluation is required before every flight

---

Teacher Notes

- Begin reinforcing weather checks as a daily habit
- Use real-world examples of weather-related incidents
- Prepare students for METAR/TAF interpretation next

Week 2 – Day 2

METAR Reports: Decoding Aviation Weather Data

Standards

Standard	Description
203.00	Students will interpret aviation weather data and apply it to safe sUAS operations.
203.04	Students will apply weather data to make go/no-go flight decisions.
203.05	Students will evaluate weather data to determine safe flight conditions.

Objective
Students will decode METAR reports and interpret aviation weather data to determine safe and legal drone operations.

Essential Question
How can a remote pilot interpret METAR reports to make safe flight decisions?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- Have you ever checked the weather and it looked confusing? Why?
- What information would a pilot need beyond a basic weather app?
- Why might aviation weather reports look coded instead of written out?

Teacher will connect responses to the need for standardized aviation reporting.

Vocabulary

- **METAR** – Aviation weather report describing current conditions
- **Station Identifier** – Four-letter airport code (e.g., KJFK)
- **Wind Group** – Wind direction and speed (e.g., 18010KT)
- **Visibility** – Distance reported in statute miles
- **Cloud Cover** – Description of cloud layers (FEW, SCT, BKN, OVC)
- **Temperature/Dew Point** – Reported in Celsius
- **Altimeter Setting** – Atmospheric pressure reading (e.g., A2992)
- **Remarks (RMK)** – Additional weather details

Materials

- Student notebook or guided notes sheet
- METAR decoding chart/reference sheet
- Sample METAR reports (printed or digital)
- Whiteboard / presentation slides
- Internet access for live METAR data (optional)

Instruction Content
METAR (Meteorological Aerodrome Report) provides standardized aviation weather data used by pilots to assess current conditions. These reports are coded to ensure quick and consistent communication across aviation operations.

A METAR report includes the following components:
- Station Identifier
- Date and Time
- Wind Direction and Speed
- Visibility
- Weather Conditions
- Cloud Coverage
- Temperature and Dew Point
- Altimeter Setting

Example METAR:
KJFK 121651Z 18010KT 10SM FEW050 SCT100 25/18 A2992

Breakdown:
- KJFK = Airport identifier
- 121651Z = Date/time (12th day at 1651 UTC)
- 18010KT = Wind from 180° at 10 knots
- 10SM = Visibility of 10 statute miles
- FEW050 = Few clouds at 5,000 feet
- SCT100 = Scattered clouds at 10,000 feet
- 25/18 = Temperature 25°C / Dew point 18°C
- A2992 = Altimeter setting

Cloud coverage codes include:
- FEW = Few clouds
- SCT = Scattered
- BKN = Broken (ceiling layer)
- OVC = Overcast

Key interpretation skills include:
- Determining if visibility meets FAA minimums (3 SM)
- Identifying wind conditions and potential hazards
- Recognizing cloud ceilings and clearance requirements
- Evaluating whether conditions are safe for flight

Understanding METAR reports is essential for FAA Part 107 exam success and real-world flight planning.

Teacher Emphasis
- Emphasize that METAR decoding is heavily tested on the FAA exam
- Reinforce that pilots must understand coded weather data
- Highlight that wind and visibility are critical decision factors
- Connect METAR interpretation to real flight planning
- Encourage repeated practice to build confidence

Activity Procedure

Activity: METAR Decoding Practice

1. Students take structured notes during instruction
2. Students decode multiple METAR reports and identify:
    - Wind conditions
    - Visibility
    - Cloud coverage
    - Temperature
3. Teacher will use the following Formative Assessment questions:
    - What does “KT” represent in a METAR?
    - How do you determine if visibility is acceptable for flight?
    - Which part of the METAR indicates cloud conditions?
4. Instructor reviews responses and provides guided corrections

---

Flight Activity (Weather Awareness Connection)

1. Review current local weather conditions
2. Compare observed conditions to a METAR report (if available)
3. Perform controlled takeoff
4. Maintain stable hover
5. Observe environmental effects (wind, visibility)
6. Execute safe landing

Instructor emphasis: connecting reported weather to real conditions

---

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
METAR Decoding	Incorrect or minimal	Partial decoding	Mostly correct	Fully accurate and detailed
Weather Interpretation	Limited understanding	Basic understanding	Correct interpretation	Advanced analysis
Scenario Evaluation	Incorrect decisions	Partial accuracy	Mostly correct	Fully accurate with reasoning
Flight Awareness	Unsafe or unaware	Basic awareness	Controlled	Precise and adaptive

---

Assessment Items

1. What does “KT” represent in a METAR?
   A. Kilometers
   B. Knots (wind speed)
   C. Temperature
   D. Time

2. What does “10SM” indicate?
   A. 10 seconds
   B. 10 statute miles visibility
   C. 10 knots wind
   D. 10% humidity
3. What does “BKN” represent?
   A. Broken cloud layer
   B. Clear sky
   C. Strong winds
   D. Rain
4. What is the temperature unit used in METAR reports?
   A. Fahrenheit
   B. Kelvin
   C. Celsius
   D. Rankine
5. Scenario:
   A METAR reports visibility of 2SM.
   Can a remote pilot legally fly under Part 107? Explain.

Answer Key

1. B
2. B
3. A
4. C
5. No — minimum visibility is 3 statute miles

Closure

- Review METAR structure and key components
- Ask students which part of the METAR was most difficult
- Reinforce that decoding improves with practice

Teacher Notes

- Provide repeated METAR decoding practice
- Use real-world METAR reports daily
- Prepare students for TAF reports next lesson

Week 2 – Day 3

TAF Reports & Aviation Weather Forecasting

Standards

Standard	Description
203.00	Students will interpret aviation weather data and apply it to safe sUAS operations.
203.04	Students will apply weather data to make go/no-go flight decisions.
203.05	Students will evaluate weather data to determine safe flight conditions.
203.06	Students will interpret forecasted weather conditions and trends.

Objective
Students will interpret TAF reports and apply forecasted weather data to make safe flight planning decisions.

Essential Question
How can a remote pilot use weather forecasts to plan safe and compliant drone operations?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- Why is it important to know future weather instead of just current conditions?
- Have you ever planned something that was affected by changing weather?
- How could changing weather impact a drone flight after takeoff?

Teacher will connect responses to the importance of forecasting in aviation.

Vocabulary

- **TAF (Terminal Aerodrome Forecast)** – Aviation weather forecast for a specific airport
- **Forecast Period** – Time range covered by the TAF
- **FM (From)** – Indicates a rapid change in weather conditions
- **TEMPO** – Temporary fluctuations in weather conditions
- **BECMG** – Gradual change in weather conditions
- **Probability (PROB)** – Likelihood of certain weather conditions occurring
- **Ceiling** – Height of the lowest broken or overcast cloud layer
- **Trend Forecasting** – Predicting changes in weather over time

---

Materials

- Student notebook or guided notes sheet
- TAF decoding reference sheet
- Sample TAF reports (printed or digital)
- Whiteboard / presentation slides
- Internet access for live aviation weather data (optional)

Instruction Content
TAF (Terminal Aerodrome Forecast) reports provide forecasted weather conditions for a specific location, typically covering a 24- to 30-hour period. These reports allow pilots to plan ahead and anticipate changes in weather conditions.

A TAF report includes:
- Station identifier
- Issue date and time
- Forecast period
- Wind conditions
- Visibility
- Weather conditions
- Cloud coverage

Example TAF:
TAF KJFK 121720Z 1218/1324 18012KT P6SM SCT050
FM122200 20015KT 5SM BKN030
TEMPO 1302/1306 3SM -RA OVC020

Breakdown:
- KJFK = Airport identifier
- 121720Z = Issued on the 12th at 1720 UTC
- 1218/1324 = Forecast valid from the 12th at 1800 UTC to the 13th at 2400 UTC
- 18012KT = Wind from 180° at 12 knots
- P6SM = Visibility greater than 6 statute miles
- SCT050 = Scattered clouds at 5,000 feet

Key forecast change indicators:
- FM = Rapid change in conditions at a specific time
- TEMPO = Temporary weather changes expected
- BECMG = Gradual change over time

Important interpretation skills include:
- Identifying when weather conditions will change
- Recognizing potential hazards such as reduced visibility or precipitation
- Determining if forecast conditions meet FAA minimums
- Planning flights to avoid unsafe conditions

Remote pilots must use both METAR (current conditions) and TAF (forecast conditions) to make informed decisions before flight.

Teacher Emphasis
- Emphasize that TAF reports are critical for flight planning
- Reinforce that weather conditions can change rapidly
- Highlight the importance of understanding forecast trends
- Connect TAF interpretation to FAA exam expectations
- Stress that pilots must anticipate future conditions, not just current weather

---

Activity Procedure

Activity: TAF Forecast Analysis

1. Students take structured notes during instruction
2. Students decode TAF reports and determine:
    - Current forecast conditions
    - Changes in weather over time
    - Potential risks for drone operations
3. Teacher will use the following Formative Assessment questions:
    - What does “FM” indicate in a TAF?
    - How does “TEMPO” affect flight planning decisions?
    - Why is it important to identify changes in visibility or ceiling?
4. Instructor reviews responses and explains correct reasoning

---

Flight Activity (Weather Trend Awareness)

1. Review current weather conditions
2. Discuss how conditions may change during flight
3. Perform controlled takeoff
4. Maintain stable hover
5. Monitor environmental conditions during flight
6. Execute safe landing

Instructor emphasis: anticipating changes and maintaining awareness

---

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
TAF Interpretation	Incorrect or minimal	Partial understanding	Mostly correct	Fully accurate and detailed
Forecast Analysis	Limited understanding	Basic interpretation	Correct analysis	Advanced and predictive reasoning
Scenario Decision-Making	Incorrect decisions	Partial accuracy	Mostly correct	Fully accurate with reasoning
Flight Awareness	Unsafe or unaware	Basic awareness	Controlled	Precise and adaptive

---

Assessment Items

1. What does “TAF” stand for?
   A. Terminal Aerodrome Forecast
   B. Total Aviation Format
   C. Time and Forecast
   D. Temperature and Fog

2. What does “FM” indicate in a TAF?
   A. Temporary change
   B. Gradual change
   C. Rapid change at a specific time
   D. No change
3. What does “TEMPO” represent?
   A. Permanent change
   B. Temporary weather conditions
   C. Wind direction
   D. Visibility
4. What does “P6SM” indicate?
   A. Visibility less than 6 miles
   B. Visibility exactly 6 miles
   C. Visibility greater than 6 miles
   D. Wind speed
5. Scenario:
   A TAF indicates worsening weather conditions later in the day.
   Should a pilot consider this before flying? Explain.

Answer Key

1. A
2. C
3. B
4. C
5. Yes — pilots must consider forecasted conditions to ensure safe operation

---

Closure

- Review differences between METAR and TAF
- Ask students why forecasting is critical for safe flight
- Reinforce that planning must include future conditions

Teacher Notes

- Continue daily weather decoding practice
- Combine METAR and TAF in upcoming lessons
- Prepare students for weather decision-making scenarios

Week 2 – Day 4

Weather Theory: Stability, Fronts, and Hazardous Conditions

Standards

Standard	Description
203.00	Students will interpret aviation weather data and apply it to safe sUAS operations.
203.02	Students will decode METAR and TAF reports.
203.05	Students will evaluate weather hazards and their impact on flight safety.
203.06	Students will interpret weather trends including fronts and stability.

Objective
Students will explain atmospheric stability, weather fronts, and hazardous weather conditions and evaluate their impact on drone operations.

Essential Question
How do atmospheric conditions and weather systems create hazards for drone operations?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- Why do storms form in some conditions but not others?
- What types of weather are most dangerous for flight?
- How might rapidly changing weather impact a drone pilot?

Teacher will connect responses to atmospheric behavior and flight risk.

Vocabulary

- **Atmospheric Stability** – The tendency of air to resist or enhance vertical motion
- **Stable Air** – Air that resists vertical movement (smooth conditions)
- **Unstable Air** – Air that promotes vertical movement (turbulence, storms)
- **Cold Front** – Boundary where cold air replaces warm air
- **Warm Front** – Boundary where warm air replaces cold air
- **Stationary Front** – Boundary between air masses that is not moving
- **Occluded Front** – When a cold front overtakes a warm front
- **Turbulence** – Irregular air movement
- **Wind Shear** – Sudden change in wind speed or direction
- **Thunderstorm** – Severe weather system with strong winds, rain, and lightning

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Materials

- Student notebook or guided notes sheet
- Weather diagrams (fronts and air masses)
- Whiteboard / presentation slides
- Videos or images of weather systems
- Internet access for weather examples (optional)

Instruction Content
Weather is driven by atmospheric conditions, including temperature, pressure, and the movement of air masses. Understanding these factors allows pilots to anticipate hazardous conditions.

Atmospheric stability determines air movement:
- Stable air produces smooth flight conditions with little turbulence
- Unstable air produces rising air, turbulence, and storm development

Characteristics of stable air include:
- Smooth conditions
- Poor visibility (haze, fog)
- Steady precipitation

Characteristics of unstable air include:
- Turbulence
- Good visibility
- Convective activity (rising air, storms)

Weather fronts form when air masses meet:
- Cold Front
    - Rapid movement
    - Strong winds
    - Thunderstorms
    - Sudden temperature drop
- Warm Front
    - Gradual movement
    - Widespread clouds
    - Steady precipitation
- Stationary Front
    - Little movement
    - Prolonged weather conditions
- Occluded Front
    - Complex weather patterns
    - Combination of warm and cold front characteristics

Hazardous weather conditions include:
- Thunderstorms
- Wind shear
- Turbulence
- Icing (more relevant to manned aircraft but still important conceptually)
- Low visibility

These conditions pose significant risks to drone operations and must be avoided.
Remote pilots must evaluate atmospheric conditions and recognize patterns that indicate unsafe flight environments.

Teacher Emphasis

- Emphasize that unstable air creates the most hazardous conditions
- Reinforce that thunderstorms are never safe for drone flight
- Highlight that fronts signal changing weather conditions
- Connect weather theory to real-world flight decisions
- Reinforce that pilots must anticipate hazards before they occur
- Stress that recognizing patterns is critical for FAA exam success

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Activity Procedure

Activity: Weather Hazard Identification

1. Students take structured notes during instruction
2. Students analyze weather scenarios and identify:
    - Type of front (if applicable)
    - Whether conditions are stable or unstable
    - Potential hazards
3. Teacher will use the following Formative Assessment questions:
    - What conditions indicate unstable air?
    - Why are cold fronts often more dangerous than warm fronts?
    - What hazards are associated with thunderstorms?
4. Instructor reviews responses and provides clarification

Flight Activity (Environmental Awareness)

1. Observe current sky conditions
2. Identify cloud types and movement
3. Discuss whether conditions appear stable or unstable
4. Perform controlled takeoff
5. Maintain stable hover
6. Execute safe landing

Instructor emphasis: recognizing environmental indicators

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Weather Theory Understanding	Limited or incorrect	Basic understanding	Accurate explanation	Detailed and applied understanding
Front Identification	Incorrect	Partial accuracy	Mostly correct	Fully accurate
Hazard Recognition	Minimal awareness	Basic identification	Correct identification	Comprehensive analysis
Flight Awareness	Unsafe or unaware	Basic awareness	Controlled	Highly aware and adaptive

---

Assessment Items

1. What type of air is most likely to produce turbulence?
   A. Stable air
   B. Unstable air
   C. Cold air
   D. Dry air
2. Which front is associated with thunderstorms?
   A. Warm front
   B. Stationary front
   C. Cold front
   D. Occluded front
3. What is wind shear?
   A. Constant wind
   B. Sudden change in wind speed or direction
   C. Change in temperature
   D. Decrease in pressure
4. Which condition is most hazardous for drone flight?
   A. Light wind
   B. Clear skies
   C. Thunderstorms
   D. Calm air
5. Scenario:
   A pilot observes rapidly rising clouds and increasing winds.
   What type of conditions may be developing and what should they do?

Answer Key

1. B
2. C
3. B
4. C
5. Unstable/storm conditions — should not fly or should land immediately

---

Closure

- Review key differences between stable and unstable air
- Ask students which weather condition they believe is most dangerous
- Reinforce that recognizing hazards is critical for safe operations

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Teacher Notes

- Use visual examples to reinforce abstract concepts
- Connect theory to real-world observations
- Prepare students for applied weather decision-making next lesson

Week 2 – Day 5

Weather Application & Flight Decision-Making + Week 2 Assessment

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Standards

Standard	Description
203.00	Students will interpret aviation weather data and apply it to safe sUAS operations.
203.04	Students will apply weather data to make go/no-go flight decisions.
203.05	Students will evaluate weather data to determine safe flight conditions.
203.06	Students will apply weather knowledge to real-world flight planning decisions.

Objective
Students will apply weather knowledge, including METAR and TAF interpretation, to determine whether drone operations are safe and compliant with FAA Part 107 regulations.

Essential Question
How can a remote pilot use weather data and forecasts to make safe and legal flight decisions?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What weather factor do you think is most dangerous for drone flight and why?
- Why is it important to check both current and forecasted weather?
- What could happen if a pilot ignores changing weather conditions?

Teacher will use responses to review Week 2 weather concepts.

Vocabulary

- **Flight Decision-Making** – The process of evaluating conditions to determine if flight is safe
- **Go/No-Go Decision** – Determination of whether conditions are safe to proceed
- **Weather Minimums** – FAA-required conditions for legal flight
- **Risk Assessment** – Evaluation of potential hazards
- **Situational Awareness** – Understanding of current and changing conditions during flight

---

Materials

- Student notebook or guided notes sheet
- METAR and TAF reference sheets
- Scenario worksheets
- Whiteboard / presentation slides
- Internet access for live weather data (optional)
- Drone and controller
- Batteries (fully charged)
- Flight area markers

Instruction Content
Remote pilots must combine all weather knowledge to make informed flight decisions. This includes evaluating both current conditions (METAR) and forecasted conditions (TAF).

The flight decision-making process includes:
1. Reviewing current weather (METAR)
2. Reviewing forecasted weather (TAF)
3. Identifying hazards (wind, visibility, clouds, precipitation)
4. Comparing conditions to FAA minimums
5. Making a Go/No-Go decision

FAA weather minimums include:
- Minimum visibility of 3 statute miles
- Cloud clearance of 500 feet below and 2,000 feet horizontally
- Maintaining visual line of sight at all times

Key risk factors include:
- Strong or gusty winds
- Low visibility
- Low cloud ceilings
- Thunderstorms or precipitation
- Rapidly changing weather conditions

Good decision-making requires:
- Evaluating all available data
- Anticipating changes in weather
- Prioritizing safety over completing a flight
- Knowing when to cancel or delay operations

Weather decision-making is a critical skill for both the FAA Part 107 exam and real-world drone operations.

Teacher Emphasis
- Reinforce that every flight requires a Go/No-Go decision
- Emphasize that safety must always take priority over mission completion
- Highlight that both current and forecasted weather must be considered
- Connect decision-making to real FAA test scenarios
- Reinforce that poor decisions are a leading cause of accidents

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<u>Activity Procedure</u>
Activity: Go / No-Go Weather Scenarios
1. Students take structured notes during instruction
2. Students analyze weather scenarios and determine:
    - Whether conditions meet FAA minimums
    - Whether the flight should proceed (Go/No-Go)
    - Justification for their decision

3. Teacher will use the following Formative Assessment questions:
    - What weather factors are most important in decision-making?
    - How do METAR and TAF work together?
    - When should a pilot cancel a flight?
4. Instructor reviews responses and explains correct reasoning

---

Flight Activity (Applied Weather Decision)

1. Observe current weather conditions
2. Discuss whether conditions meet FAA minimums
3. Make a class Go/No-Go decision
4. If safe, perform controlled takeoff
5. Maintain stable flight while monitoring conditions
6. Execute safe landing

Instructor emphasis: applying decision-making to real conditions

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Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Weather Interpretation	Limited or incorrect	Basic understanding	Accurate interpretation	Advanced analysis
Decision-Making	Incorrect decisions	Partial reasoning	Mostly correct	Fully justified decisions
Scenario Evaluation	Minimal accuracy	Partial accuracy	Mostly correct	Fully accurate
Flight Awareness	Unsafe	Basic awareness	Controlled	Highly aware and adaptive

---

Assessment Items (Week 2 Quiz)

1. What is the minimum visibility required under Part 107?
   A. 1 mile
   B. 2 miles
   C. 3 miles
   D. 5 miles
2. What report provides current weather conditions?
   A. TAF
   B. METAR
   C. NOTAM
   D. LAANC
3. What does “FM” indicate in a TAF?
   A. Temporary change
   B. Rapid change at a specific time
   C. Visibility
   D. Wind speed

4. Which condition is most hazardous for drone flight?
   A. Calm wind
   B. Clear skies
   C. Thunderstorms
   D. Mild temperature
5. What is the first step in flight decision-making?
   A. Fly the drone
   B. Check battery
   C. Review weather conditions
   D. Set camera
6. Scenario:
   A METAR shows 2SM visibility and strong winds.
   Should the pilot proceed with flight? Explain.

Answer Key

1. C
2. B
3. B
4. C
5. C
6. No — visibility is below minimum and winds create unsafe conditions

---

Closure

- Review the Go/No-Go decision process
- Ask students what factor most influences their decision
- Reinforce that safe pilots make informed decisions before flight

---

Teacher Notes

- Reinforce decision-making as a habit, not a one-time action
- Use real-world weather examples daily
- Prepare students for regulations and FAA rules in Week 3

Week 2 COMPLETE

Students now have strong FAA-aligned understanding of:

- Weather fundamentals
- METAR decoding
- TAF forecasting
- Weather theory
- Flight decision-making

Week 3 – Day 1

FAA Part 107 Regulations: Overview & Structure

Standards

Standard	Description
201.00	Students will explain FAA Part 107 regulations and operational requirements governing small UAS operations.
201.02	Students will interpret operational rules and regulatory requirements under Part 107.
201.03	Students will explain Remote Pilot in Command (PIC) responsibilities and legal accountability.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.02	Students will apply FAA regulations to determine legal drone operations.

Objective
Students will explain the structure and purpose of FAA Part 107 regulations and identify key rules governing drone operations.

Essential Question
Why are FAA Part 107 regulations necessary, and how do they ensure safe drone operations?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- Why do you think the government regulates airspace?
- What could happen if there were no rules for drones?
- Should drone pilots be held to the same standards as airplane pilots? Why or why not?

Teacher will connect responses to the need for federal regulation and safety oversight.

Vocabulary

- **Part 107** – FAA regulations governing small unmanned aircraft systems
- **14 CFR** – Title 14 of the Code of Federal Regulations (aviation rules)
- **Remote Pilot in Command (PIC)** – Person responsible for the drone operation
- **Waiver** – FAA authorization to deviate from specific rules
- **Certificate of Authorization (COA)** – Special authorization for certain operations
- **Regulatory Compliance** – Following established rules and laws
- **Operational Rule** – A regulation governing how a drone is flown

Materials

- Student notebook or guided notes sheet
- FAA Part 107 summary sheet
- Whiteboard / presentation slides
- Printed regulation excerpts (optional)
- Drone and controller

- Batteries (fully charged)

Instruction Content
FAA Part 107 is the set of federal regulations that governs the operation of small unmanned aircraft systems (sUAS) in the United States. These rules are part of Title 14 of the Code of Federal Regulations (14 CFR).

Part 107 establishes requirements for:
- Pilot certification
- Aircraft operation
- Airspace usage
- Safety procedures

The purpose of Part 107 is to:
- Ensure safety in the National Airspace System (NAS)
- Protect people and property on the ground
- Provide standardized rules for drone operations

Key regulatory areas include:
- Pilot certification requirements
- Operational limitations
- Airspace authorization
- Maintenance and inspection requirements
- Emergency procedures

The Remote Pilot in Command (PIC) is responsible for:
- Ensuring compliance with all FAA regulations
- Conducting safe operations
- Making final decisions regarding flight
- Assessing risks before and during flight

Waivers allow pilots to operate outside certain rules:
- Must be approved by the FAA
- Require demonstration of safe operation
- Common examples include night operations (historically) and operations over people

Understanding Part 107 is essential for FAA exam success and legal drone operation.

Teacher Emphasis
- Emphasize that Part 107 is federal law, not optional guidance
- Reinforce that pilots are legally responsible for compliance
- Highlight that violations can result in fines or certificate loss
- Connect regulations to real-world safety outcomes
- Reinforce that this content is heavily tested on the FAA exam

---

<u>Activity Procedure</u>
Activity: Regulation Identification
1. Students take structured notes during instruction

2. Students analyze different scenarios and identify:
    - Which regulation applies
    - Whether the operation is compliant
3. Teacher will use the following Formative Assessment questions:
    - Why does the FAA regulate drone operations?
    - What is the role of the PIC?
    - What happens if regulations are not followed?
4. Instructor reviews responses and provides clarification

Flight Activity (Regulation Awareness)

1. Review operational rules before flight
2. Identify safe flight area
3. Perform controlled takeoff
4. Maintain safe altitude and position
5. Demonstrate awareness of surroundings
6. Execute safe landing

Instructor emphasis: following rules during flight

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Regulation Understanding	Limited or incorrect	Basic understanding	Accurate explanation	Detailed and applied understanding
Scenario Analysis	Incorrect	Partial accuracy	Mostly correct	Fully accurate with reasoning
Compliance Awareness	Minimal	Basic	Consistent	Highly consistent
Flight Safety	Unsafe	Basic control	Safe	Precise and controlled

---

Assessment Items

1. What does Part 107 regulate?
   A. Cars
   B. Boats
   C. Drones
   D. Trains
2. Who is responsible for the drone operation?
   A. FAA
   B. Manufacturer
   C. Remote Pilot in Command
   D. Observer

3. What is a waiver?
   A. A license
   B. Permission to break rules without approval
   C. FAA approval to operate outside certain rules
   D. A weather report
4. What is the purpose of Part 107?
   A. Entertainment
   B. Safety and regulation
   C. Marketing
   D. Navigation
5. Scenario:
   A pilot ignores FAA regulations during flight.
   What could happen?

Answer Key

1. C
2. C
3. C
4. B
5. Fines, penalties, or certificate suspension/revocation

Closure

- Review purpose of Part 107
- Ask students why regulations are necessary
- Reinforce pilot responsibility and accountability

Teacher Notes

- Begin reinforcing regulation recall daily
- Use real-world examples of violations
- Prepare students for deeper rule breakdown next lesson

Week 3 – Day 2

Operational Rules Deep Dive (Part 107 Limitations & Requirements)

Standards

Standard	Description
201.00	Students will explain FAA Part 107 regulations and operational requirements governing small UAS operations.
201.02	Students will apply operational rules to determine legal drone operations.
201.03	Students will explain Remote Pilot in Command (PIC) responsibilities and legal accountability.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.02	Students will apply FAA regulations to determine legal drone operations.

Objective
Students will apply FAA Part 107 operational rules to determine whether drone operations are safe and compliant.

Essential Question
What operational rules must a remote pilot follow to ensure safe and legal drone operations?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What rules do you remember about how high or fast a drone can fly?
- Why would the FAA limit altitude and speed?
- What risks could occur if these limits were ignored?

Teacher will connect responses to specific Part 107 operational rules.

Vocabulary

- **Operational Limitation** – FAA rule restricting how a drone may be flown
- **Groundspeed** – Speed of the aircraft relative to the ground
- **Visual Observer (VO)** – Person assisting the pilot in maintaining visual contact
- **Right-of-Way** – Requirement to yield to manned aircraft
- **Civil Twilight** – Time period when limited visibility operations are allowed
- **Anti-Collision Lighting** – Lighting required during low-light operations
- **Over People Rule** – Restrictions on flying over individuals
- **Moving Vehicle Restriction** – Limitations on operating from moving vehicles

Materials

- Student notebook or guided notes sheet
- FAA Part 107 rule summary sheet
- Scenario worksheets
- Whiteboard / presentation slides

- Drone and controller
- Batteries (fully charged)

Instruction Content

FAA Part 107 establishes specific operational rules that all remote pilots must follow. These rules are designed to reduce risk and ensure safe integration with manned aircraft operations.

Key operational limitations include:

- Maximum altitude of 400 feet AGL
- Maximum groundspeed of 100 mph (87 knots)
- Maintaining visual line of sight (VLOS)
- Yielding right-of-way to all manned aircraft
- Operations limited to daylight or civil twilight with proper lighting

Restrictions include:

- No flying directly over people unless permitted under specific categories
- No operation from a moving vehicle unless in a sparsely populated area
- No careless or reckless operation

Visual Line of Sight (VLOS) requirement:

- The drone must remain visible to the pilot or visual observer
- Camera-only viewing (FPV) is not sufficient by itself

Right-of-way rule:

- Drones must always yield to manned aircraft
- Immediate action must be taken to avoid collisions

Operational judgment:

- The PIC must determine if conditions are safe
- Even legal operations must be avoided if unsafe

Understanding and applying these rules is critical for FAA exam success and safe drone operation.

Teacher Emphasis

- Emphasize that operational rules must be followed at all times
- Reinforce that legal does not always mean safe
- Highlight that VLOS is a strict requirement
- Connect rules to real-world accident prevention
- Reinforce that violations have legal consequences
- Encourage students to think like responsible pilots

<u>Activity Procedure</u>

Activity: Legal vs Illegal Operations

1. Students take structured notes during instruction
2. Students analyze scenarios and determine:
    - Which rule applies
    - Whether the operation is legal
    - What correction is needed if not compliant

3. Teacher will use the following Formative Assessment questions:
    - Why is VLOS required for safety?
    - What risks are associated with flying over people?
    - Why does the FAA limit altitude and speed?
4. Instructor reviews responses and explains correct reasoning

---

Flight Activity (Rule-Based Operation)

1. Review operational rules prior to flight
2. Perform controlled takeoff
3. Maintain altitude within safe limits
4. Demonstrate controlled movement within visual range
5. Maintain awareness of surroundings
6. Execute safe landing

Instructor emphasis: following operational rules during flight

---

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Rule Understanding	Limited or incorrect	Basic understanding	Accurate application	Detailed and applied understanding
Scenario Evaluation	Incorrect	Partial accuracy	Mostly correct	Fully accurate with reasoning
Compliance Awareness	Minimal	Basic	Consistent	Highly consistent
Flight Execution	Unsafe	Basic control	Safe	Precise and controlled

---

Assessment Items

1. What is the maximum altitude allowed under Part 107?
   A. 200 feet
   B. 300 feet
   C. 400 feet
   D. 500 feet
2. What must be maintained at all times during flight?
   A. Internet connection
   B. Visual Line of Sight
   C. GPS signal
   D. Camera view
3. Who has the right-of-way?
   A. Drone
   B. Ground vehicles
   C. Manned aircraft
   D. Observer

4. When can a drone be flown during civil twilight?
   A. Never
   B. Without restriction
   C. With anti-collision lighting
   D. Only indoors
5. Scenario:
   A pilot flies a drone beyond visual line of sight using only the camera.
   Is this legal? Explain.

Answer Key

1. C
2. B
3. C
4. C
5. No — VLOS must be maintained at all times

Closure

- Review key operational rules
- Ask students which rule they think is most important
- Reinforce that all rules are designed for safety

Teacher Notes

- Reinforce rule recall through repetition
- Use real-world violation examples
- Prepare students for airspace + regulation integration next lesson

Week 3 – Day 3

Airspace Authorization & Regulatory Integration (LAANC & Controlled Airspace)

Standards

Standard	Description
201.00	Students will explain FAA Part 107 regulations and operational requirements governing small UAS operations.
201.02	Students will apply operational rules to determine legal drone operations.
202.00	Students will apply airspace classifications using sectional charts and UAS facility maps to determine legal flight operations.
202.02	Students will interpret sectional chart symbols and legends.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.02	Students will apply FAA regulations and airspace rules to real-world scenarios.

Objective
Students will determine when FAA authorization is required and apply airspace and regulatory knowledge to make compliant flight decisions.

Essential Question
When is FAA authorization required, and how do airspace and regulations work together to ensure safe operations?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- Can you fly a drone anywhere if you follow basic rules? Why or why not?
- What would you do if you wanted to fly near an airport?
- Why might the FAA require permission before flying in certain areas?

Teacher will connect responses to controlled airspace and authorization requirements.

Vocabulary

- **LAANC** – Low Altitude Authorization and Notification Capability system
- **Controlled Airspace** – Airspace requiring FAA authorization (B, C, D, E)
- **Authorization Grid** – FAA map showing altitude limits for LAANC approval
- **ANC (Airspace Notification Capability)** – FAA system component supporting authorization
- **UAS Facility Map** – Map used to determine allowable altitudes in controlled airspace
- **Authorization Approval** – FAA permission to operate in controlled airspace
- **Geofencing** – Software restriction preventing drones from entering certain areas

Materials

- Student notebook or guided notes sheet
- UAS Facility Maps (printed or digital)
- LAANC screenshots or demo visuals
- Scenario worksheets
- Whiteboard / presentation slides
- Internet access (optional for LAANC demo)

Instruction Content

Drone operations in controlled airspace require FAA authorization. Controlled airspace includes Class B, C, D, and some Class E airspace surrounding airports.

Authorization is required when:

- Operating in controlled airspace
- Flying near airports
- Exceeding certain altitude limits within grid zones

LAANC is used to obtain authorization:

- Provides near real-time approval
- Uses grid maps to determine maximum altitude
- Available through approved applications

UAS Facility Maps provide:

- Maximum allowable altitudes in grid sections
- Guidance for LAANC approval
- Location-based restrictions

Key process for authorization includes:

1. Identify location on sectional chart
2. Determine airspace classification
3. Check UAS Facility Map grid altitude
4. Submit LAANC request if required
5. Receive authorization before flight

Important considerations:

- Authorization is not automatic in all areas
- Some areas require manual FAA approval
- Pilots must follow all conditions of authorization

Failure to obtain authorization:

- Results in illegal operation
- Can lead to fines and penalties
- Increases risk to manned aircraft

Understanding how airspace and regulations work together is essential for FAA exam success and safe drone operations.

Teacher Emphasis

- Emphasize that controlled airspace always requires authorization
- Reinforce that LAANC is the primary method for approval
- Highlight that authorization is location-specific
- Connect airspace knowledge to real-world operations
- Reinforce that flying without authorization is illegal
- Encourage careful planning before every flight

Activity Procedure

Activity: Authorization Decision Scenarios

1. Students take structured notes during instruction
2. Students analyze scenarios and determine:
    - Airspace classification
    - Whether authorization is required
    - Maximum allowable altitude
3. Teacher will use the following Formative Assessment questions:
    - When is LAANC required?
    - How do UAS Facility Maps determine altitude limits?
    - Why is authorization critical near airports?
4. Instructor reviews responses and provides clarification

Flight Activity (Simulated Authorization Awareness)

1. Identify local airspace classification
2. Discuss whether authorization would be required
3. Define safe operational boundaries
4. Perform controlled takeoff
5. Maintain controlled flight within boundaries
6. Execute safe landing

Instructor emphasis: awareness of airspace restrictions

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Airspace Identification	Incorrect	Partial accuracy	Mostly correct	Fully accurate
Authorization Knowledge	Limited understanding	Basic understanding	Correct application	Detailed and accurate
Scenario Evaluation	Incorrect decisions	Partial accuracy	Mostly correct	Fully accurate with reasoning
Flight Awareness	Unsafe	Basic awareness	Controlled	Highly aware and precise

---

Assessment Items

1. What airspace requires FAA authorization?
   A. Class G
   B. Controlled airspace
   C. Rural areas
   D. Private property
2. What system is used for near real-time authorization?
   A. METAR
   B. LAANC
   C. GPS
   D. ADS-B
3. What do UAS Facility Maps show?
   A. Weather
   B. Altitude limits
   C. Battery levels
   D. Camera settings
4. Where is authorization most likely required?
   A. Open field
   B. Near airports
   C. Indoor space
   D. Private yard
5. Scenario:
   A pilot wants to fly in Class D airspace without authorization.
   Is this legal? Explain.

Answer Key

1. B
2. B
3. B
4. B
5. No — authorization is required in controlled airspace

Closure

- Review authorization process
- Ask students why authorization is critical near airports
- Reinforce safe and legal flight planning

Teacher Notes

- Use real local airspace examples when possible
- Reinforce chart + regulation integration daily
- Prepare students for advanced regulatory scenarios next lesson

Week 3 – Day 4

Waivers, Operations Over People, and Advanced Part 107 Rules

Standards

Standard	Description
201.00	Students will explain FAA Part 107 regulations and operational requirements governing small UAS operations.
201.04	Students will recognize situations requiring waivers or FAA authorization.
201.05	Students will interpret FAA requirements for specialized drone operations.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.02	Students will apply FAA regulations to determine legal drone operations.

Objective
Students will explain FAA waiver requirements, operations over people categories, and advanced operational rules under Part 107.

Essential Question
How do advanced FAA rules and waivers expand or restrict drone operations?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- Should drone pilots ever be allowed to break standard rules? Why or why not?
- What risks exist when flying over people?
- What additional training or safeguards might be required for advanced operations?

Teacher will connect responses to FAA waiver systems and safety requirements.

Vocabulary

- **Waiver** – FAA approval to operate outside specific Part 107 rules
- **Operations Over People (OOP)** – Regulations governing flight over human beings
- **Category 1–4 Operations** – FAA-defined categories allowing flight over people under specific conditions
- **Safety Case** – Evidence provided to the FAA to justify a waiver
- **Risk Mitigation** – Actions taken to reduce operational risk
- **Compliance Documentation** – Records demonstrating adherence to FAA rules

Materials

- Student notebook or guided notes sheet
- FAA waiver examples (optional)
- Scenario worksheets
- Whiteboard / presentation slides
- Drone and controller
- Batteries (fully charged)

Instruction Content
FAA Part 107 allows for advanced operations under specific conditions, including operations over people and operations conducted under waivers. These rules expand operational capability but require strict compliance and risk management.

Waivers allow pilots to operate outside standard rules:
- Must be approved by the FAA
- Require a detailed safety justification
- Demonstrate that the operation can be conducted safely

Examples of waiverable rules include:
- Operations beyond visual line of sight (BVLOS)
- Operations at night (historically required waiver)
- Operations over people (depending on category)

Operations Over People (OOP) categories include:
- Category 1
  - Small drones with minimal injury risk
- Category 2
  - Drones meeting specific safety standards
- Category 3
  - Limited operations over people in restricted conditions
- Category 4
  - Certified aircraft with FAA approval

Key requirements for operations over people:
- Must meet category requirements
- Must not pose undue risk to individuals
- Must comply with FAA safety standards

Important considerations:
- Not all operations are automatically allowed
- Additional requirements may apply depending on operation type
- Documentation and compliance are critical

Understanding advanced rules and waiver processes is important for both FAA exam success and real-world drone operations.

Teacher Emphasis
- Emphasize that waivers are not automatic and require FAA approval
- Reinforce that operations over people carry increased risk
- Highlight that safety justification is required for advanced operations
- Connect advanced rules to real-world commercial applications
- Reinforce that pilots must fully understand limitations before expanding operations

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Activity Procedure
Activity: Advanced Operations Analysis
1. Students take structured notes during instruction

2. Students analyze scenarios and determine:
    - Whether a waiver is required
    - Whether operations over people are allowed
    - What safety considerations must be addressed
3. Teacher will use the following Formative Assessment questions:
    - When is a waiver required?
    - What risks are involved in flying over people?
    - How do categories determine allowed operations?
4. Instructor reviews responses and provides clarification

Flight Activity (Risk Awareness Focus)

1. Define safe flight boundaries
2. Identify areas where people are present
3. Discuss safe distances and avoidance strategies
4. Perform controlled takeoff
5. Maintain controlled flight avoiding designated “people zones”
6. Execute safe landing

Instructor emphasis: risk awareness and safe operation

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Advanced Rule Understanding	Limited or incorrect	Basic understanding	Accurate explanation	Detailed and applied understanding
Waiver Knowledge	Minimal	Basic	Correct application	Comprehensive understanding
Scenario Evaluation	Incorrect	Partial accuracy	Mostly correct	Fully accurate with reasoning
Flight Safety Awareness	Unsafe	Basic awareness	Controlled	Highly aware and precise

---

Assessment Items

1. What is a waiver?
   A. A license
   B. Permission to ignore all rules
   C. FAA approval to operate outside certain rules
   D. A weather report

2. What must be demonstrated to obtain a waiver?
   A. Speed
   B. Safety
   C. Distance
   D. Camera quality

3. What is a key concern with operations over people?
   A. Battery life
   B. Injury risk
   C. Camera angle
   D. GPS signal
4. How many categories exist for operations over people?
   A. 2
   B. 3
   C. 4
   D. 5
5. Scenario:
   A pilot wants to fly directly over a crowd without meeting category requirements.
   Is this allowed? Explain.

Answer Key

1. C
2. B
3. B
4. C
5. No — must meet FAA category requirements for operations over people

---

Closure

- Review waiver and OOP concepts
- Ask students why advanced operations require additional rules
- Reinforce that increased capability requires increased responsibility

---

Teacher Notes

- Emphasize real-world application of advanced operations
- Reinforce safety as the foundation of all expanded capabilities
- Prepare students for full regulation integration assessment next lesson

Week 3 – Day 5

Regulations Application & Flight Compliance + Week 3 Assessment

Standards

Standard	Description
201.00	Students will explain FAA Part 107 regulations and operational requirements governing small UAS operations.
201.02	Students will apply operational rules to determine legal drone operations.
201.03	Students will explain Remote Pilot in Command (PIC) responsibilities and legal accountability.
202.00	Students will apply airspace classifications using sectional charts and UAS facility maps to determine legal flight operations.
202.02	Students will interpret sectional chart symbols and legends.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.02	Students will evaluate scenarios for compliance with FAA regulations.

Objective
Students will apply FAA Part 107 regulations, airspace rules, and pilot responsibilities to determine whether drone operations are safe and compliant.

Essential Question
How can a remote pilot apply FAA regulations and airspace knowledge to make safe and legal flight decisions?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What is the most important rule a drone pilot must follow?
- Why is it important to combine multiple rules when making decisions?
- What could happen if a pilot misunderstands regulations?

Teacher will use responses to review key Week 3 concepts.

Vocabulary

- **Regulatory Compliance** – Following FAA rules and regulations
- **Flight Scenario** – A simulated or real situation used for decision-making
- **Risk Assessment** – Evaluating hazards before and during flight
- **Operational Judgment** – Decision-making based on safety and rules
- **Violation** – Failure to comply with FAA regulations

Materials

- Student notebook or guided notes sheet
- Scenario worksheets

- Whiteboard / presentation slides
- FAA reference materials
- Drone and controller
- Batteries (fully charged)
- Flight area markers

Instruction Content

Remote pilots must apply all Part 107 regulations together when planning and conducting a flight. Safe and legal operation requires understanding how rules interact, not just memorizing them individually.

The regulatory decision-making process includes:

1. Identify the flight location
2. Determine airspace classification
3. Check if authorization is required
4. Review operational limitations
5. Evaluate weather conditions
6. Assess safety risks
7. Make a Go/No-Go decision

Key areas of compliance include:

- Airspace authorization (LAANC if required)
- Maintaining visual line of sight (VLOS)
- Staying within altitude and speed limits
- Avoiding operations over people unless permitted
- Yielding to manned aircraft
- Avoiding hazardous operations

Common violations include:

- Flying without authorization in controlled airspace
- Flying beyond visual line of sight
- Exceeding altitude limits
- Operating in unsafe weather conditions

Good pilots demonstrate:

- Strong situational awareness
- Knowledge of regulations
- Consistent decision-making
- Commitment to safety

This integrated approach is critical for FAA exam success and real-world drone operations.

Teacher Emphasis

- Emphasize that all rules must be applied together
- Reinforce that safety is the priority in every decision
- Highlight that mistakes often occur when rules are considered in isolation
- Connect integrated decision-making to FAA test scenarios
- Reinforce that responsible pilots think before they act

Activity Procedure

Activity: Full Flight Compliance Scenarios

1. Students take structured notes during instruction
2. Students analyze complex flight scenarios and determine:
    - Airspace classification
    - Authorization requirements
    - Applicable operational rules
    - Whether the flight is legal and safe
3. Teacher will use the following Formative Assessment questions:
    - What steps must be completed before every flight?
    - How do multiple rules interact in a single scenario?
    - Why is decision-making more complex than memorization?
4. Instructor reviews responses and provides detailed explanations

---

Flight Activity (Full Compliance Application)

1. Identify flight location and airspace
2. Review operational rules before takeoff
3. Make a class Go/No-Go decision
4. Perform controlled takeoff
5. Maintain safe altitude and visual line of sight
6. Execute controlled landing

Instructor emphasis: applying full regulatory compliance

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Regulation Application	Incorrect or incomplete	Partial understanding	Correct application	Fully accurate and consistent
Scenario Evaluation	Incorrect	Partial accuracy	Mostly correct	Fully accurate with reasoning
Decision-Making	Poor or unsafe	Basic reasoning	Sound decisions	Advanced and justified decisions
Flight Compliance	Unsafe	Basic compliance	Safe operation	Highly consistent and precise

---

Assessment Items (Week 3 Quiz)

1. What must be checked before flying in controlled airspace?
   A. Battery level
   B. Authorization
   C. Camera settings
   D. Speed

2. What is required at all times during flight?
   A. GPS
   B. Visual Line of Sight
   C. Internet
   D. Camera
3. Who is responsible for the flight?
   A. FAA
   B. Observer
   C. Remote Pilot in Command
   D. Manufacturer
4. What is a common violation?
   A. Checking weather
   B. Flying within limits
   C. Flying without authorization
   D. Maintaining VLOS
5. What is the first step in flight planning?
   A. Fly
   B. Check camera
   C. Identify location
   D. Turn on drone
6. Scenario:
   A pilot plans to fly near an airport without checking airspace or obtaining authorization. Is this compliant with Part 107? Explain.

Answer Key

1. B
2. B
3. C
4. C
5. C
6. No — authorization and airspace evaluation are required

Closure

- Review full decision-making process
- Ask students what step is most important
- Reinforce that safe pilots follow all rules consistently

Teacher Notes

- Reinforce integration of all knowledge areas
- Identify and reteach weak areas before moving forward
- Prepare students for performance-based application in upcoming weeks

---

Week 3 COMPLETE

Students now have strong FAA-aligned understanding of:

- Part 107 regulations
- Operational rules
- Airspace authorization
- Advanced rules (waivers & OOP)
- Integrated decision-making

Week 4 – Day 1

Aircraft Performance Fundamentals (Weight, Balance, and Efficiency)

Standards

Standard	Description
204.00	Students will explain how loading and environmental factors affect sUAS performance.
204.01	Students will identify factors affecting performance, such as weight and balance.
204.02	Students will explain the impact of density altitude on flight performance.
204.03	Students will interpret environmental effects such as wind and temperature on operations.

Objective
Students will explain how weight and loading affect drone performance, flight efficiency, and operational safety.

Essential Question
How does aircraft loading impact drone performance and safe operation?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What happens when you add extra weight to a vehicle?
- How might additional weight affect a drone differently than a car?
- Why might a heavier drone require more power to fly?

Teacher will connect responses to aircraft performance principles.

Vocabulary

- **Weight** – The total mass of the drone including payload
- **Payload** – Additional equipment carried by the drone
- **Thrust** – Upward force produced by propellers
- **Lift** – Force that allows the drone to stay airborne
- **Drag** – Resistance opposing motion through air
- **Efficiency** – Ability to perform using minimal energy
- **Power-to-Weight Ratio** – Relationship between available power and total weight

Materials

- Student notebook or guided notes sheet
- Drone and controller
- Batteries (fully charged)
- Small payload objects (optional for demonstration)
- Whiteboard / presentation slides

Instruction Content
Aircraft performance is directly affected by the weight and loading of the drone. Heavier drones require more thrust to achieve lift, which impacts efficiency and battery life.

Key performance relationships include:
- Increased weight requires increased thrust
- Increased thrust requires more power
- More power usage reduces battery life

Effects of increased weight include:
- Reduced flight time
- Slower climb rate
- Increased motor strain
- Reduced maneuverability

Efficiency considerations include:
- Optimal weight allows better performance
- Overloading reduces stability and control
- Proper balance ensures smooth operation

Power-to-weight ratio is critical:
- Higher ratio = better performance
- Lower ratio = reduced performance

Operational implications include:
- Pilots must avoid exceeding manufacturer limits
- Payload must be considered before flight
- Performance limitations must be understood for safe operation

These concepts are directly tested on the FAA Part 107 exam and are critical for real-world flight safety.

Teacher Emphasis
- Emphasize that weight directly affects safety and performance
- Reinforce that more weight = more power required
- Highlight that reduced efficiency leads to shorter flight time
- Connect performance concepts to real-world drone operation
- Reinforce that pilots must consider weight before every flight

---

Activity Procedure
Activity: Weight Impact Analysis
1. Students take structured notes during instruction
2. Students analyze scenarios and determine:
    - How added weight affects performance
    - What risks are introduced
    - Whether the operation is safe

3. Teacher will use the following Formative Assessment questions:
    - Why does increased weight reduce efficiency?
    - How does weight impact battery life?
    - What risks are associated with overloading?
4. Instructor reviews responses and explains reasoning

Flight Activity (Weight Awareness)

1. Perform baseline flight without payload
2. Observe stability and responsiveness
3. (If safe and applicable) add light payload
4. Repeat flight and observe differences
5. Compare performance changes
6. Execute controlled landing

Instructor emphasis: recognizing performance changes

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Performance Understanding	Limited or incorrect	Basic understanding	Accurate explanation	Detailed and applied understanding
Scenario Analysis	Incorrect	Partial accuracy	Mostly correct	Fully accurate with reasoning
Risk Awareness	Minimal	Basic	Consistent	Advanced awareness
Flight Observation	Limited	Basic	Accurate	Detailed and analytical

---

Assessment Items

1. What happens when weight increases?
   A. Efficiency increases
   B. Power required increases
   C. Battery lasts longer
   D. Speed increases
2. What is payload?
   A. Battery
   B. Extra equipment carried
   C. Propeller
   D. Controller
3. What is thrust?
   A. Downward force
   B. Side force
   C. Upward force
   D. Resistance

4. What happens to battery life with increased weight?
   A. Increases
   B. Decreases
   C. Stays the same
   D. Doubles
5. Scenario:
   A pilot adds extra equipment beyond recommended limits.
   What risks are introduced?

Answer Key

1. B
2. B
3. C
4. B
5. Reduced performance, instability, and potential system failure

---

Closure

- Review relationship between weight and performance
- Ask students what factor affects efficiency the most.
- Reinforce importance of proper loading

Teacher Notes

- Use real drone specs when possible
- Reinforce performance concepts throughout week
- Prepare students for density altitude next lesson

Week 4 – Day 2

Density Altitude & Environmental Effects on Drone Performance

Standards

Standard	Description
204.00	Students will explain how loading and environmental factors affect sUAS performance.
204.02	Students will explain the impact of density altitude on flight performance.
204.04	Students will evaluate the impact of density altitude on drone operations.
204.05	Students will apply performance concepts to real-world flight conditions.

Objective
Students will explain density altitude and evaluate how temperature, altitude, and air density affect drone performance.

Essential Question
How do environmental conditions impact drone performance and flight safety?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- Why might a drone perform differently on a hot day compared to a cold day?
- How does air feel different at higher elevations?
- Why might engines or motors struggle in certain environments?

Teacher will connect responses to air density and performance concepts.

Vocabulary

- **Density Altitude** – The altitude corrected for temperature and pressure affecting air density
- **Air Density** – The amount of air in a given space
- **High Density Altitude** – Low air density conditions (hot, high, humid)
- **Low Density Altitude** – High air density conditions (cool, low elevation)
- **Lift Efficiency** – Effectiveness of generating lift
- **Performance Degradation** – Reduction in aircraft performance

Materials

- Student notebook or guided notes sheet
- Whiteboard / presentation slides
- Weather data examples (optional)
- Drone and controller
- Batteries (fully charged)

Instruction Content
Density altitude is a critical factor affecting aircraft performance. It represents how “thin” or “dense” the air is, which directly impacts lift, thrust, and efficiency.

Density altitude increases when:
- Temperature increases
- Altitude increases
- Humidity increases

High density altitude results in:
- Reduced lift
- Reduced propeller efficiency
- Increased power required
- Reduced climb performance
- Shorter flight time

Low density altitude results in:
- Increased lift
- Better performance
- Improved efficiency

Key relationship:
- Hot + High + Humid = Poor performance

Operational implications include:
- Drones may struggle to maintain altitude
- Motors must work harder
- Battery drains faster
- Stability may be reduced

Pilot responsibilities include:
- Evaluating environmental conditions before flight
- Adjusting expectations for performance
- Avoiding operations in extreme conditions

Density altitude is frequently tested on the FAA Part 107 exam and is critical for safe drone operation.

Teacher Emphasis
- Emphasize that air density directly affects lift and performance
- Reinforce that hot and high conditions reduce efficiency
- Highlight that performance limitations increase risk
- Connect environmental factors to real-world flight planning
- Reinforce that pilots must adjust for conditions

Activity Procedure
Activity: Environmental Impact Scenarios
1. Students take structured notes during instruction

2. Students analyze scenarios and determine:
    - Whether density altitude is high or low
    - How performance will be affected
    - What risks are present
3. Teacher will use the following Formative Assessment questions:
    - Why does hot air reduce performance?
    - What combination creates the worst conditions?
    - How should a pilot adjust for high density altitude?
4. Instructor reviews responses and provides clarification

Flight Activity (Environmental Awareness)

1. Observe current environmental conditions
2. Discuss expected performance
3. Perform controlled takeoff
4. Maintain stable hover
5. Observe responsiveness and power usage
6. Execute controlled landing

Instructor emphasis: recognizing environmental impact

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Density Altitude Understanding	Limited or incorrect	Basic understanding	Accurate explanation	Detailed and applied understanding
Scenario Analysis	Incorrect	Partial accuracy	Mostly correct	Fully accurate with reasoning
Risk Awareness	Minimal	Basic	Consistent	Advanced awareness
Flight Observation	Limited	Basic	Accurate	Detailed and analytical

---

Assessment Items

1. What increases density altitude?
   A. Cold temperature
   B. Low altitude
   C. High temperature
   D. Low humidity

2. What happens in high density altitude conditions?
   A. Increased performance
   B. Reduced performance
   C. No change
   D. Increased lift

3. What combination creates the worst performance?
   A. Cold, low altitude
   B. Hot, high altitude
   C. Cool, humid
   D. Low humidity

4. What happens to lift in thin air?
   A. Increases
   B. Decreases
   C. Stays the same
   D. Doubles
5. Scenario:
   A pilot is flying on a hot day at high elevation.
   What performance issues should be expected?

Answer Key

1. C
2. B
3. B
4. B
5. Reduced lift, decreased efficiency, and shorter flight time

---

Closure

- Review density altitude concept
- Ask students what conditions create the highest risk
- Reinforce importance of environmental awareness

Teacher Notes

- Use local weather examples for relevance
- Reinforce connection to weather concepts
- Prepare students for aerodynamic forces next lesson

Week 4 – Day 3

Aerodynamics: Lift, Drag, Thrust, and Control

Standards

Standard	Description
204.00	Students will explain how loading and environmental factors affect sUAS performance.
204.06	Students will define the four forces of flight: lift, weight, thrust, and drag.
204.07	Students will explain how aerodynamic forces affect drone control and stability.
204.08	Students will apply aerodynamic principles to flight operations.

Objective
Students will explain the four forces of flight and how they affect drone movement, stability, and control.

Essential Question
How do the four forces of flight interact to control drone movement and stability?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What keeps a drone in the air?
- What causes a drone to move forward or backward?
- What might cause a drone to slow down or stop?

Teacher will connect responses to the four forces of flight.

Vocabulary

- **Lift** – Upward force that opposes weight
- **Weight** – Downward force due to gravity
- **Thrust** – Forward or upward force generated by propellers
- **Drag** – Resistance opposing motion
- **Stability** – Ability to maintain controlled flight
- **Control Input** – Commands given by the pilot
- **Hover** – Maintaining a fixed position in the air

Materials

- Student notebook or guided notes sheet
- Whiteboard / presentation slides
- Drone and controller
- Batteries (fully charged)

Instruction Content
All aircraft, including drones, are controlled by four primary forces: lift, weight, thrust, and drag. These forces must be balanced for stable flight.

The four forces include:
- Lift (upward force)
- Weight (downward force)
- Thrust (movement force)
- Drag (resistance force)

Balanced flight occurs when:
- Lift equals weight
- Thrust equals drag

Unbalanced forces cause motion:
- Increased thrust → forward movement
- Increased lift → climb
- Increased drag → slowing down
- Reduced lift → descent

Drone control is achieved by adjusting propeller speeds:
- Increasing speed increases lift and thrust
- Decreasing speed reduces lift

Stability depends on:
- Balanced forces
- Smooth control inputs
- Environmental conditions

Operational implications include:
- Pilots must understand how inputs affect movement
- Sudden inputs can destabilize the aircraft
- Controlled adjustments lead to stable flight

Understanding these principles is essential for FAA exam success and effective drone operation.

Teacher Emphasis
- Emphasize that all flight depends on balancing forces
- Reinforce that control inputs change force relationships
- Highlight that instability results from unbalanced forces
- Connect aerodynamic principles to real flight control
- Reinforce that smooth inputs improve stability

Activity Procedure

Activity: Force Interaction Analysis

1. Students take structured notes during instruction
2. Students analyze scenarios and determine:
    - Which forces are changing
    - What motion will occur
    - How to correct instability
3. Teacher will use the following Formative Assessment questions:
    - What happens when lift exceeds weight?
    - How does drag affect movement?
    - How do pilots control thrust?

4. Instructor reviews responses and explains reasoning

Flight Activity (Force Control Practice)

1. Perform controlled takeoff
2. Establish stable hover
3. Practice slow forward movement
4. Practice controlled ascent and descent
5. Observe effects of control inputs
6. Execute controlled landing

Instructor emphasis: understanding cause-and-effect of inputs

---

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Force Understanding	Limited or incorrect	Basic understanding	Accurate explanation	Detailed and applied understanding
Scenario Analysis	Incorrect	Partial accuracy	Mostly correct	Fully accurate with reasoning
Control Awareness	Minimal	Basic	Consistent	Advanced understanding
Flight Execution	Unsafe	Basic control	Controlled	Smooth and precise

---

Assessment Items

1. What force opposes weight?
   A. Drag
   B. Lift
   C. Thrust
   D. Gravity
2. What force opposes motion?
   A. Lift
   B. Weight
   C. Drag
   D. Thrust
3. What happens when lift is greater than weight?
   A. Descent
   B. Hover
   C. Climb
   D. Stop
4. What controls thrust in a drone?
   A. Camera
   B. Battery
   C. Propeller speed
   D. GPS

5. Scenario:
   A drone begins to descend unexpectedly.
   Which force has decreased or changed?

Answer Key

1. B
2. C
3. C
4. C
5. Lift has decreased or weight is no longer balanced

Closure

- Review the four forces of flight
- Ask students which force is hardest to control
- Reinforce importance of balanced forces

Teacher Notes

- Reinforce connections between forces and control inputs
- Use demonstrations when possible
- Prepare students for performance limitations next lesson

Week 4 – Day 4

Performance Limitations & Emergency Considerations

Standards

Standard	Description
204.00	Students will explain how loading and environmental factors affect sUAS performance.
204.09	Students will identify operational limitations affecting safe drone performance.
204.10	Students will evaluate emergency situations and appropriate pilot responses.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.03	Students will apply emergency procedures to maintain safe flight operations.

Objective
Students will identify performance limitations and apply appropriate responses to emergency situations during drone operations.

Essential Question
How do performance limitations and emergency situations affect safe drone operations?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What could go wrong during a drone flight?
- What would you do if your drone suddenly lost power?
- Why is it important to be prepared for emergencies before flying?

Teacher will connect responses to risk management and emergency procedures.

Vocabulary

- **Performance Limitation** – A factor that restricts aircraft capability
- **System Failure** – Malfunction of drone components
- **Lost Link** – Loss of connection between controller and drone
- **Return-to-Home (RTH)** – Automated function returning drone to launch point
- **Emergency Procedure** – Planned response to unexpected situations
- **Situational Awareness** – Awareness of surroundings and conditions during flight

Materials

- Student notebook or guided notes sheet
- Scenario worksheets
- Whiteboard / presentation slides
- Drone and controller
- Batteries (fully charged)
- Flight area markers

Instruction Content
Drone performance limitations and emergency situations can significantly impact flight safety. Remote pilots must be prepared to recognize and respond to these situations quickly and effectively.

Common performance limitations include:
- Low battery levels
- High winds
- High density altitude
- Overloading
- Signal interference

Common emergency situations include:
- Loss of signal (lost link)
- Battery failure
- Motor or propeller malfunction
- GPS failure
- Sudden weather changes

Key emergency procedures include:
- Maintaining control and avoiding panic
- Activating Return-to-Home (RTH) when appropriate
- Executing controlled landing as soon as possible
- Avoiding people and obstacles
- Monitoring battery levels continuously

Lost link procedures:
- Drone may automatically return to home
- Pilot must ensure safe return path
- Pre-flight configuration of RTH is critical

Pilot responsibilities include:
- Planning for emergencies before flight
- Monitoring systems during flight
- Making immediate safety decisions

Understanding performance limitations and emergency response is essential for FAA exam success and safe drone operation.

Teacher Emphasis
- Emphasize that emergencies can happen at any time
- Reinforce that preparation is critical for safe response
- Highlight the importance of staying calm during emergencies
- Connect emergency procedures to real-world incidents
- Reinforce that pilots must prioritize safety over equipment

---

Activity Procedure

Activity: Emergency Scenario Response

1. Students take structured notes during instruction
2. Students analyze emergency scenarios and determine:
    - What failure has occurred
    - What risks are present
    - What actions should be taken
3. Teacher will use the following Formative Assessment questions:
    - What is the first action during an emergency?
    - When should RTH be used?
    - Why is situational awareness critical?
4. Instructor reviews responses and explains correct procedures

---

Flight Activity (Emergency Awareness Simulation)

1. Review emergency procedures before flight
2. Perform controlled takeoff
3. Simulate low battery condition (discussion-based)
4. Practice controlled descent and landing
5. Discuss RTH function and limitations
6. Execute safe landing

Instructor emphasis: controlled response and awareness

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Limitation Awareness	Limited or incorrect	Basic understanding	Accurate identification	Detailed and applied understanding
Emergency Response	Incorrect or unsafe	Basic response	Correct response	Advanced and proactive response
Scenario Evaluation	Incorrect	Partial accuracy	Mostly correct	Fully accurate with reasoning
Flight Safety	Unsafe	Basic control	Safe	Highly controlled and precise

---

Assessment Items

1. What is a common performance limitation?
   A. Strong signal
   B. Low battery
   C. Clear skies
   D. Stable hover
2. What is lost link?
   A. Loss of GPS
   B. Loss of camera
   C. Loss of connection between drone and controller
   D. Loss of battery

3. What is the purpose of Return-to-Home?
   A. Increase speed
   B. Return drone to launch point
   C. Improve camera quality
   D. Reduce battery use
4. What is the best response to an emergency?
   A. Panic
   B. Ignore it
   C. Stay calm and act safely
   D. Fly faster
5. Scenario:
   A drone begins losing signal during flight.
   What action should the pilot take?

Answer Key

1. B
2. C
3. B
4. C
5. Initiate safe recovery (RTH or controlled landing)

Closure

- Review key emergency procedures
- Ask students what situation is most dangerous
- Reinforce importance of preparation and awareness

Teacher Notes

- Emphasize real-world application of emergency procedures
- Reinforce pre-flight planning as critical
- Prepare students for full performance integration next lesson

Week 4 – Day 5

Performance Integration & Flight Safety + Week 4 Assessment

Standards

Standard	Description
204.00	Students will explain how loading and environmental factors affect sUAS performance.
204.03	Students will interpret environmental effects such as wind and temperature on operations.
204.05	Students will apply performance concepts to real-world flight conditions.
204.08	Students will apply aerodynamic principles to flight operations.
204.10	Students will evaluate emergency situations and appropriate pilot responses.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.03	Students will apply emergency procedures to maintain safe flight operations.

Objective
Students will apply aircraft performance concepts, environmental factors, and emergency procedures to evaluate safe drone operations.

Essential Question
How do performance factors and environmental conditions combine to impact safe drone flight?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What is the most important performance factor to consider before flying?
- How do multiple factors (weather, weight, environment) affect flight together?
- Why is it important to think about all risks before flying?

Teacher will use responses to review Week 4 concepts.

Vocabulary

- **Performance Integration** – Applying multiple performance factors together
- **Operational Limitation** – Restriction affecting safe flight
- **Environmental Impact** – Effect of weather and conditions on performance
- **Flight Safety** – Maintaining safe operation throughout flight
- **Risk Evaluation** – Assessing hazards before and during flight

Materials

- Student notebook or guided notes sheet
- Scenario worksheets
- Whiteboard / presentation slides
- Drone and controller

- Batteries (fully charged)
- Flight area markers

Instruction Content
Safe drone operation requires understanding how multiple performance factors interact. Pilots must evaluate all conditions before and during flight.

Integrated performance factors include:
- Weight and payload
- Density altitude (temperature, altitude, humidity)
- Aerodynamic forces
- Battery limitations
- Environmental conditions

The performance evaluation process includes:
1. Assess environmental conditions
2. Evaluate aircraft loading
3. Consider performance limitations
4. Identify potential risks
5. Plan for emergency situations
6. Make a Go/No-Go decision

Common risk combinations include:
- High weight + high temperature = reduced lift and efficiency
- High winds + low battery = increased risk of loss of control
- High altitude + heavy load = reduced climb performance

Good pilots demonstrate:
- Awareness of multiple factors
- Ability to predict performance outcomes
- Safe and informed decision-making
- Consistent application of knowledge

Understanding integrated performance concepts is essential for FAA exam success and safe drone operation.

Teacher Emphasis
- Emphasize that performance factors must be considered together
- Reinforce that risk increases when multiple factors combine
- Highlight that safe pilots plan before flying
- Connect integrated thinking to FAA exam scenarios
- Reinforce that decision-making is the most important skill

Activity Procedure
Activity: Integrated Performance Scenarios
1. Students take structured notes during instruction

2. Students analyze complex scenarios and determine:
    - What performance factors are involved
    - What risks are present
    - Whether the flight is safe
3. Teacher will use the following Formative Assessment questions:
    - How do multiple factors affect performance?
    - What combination creates the greatest risk?
    - How should a pilot respond to increased risk?
4. Instructor reviews responses and provides detailed explanations

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Flight Activity (Full Performance Application)

1. Evaluate current conditions
2. Discuss performance factors affecting flight
3. Make a class Go/No-Go decision
4. Perform controlled takeoff
5. Maintain stable and controlled flight
6. Execute safe landing

Instructor emphasis: applying all performance concepts

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Performance Understanding	Limited or incorrect	Basic understanding	Accurate application	Detailed and integrated understanding
Scenario Evaluation	Incorrect	Partial accuracy	Mostly correct	Fully accurate with reasoning
Risk Assessment	Minimal	Basic	Consistent	Advanced and proactive
Flight Execution	Unsafe	Basic control	Safe	Highly controlled and precise

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Assessment Items (Week 4 Quiz)

1. What is the first step in evaluating performance?
   A. Fly
   B. Assess conditions
   C. Check camera
   D. Increase speed

2. What happens when weight and temperature increase together?
   A. Performance improves
   B. Performance decreases
   C. No change
   D. Speed doubles

3. What is density altitude affected by?
   A. Camera
   B. Temperature and altitude
   C. Battery only
   D. GPS
4. What is the safest approach to flight planning?
   A. Ignore risks
   B. Consider one factor
   C. Evaluate all factors
   D. Fly quickly
5. What is a major risk factor combination?
   A. Clear skies + low wind
   B. High wind + low battery
   C. Calm conditions
   D. Cool temperature
6. Scenario:
   A pilot plans to fly a heavily loaded drone on a hot day with moderate wind.
   What risks are present and what decision should be made?

Answer Key

1. B
2. B
3. B
4. C
5. B
6. Reduced performance and increased risk; flight should be carefully evaluated or delayed

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Closure

- Review integrated performance concepts
- Ask students what factor is most important in decision-making
- Reinforce importance of evaluating all conditions

Teacher Notes

- Reinforce integration as a key skill
- Identify weak areas for reteaching
- Prepare students for next unit: Airport Operations & Sectional Charts

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Week 4 COMPLETE

Students now have strong FAA-aligned understanding of:

- Aircraft performance
- Weight and loading
- Density altitude
- Aerodynamics
- Emergency procedures
- Integrated decision-making

Week 5 – Day 1

Introduction to Airspace & Sectional Charts

Standards

Standard	Description
202.00	Students will apply airspace classifications using sectional charts and UAS facility maps to determine legal flight operations.
202.01	Students will identify airspace classes (B, C, D, E, G) and their characteristics.
202.03	Students will differentiate between controlled and uncontrolled airspace.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.02	Students will apply airspace knowledge to determine safe operations.

Objective
Students will identify types of airspace and explain how sectional charts are used to determine safe and legal drone operations.

Essential Question
How do sectional charts help pilots understand and safely navigate airspace?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What do you think airspace looks like above you?
- Why would different areas of airspace have different rules?
- How might a pilot know where they are allowed to fly?

Teacher will connect responses to the concept of mapped airspace.

Vocabulary

- **Airspace** – The portion of the atmosphere controlled by aviation authorities
- **Sectional Chart** – A map used by pilots to navigate airspace
- **Class B Airspace** – Highly controlled airspace around major airports
- **Class C Airspace** – Controlled airspace around medium airports
- **Class D Airspace** – Controlled airspace around smaller airports
- **Class E Airspace** – Controlled airspace not classified as B, C, or D
- **Class G Airspace** – Uncontrolled airspace
- **Aeronautical Chart** – Map displaying aviation information

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Materials

- Student notebook or guided notes sheet
- Printed sectional charts or digital access
- Whiteboard / presentation slides
- Chart legend reference sheet
- Highlighters or markers

Instruction Content
Airspace is divided into different classifications to ensure safe and organized aircraft operations. Remote pilots must understand these classifications to operate legally and safely.

The five main classes of airspace include:
- Class B
- Class C
- Class D
- Class E
- Class G

Controlled vs Uncontrolled Airspace:
- Controlled: Class B, C, D, and E (authorization required for drones)
- Uncontrolled: Class G (no authorization required under normal conditions)

Sectional charts are used to:
- Identify airspace classifications
- Locate airports and obstacles
- Determine altitude limits
- Identify restricted or special use areas

Key chart features include:
- Color-coded airspace boundaries
- Airport symbols
- Elevation information
- Navigation aids

Operational importance:
- Pilots must read charts before flight
- Airspace determines where drones can legally operate
- Understanding charts is heavily tested on the FAA Part 107 exam

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Teacher Emphasis
- Emphasize that sectional charts are essential for flight planning
- Reinforce that airspace determines where you can fly
- Highlight that misreading charts leads to violations
- Connect charts to real-world pilot responsibilities
- Reinforce that this is a high-weight FAA test area

Activity Procedure
Activity: Chart Exploration
1. Students take structured notes during instruction
2. Students examine a sectional chart and identify:
    - Different airspace classes
    - Airport locations
    - Chart symbols

3. Teacher will use the following Formative Assessment questions:
    - What do the different colors represent?
    - Why is airspace divided into classes?
    - How do charts improve safety?
4. Instructor reviews responses and explains chart features

Flight Activity (Airspace Awareness Discussion-Based)

1. Identify local airspace using chart
2. Discuss whether authorization is required
3. Define safe flight boundaries
4. Perform controlled takeoff (if applicable)
5. Maintain controlled flight
6. Execute safe landing

Instructor emphasis: linking charts to real flight decisions

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Airspace Identification	Incorrect	Partial accuracy	Mostly correct	Fully accurate
Chart Interpretation	Limited	Basic understanding	Accurate	Detailed and confident
Scenario Application	Incorrect	Partial accuracy	Mostly correct	Fully accurate with reasoning
Flight Awareness	Unsafe	Basic	Controlled	Highly aware

Assessment Items

1. What is a sectional chart used for?
   A. Weather only
   B. Navigation and airspace identification
   C. Camera control
   D. Battery management
2. Which airspace does NOT require authorization?
   A. Class B
   B. Class C
   C. Class D
   D. Class G
3. What type of airspace is highly controlled around major airports?
   A. Class G
   B. Class E
   C. Class B
   D. Class D

4. What do sectional charts display?
   A. Only roads
   B. Only weather
   C. Airspace and aviation information
   D. Only buildings
5. Scenario:
   A pilot plans to fly without checking a sectional chart.
   What risks are involved?

Answer Key

1. B
2. D
3. C
4. C
5. Airspace violations and unsafe operation

Closure

- Review importance of sectional charts
- Ask students why charts are critical for safety
- Reinforce that all flights begin with airspace awareness

Teacher Notes

- Provide real charts for hands-on learning
- Reinforce chart reading daily
- Prepare students for airspace classification deep dive

Week 5 – Day 2

Airspace Classes Deep Dive (Class B, C, D, E, G)

Standards

Standard	Description
202.00	Students will apply airspace classifications using sectional charts and UAS facility maps to determine legal flight operations.
202.01	Students will identify airspace classes (B, C, D, E, G) and their characteristics.
202.02	Students will interpret sectional chart symbols and legends.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.02	Students will apply airspace knowledge to determine safe operations.

Objective
Students will identify and differentiate between Class B, C, D, E, and G airspace and explain operational requirements for each.

Essential Question
How do different airspace classes affect where and how a drone can be operated?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- Why would some areas of airspace have stricter rules than others?
- What type of airspace do you think is safest for drone operations?
- Why would airports require more control over airspace?

Teacher will connect responses to air traffic density and safety.

Vocabulary

- **Class B Airspace** – Highly controlled airspace around major airports
- **Class C Airspace** – Controlled airspace around medium airports
- **Class D Airspace** – Controlled airspace around smaller airports
- **Class E Airspace** – Controlled airspace not classified as B, C, or D
- **Class G Airspace** – Uncontrolled airspace
- **Surface Area** – Airspace starting at ground level
- **Controlled Airspace** – Airspace requiring FAA authorization
- **Uncontrolled Airspace** – Airspace not requiring authorization under normal conditions

Materials

- Student notebook or guided notes sheet
- Sectional charts (printed or digital)
- Airspace diagram visuals
- Whiteboard / presentation slides
- Highlighters or markers

Instruction Content
Airspace is divided into classes based on the level of control required to ensure safe aircraft operations. Each class has specific rules and requirements for drone pilots.

Class B Airspace:
- Surrounds major airports
- Highly controlled
- Requires FAA authorization
- Typically depicted in solid blue lines on charts

Class C Airspace:
- Surrounds medium-sized airports
- Requires authorization
- Typically depicted in solid magenta lines

Class D Airspace:
- Surrounds smaller airports
- Requires authorization
- Typically depicted in dashed blue lines

Class E Airspace:
- Controlled but less restrictive
- May begin at surface or higher altitudes
- Requires authorization when at surface level

Class G Airspace:
- Uncontrolled airspace
- No authorization required under standard conditions
- Common in rural areas

Key operational takeaway:
- Authorization is required in all controlled airspace
- No authorization is required in Class G (unless otherwise restricted)

Why airspace classification matters:
- Prevents collisions with manned aircraft
- Ensures organized traffic flow
- Protects high-traffic airport environments

Understanding airspace classes is heavily tested on the FAA Part 107 exam and is essential for safe operations.

Teacher Emphasis
- Emphasize differences between controlled and uncontrolled airspace
- Reinforce that authorization is required in B, C, D, and some E
- Highlight that Class G is the most accessible for drone operations
- Connect airspace classes to real-world flight planning
- Reinforce that misidentification leads to violations

Activity Procedure

Activity: Airspace Identification Practice

1. Students take structured notes during instruction
2. Students analyze sectional charts and identify:
    - Airspace class
    - Whether authorization is required
    - Operational considerations
3. Teacher will use the following Formative Assessment questions:
    - Which airspace requires authorization?
    - How can you identify Class B vs Class C?
    - Why is Class G considered safer for drone pilots?
4. Instructor reviews responses and provides clarification

Flight Activity (Airspace Awareness)

1. Identify local airspace classification
2. Determine if authorization is required
3. Define safe flight boundaries
4. Perform controlled takeoff
5. Maintain controlled flight
6. Execute safe landing

Instructor emphasis: applying airspace knowledge to real flight

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Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Airspace Identification	Incorrect	Partial accuracy	Mostly correct	Fully accurate
Rule Application	Limited	Basic understanding	Correct application	Detailed and accurate
Scenario Evaluation	Incorrect	Partial accuracy	Mostly correct	Fully accurate with reasoning
Flight Awareness	Unsafe	Basic	Controlled	Highly aware

Assessment Items

1. Which airspace is uncontrolled?
   A. Class B
   B. Class C
   C. Class D
   D. Class G

2. Which airspace surrounds major airports?
   A. Class G
   B. Class E
   C. Class B
   D. Class D

3. Which airspace uses dashed blue lines?
   A. Class B
   B. Class C
   C. Class D
   D. Class G
4. Which airspace may start at the surface or higher altitudes?
   A. Class E
   B. Class G
   C. Class B
   D. Class C
5. Scenario:
   A pilot is flying in Class C airspace without authorization.
   Is this legal? Explain.

Answer Key

1. D
2. C
3. C
4. A
5. No — authorization is required in controlled airspace

Closure

- Review airspace classifications
- Ask students which airspace is most restrictive
- Reinforce importance of correct identification

Teacher Notes

- Use real chart examples for clarity
- Reinforce color and symbol recognition
- Prepare students for sectional chart symbols next lesson

Week 5 – Day 3

Sectional Chart Symbols & Legend Mastery

Standards

Standard	Description
202.00	Students will apply airspace classifications using sectional charts and UAS facility maps to determine legal flight operations.
202.03	Students will differentiate between controlled and uncontrolled airspace.
202.04	Students will apply airspace knowledge to determine authorization requirements.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.02	Students will apply chart interpretation to determine safe operations.

Objective
Students will interpret sectional chart symbols, including airports, obstacles, and navigation aids, to support safe and legal drone operations.

Essential Question
How do sectional chart symbols help pilots identify hazards and navigate safely?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What symbols have you seen on maps before?
- Why are symbols used instead of words on maps?
- What types of hazards might a pilot need to identify before flying?

Teacher will connect responses to aviation chart symbols and safety.

Vocabulary

- **Legend** – Key explaining symbols on a chart
- **Obstacle** – Structure that may pose a hazard to aircraft (towers, buildings)
- **MSL (Mean Sea Level)** – Altitude measured from sea level
- **AGL (Above Ground Level)** – Height above the ground
- **Airport Symbol** – Chart symbol representing an airport
- **Navigation Aid (NAVAID)** – Equipment used for navigation (VOR, etc.)
- **Obstruction Marking** – Symbol indicating tall structures

Materials

- Student notebook or guided notes sheet
- Sectional charts (printed or digital)
- Chart legend reference sheet
- Highlighters or markers
- Whiteboard / presentation slides

Instruction Content
Sectional charts use standardized symbols to represent important aviation information. Pilots must understand these symbols to safely navigate airspace and avoid hazards.

The chart legend explains all symbols used on sectional charts.

Common symbols include:

- **Airports:**
  - Blue = towered airport
  - Magenta = non-towered airport
- **Obstacles:**
  - Towers and structures marked with height
  - Numbers indicate height above MSL and AGL
- **Elevation numbers:**
  - Large numbers indicate terrain elevation
  - Obstacle heights shown as two numbers (MSL/AGL)
- **Navigation aids (NAVAIDs):**
  - VOR stations used for aircraft navigation
  - Marked with specific symbols
- **Other important features:**
  - Roads and cities
  - Water features
  - Boundaries and restricted areas

Why symbol interpretation matters:

- Helps pilots avoid obstacles
- Identifies airport locations and traffic areas
- Supports safe flight planning
- Ensures compliance with FAA regulations

Understanding sectional chart symbols is heavily tested on the FAA Part 107 exam.

Teacher Emphasis

- Emphasize that symbols provide critical safety information
- Reinforce that misreading symbols can lead to accidents
- Highlight importance of obstacle awareness
- Connect symbols to real-world flight hazards
- Reinforce frequent FAA testing of chart interpretation

Activity Procedure

Activity: Chart Symbol Identification

1. Students take structured notes during instruction
2. Students examine sectional charts and identify:
   - Airport types
   - Obstacles and their heights
   - Navigation aids
   - Terrain elevations

3. Teacher will use the following Formative Assessment questions:
    - What do blue vs magenta airport symbols indicate?
    - How are obstacle heights displayed?
    - Why is it important to know elevation?
4. Instructor reviews responses and explains correct interpretations

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Flight Activity (Obstacle Awareness)

1. Identify obstacles in local environment
2. Discuss potential hazards
3. Define safe flight boundaries
4. Perform controlled takeoff
5. Maintain safe distance from obstacles
6. Execute safe landing

Instructor emphasis: hazard recognition

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Symbol Recognition	Incorrect	Partial accuracy	Mostly correct	Fully accurate
Chart Interpretation	Limited	Basic understanding	Accurate	Detailed and confident
Hazard Identification	Minimal	Basic	Consistent	Advanced awareness
Flight Awareness	Unsafe	Basic	Controlled	Highly aware

Assessment Items

1. What does a blue airport symbol indicate?
   A. Closed airport
   B. Towered airport
   C. Military only
   D. Private use
2. What does a magenta airport symbol indicate?
   A. Towered airport
   B. Non-towered airport
   C. Military base
   D. Closed airport
3. What do obstacle numbers represent?
   A. Speed
   B. Height
   C. Distance
   D. Weight

4. What does the chart legend provide?
   A. Weather data
   B. Symbol explanations
   C. Flight speed
   D. Camera settings
5. Scenario:
   A pilot ignores obstacle markings on a sectional chart.
   What risk does this create?

Answer Key

1. B
2. B
3. B
4. B
5. Collision risk with obstacles

Closure

- Review key chart symbols
- Ask students which symbol is most important for safety
- Reinforce importance of accurate interpretation

Teacher Notes

- Provide hands-on chart practice daily
- Reinforce symbol recognition through repetition
- Prepare students for airspace + chart integration next lesson

Week 5 – Day 4

Sectional Chart Interpretation & Airspace Integration

Standards

Standard	Description
202.00	Students will apply airspace classifications using sectional charts and UAS facility maps to determine legal flight operations.
202.02	Students will interpret sectional chart symbols and legends.
202.03	Students will differentiate between controlled and uncontrolled airspace.
202.04	Students will apply airspace knowledge to determine authorization requirements.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.02	Students will apply chart interpretation to determine safe and legal operations.

Objective
Students will interpret sectional charts by combining airspace classification, symbols, and operational rules to determine safe and legal drone flight operations.

Essential Question
How do pilots use sectional charts to make safe and legal flight decisions?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What information must a pilot know before flying in a new location?
- Why is it important to combine multiple pieces of information from a chart?
- What could happen if a pilot misinterprets airspace or symbols?

Teacher will connect responses to integrated chart use.

Vocabulary

- **Chart Interpretation** – Understanding and applying information from a sectional chart
- **Airspace Boundary** – Line defining limits of airspace classification
- **Operational Area** – The location where a drone is flown
- **Flight Planning** – Process of preparing for safe and legal operation
- **Compliance Decision** – Determination of whether flight meets FAA rules

Materials

- Student notebook or guided notes sheet
- Sectional charts (printed or digital)
- Scenario worksheets
- Chart legend reference sheet
- Highlighters or markers
- Whiteboard / presentation slides

Instruction Content
Sectional chart interpretation requires combining multiple types of information to make safe and legal flight decisions. Pilots must analyze airspace, symbols, and operational rules together.

The chart interpretation process includes:
1. Identify the flight location
2. Determine airspace classification
3. Identify nearby airports
4. Check for obstacles and hazards
5. Determine if authorization is required
6. Evaluate safe flight boundaries

Key elements to analyze include:
- Airspace class (B, C, D, E, G)
- Airport proximity
- Obstacle locations and heights
- Terrain elevation
- Special use areas

Common errors include:
- Misidentifying airspace boundaries
- Ignoring nearby airports
- Overlooking obstacles
- Failing to determine authorization requirements

Operational importance:
- All flight planning begins with chart analysis
- Safe operations depend on accurate interpretation
- FAA exam frequently tests integrated chart scenarios

Teacher Emphasis
- Emphasize that chart interpretation requires combining multiple concepts
- Reinforce that errors in interpretation lead to unsafe operations
- Highlight importance of step-by-step analysis
- Connect chart interpretation to FAA exam scenarios
- Reinforce that this is a critical pilot skill

Activity Procedure
Activity: Full Chart Analysis Scenarios
1. Students take structured notes during instruction
2. Students analyze sectional chart scenarios and determine:
    - Airspace classification
    - Authorization requirements
    - Nearby hazards
    - Whether flight is safe and legal

3. Teacher will use the following Formative Assessment questions:
    - What is the first step in chart interpretation?

    - How do airspace and symbols work together?
    - Why must all factors be considered together?
4. Instructor reviews responses and provides detailed explanations

---

Flight Activity (Chart-Based Planning)

1. Identify flight location on chart
2. Determine airspace classification
3. Define safe operational area
4. Make Go/No-Go decision
5. Perform controlled takeoff
6. Execute safe landing

Instructor emphasis: applying chart knowledge to real flight

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Chart Interpretation	Incorrect	Partial accuracy	Mostly correct	Fully accurate
Airspace Application	Limited	Basic	Correct	Detailed and accurate
Scenario Evaluation	Incorrect	Partial accuracy	Mostly correct	Fully accurate with reasoning
Flight Planning	Unsafe	Basic	Safe	Highly precise

Assessment Items

1. What is the first step in chart interpretation?
   A. Fly
   B. Identify location
   C. Check battery
   D. Increase speed
2. What must be determined after identifying location?
   A. Camera angle
   B. Airspace classification
   C. Speed
   D. Battery level
3. What is a common chart interpretation error?
   A. Checking airspace
   B. Ignoring obstacles
   C. Using a legend
   D. Planning ahead
4. What determines if authorization is required?
   A. Battery
   B. Airspace classification

C. Weather only
D. Camera

5. Scenario:
   A pilot fails to identify controlled airspace on a chart before flying.
   What risk does this create?

Answer Key

1. B
2. B
3. B
4. B
5. Airspace violation and unsafe operation

Closure

- Review chart interpretation steps
- Ask students what step is most important
- Reinforce importance of integrated analysis

Teacher Notes

- Reinforce step-by-step chart reading
- Use real-world scenarios frequently
- Prepare students for full airspace and chart assessment

Week 5 – Day 5

Airspace & Sectional Chart Integration + Week 5 Assessment

Standards

Standard	Description
202.00	Students will apply airspace classifications using sectional charts and UAS facility maps to determine legal flight operations.
202.01	Students will identify airspace classes (B, C, D, E, G) and their characteristics.
202.02	Students will interpret sectional chart symbols and legends.
202.03	Students will differentiate between controlled and uncontrolled airspace.
202.04	Students will apply airspace knowledge to determine authorization requirements.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.02	Students will evaluate flight scenarios for safety and compliance.

Objective
Students will apply airspace classification and sectional chart interpretation to evaluate safe and legal drone flight operations.

Essential Question
How do airspace and sectional charts work together to ensure safe and legal drone operations?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What is the most important thing to check on a sectional chart before flying?
- Why is airspace classification critical for drone pilots?
- How do charts help prevent accidents?

Teacher will use responses to review Week 5 concepts.

Vocabulary

- **Airspace Integration** – Combining airspace knowledge with chart interpretation
- **Flight Planning** – Preparing for safe and legal operations
- **Operational Boundary** – Limits within which a drone can safely operate
- **Compliance Check** – Verification that flight meets FAA rules
- **Hazard Identification** – Recognizing risks before flight

Materials

- Student notebook or guided notes sheet
- Sectional charts (printed or digital)
- Scenario worksheets
- Chart legend reference sheet
- Whiteboard / presentation slides

- Drone and controller
- Batteries (fully charged)

Instruction Content
Safe drone operations require full integration of airspace knowledge and sectional chart interpretation. Pilots must evaluate all available information before flight.

The integrated flight planning process includes:
1. Identify flight location
2. Determine airspace classification
3. Check for nearby airports
4. Identify obstacles and hazards
5. Determine authorization requirements
6. Define safe operational boundaries
7. Make a Go/No-Go decision

Key considerations include:
- Controlled vs uncontrolled airspace
- Authorization requirements (LAANC)
- Obstacle avoidance
- Airport proximity
- Terrain elevation

Common errors include:
- Failing to identify controlled airspace
- Ignoring obstacles or terrain
- Misinterpreting chart symbols
- Skipping planning steps

Good pilots demonstrate:
- Accurate chart interpretation
- Strong situational awareness
- Careful planning and decision-making
- Consistent compliance with FAA rules

This integrated knowledge is one of the highest-weight areas on the FAA Part 107 exam.

Teacher Emphasis
- Emphasize that all chart and airspace knowledge must be applied together
- Reinforce that planning prevents violations and accidents
- Highlight that errors often occur when steps are skipped
- Connect integrated thinking to FAA exam success
- Reinforce that safe pilots always plan before flying

Activity Procedure

Activity: Full Airspace & Chart Scenarios

1. Students take structured notes during instruction
2. Students analyze complex sectional chart scenarios and determine:
    - Airspace classification
    - Authorization requirements
    - Hazards present
    - Whether flight is safe and legal
3. Teacher will use the following Formative Assessment questions:
    - What is the first step in flight planning?
    - How do charts and airspace work together?
    - Why must all factors be considered together?
4. Instructor reviews responses and provides detailed explanations

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Flight Activity (Full Planning Application)

1. Identify flight location on chart
2. Determine airspace classification
3. Define safe operational boundaries
4. Make a class Go/No-Go decision
5. Perform controlled takeoff
6. Execute safe landing

Instructor emphasis: full integration of planning and execution

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Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Chart Interpretation	Incorrect	Partial accuracy	Mostly correct	Fully accurate
Airspace Application	Limited	Basic	Correct	Detailed and accurate
Scenario Evaluation	Incorrect	Partial accuracy	Mostly correct	Fully accurate with reasoning
Flight Planning	Unsafe	Basic	Safe	Highly precise and consistent

---

Assessment Items (Week 5 Quiz)

1. What is the first step in flight planning?
   A. Fly
   B. Identify location
   C. Increase speed
   D. Check camera

2. What determines if authorization is required?
   A. Battery
   B. Airspace classification
   C. Camera
   D. Speed
3. What do sectional charts help identify?
   A. Only roads
   B. Airspace and hazards
   C. Only weather
   D. Only airports
4. What is a common mistake in flight planning?
   A. Checking charts
   B. Identifying airspace
   C. Ignoring obstacles
   D. Planning ahead
5. What airspace does NOT require authorization (normally)?
   A. Class B
   B. Class C
   C. Class D
   D. Class G
6. Scenario:
   A pilot plans a flight near an airport but does not check airspace or charts.
   What risks are present and what should the pilot do?

Answer Key

1. B
2. B
3. B
4. C
5. D
6. Risk of airspace violation and unsafe operation; pilot must check charts and obtain authorization if required

---

Closure

- Review full chart and airspace integration process
- Ask students what step is most important
- Reinforce importance of planning and compliance

Teacher Notes

- Reinforce daily chart interpretation practice
- Identify weak areas before moving forward
- Prepare students for next unit: Airport Operations & Traffic Patterns

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Week 5 COMPLETE
Students now have strong FAA-aligned understanding of:

- Airspace classifications
- Sectional charts
- Chart symbols and legend
- Airspace authorization
- Integrated flight planning

Week 6 – Day 1

Airport Operations & Traffic Pattern Fundamentals

Standards

Standard	Description
205.00	Students will interpret airport operations and apply right-of-way rules for safe integration into airspace.
205.01	Students will identify airport layouts and traffic patterns.
205.02	Students will explain right-of-way rules between aircraft and drones.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.02	Students will apply airport operation knowledge to ensure safe drone operations.

Objective
Students will identify traffic pattern components and explain how manned aircraft operate near airports.

Essential Question
How do airport traffic patterns affect safe drone operations near airports?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What do you think happens around an airport during takeoff and landing?
- Why would aircraft follow a specific path when landing?
- What risks might exist if a drone flies near an airport?

Teacher will connect responses to organized traffic flow and safety.

Vocabulary

- **Traffic Pattern** – Standard path aircraft follow when taking off or landing
- **Runway** – Surface used for aircraft takeoff and landing
- **Upwind Leg** – Flight path after takeoff
- **Crosswind Leg** – Flight path perpendicular to runway
- **Downwind Leg** – Flight path parallel to runway in opposite direction
- **Base Leg** – Turn toward final approach
- **Final Approach** – Final path aligned with runway for landing

Materials

- Student notebook or guided notes sheet
- Airport traffic pattern diagrams
- Whiteboard / presentation slides
- Sectional charts (optional for reference)

Instruction Content
Aircraft follow standardized traffic patterns at airports to ensure safe and predictable movement. Drone pilots must understand these patterns to avoid conflicts with manned aircraft.

Standard traffic pattern components include:
- Upwind
- Crosswind
- Downwind
- Base
- Final

Typical pattern characteristics:
- Flown in a rectangular shape
- Usually at 1,000 feet AGL for manned aircraft
- Most patterns are flown to the left (left-hand traffic)

Why traffic patterns are important:
- Organize aircraft movement
- Reduce collision risk
- Provide predictable flight paths

Operational considerations for drone pilots:
- Avoid flying near airports without authorization
- Be aware of aircraft approach and departure paths
- Always yield to manned aircraft
- Maintain situational awareness

Understanding airport operations is critical for FAA exam success and safe drone operation.

Teacher Emphasis
- Emphasize that aircraft follow predictable patterns
- Reinforce that drones must avoid these areas
- Highlight that most aircraft are at low altitude near airports
- Connect traffic patterns to real-world collision risk
- Reinforce that drones must always yield to manned aircraft

Activity Procedure
Activity: Traffic Pattern Identification
1. Students take structured notes during instruction
2. Students label a traffic pattern diagram including:
    - All pattern legs
    - Direction of travel
    - Runway alignment
3. Teacher will use the following Formative Assessment questions:
    - What is the purpose of the traffic pattern?
    - Which leg is aligned with landing?
    - Why are patterns usually flown to the left?
4. Instructor reviews responses and clarifies misconceptions

Flight Activity (Pattern Awareness – Ground-Based Discussion)

1. Identify nearby airport (if applicable)
2. Discuss expected traffic pattern
3. Identify safe drone operating area
4. Discuss avoidance strategies
5. Reinforce visual scanning techniques

Instructor emphasis: awareness, not proximity flying

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Pattern Identification	Incorrect	Partial accuracy	Mostly correct	Fully accurate
Concept Understanding	Limited	Basic	Accurate	Detailed and applied
Scenario Awareness	Minimal	Basic	Consistent	Advanced awareness
Safety Understanding	Unsafe	Basic	Safe	Highly aware

Assessment Items

1. What is the final approach?
   A. First turn
   B. Landing path
   C. Takeoff
   D. Taxi
2. What is the downwind leg?
   A. Toward runway
   B. Parallel opposite direction
   C. Landing
   D. Vertical climb
3. What altitude is typically used in traffic patterns?
   A. 100 ft
   B. 400 ft
   C. 1,000 ft AGL
   D. 5,000 ft
4. What direction are most traffic patterns flown?
   A. Right only
   B. Left only
   C. Both always
   D. Random
5. Scenario:
   A drone is flown near an airport traffic pattern.
   What risk does this create?

Answer Key

1. B
2. B
3. C
4. B
5. Collision risk with manned aircraft

Closure

- Review traffic pattern components
- Ask students why patterns improve safety
- Reinforce the importance of avoiding airport traffic areas

Teacher Notes

- Use diagrams heavily for visual learners
- Reinforce pattern terminology daily
- Prepare students for airport operations in detail next lesson

Week 6 – Day 2

Airport Types & Operations (Towered vs Non-Towered Airports)

Standards

Standard	Description
205.00	Students will interpret airport operations and apply right-of-way rules for safe integration into airspace.
205.03	Students will recognize basic radio communication procedures and terminology.
205.04	Students will explain communication and operational procedures at airports.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.02	Students will apply airport operation knowledge to ensure safe drone operations.

Objective
Students will differentiate between towered and non-towered airports and explain how aircraft operate at each.

Essential Question
How do different types of airports impact aircraft operations and drone safety?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What differences might exist between large and small airports?
- Why would some airports need control towers while others do not?
- How might communication differ between these airports?

Teacher will connect responses to airport complexity and traffic levels.

Vocabulary

- **Towered Airport** – Airport with an operating control tower
- **Non-Towered Airport** – Airport without a control tower
- **ATC (Air Traffic Control)** – Authority that manages aircraft movement
- **CTAF (Common Traffic Advisory Frequency)** – Radio frequency used at non-towered airports
- **UNICOM** – Advisory service providing airport information
- **Taxiway** – Path for aircraft movement on the ground
- **Apron/Ramp** – Area for parking and loading aircraft

Materials

- Student notebook or guided notes sheet
- Sectional charts
- Airport diagram visuals
- Whiteboard / presentation slides

Instruction Content
Airports are classified based on whether they have an operating control tower. This affects how aircraft communicate and operate within the airspace.

Towered Airports:
- Have active Air Traffic Control (ATC)
- ATC provides instructions to pilots
- Pilots must receive clearance before takeoff and landing
- Typically busier with higher traffic volume

Non-Towered Airports:
- No active control tower
- Pilots communicate using CTAF
- Pilots announce intentions to other aircraft
- Rely on see-and-avoid procedures

Key operational differences:
- Towered: controlled, directed by ATC
- Non-towered: pilot-controlled communication

Drone pilot considerations:
- Must be aware of nearby airport type
- Must avoid interfering with aircraft operations
- Must maintain visual awareness of traffic
- Must follow all airspace authorization requirements

Safety importance:
- Aircraft may be approaching or departing at low altitudes
- Communication differences increase risk at non-towered airports
- Predictable behavior reduces collision risk

Understanding airport operations is essential for FAA exam success and safe drone operation.

Teacher Emphasis
- Emphasize differences between towered and non-towered operations
- Reinforce that communication is critical for safety
- Highlight increased risk near non-towered airports
- Connect airport operations to real-world drone restrictions
- Reinforce that drones must always yield to aircraft

Activity Procedure
Activity: Airport Type Identification
1. Students take structured notes during instruction
2. Students analyze charts and scenarios to determine:
    - Whether an airport is towered or non-towered
    - How aircraft operate in each environment
    - What risks are present for drone operations

3. Teacher will use the following Formative Assessment questions:
    - What role does ATC play?
    - How do pilots communicate at non-towered airports?
    - Why are non-towered airports potentially more dangerous?
4. Instructor reviews responses and provides clarification

Flight Activity (Airport Awareness Discussion)

1. Identify nearest airport (if applicable)
2. Determine airport type
3. Discuss operational risks
4. Define safe drone operating area
5. Reinforce visual scanning for aircraft

Instructor emphasis: awareness and avoidance

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Airport Identification	Incorrect	Partial accuracy	Mostly correct	Fully accurate
Operational Understanding	Limited	Basic	Accurate	Detailed and applied
Scenario Awareness	Minimal	Basic	Consistent	Advanced awareness
Safety Understanding	Unsafe	Basic	Safe	Highly aware

Assessment Items

1. What is a towered airport?
   A. No communication
   B. Has ATC
   C. Closed airport
   D. Private airport
2. What is CTAF used for?
   A. Weather
   B. Drone control
   C. Pilot communication at non-towered airports
   D. Navigation
3. Who gives takeoff clearance at a towered airport?
   A. Pilot
   B. Observer
   C. ATC
   D. Manufacturer

4. What is the main safety method at non-towered airports?
   A. ATC control
   B. See-and-avoid
   C. Automation
   D. GPS
5. Scenario:
   A drone is flown near a non-towered airport without awareness of traffic.
   What risk does this create?

Answer Key

1. B
2. C
3. C
4. B
5. Collision risk due to lack of coordinated communication

Closure

- Review differences between airport types
- Ask students which type presents greater risk
- Reinforce importance of awareness near all airports

Teacher Notes

- Use real local airport examples
- Reinforce communication concepts
- Prepare students for airport markings and lighting next lesson

Week 6 – Day 3

Airport Markings, Lighting, and Signs

Standards

Standard	Description
205.00	Students will interpret airport operations and apply right-of-way rules for safe integration into airspace.
205.05	Students will identify airport markings and lighting systems.
205.06	Students will evaluate airport hazards and operational risks.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.02	Students will apply airport knowledge to identify hazards and ensure safe operations.

Objective
Students will identify airport markings, lighting systems, and signs, and explain their role in safe aircraft operations.

Essential Question
How do airport markings and lighting systems improve safety for aircraft operations?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- Why do runways have markings and lights?
- How might pilots use visual cues during landing?
- What could happen if markings or lighting were missing?

Teacher will connect responses to visibility and safety.

Vocabulary

- **Runway Markings** – Painted lines and numbers on runways
- **Threshold** – Beginning of usable runway for landing
- **Runway Numbers** – Indicate runway direction (based on compass heading)
- **Taxiway Markings** – Lines guiding aircraft on the ground
- **Runway Edge Lights** – White lights outlining runway edges
- **Taxiway Lights** – Blue lights outlining taxiways
- **Approach Lighting System (ALS)** – Lighting aiding aircraft during landing
- **Hold Short Line** – Marking indicating where aircraft must stop

Materials

- Student notebook or guided notes sheet
- Airport diagram visuals
- Whiteboard / presentation slides
- Sectional charts (optional reference)

Instruction Content
Airport markings, lighting, and signage provide essential visual information to pilots during takeoff, landing, and ground operations.

Runway markings include:
- Centerline (guides aircraft during takeoff/landing)
- Threshold markings (beginning of landing area)
- Runway numbers (indicate magnetic heading)

Taxiway markings include:
- Yellow centerlines
- Edge markings
- Hold short lines (critical safety boundary)

Lighting systems include:
- Runway edge lights (white)
- Taxiway lights (blue)
- Approach lighting systems (assist landing)

Key safety functions include:
- Guiding aircraft safely on the ground and in air
- Preventing runway incursions
- Supporting visibility in low-light conditions

Operational importance for drone pilots:
- Awareness of airport layout
- Avoiding active runways and taxiways
- Recognizing high-risk areas
- Maintaining safe distance from operations

Understanding markings and lighting is tested on the FAA Part 107 exam and is critical for safe drone operations near airports.

Teacher Emphasis
- Emphasize that markings and lighting communicate critical safety information
- Reinforce that pilots rely heavily on visual cues
- Highlight that runways and taxiways are high-risk areas
- Connect markings to real-world accident prevention
- Reinforce that drones must stay clear of airport operations

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Activity Procedure
Activity: Airport Marking Identification
1. Students take structured notes during instruction
2. Students analyze airport diagrams and identify:
    - Runway markings
    - Taxiway markings
    - Lighting systems
    - Safety boundaries

3. Teacher will use the following Formative Assessment questions:
    - What does a runway number represent?
    - What is the purpose of a hold short line?
    - Why are lighting systems critical at night?
4. Instructor reviews responses and provides clarification

Flight Activity (Airport Hazard Awareness – Discussion-Based)

1. Identify airport features from diagrams
2. Discuss high-risk areas
3. Define safe drone operating zones
4. Reinforce avoidance strategies
5. Discuss visual awareness techniques

Instructor emphasis: hazard recognition and avoidance

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Marking Identification	Incorrect	Partial accuracy	Mostly correct	Fully accurate
Lighting Understanding	Limited	Basic	Accurate	Detailed and applied
Hazard Recognition	Minimal	Basic	Consistent	Advanced awareness
Safety Awareness	Unsafe	Basic	Safe	Highly aware

Assessment Items

1. What do runway numbers represent?
   A. Speed
   B. Direction
   C. Distance
   D. Weight

2. What color are taxiway lights?
   A. White
   B. Blue
   C. Red
   D. Green

3. What is a hold short line?
   A. Landing zone
   B. Stop boundary
   C. Taxiway centerline
   D. Runway number

4. What do runway edge lights indicate?
   A. Taxiway
   B. Runway edges
   C. Parking area
   D. Weather

5. Scenario:
   A drone is flown near an active runway.
   What risk does this create?

Answer Key

1. B
2. B
3. B
4. B
5. Collision risk with aircraft

Closure

- Review markings and lighting systems
- Ask students which feature is most critical for safety
- Reinforce importance of airport awareness

Teacher Notes

- Use diagrams for visual reinforcement
- Reinforce recognition through repetition
- Prepare students for full airport operations integration next lesson

Week 6 – Day 4

Airport Operations Integration & Risk Management

Standards

Standard	Description
205.00	Students will interpret airport operations and apply right-of-way rules for safe integration into airspace.
205.02	Students will explain right-of-way rules between aircraft and drones.
205.04	Students will explain communication and operational procedures at airports.
205.06	Students will evaluate airport hazards and operational risks.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.02	Students will apply risk management strategies for safe operations.

Objective
Students will integrate knowledge of airport operations, traffic patterns, and markings to evaluate risks and ensure safe drone operations near airports.

Essential Question
How can drone pilots safely operate near airports while avoiding risks to aircraft and people?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What is the greatest risk when flying near an airport?
- Why must drone pilots be especially cautious in these areas?
- What steps should a pilot take before flying near an airport?

Teacher will connect responses to integrated risk management.

Vocabulary

- **Risk Management** – Process of identifying and reducing hazards
- **Operational Hazard** – Condition that increases risk during flight
- **Situational Awareness** – Understanding of environment and conditions
- **Traffic Conflict** – Potential collision between aircraft
- **Mitigation Strategy** – Action taken to reduce risk

Materials

- Student notebook or guided notes sheet
- Sectional charts
- Scenario worksheets
- Airport diagrams
- Whiteboard / presentation slides

Instruction Content
Safe drone operations near airports require integrating knowledge of traffic patterns, airspace, markings, and communication procedures.

Key risk factors near airports include:
- Low-flying aircraft during takeoff and landing
- High traffic density
- Limited reaction time
- Communication limitations (especially at non-towered airports)

Risk management process includes:
1. Identify hazards
2. Assess risk level
3. Implement mitigation strategies
4. Monitor conditions continuously

Common mitigation strategies include:
- Avoiding airport traffic pattern areas
- Maintaining visual awareness of aircraft
- Operating at safe distances
- Obtaining required authorization
- Adjusting or cancelling flights if necessary

High-risk situations include:
- Flying near runways or approach paths
- Operating without awareness of traffic patterns
- Ignoring airspace requirements

Pilot responsibilities include:
- Always yielding to manned aircraft
- Making safe and informed decisions
- Avoiding operations that create hazards

This integrated understanding is critical for FAA exam success and real-world safety.

Teacher Emphasis
- Emphasize that airports are high-risk environments
- Reinforce that risk management is an ongoing process
- Highlight that most accidents result from poor decision-making
- Connect risk management to FAA test scenarios
- Reinforce that safe pilots anticipate hazards

Activity Procedure
Activity: Airport Risk Analysis Scenarios
1. Students take structured notes during instruction
2. Students analyze scenarios and determine:
    - Hazards present
    - Risk level (low, medium, high)
    - Appropriate mitigation strategies
    - Whether flight should proceed

3. Teacher will use the following Formative Assessment questions:
    - What makes airport environments high risk?
    - How can risk be reduced?
    - When should a pilot cancel a flight?
4. Instructor reviews responses and provides detailed explanations

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Flight Activity (Risk-Based Decision Making)

1. Identify nearby airport (if applicable)
2. Evaluate potential hazards
3. Determine safe operating area
4. Make Go/No-Go decision
5. Perform controlled takeoff (if safe)
6. Execute safe landing

Instructor emphasis: decision-making and awareness

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Hazard Identification	Incorrect	Partial accuracy	Mostly correct	Fully accurate
Risk Evaluation	Limited	Basic	Accurate	Detailed and justified
Mitigation Strategy	Minimal	Basic	Appropriate	Advanced and proactive
Decision-Making	Unsafe	Basic	Safe	Highly consistent and justified

---

Assessment Items

1. What is the first step in risk management?
   A. Fly
   B. Identify hazards
   C. Increase speed
   D. Ignore risks
2. What is a traffic conflict?
   A. Battery issue
   B. Collision risk between aircraft
   C. Weather issue
   D. Camera issue
3. What is the safest action if risk is too high?
   A. Continue flying
   B. Increase speed
   C. Cancel or delay flight
   D. Ignore it

4. What must drone pilots always do near aircraft?
   A. Speed up
   B. Yield
   C. Hover
   D. Land immediately
5. Scenario:
   A pilot observes aircraft approaching while flying near an airport.
   What should the pilot do?

Answer Key

1. B
2. B
3. C
4. B
5. Yield immediately and move away or land safely

Closure

- Review risk management steps
- Ask students what makes airports dangerous
- Reinforce importance of proactive decision-making

Teacher Notes

- Reinforce risk thinking in every lesson
- Use real-world examples for relevance
- Prepare students for full airport operations assessment

Week 6 – Day 5

Airport Operations Integration + Week 6 Assessment

Standards

Standard	Description
205.00	Students will interpret airport operations and apply right-of-way rules for safe integration into airspace.
205.01	Students will identify airport layouts and traffic patterns.
205.03	Students will recognize basic radio communication procedures and terminology.
205.05	Students will identify airport markings and lighting systems.
205.06	Students will evaluate airport hazards and operational risks.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.02	Students will apply airport knowledge to ensure safe and legal operations.

Objective
Students will apply knowledge of airport operations, traffic patterns, markings, and risk management to evaluate safe and compliant drone operations.

Essential Question
How do airport operations knowledge and risk management combine to ensure safe drone flight?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What is the most dangerous aspect of flying near an airport?
- Why must drone pilots understand airport operations?
- What steps should be taken before flying near an airport?

Teacher will use responses to review Week 6 concepts.

Vocabulary

- **Airport Integration** – Applying airport knowledge to drone operations
- **Operational Hazard** – Condition that increases risk
- **Flight Conflict** – Potential interference with aircraft
- **Safe Operating Area** – Location free from immediate hazards
- **Compliance Decision** – Determining if operation follows FAA rules

Materials

- Student notebook or guided notes sheet
- Scenario worksheets
- Sectional charts
- Airport diagrams
- Whiteboard / presentation slides

- Drone and controller
- Batteries (fully charged)

Instruction Content
Safe drone operations near airports require full integration of traffic patterns, airport types, markings, and risk management strategies.

The airport safety evaluation process includes:
1. Identify nearby airport
2. Determine airport type (towered or non-towered)
3. Analyze traffic patterns
4. Identify runways, taxiways, and hazards
5. Evaluate airspace classification
6. Determine authorization requirements
7. Make a Go/No-Go decision

Key safety considerations include:
- Aircraft operate at low altitude near airports
- Traffic patterns create predictable but busy airspace
- Non-towered airports rely on pilot awareness
- Runways and approach paths are high-risk zones

Common errors include:
- Flying near traffic patterns
- Ignoring airport proximity
- Failing to identify runway orientation
- Not maintaining awareness of aircraft

Good pilots demonstrate:
- Strong situational awareness
- Careful planning and analysis
- Consistent risk management
- Compliance with FAA regulations

This integrated knowledge is heavily tested on the FAA Part 107 exam and critical for real-world operations.

Teacher Emphasis
- Emphasize that airport environments are among the highest risk areas
- Reinforce that all knowledge must be applied together
- Highlight that awareness prevents accidents
- Connect integration to FAA exam success
- Reinforce that safe pilots always plan ahead

<u>Activity Procedure</u>
Activity: Full Airport Scenario Analysis
1. Students take structured notes during instruction

2. Students analyze complex scenarios and determine:
    - Airport type
    - Traffic pattern considerations
    - Hazards present
    - Whether flight is safe and legal
3. Teacher will use the following Formative Assessment questions:
    - What is the first step when evaluating an airport environment?
    - Why are traffic patterns critical to understand?
    - When should a flight be cancelled?
4. Instructor reviews responses and provides detailed explanations

---

Flight Activity (Airport Safety Application)

1. Identify nearby airport and airspace
2. Evaluate potential hazards
3. Define safe operating boundaries
4. Make Go/No-Go decision
5. Perform controlled takeoff (if safe)
6. Execute safe landing

Instructor emphasis: applying full airport safety awareness

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Airport Knowledge	Limited or incorrect	Basic understanding	Accurate application	Detailed and integrated
Scenario Evaluation	Incorrect	Partial accuracy	Mostly correct	Fully accurate with reasoning
Risk Assessment	Minimal	Basic	Consistent	Advanced and proactive
Flight Decision-Making	Unsafe	Basic	Safe	Highly consistent and justified

---

Assessment Items (Week 6 Quiz)

1. What is the first step in airport safety evaluation?
   A. Fly
   B. Identify airport
   C. Increase speed
   D. Check camera
2. What is the greatest risk near airports?
   A. Battery
   B. Aircraft traffic
   C. Camera
   D. Speed

3. What type of airport uses CTAF?
   A. Towered
   B. Non-towered
   C. Military
   D. Private
4. What is a high-risk area near airports?
   A. Parking lot
   B. Runway and approach path
   C. Classroom
   D. Field
5. What must a pilot do when aircraft are nearby?
   A. Ignore
   B. Speed up
   C. Yield
   D. Hover
6. Scenario:
   A pilot plans to fly near an airport without checking traffic patterns or airspace.
   What risks are present and what should the pilot do?

Answer Key

1. B
2. B
3. B
4. B
5. C
6. Risk of collision and airspace violation; pilot must evaluate charts, airspace, and traffic patterns before flight

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Closure

- Review full airport operations process
- Ask students what factor is most important
- Reinforce importance of awareness and planning

Teacher Notes

- Reinforce integration of all concepts
- Identify areas needing reinforcement
- Prepare students for next unit: Regulations Review & Practice Testing

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Week 6 COMPLETE

Students now have strong FAA-aligned understanding of:

- Traffic patterns
- Airport types
- Airport markings and lighting
- Risk management near airports
- Integrated airport safety decision-making

Week 7 – Day 1

FAA Part 107 Comprehensive Review – Regulations & Airspace

Standards

Standard	Description
201.00	Students will explain FAA Part 107 regulations and operational requirements governing small UAS operations.
201.01	Students will identify eligibility requirements and certification steps for obtaining a Remote Pilot Certificate.
201.02	Students will apply FAA regulations to real-world flight scenarios.
202.00	Students will apply airspace classifications using sectional charts and UAS facility maps to determine legal flight operations.
202.02	Students will interpret sectional chart symbols and legends.
202.04	Students will apply airspace knowledge to determine authorization requirements.

Objective
Students will review and apply FAA Part 107 regulations and airspace classifications to prepare for the FAA knowledge test.

Essential Question
How do FAA regulations and airspace rules work together to ensure safe drone operations?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What is one FAA regulation you remember?
- Why are airspace rules important for safety?
- What happens if a pilot violates FAA regulations?

Teacher will use responses to activate prior knowledge.

Vocabulary

- **Part 107** – FAA regulations for small UAS operations
- **Operational Limitation** – Rule restricting how a drone may be flown
- **Controlled Airspace** – Airspace requiring authorization
- **Uncontrolled Airspace** – Airspace not requiring authorization
- **Compliance** – Following FAA regulations

Materials

- Student notebook or guided notes sheet
- Sectional charts
- FAA regulation summary sheets
- Practice test questions
- Whiteboard / presentation slides

Instruction Content
This lesson begins comprehensive FAA test preparation by reviewing key regulations and airspace concepts.

Key Part 107 regulations include:
- Maximum altitude: 400 feet AGL
- Maximum speed: 100 mph (87 knots)
- Visual Line of Sight (VLOS) required
- No operations over people (unless compliant categories)
- Daylight or civil twilight operations (with lighting)
- Yield to all manned aircraft

Airspace classifications include:
- Class B, C, D, E (controlled airspace – authorization required)
- Class G (uncontrolled airspace – no authorization required)

Authorization requirements:
- LAANC used for controlled airspace approval
- Must follow altitude limits based on location

Common FAA test focus areas:
- Identifying correct regulations
- Applying rules to scenarios
- Understanding airspace requirements

Common mistakes include:
- Confusing airspace classes
- Forgetting altitude limits
- Ignoring VLOS requirements

This content represents a large portion of the FAA Part 107 exam.

Teacher Emphasis
- Emphasize that regulations must be memorized and applied
- Reinforce that airspace determines where drones can fly
- Highlight that FAA questions are scenario-based
- Connect review directly to test success
- Reinforce that compliance is a legal requirement

Activity Procedure
Activity: Regulation & Airspace Review Scenarios
1. Students take structured notes during instruction
2. Students analyze FAA-style questions and determine:
    - Which regulation applies
    - Whether the operation is legal
    - What correction is needed if not compliant

3. Teacher will use the following Formative Assessment questions:
    - What is the maximum altitude under Part 107?
    - Which airspace requires authorization?
    - What does VLOS mean and why is it required?
4. Instructor reviews responses and explains reasoning

Flight Activity (Regulation Application)

1. Define flight area
2. Identify airspace classification
3. Determine legal altitude
4. Confirm VLOS capability
5. Perform controlled takeoff
6. Execute safe landing

Instructor emphasis: applying regulations during flight

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Regulation Knowledge	Incorrect	Partial accuracy	Mostly correct	Fully accurate
Airspace Understanding	Limited	Basic	Accurate	Detailed and applied
Scenario Application	Incorrect	Partial accuracy	Mostly correct	Fully accurate with reasoning
Compliance Decisions	Unsafe	Basic	Safe	Highly consistent

Assessment Items

1. What is the maximum altitude under Part 107?
   A. 200 ft
   B. 300 ft
   C. 400 ft
   D. 500 ft
2. What airspace requires authorization?
   A. Class G
   B. Class B, C, D, E
   C. Private airspace
   D. Rural airspace
3. What does VLOS mean?
   A. Visual Line of Sight
   B. Video Link Operation System
   C. Vertical Landing Option
   D. Visual Light Operation

4. What must a drone pilot do when a manned aircraft approaches?
   A. Speed up
   B. Hover
   C. Yield
   D. Land immediately
5. Scenario:
   A pilot flies at 500 feet AGL in Class G airspace.
   Is this legal? Why or why not?

Answer Key

1. C
2. B
3. A
4. C
5. Not legal; exceeds 400 ft limit

Closure

- Review key regulations and airspace rules
- Ask students what concept is most challenging
- Reinforce importance of test preparation

Teacher Notes

- Begin increasing rigor toward FAA test level
- Encourage students to explain reasoning
- Prepare for deeper scenario practice next lesson

Week 7 – Day 2

Weather Theory & FAA Test Application

Standards

Standard	Description
203.00	Students will interpret aviation weather data and apply it to safe sUAS operations.
203.01	Students will identify basic weather concepts, including wind, pressure, and stability.
203.02	Students will decode METAR and TAF reports.
203.03	Students will apply weather knowledge to determine safe operations.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.02	Students will evaluate weather-related risks and make safe decisions.

Objective
Students will interpret basic weather concepts and aviation weather reports to determine safe drone flight conditions.

Essential Question
How does weather impact safe and legal drone operations?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What types of weather conditions could make flying unsafe?
- Why is wind a major concern for drones?
- How do pilots know what the weather conditions are before flying?

Teacher will connect responses to aviation weather data.

Vocabulary

- **METAR** – Aviation routine weather report
- **TAF** – Terminal Aerodrome Forecast
- **Visibility** – Distance a pilot can see
- **Ceiling** – Height of lowest cloud layer
- **Wind Speed** – Rate of air movement
- **Gusts** – Sudden increases in wind speed
- **Density Altitude** – Air density affecting aircraft performance

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Materials

- Student notebook or guided notes sheet
- Sample METAR/TAF reports
- Weather charts or visuals
- Whiteboard / presentation slides

Instruction Content
Weather plays a critical role in drone flight safety. Pilots must understand both basic weather concepts and how to interpret aviation weather reports.

Key weather factors affecting flight include:
- Wind speed and direction
- Visibility
- Cloud ceiling
- Temperature
- Humidity

Wind considerations:
- High winds reduce control
- Gusts create instability
- Wind direction affects flight path

Visibility and ceiling:
- Poor visibility increases collision risk
- Low ceilings limit safe flight altitude

METAR reports provide:
- Current weather conditions
- Wind, visibility, temperature
- Cloud coverage

TAF reports provide:
- Forecasted weather conditions
- Expected changes over time

FAA test focus includes:
- Reading METAR/TAF data
- Identifying unsafe conditions
- Applying weather knowledge to scenarios

Common errors include:
- Ignoring wind conditions
- Misinterpreting METAR data
- Underestimating weather impact

Understanding weather is essential for FAA exam success and safe drone operation.

Teacher Emphasis
- Emphasize that weather directly impacts flight safety
- Reinforce that wind is one of the most critical factors
- Highlight that METAR/TAF interpretation is test-heavy
- Connect weather knowledge to real-world decision-making
- Reinforce that pilots must assess weather before every flight

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Activity Procedure

Activity: Weather Scenario Analysis

1. Students take structured notes during instruction
2. Students interpret METAR/TAF reports and determine:
    - Wind conditions
    - Visibility and ceiling
    - Whether flight is safe
3. Teacher will use the following Formative Assessment questions:
    - What does a METAR report provide?
    - Why are wind gusts dangerous?
    - What weather conditions would cancel a flight?
4. Instructor reviews responses and explains reasoning

Flight Activity (Weather Awareness Check)

1. Observe current weather conditions
2. Estimate wind speed and direction
3. Assess visibility and cloud conditions
4. Determine if flight is safe
5. Perform controlled takeoff (if safe)
6. Execute safe landing

Instructor emphasis: real-time weather evaluation

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Weather Knowledge	Incorrect	Partial accuracy	Mostly correct	Fully accurate
METAR/TAF Interpretation	Limited	Basic	Accurate	Detailed and applied
Scenario Evaluation	Incorrect	Partial accuracy	Mostly correct	Fully accurate with reasoning
Flight Decision-Making	Unsafe	Basic	Safe	Highly consistent

Assessment Items

1. What does a METAR report provide?
   A. Forecast
   B. Current weather
   C. Airspace
   D. Regulations
2. What is a TAF?
   A. Current weather
   B. Forecast
   C. Airspace map
   D. Flight plan

3. What weather factor most affects drone control?
   A. Temperature
   B. Wind
   C. Humidity
   D. Pressure
4. What is visibility?
   A. Wind speed
   B. Distance a pilot can see
   C. Temperature
   D. Cloud height
5. Scenario:
   A METAR shows strong winds and low visibility.
   Should the pilot fly? Why or why not?

Answer Key

1. B
2. B
3. B
4. B
5. No; unsafe due to poor visibility and wind conditions

Closure

- Review key weather concepts
- Ask students what condition is most dangerous
- Reinforce importance of weather evaluation

Teacher Notes

- Reinforce METAR/TAF decoding regularly
- Use real-world weather examples
- Prepare students for advanced weather interpretation next lesson

Week 7 – Day 3

Advanced Weather Interpretation & Density Altitude

Standards

Standard	Description
203.00	Students will interpret aviation weather data and apply it to safe sUAS operations.
203.02	Students will decode METAR and TAF reports.
203.03	Students will analyze advanced weather conditions affecting flight.
203.04	Students will apply weather data to make go/no-go flight decisions.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.02	Students will evaluate weather-related risks and make safe operational decisions.

Objective
Students will analyze advanced weather conditions and explain how density altitude affects drone performance and flight safety.

Essential Question
How do advanced weather conditions and density altitude impact drone performance and safety?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- Why might a drone perform differently on a hot day versus a cold day?
- How could altitude affect drone performance?
- What happens to aircraft performance when air is less dense?

Teacher will connect responses to density altitude and performance.

Vocabulary

- **Density Altitude** – Air density expressed as altitude
- **High Density Altitude** – Less dense air (hot, high, humid conditions)
- **Low Density Altitude** – Denser air (cold, low elevation)
- **Performance Degradation** – Reduction in aircraft capability
- **Lift** – Force that keeps an aircraft airborne
- **Relative Humidity** – Amount of moisture in the air

Materials

- Student notebook or guided notes sheet
- Sample METAR/TAF reports
- Weather charts or visuals
- Whiteboard / presentation slides

Instruction Content
Advanced weather understanding includes recognizing how environmental conditions affect aircraft performance, especially through density altitude.

Density altitude is affected by:
- Temperature
- Altitude (elevation)
- Humidity

High density altitude conditions occur when:
- Temperature is high
- Elevation is high
- Humidity is high

Effects of high density altitude include:
- Reduced lift
- Reduced thrust
- Decreased climb performance
- Increased takeoff distance (for manned aircraft)

Implications for drones:
- Reduced motor efficiency
- Decreased stability
- Shorter flight times
- Increased difficulty maintaining altitude

Advanced weather hazards include:
- Thermal activity (rising hot air)
- Wind shear (sudden wind changes)
- Gust fronts
- Temperature inversions

FAA test focus includes:
- Understanding density altitude effects
- Identifying unsafe weather conditions
- Applying weather knowledge to scenarios

Common errors include:
- Ignoring temperature effects
- Underestimating performance limitations
- Failing to adjust flight plans

Understanding density altitude is critical for FAA exam success and safe drone operations.

Teacher Emphasis
- Emphasize that air density directly affects performance
- Reinforce that hot weather reduces drone efficiency
- Highlight that density altitude is a common FAA test topic
- Connect performance limitations to real-world safety
- Reinforce that pilots must adjust operations based on conditions

---

Activity Procedure

Activity: Weather & Density Altitude Scenarios

1. Students take structured notes during instruction
2. Students analyze scenarios and determine:
    - Density altitude conditions (high or low)
    - Impact on drone performance
    - Whether flight is safe
3. Teacher will use the following Formative Assessment questions:
    - What factors affect density altitude?
    - Why does high density altitude reduce performance?
    - What adjustments should a pilot make in hot conditions?
4. Instructor reviews responses and provides explanations

Flight Activity (Performance Awareness)

1. Observe current temperature and conditions
2. Discuss expected performance impacts
3. Identify potential risks
4. Adjust flight plan if necessary
5. Perform controlled takeoff (if safe)
6. Execute safe landing

Instructor emphasis: adapting to environmental conditions

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Weather Understanding	Incorrect	Partial accuracy	Mostly correct	Fully accurate
Density Altitude Knowledge	Limited	Basic	Accurate	Detailed and applied
Scenario Analysis	Incorrect	Partial accuracy	Mostly correct	Fully accurate with reasoning
Flight Decision-Making	Unsafe	Basic	Safe	Highly consistent

Assessment Items

1. What factors affect density altitude?
   A. Speed
   B. Temperature, altitude, humidity
   C. Battery
   D. Camera
2. What happens in high density altitude conditions?
   A. Increased performance
   B. Reduced performance
   C. No change
   D. Faster flight

3. What causes high density altitude?
   A. Cold air
   B. Low humidity
   C. Hot temperatures
   D. Low elevation
4. What is a major effect of high density altitude?
   A. Increased lift
   B. Reduced lift
   C. No effect
   D. Increased visibility
5. Scenario:
   A drone is flown on a hot, humid day at high elevation.
   What performance issues might occur?

Answer Key

1. B
2. B
3. C
4. B
5. Reduced lift, reduced performance, decreased stability

Closure

- Review density altitude concepts
- Ask students how weather affects performance
- Reinforce importance of environmental awareness

Teacher Notes

- Use real-world examples (hot summer days)
- Reinforce performance impacts regularly
- Prepare students for full practice testing next lesson

Week 7 – Day 4

FAA Practice Test + Scenario-Based Review

Standards

Standard	Description
201.00	Students will explain FAA Part 107 regulations and operational requirements governing small UAS operations.
201.02	Students will apply operational rules to determine legal drone operations.
202.00	Students will apply airspace classifications using sectional charts and UAS facility maps to determine legal flight operations.
202.04	Students will apply airspace knowledge to determine authorization requirements.
203.00	Students will interpret aviation weather data and apply it to safe sUAS operations.
203.03	Students will evaluate weather conditions for safe operations.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.02	Students will evaluate scenarios and make safe operational decisions.

Objective
Students will complete FAA-style practice questions and apply knowledge to scenario-based decision-making.

Essential Question
How can FAA knowledge be applied to real-world drone flight decisions?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What topic do you feel most confident about?
- What topic is most challenging?
- Why are FAA questions often scenario-based?

Teacher will connect responses to test strategy and application.

Vocabulary

- **Scenario-Based Question** – Question requiring application of knowledge
- **Compliance Decision** – Determining if an operation is legal
- **Operational Judgment** – Decision-making during flight
- **Risk Evaluation** – Assessing potential hazards
- **Test Strategy** – Approach to answering exam questions

Materials

- Student notebook or answer sheet
- FAA-style practice test
- Sectional charts (for reference questions)

- Whiteboard / presentation slides

Instruction Content
FAA Part 107 exam questions are primarily scenario-based and require application of knowledge rather than simple memorization.

Key test strategies include:
- Read the entire question carefully
- Identify key details (airspace, weather, regulations)
- Eliminate incorrect answers
- Choose the safest and most compliant option

Common question types include:
- Regulation application
- Airspace interpretation
- Weather analysis
- Airport operations
- Risk management scenarios

Common mistakes include:
- Rushing through questions
- Ignoring key details
- Choosing answers that are partially correct but unsafe

Successful test-takers:
- Think like a pilot
- Prioritize safety
- Apply FAA rules consistently

Teacher Emphasis
- Emphasize that FAA questions require critical thinking
- Reinforce that safety is always the correct approach
- Highlight importance of reading questions carefully
- Connect strategies to improved test performance
- Reinforce confidence through practice

Activity Procedure
Activity: FAA Practice Test (Scenario-Based)
1. Students complete a 15–20 question FAA-style practice test
2. Students must:
    - Select the correct answer
    - Identify why incorrect answers are wrong
3. Teacher will use the following Formative Assessment questions:
    - What information in the question helped you decide?
    - Why is one answer safer than the others?
    - What mistake could a pilot make in this scenario?
4. Instructor reviews answers and explains reasoning in detail

---

Flight Activity (Scenario-Based Decision Making)

1. Present a flight scenario
2. Identify hazards
3. Determine compliance requirements
4. Make Go/No-Go decision
5. Perform controlled takeoff (if safe)
6. Execute safe landing

Instructor emphasis: applying knowledge under pressure

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Test Accuracy	Low accuracy	Moderate accuracy	High accuracy	Very high accuracy
Scenario Analysis	Incorrect	Partial accuracy	Mostly correct	Fully accurate
Decision-Making	Unsafe	Basic	Safe	Highly consistent
Reasoning	Limited	Basic	Clear	Detailed and justified

Assessment Items (Practice Questions)

1. A drone pilot is flying in Class D airspace without authorization.
   What is the issue?
   A. No issue
   B. Requires authorization
   C. Too slow
   D. Too low

2. A pilot observes strong wind gusts before flight.
   What should the pilot do?
   A. Ignore
   B. Increase altitude
   C. Evaluate and possibly delay
   D. Fly faster

3. A drone is flown beyond visual line of sight.
   What rule is being violated?
   A. Speed
   B. Altitude
   C. VLOS
   D. Weather

4. A pilot sees a manned aircraft approaching.
   What action is required?
   A. Maintain course
   B. Increase speed
   C. Yield
   D. Ignore

5. A sectional chart shows controlled airspace at the flight location.
   What must the pilot do?
   A. Nothing
   B. Fly anyway
   C. Obtain authorization
   D. Increase altitude
6. Scenario:
   A pilot plans a flight in hot weather with strong winds and near controlled airspace.
   What factors must be evaluated before flying?

Answer Key

1. B
2. C
3. C
4. C
5. C
6. Weather conditions, airspace authorization, and safety risks

---

Closure

- Review common errors from practice test
- Ask students what strategy helped most
- Reinforce importance of applying knowledge

Teacher Notes

- Encourage discussion of reasoning
- Focus on weak areas identified
- Prepare students for full assessment next lesson

Week 7 – Day 5

Full FAA Practice Assessment + Readiness Check

Standards

Standard	Description
201.00	Students will explain FAA Part 107 regulations and operational requirements governing small UAS operations.
201.02	Students will apply operational rules to determine legal drone operations.
202.00	Students will apply airspace classifications using sectional charts and UAS facility maps to determine legal flight operations.
202.04	Students will apply airspace knowledge to determine authorization requirements.
203.00	Students will interpret aviation weather data and apply it to safe sUAS operations.
203.03	Students will evaluate weather conditions for safe operations.
205.00	Students will interpret airport operations and apply right-of-way rules for safe integration into airspace.
205.06	Students will evaluate airport hazards and operational risks.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.02	Students will evaluate scenarios and make safe operational decisions.

Objective
Students will complete a comprehensive FAA-style assessment and evaluate their readiness for the Part 107 knowledge test.

Essential Question
Am I prepared to pass the FAA Part 107 knowledge test and operate safely as a remote pilot?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What area do you feel most prepared in?
- What area still needs improvement?
- What strategies will you use during the test?

Teacher will connect responses to confidence and preparation.

Vocabulary

- **Assessment Readiness** – Level of preparation for testing
- **Comprehensive Review** – Evaluation of all content areas
- **Operational Judgment** – Decision-making in real scenarios
- **Test Strategy** – Methods used to answer questions effectively
- **Performance Evaluation** – Measuring knowledge and skill level

Materials

- Student answer sheets
- FAA-style full practice test (25–40 questions)
- Sectional charts (for reference questions)
- Whiteboard / presentation slides

Instruction Content

This lesson provides a full FAA-style assessment to evaluate readiness for the Part 107 exam.

Key expectations include:

- Apply knowledge from all content areas
- Read and analyze scenario-based questions
- Select the safest and most compliant answer

Content areas assessed include:

- FAA regulations
- Airspace classification
- Sectional charts
- Weather interpretation
- Airport operations
- Risk management

Test-taking strategies include:

- Read questions carefully
- Identify key details
- Eliminate incorrect answers
- Choose the safest option

Performance goals:

- Minimum passing benchmark: 70%
- Target readiness level: 80% or higher

Common issues include:

- Misreading questions
- Confusing similar concepts
- Rushing through scenarios

This assessment simulates the FAA Part 107 testing experience.

Teacher Emphasis

- Emphasize that this is a realistic FAA test simulation
- Reinforce importance of careful reading
- Highlight that safety is always the best answer
- Encourage confidence and focus
- Reinforce that mistakes are part of learning

Activity Procedure

Activity: Full FAA Practice Assessment

1. Students complete a 25–40 question FAA-style test independently

2. Students must:
    - Answer all questions
    - Avoid rushing
    - Apply full knowledge from course
3. Teacher will use the following Formative Assessment questions (post-assessment):
    - Which questions were most difficult?
    - What areas need more review?
    - What strategies worked best?
4. Instructor reviews selected questions and explains correct reasoning

---

Flight Activity (Readiness-Based Decision Making)

1. Present a comprehensive flight scenario
2. Identify all relevant factors (airspace, weather, airport, regulations)
3. Evaluate risks
4. Make Go/No-Go decision
5. Perform controlled takeoff (if safe)
6. Execute safe landing

Instructor emphasis: full integration of all course knowledge

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Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Test Performance	Below 60%	60–69%	70–84%	85%+
Scenario Application	Incorrect	Partial accuracy	Mostly correct	Fully accurate
Decision-Making	Unsafe	Basic	Safe	Highly consistent
Test Strategy Use	Limited	Basic	Effective	Highly effective

Assessment Items (Sample from Full Test)

1. What is the maximum allowable altitude under Part 107?
   A. 300 ft
   B. 400 ft
   C. 500 ft
   D. 600 ft
2. What is required to fly in Class C airspace?
   A. Nothing
   B. Authorization
   C. Special license
   D. Night waiver
3. What does a METAR provide?
   A. Forecast
   B. Current weather
   C. Airspace
   D. Regulations

4. What is the primary risk near airports?
   A. Battery failure
   B. Aircraft traffic
   C. Camera issues
   D. GPS error
5. What should a pilot do in high wind conditions?
   A. Fly anyway
   B. Increase speed
   C. Evaluate and delay if necessary
   D. Ignore
6. Scenario:
   A pilot plans a flight near controlled airspace with poor weather conditions.
   What factors must be evaluated before proceeding?

Answer Key

1. B
2. B
3. B
4. B
5. C
6. Airspace authorization, weather conditions, and overall safety risks

---

Closure

- Reflect on assessment performance
- Ask students if they feel ready for FAA testing
- Reinforce next steps for improvement

Teacher Notes

- Identify students below readiness threshold
- Provide targeted remediation if needed
- Prepare students for continued reinforcement and advanced applications

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Week 7 COMPLETE

Students now have:

- Full FAA content exposure
- Scenario-based reasoning skills
- Practice test experience
- Readiness evaluation

Week 8 – Day 1

FAA Weak Area Remediation: Regulations & Airspace Reinforcement

Standards

Standard	Description
201.00	Students will explain FAA Part 107 regulations and operational requirements governing small UAS operations.
201.01	Students will identify eligibility requirements and certification steps for obtaining a Remote Pilot Certificate.
201.02	Students will interpret operational limitations, including altitude, speed, visibility, and daylight restrictions.
202.00	Students will apply airspace classifications using sectional charts and UAS facility maps to determine legal flight operations.
202.02	Students will interpret sectional chart symbols and legends.
202.04	Students will apply airspace knowledge to determine authorization requirements.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.02	Students will evaluate scenarios and make safe operational decisions.

Objective
Students will strengthen understanding of FAA regulations and airspace through targeted remediation and scenario-based application.

Essential Question
How can I correct my mistakes and improve my understanding of FAA regulations and airspace?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What mistakes did you make on the practice test?
- Why do you think those mistakes occurred?
- What can you do to improve in those areas?

Teacher will connect responses to growth and mastery.

Vocabulary

- **Remediation** – Targeted practice to improve weak areas
- **Compliance** – Following FAA regulations
- **Controlled Airspace** – Airspace requiring authorization
- **Uncontrolled Airspace** – Airspace not requiring authorization
- **Operational Limitation** – Restriction under Part 107

Materials
- Student test results (from Week 7)
- FAA regulation summary sheets
- Sectional charts
- Scenario worksheets
- Whiteboard / presentation slides

Instruction Content
This lesson focuses on improving areas where students struggled during FAA practice testing.

Common weak areas include:
- Misunderstanding altitude limits
- Confusing airspace classifications
- Incorrectly applying regulations
- Misreading scenario questions

Regulation review includes:
- 400 ft altitude limit
- VLOS requirement
- Yielding to manned aircraft
- Operations over people restrictions

Airspace review includes:
- Controlled vs uncontrolled airspace
- Authorization requirements
- Reading sectional charts

Improvement strategies include:
- Slowing down when reading questions
- Identifying key details
- Applying rules step-by-step
- Choosing the safest answer

Goal:
- Move students from partial understanding to consistent accuracy

---

Teacher Emphasis
- Emphasize that mistakes are part of learning
- Reinforce that improvement comes from targeted practice
- Highlight importance of understanding—not memorizing
- Connect remediation to test success
- Reinforce confidence through repetition

Activity Procedure
Activity: Targeted Remediation Scenarios
1. Students review incorrect answers from previous assessment

2. Students analyze corrected scenarios and determine:
    - What was misunderstood
    - What the correct answer is
    - Why the correct answer is safest and compliant
3. Teacher will use the following Formative Assessment questions:
    - What rule applies in this situation?
    - Why was the original answer incorrect?
    - What makes the correct answer safer?
4. Instructor provides guided correction and explanation

Flight Activity (Corrected Application)

1. Define flight scenario
2. Identify airspace classification
3. Determine legal operation
4. Make corrected decision
5. Perform controlled takeoff
6. Execute safe landing

Instructor emphasis: applying corrected understanding

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Regulation Accuracy	Incorrect	Partial accuracy	Mostly correct	Fully accurate
Airspace Understanding	Limited	Basic	Accurate	Detailed and applied
Error Correction	Minimal	Basic	Effective	Highly accurate and consistent
Decision-Making	Unsafe	Basic	Safe	Highly consistent

Assessment Items

1. What is the maximum altitude allowed under Part 107?
   A. 200 ft
   B. 300 ft
   C. 400 ft
   D. 500 ft
2. What airspace requires authorization?
   A. Class G
   B. Class B, C, D, E
   C. Private airspace
   D. Rural airspace

3. What must a pilot do when a manned aircraft approaches?
   A. Speed up
   B. Hover
   C. Yield
   D. Ignore
4. What is a common mistake on FAA tests?
   A. Reading carefully
   B. Rushing through questions
   C. Checking answers
   D. Studying
5. Scenario:
   A pilot misidentifies airspace and flies without authorization.
   What was the error and how can it be corrected?

Answer Key

1. C
2. B
3. C
4. B
5. Misidentified airspace; must correctly read chart and obtain authorization

---

Closure

- Reflect on improvements made
- Ask students what concept is clearer now
- Reinforce growth mindset

Teacher Notes

- Focus on individual weak areas
- Provide additional support where needed
- Prepare students for continued reinforcement

Week 8 – Day 2

Weather & Performance Remediation

Standards

Standard	Description
203.00	Students will interpret aviation weather data and apply it to safe sUAS operations.
203.01	Students will identify basic weather concepts, including wind, pressure, and stability.
203.02	Students will decode METAR and TAF reports.
203.03	Students will explain how weather conditions affect drone performance.
203.04	Students will apply weather data to make go/no-go flight decisions.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.02	Students will evaluate weather-related risks and make safe decisions.

Objective
Students will strengthen understanding of weather concepts and performance limitations through targeted remediation and scenario-based application.

Essential Question
How can weather knowledge be applied more accurately to improve flight safety and FAA test performance?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What weather concept is most difficult for you?
- What mistakes did you make related to weather on the test?
- Why is weather often underestimated by drone pilots?

Teacher will connect responses to safety and decision-making.

Vocabulary

- **Weather Remediation** – Improving understanding of weather concepts
- **Wind Gust** – Sudden increase in wind speed
- **Ceiling** – Lowest cloud layer height
- **Visibility** – Distance a pilot can see
- **Density Altitude** – Air density affecting performance

Materials

- Student test results (weather-related)
- Sample METAR/TAF reports
- Weather charts or visuals
- Scenario worksheets
- Whiteboard / presentation slides

Instruction Content
This lesson focuses on correcting misunderstandings related to weather and performance from FAA practice assessments.

Common weak areas include:
- Misinterpreting METAR reports
- Underestimating wind impact
- Confusing visibility and ceiling
- Not understanding density altitude

Weather concept reinforcement includes:
- Wind effects on control and stability
- Visibility requirements for safe flight
- Cloud ceiling limitations
- Temperature and humidity effects

Density altitude review includes:
- High density altitude reduces performance
- Occurs in hot, high, humid conditions
- Affects lift, stability, and flight time

Improvement strategies include:
- Breaking down METAR reports step-by-step
- Identifying key weather hazards
- Applying weather knowledge to scenarios
- Choosing the safest operational decision

Goal:
- Improve accuracy in weather-related FAA questions
- Strengthen real-world decision-making

Teacher Emphasis
- Emphasize that weather is a leading cause of flight risk
- Reinforce that wind is the most critical factor for drones
- Highlight importance of METAR/TAF interpretation
- Connect weather knowledge to safety decisions
- Reinforce that pilots must evaluate conditions before every flight

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Activity Procedure
Activity: Weather Correction Scenarios
1. Students review incorrect weather-related questions
2. Students analyze corrected scenarios and determine:
    - What was misunderstood
    - Correct interpretation of weather data
    - Whether flight is safe

3. Teacher will use the following Formative Assessment questions:
    - What does this METAR indicate?
    - Why are these conditions unsafe?
    - What decision should the pilot make?
4. Instructor provides guided correction and explanation

Flight Activity (Weather-Based Decision Making)

1. Observe current weather conditions
2. Identify wind, visibility, and temperature
3. Evaluate performance impact
4. Make Go/No-Go decision
5. Perform controlled takeoff (if safe)
6. Execute safe landing

Instructor emphasis: applying corrected weather understanding

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Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Weather Knowledge	Incorrect	Partial accuracy	Mostly correct	Fully accurate
METAR/TAF Interpretation	Limited	Basic	Accurate	Detailed and applied
Scenario Evaluation	Incorrect	Partial accuracy	Mostly correct	Fully accurate with reasoning
Decision-Making	Unsafe	Basic	Safe	Highly consistent

Assessment Items

1. What does a METAR report provide?
   A. Forecast
   B. Current weather
   C. Airspace
   D. Regulations
2. What is the biggest weather risk for drones?
   A. Temperature
   B. Wind
   C. Humidity
   D. Pressure
3. What is density altitude?
   A. Speed
   B. Air density expressed as altitude
   C. Visibility
   D. Temperature

4. What condition creates high density altitude?
   A. Cold weather
   B. Low elevation
   C. Hot, humid conditions
   D. Low humidity
5. Scenario:
   A METAR shows strong winds and low visibility.
   What should the pilot do and why?

Answer Key

1. B
2. B
3. B
4. C
5. Delay or cancel flight due to unsafe conditions

Closure

- Reflect on improvements in weather understanding
- Ask students what concept is clearer now
- Reinforce importance of weather awareness

Teacher Notes

- Use real weather reports for practice
- Reinforce decoding skills daily
- Prepare students for airport and scenario integration

Week 8 – Day 3

Airport Operations Remediation & Integration

Standards

Standard	Description
205.00	Students will interpret airport operations and apply right-of-way rules for safe integration into airspace.
205.01	Students will identify airport layouts and traffic patterns.
205.03	Students will recognize basic radio communication procedures and terminology.
205.05	Students will identify airport markings and lighting systems.
205.06	Students will evaluate airport hazards and operational risks.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.02	Students will evaluate airport-related scenarios for safe operations.

Objective
Students will strengthen understanding of airport operations and apply knowledge to evaluate safe and compliant drone operations near airports.

Essential Question
How can airport operations knowledge be applied to reduce risk and improve flight safety?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What airport concept is most difficult for you?
- What mistakes did you make related to airport operations?
- Why are airports considered high-risk environments?

Teacher will connect responses to safety and awareness.

Vocabulary

- **Traffic Pattern** – Standard path aircraft follow
- **Towered Airport** – Airport with ATC control
- **Non-Towered Airport** – Airport using pilot communication
- **Runway Incursion** – Unauthorized presence on a runway
- **Situational Awareness** – Awareness of surroundings and hazards

Materials

- Student test results (airport-related)
- Sectional charts
- Airport diagrams
- Scenario worksheets
- Whiteboard / presentation slides

Instruction Content
This lesson focuses on correcting misunderstandings related to airport operations and integrating all concepts for safe decision-making.

Common weak areas include:
- Misidentifying traffic pattern components
- Confusing towered vs non-towered operations
- Not recognizing airport hazards
- Ignoring runway and approach areas

Airport operations review includes:
- Traffic pattern structure and purpose
- Communication differences between airport types
- Markings, lighting, and runway identification

Hazard awareness includes:
- Low-flying aircraft near airports
- Approach and departure paths
- Runway and taxiway activity

Integration concepts include:
- Combining airport knowledge with airspace rules
- Evaluating full flight environment
- Making safe operational decisions

Improvement strategies include:
- Visualizing traffic patterns
- Analyzing real-world scenarios
- Identifying hazards before flight
- Prioritizing safety in decision-making

Goal:
- Improve accuracy in airport-related FAA questions
- Strengthen real-world situational awareness

Teacher Emphasis
- Emphasize that airports are high-risk environments
- Reinforce that aircraft always have priority
- Highlight importance of understanding traffic patterns
- Connect airport knowledge to FAA test scenarios
- Reinforce that awareness prevents accidents

Activity Procedure
Activity: Airport Scenario Correction & Integration
1. Students review incorrect airport-related questions

2. Students analyze corrected scenarios and determine:
    - Airport type
    - Traffic pattern considerations
    - Hazards present
    - Whether flight is safe and legal
3. Teacher will use the following Formative Assessment questions:
    - What hazards exist in this scenario?
    - How does airport type affect operations?
    - What decision should the pilot make?
4. Instructor provides guided correction and explanation

Flight Activity (Airport Awareness Application)

1. Identify nearby airport (if applicable)
2. Determine airport type and traffic pattern
3. Identify hazards and risk areas
4. Define safe operating boundaries
5. Make Go/No-Go decision
6. Perform controlled takeoff and landing (if safe)

Instructor emphasis: applying integrated airport knowledge

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Airport Knowledge	Incorrect	Partial accuracy	Mostly correct	Fully accurate
Hazard Identification	Limited	Basic	Accurate	Detailed and proactive
Scenario Evaluation	Incorrect	Partial accuracy	Mostly correct	Fully accurate with reasoning
Decision-Making	Unsafe	Basic	Safe	Highly consistent

Assessment Items

1. What is a traffic pattern?
   A. Random flight
   B. Standard flight path for aircraft
   C. Weather system
   D. Airspace type
2. What is the main difference between towered and non-towered airports?
   A. Size
   B. Communication method
   C. Location
   D. Weather

3. What is a runway incursion?
   A. Landing
   B. Unauthorized runway presence
   C. Takeoff
   D. Taxi
4. What is the greatest risk near airports?
   A. Battery
   B. Aircraft traffic
   C. Camera
   D. GPS
5. Scenario:
   A drone pilot plans to fly near an airport without considering traffic patterns.
   What is the risk and what should the pilot do?

Answer Key

1. B
2. B
3. B
4. B
5. Risk of collision with aircraft; pilot must evaluate traffic patterns and avoid the area

---

Closure

- Reflect on improvements in airport understanding
- Ask students what concept is clearer now
- Reinforce importance of airport awareness

Teacher Notes

- Use real airport examples when possible
- Reinforce hazard identification
- Prepare students for full integration scenarios next lesson

Week 8 – Day 4

Full Integration Scenarios – Regulations, Weather, Airspace, Airports

Standards

Standard	Description
201.00	Students will explain FAA Part 107 regulations and operational requirements governing small UAS operations.
201.02	Students will interpret operational limitations, including altitude, speed, visibility, and daylight restrictions.
202.00	Students will apply airspace classifications using sectional charts and UAS facility maps to determine legal flight operations.
202.04	Students will apply airspace knowledge to determine authorization requirements.
203.00	Students will interpret aviation weather data and apply it to safe sUAS operations.
203.03	Students will explain how weather conditions affect drone performance.
205.00	Students will interpret airport operations and apply right-of-way rules for safe integration into airspace.
205.06	Students will evaluate airport hazards and operational risks.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.02	Students will evaluate complex scenarios and make safe operational decisions.

Objective
Students will integrate all FAA Part 107 knowledge areas to evaluate complex flight scenarios and make safe, legal decisions.

Essential Question
How do all FAA knowledge areas work together to determine safe drone operations?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What factor (airspace, weather, regulations, or airports) is most important?
- Why must pilots consider all factors together?
- What could happen if one factor is ignored?

Teacher will connect responses to full integration thinking.

Vocabulary

- **Integrated Decision-Making** – Combining multiple factors for safe decisions
- **Operational Scenario** – Real-world flight situation
- **Risk Assessment** – Evaluating hazards before flight
- **Compliance Evaluation** – Determining if operation follows FAA rules
- **Go/No-Go Decision** – Determining whether to proceed with flight

---

Materials

- Student notebook or guided notes sheet
- Sectional charts
- Scenario worksheets
- Weather reports (METAR/TAF samples)
- Whiteboard / presentation slides

Instruction Content

Safe drone operations require integrating multiple knowledge areas into a single decision-making process.

Key factors in every flight include:

- Airspace classification
- Weather conditions
- Airport proximity and operations
- FAA regulations

The integrated decision-making process includes:

1. Identify flight location
2. Determine airspace classification
3. Check weather conditions
4. Evaluate airport proximity and traffic
5. Apply FAA regulations
6. Identify hazards
7. Make Go/No-Go decision

High-risk conditions include:

- Controlled airspace without authorization
- Poor weather conditions
- Proximity to airports or traffic patterns
- Multiple risk factors combined

Good pilot decision-making includes:

- Evaluating all factors together
- Prioritizing safety
- Making conservative decisions
- Adjusting plans as needed

FAA test focus includes:

- Complex scenario-based questions
- Multi-step reasoning
- Identifying safest and most compliant option

Teacher Emphasis

- Emphasize that no single factor determines safety
- Reinforce that integration is required for FAA success
- Highlight that real-world decisions involve multiple variables

- Connect integrated thinking to professional pilot behavior
- Reinforce that safest answer is always correct

Activity Procedure

Activity: Full Integration Scenario Analysis

1. Students take structured notes during instruction
2. Students analyze complex scenarios and determine:
    - Airspace classification
    - Weather conditions
    - Airport risks
    - Regulatory compliance
    - Final Go/No-Go decision
3. Teacher will use the following Formative Assessment questions:
    - What factors must be considered first?
    - Which risk is most critical in this scenario?
    - What makes the operation unsafe?
4. Instructor reviews responses and provides detailed explanations

---

Flight Activity (Full Integration Application)

1. Define flight location
2. Identify airspace classification
3. Evaluate weather conditions
4. Assess airport proximity
5. Apply FAA regulations
6. Make Go/No-Go decision
7. Perform controlled takeoff and landing (if safe)

Instructor emphasis: complete integration of all knowledge

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Integration of Knowledge	Limited	Basic	Accurate	Fully integrated
Scenario Evaluation	Incorrect	Partial accuracy	Mostly correct	Fully accurate with reasoning
Risk Assessment	Minimal	Basic	Consistent	Advanced and proactive
Decision-Making	Unsafe	Basic	Safe	Highly consistent and justified

---

Assessment Items

1. What is the first step in flight decision-making?
   A. Fly
   B. Identify location
   C. Increase speed
   D. Check camera
2. What factor determines if authorization is required?
   A. Weather
   B. Airspace
   C. Battery
   D. Camera
3. What should a pilot do in poor weather conditions?
   A. Fly anyway
   B. Increase speed
   C. Delay or cancel
   D. Ignore
4. What is the greatest risk near airports?
   A. Battery
   B. Aircraft traffic
   C. Camera
   D. GPS
5. Scenario:
   A pilot plans to fly in controlled airspace, near an airport, with strong winds.
   What factors must be evaluated and what decision should be made?

Answer Key

1. B
2. B
3. C
4. B
5. Airspace authorization, airport traffic, weather conditions; likely delay or cancel unless all risks are mitigated

---

Closure

- Review integrated decision-making steps
- Ask students what factor is hardest to evaluate
- Reinforce importance of considering all factors

Teacher Notes

- Emphasize multi-step thinking
- Encourage explanation of reasoning
- Prepare students for final integration assessment

Week 8 – Day 5

Full Integration Assessment + Mastery Check

Standards

Standard	Description
201.00	Students will explain FAA Part 107 regulations and operational requirements governing small UAS operations.
201.02	Students will interpret operational limitations, including altitude, speed, visibility, and daylight restrictions.
202.00	Students will apply airspace classifications using sectional charts and UAS facility maps to determine legal flight operations.
202.04	Students will apply airspace knowledge to determine authorization requirements.
203.00	Students will interpret aviation weather data and apply it to safe sUAS operations.
203.03	Students will explain how weather conditions affect drone performance.
205.00	Students will interpret airport operations and apply right-of-way rules for safe integration into airspace.
205.06	Students will evaluate airport hazards and operational risks.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.02	Students will evaluate complex scenarios and make safe operational decisions.

Objective
Students will demonstrate mastery by applying all FAA knowledge areas to comprehensive, scenario-based assessments.

Essential Question
Can I consistently apply all FAA knowledge areas to make safe and legal flight decisions?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What area do you feel strongest in now?
- What area still needs improvement?
- What is your strategy for making safe decisions?

Teacher will connect responses to mastery and confidence.

Vocabulary

- **Mastery** – High level of understanding and application
- **Integrated Scenario** – Situation requiring multiple knowledge areas
- **Operational Judgment** – Decision-making during flight
- **Compliance Evaluation** – Determining if rules are followed
- **Risk Mitigation** – Reducing hazards before flight

Materials

- Student answer sheets
- Comprehensive scenario worksheets
- Sectional charts
- Weather reports (METAR/TAF samples)
- Whiteboard / presentation slides

Instruction Content

This lesson serves as a mastery check where students must demonstrate the ability to apply all FAA Part 107 knowledge areas together.

Mastery expectations include:

- Accurate interpretation of airspace
- Proper application of FAA regulations
- Correct evaluation of weather conditions
- Awareness of airport operations
- Strong risk management decision-making

The mastery decision process includes:

1. Identify flight location
2. Determine airspace classification
3. Evaluate weather conditions
4. Analyze airport proximity and operations
5. Apply FAA regulations
6. Identify hazards
7. Make final Go/No-Go decision

Indicators of mastery include:

- Consistent correct answers
- Clear reasoning and justification
- Safe and compliant decisions
- Ability to explain decisions

Common final challenges include:

- Overthinking scenarios
- Missing small details
- Not prioritizing safety

This lesson confirms readiness for FAA testing and real-world operations.

Teacher Emphasis

- Emphasize that mastery means consistent correct decisions
- Reinforce that safety is always the priority
- Highlight importance of confidence and clarity
- Connect mastery to real-world pilot responsibility
- Reinforce readiness for FAA certification

Activity Procedure

Activity: Full Integration Mastery Assessment

1. Students complete a comprehensive scenario-based assessment (20–30 questions)
2. Students must:
    - Identify all relevant factors
    - Select the safest and most compliant answer
    - Provide reasoning for key scenarios
3. Teacher will use the following Formative Assessment questions (post-assessment):
    - What factors did you consider first?
    - What made a decision safe or unsafe?
    - How did you eliminate incorrect answers?
4. Instructor reviews results and provides targeted feedback

Flight Activity (Mastery Application)

1. Present a full operational scenario
2. Identify all relevant factors
3. Evaluate risks
4. Make Go/No-Go decision
5. Perform controlled takeoff (if safe)
6. Execute safe landing

Instructor emphasis: consistent and confident decision-making

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Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Knowledge Integration	Limited	Basic	Accurate	Fully integrated
Scenario Accuracy	Incorrect	Partial accuracy	Mostly correct	Fully accurate
Decision-Making	Unsafe	Basic	Safe	Highly consistent and justified
Reasoning	Limited	Basic	Clear	Detailed and professional

Assessment Items

1. What is the first step in integrated decision-making?
   A. Fly
   B. Identify location
   C. Increase speed
   D. Check camera

2. What determines if authorization is required?
   A. Weather
   B. Airspace
   C. Battery
   D. Camera
3. What should a pilot do in unsafe weather conditions?
   A. Fly anyway
   B. Increase speed
   C. Delay or cancel
   D. Ignore
4. What is the greatest risk near airports?
   A. Battery
   B. Aircraft traffic
   C. Camera
   D. GPS
5. Scenario:
   A pilot plans a flight near controlled airspace, close to an airport, with high winds and poor visibility.
   What factors must be evaluated and what is the safest decision?

Answer Key

1. B
2. B
3. C
4. B
5. Airspace authorization, airport traffic, weather conditions; safest decision is to delay or cancel

---

Closure

- Reflect on mastery level
- Ask students if they feel FAA-ready
- Reinforce importance of continued practice

Teacher Notes

- Identify students ready for certification testing
- Provide additional support where needed
- Transition into advanced application and real-world scenarios

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Week 8 COMPLETE

Students now have:

- Reinforced weak areas
- Integrated knowledge across all domains
- Demonstrated mastery-level thinking
- FAA test readiness

Week 9 – Day 1

Mission Planning Fundamentals (Professional Drone Operations)

Standards

Standard	Description
201.00	Students will explain FAA Part 107 regulations and operational requirements governing small UAS operations.
201.02	Students will interpret operational limitations, including altitude, speed, visibility, and daylight restrictions.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.02	Students will apply risk management during mission planning.
210.00	Students will apply mission planning principles to professional drone operations.
210.01	Students will identify FAA safety requirements, including VLOS.
210.02	Students will demonstrate safe flight operations in controlled environments.

Objective
Students will develop a structured mission planning process that integrates FAA regulations, airspace, weather, and operational safety.

Essential Question
What steps must a professional drone pilot take to safely and successfully plan a mission?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What should a pilot consider before starting any drone flight?
- Why is planning important before flying?
- What could go wrong without proper planning?

Teacher will connect responses to professional operations.

Vocabulary

- **Mission Planning** – Preparing all aspects of a drone operation before flight
- **Operational Area** – Location where the drone will be flown
- **Site Survey** – Evaluation of the flight environment
- **Risk Assessment** – Identifying hazards before flight
- **Contingency Plan** – Backup plan for emergencies

Materials

- Student notebook or guided notes sheet
- Sectional charts
- Weather reports (METAR/TAF)
- Mission planning worksheet

- Whiteboard / presentation slides

Instruction Content
Professional drone operations require structured mission planning to ensure safety, compliance, and success.

The mission planning process includes:
1. Define mission objective
2. Identify operational area
3. Determine airspace classification
4. Evaluate weather conditions
5. Identify hazards and obstacles
6. Assess airport proximity
7. Verify FAA compliance
8. Develop contingency plans

Key planning considerations include:
- Airspace authorization requirements
- Weather conditions and limitations
- Nearby people, structures, and obstacles
- Emergency procedures

Risk management includes:
- Identifying potential hazards
- Reducing risk through planning
- Adjusting mission as needed

Professional expectations include:
- Consistent planning before every flight
- Documentation of mission details
- Prioritizing safety over completion

Mission planning is a critical skill for real-world drone operations and FAA test application.

Teacher Emphasis
- Emphasize that every professional flight begins with planning
- Reinforce that planning reduces risk and errors
- Highlight that FAA knowledge must be applied before flight
- Connect planning to real-world drone jobs
- Reinforce that safe pilots never skip planning

Activity Procedure
Activity: Mission Planning Exercise
1. Students take structured notes during instruction

2. Students complete a mission planning worksheet including:
    - Mission objective
      Airspace classification
      Weather conditions
      Hazards and risks
      Compliance requirements
3. Teacher will use the following Formative Assessment questions:
    - What is the first step in mission planning?
    - Why is airspace evaluation critical?
    - What risks must be considered?
4. Instructor reviews responses and provides feedback

Flight Activity (Planned Operation)

1. Define mission objective
2. Identify operational area
3. Evaluate airspace and weather
4. Identify hazards
5. Make Go/No-Go decision
6. Perform controlled takeoff
7. Execute safe landing

Instructor emphasis: planning before action

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Mission Planning	Incomplete	Partial	Complete	Detailed and professional
Risk Assessment	Minimal	Basic	Accurate	Comprehensive
Compliance Evaluation	Incorrect	Partial	Accurate	Fully compliant
Decision-Making	Unsafe	Basic	Safe	Highly consistent

Assessment Items

1. What is the first step in mission planning?
   A. Fly
   B. Define objective
   C. Increase speed
   D. Check camera

2. What must be evaluated before flight?
   A. Airspace and weather
   B. Camera only
   C. Speed
   D. Battery only

3. What is a contingency plan?
   A. Flight plan
   B. Backup plan
   C. Camera plan
   D. Speed plan
4. Why is mission planning important?
   A. Saves time
   B. Reduces risk
   C. Increases speed
   D. Improves camera
5. Scenario:
   A pilot begins a flight without checking airspace or weather.
   What risks are present and what should have been done?

Answer Key

1. B
2. A
3. B
4. B
5. Risk of unsafe or illegal operation; pilot should complete full mission planning

---

Closure

- Review mission planning steps
- Ask students what step is most important
- Reinforce importance of preparation

Teacher Notes

- Emphasize professional mindset
- Reinforce planning as a habit
- Prepare students for deeper site analysis next lesson

Week 9 – Day 2

Site Survey & Operational Environment Analysis

Standards

Standard	Description
202.00	Students will apply airspace classifications using sectional charts and UAS facility maps to determine legal flight operations.
202.04	Students will apply airspace knowledge to determine authorization requirements.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.02	Students will demonstrate safe flight operations in controlled environments.
210.00	Students will apply mission planning principles to professional drone operations.
210.02	Students will demonstrate safe flight operations in controlled environments.
210.03	Students will conduct site surveys to identify hazards and constraints.

Objective
Students will conduct a site survey and analyze the operational environment to identify hazards, constraints, and safe operating areas.

Essential Question
How does a site survey improve safety and mission success in drone operations?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What hazards might exist in a typical drone flight area?
- Why is it important to evaluate a location before flying?
- What environmental factors could affect flight safety?

Teacher will connect responses to structured site evaluation.

Vocabulary

- **Site Survey** – Systematic evaluation of a flight location
- **Operational Environment** – Physical and environmental conditions of flight area
- **Obstacle** – Object that could interfere with flight
- **Hazard Identification** – Recognizing potential risks
- **Flight Boundary** – Defined safe operating area

Materials

- Student notebook or guided notes sheet
- Sectional charts
- Site survey worksheet
- Drone and controller
- Whiteboard / presentation slides

Instruction Content
A site survey is a critical step in mission planning that ensures safe and efficient drone operations.

The site survey process includes:
1. Identify operational area
2. Evaluate airspace classification
3. Identify obstacles (trees, buildings, power lines)
4. Assess people and property in the area
5. Evaluate terrain and elevation
6. Identify takeoff and landing zones
7. Define safe flight boundaries

Key environmental considerations include:
- Obstacle proximity
- Surface conditions
- Wind exposure
- Visibility
- Human activity

Hazard identification includes:
- Physical obstacles
- Moving hazards (vehicles, people)
- Environmental risks (wind, terrain)

Operational constraints include:
- Limited space
- Restricted airspace
- Nearby airports
- Safety buffers

Professional expectations include:
- Conducting a site survey before every mission
- Clearly defining safe operating zones
- Adjusting plans based on environment

Site surveys are essential for safe operations and are a key component of professional drone work.

Teacher Emphasis
- Emphasize that every flight environment is different
- Reinforce importance of identifying hazards before flight
- Highlight that most incidents occur due to poor planning
- Connect site surveys to real-world drone jobs
- Reinforce that safe pilots evaluate before flying

Activity Procedure

Activity: Site Survey Exercise

1. Students take structured notes during instruction
2. Students conduct a site survey and document:
    - Operational area
      Airspace classification
      Hazards and obstacles
      Safe flight boundaries
3. Teacher will use the following Formative Assessment questions:
    - What hazards are present in this area?
    - How does the environment affect flight safety?
    - What is the safest operating zone?
4. Instructor reviews responses and provides feedback

Flight Activity (Site-Based Operation)

1. Conduct site survey
2. Identify hazards and obstacles
3. Define safe flight boundaries
4. Make Go/No-Go decision
5. Perform controlled takeoff
6. Execute safe landing

Instructor emphasis: environment awareness and safety

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Site Survey Completion	Incomplete	Partial	Complete	Detailed and professional
Hazard Identification	Minimal	Basic	Accurate	Comprehensive
Boundary Definition	Unclear	Basic	Clear	Highly precise
Decision-Making	Unsafe	Basic	Safe	Highly consistent

Assessment Items

1. What is a site survey?
   A. Flight
   B. Evaluation of location
   C. Weather report
   D. Regulation

2. What is a common hazard?
   A. Battery
   B. Trees
   C. Camera
   D. Speed

3. What should be identified during a site survey?
   A. Obstacles
   B. Camera
   C. Speed
   D. Color
4. What is a flight boundary?
   A. Speed limit
   B. Safe operating area
   C. Battery level
   D. Camera setting
5. Scenario:
   A pilot flies without identifying obstacles in the area.
   What risk does this create and what should have been done?

Answer Key

1. B
2. B
3. A
4. B
5. Risk of collision; pilot should conduct a full site survey

---

Closure

- Review site survey steps
- Ask students what hazard is most common
- Reinforce importance of preparation

Teacher Notes

- Use real environments when possible
- Reinforce hazard awareness
- Prepare students for risk management integration next lesson

Week 9 – Day 3

Risk Management & Operational Decision-Making

Standards

Standard	Description
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.01	Students will identify FAA safety requirements, including VLOS.
209.02	Students will demonstrate safe flight operations in controlled environments.
210.00	Students will apply mission planning principles to professional drone operations.
210.04	Students will apply risk management strategies to drone operations.

Objective
Students will apply structured risk management processes to evaluate hazards and make safe, professional flight decisions.

Essential Question
How do professional drone pilots assess risk and make safe operational decisions?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What is the biggest risk when flying a drone?
- Why do pilots sometimes make unsafe decisions?
- What factors should be considered before deciding to fly?

Teacher will connect responses to decision-making and risk awareness.

Vocabulary

- **Risk Management** – Process of identifying and reducing hazards
- **Hazard** – Condition that could cause harm
- **Risk Level** – Degree of potential danger (low, medium, high)
- **Mitigation Strategy** – Action taken to reduce risk
- **Go/No-Go Decision** – Determination to proceed or cancel flight

Materials

- Student notebook or guided notes sheet
- Scenario worksheets
- Sectional charts
- Whiteboard / presentation slides

Instruction Content
Risk management is a critical skill that allows drone pilots to make safe and informed decisions before and during flight.

The risk management process includes:

1. Identify hazards
2. Assess risk level
3. Apply mitigation strategies
4. Make Go/No-Go decision
5. Monitor conditions during flight

Types of hazards include:

- Environmental (weather, terrain)
- Operational (airspace, airports)
- Human factors (fatigue, inexperience)
- Equipment (battery, system issues)

Risk levels include:

- Low: Minimal impact
- Medium: Manageable with mitigation
- High: Unsafe, flight should not proceed

Mitigation strategies include:

- Adjusting flight location
- Delaying or cancelling flight
- Reducing altitude or distance
- Increasing awareness and monitoring

Professional decision-making includes:

- Prioritizing safety over mission completion
- Recognizing when not to fly
- Continuously evaluating conditions

FAA relevance:

- Risk management is embedded in all FAA test scenarios
- The safest answer is always correct

Teacher Emphasis

- Emphasize that risk management is continuous
- Reinforce that all hazards must be considered
- Highlight importance of conservative decision-making
- Connect risk management to FAA exam scenarios
- Reinforce that professional pilots choose safety first

<u>Activity Procedure</u>

Activity: Risk Evaluation Scenarios

1. Students take structured notes during instruction
2. Students analyze scenarios and determine:
    - Hazards present
    - Risk level (low, medium, high)
    - Appropriate mitigation strategies
    - Final Go/No-Go decision

3. Teacher will use the following Formative Assessment questions:
    - What hazards are present in this scenario?
    - How would you reduce the risk?
    - What decision should the pilot make?
4. Instructor reviews responses and provides detailed explanations

---

Flight Activity (Risk-Based Operation)

1. Identify hazards in flight area
2. Assess risk level
3. Apply mitigation strategies
4. Make Go/No-Go decision
5. Perform controlled takeoff (if safe)
6. Execute safe landing

Instructor emphasis: decision-making under real conditions

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Hazard Identification	Incorrect	Partial accuracy	Mostly correct	Fully accurate
Risk Assessment	Limited	Basic	Accurate	Detailed and justified
Mitigation Strategy	Minimal	Basic	Appropriate	Advanced and proactive
Decision-Making	Unsafe	Basic	Safe	Highly consistent

Assessment Items

1. What is the first step in risk management?
   A. Fly
   B. Identify hazards
   C. Increase speed
   D. Ignore risks
2. What is a hazard?
   A. Camera
   B. Condition that could cause harm
   C. Speed
   D. Battery
3. What is a high-risk situation?
   A. Safe
   B. Requires no action
   C. Unsafe to fly
   D. Easy
4. What is mitigation?
   A. Ignoring risk
   B. Reducing risk
   C. Increasing speed
   D. Flying higher

5. Scenario:
   A pilot identifies strong winds and nearby obstacles.
   What risks are present and what should the pilot do?

Answer Key

1. B
2. B
3. C
4. B
5. High risk due to wind and obstacles; delay or adjust flight plan

---

Closure

- Review risk management steps
- Ask students what makes a decision safe
- Reinforce importance of conservative choices

Teacher Notes

- Emphasize real-world application
- Reinforce continuous evaluation
- Prepare students for full mission integration next lesson

Week 9 – Day 4

Full Mission Planning Integration & Execution

Standards

Standard	Description
201.00	Students will explain FAA Part 107 regulations and operational requirements governing small UAS operations.
201.02	Students will interpret operational limitations, including altitude, speed, visibility, and daylight restrictions.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.02	Students will demonstrate safe flight operations in controlled environments.
210.00	Students will apply mission planning principles to professional drone operations.
210.01	Students will identify FAA safety requirements, including VLOS.
210.02	Students will demonstrate safe flight operations in controlled environments.
210.04	Students will apply risk management strategies to drone operations.

Objective
Students will integrate mission planning, site survey, and risk management into a complete operational plan and execute a safe flight.

Essential Question
How do professional drone pilots combine planning, environment analysis, and risk management to execute a safe mission?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What are the most important steps before a drone flight?
- Which part of planning is most difficult?
- What could cause a mission to fail?

Teacher will connect responses to full integration.

Vocabulary

- **Mission Execution** – Carrying out a planned drone operation
- **Operational Workflow** – Step-by-step process for completing a mission
- **Preflight Planning** – Preparation before flight
- **Execution Phase** – Active flight operation
- **Post-Flight Review** – Evaluation after flight

Materials

- Student notebook or guided notes sheet
- Sectional charts

- Weather reports (METAR/TAF)
- Mission planning worksheet
- Drone and controller
- Whiteboard / presentation slides

Instruction Content
Professional drone operations require integrating all planning and safety elements into a structured workflow.

The full mission workflow includes:
1. Define mission objective
2. Conduct site survey
3. Evaluate airspace
4. Analyze weather conditions
5. Identify hazards and risks
6. Apply FAA regulations
7. Develop mitigation strategies
8. Make Go/No-Go decision
9. Execute flight safely
10. Conduct post-flight review

Key integration concepts include:
- All planning elements must be considered together
- Decisions must prioritize safety and compliance
- Adjustments must be made based on conditions

Execution expectations include:
- Controlled takeoff and landing
- Maintaining visual line of sight
- Avoiding hazards and obstacles
- Adhering to FAA regulations

Post-flight evaluation includes:
- Reviewing what went well
- Identifying areas for improvement
- Documenting mission outcomes

FAA relevance:
- Scenario-based questions require full integration
- Safe and compliant answers are always correct

Teacher Emphasis
- Emphasize that all knowledge areas must work together
- Reinforce that planning directly impacts execution
- Highlight importance of adaptability during flight
- Connect workflow to real-world drone operations
- Reinforce that professional pilots follow structured processes

---

Activity Procedure

Activity: Full Mission Planning & Execution Exercise

1. Students take structured notes during instruction
2. Students complete a full mission plan including:
    - Mission objective
      Airspace classification
      Weather conditions
      Hazards and risks
      Mitigation strategies
      Compliance requirements
3. Teacher will use the following Formative Assessment questions:
    - What is the most critical step in mission planning?
    - How do risks affect execution?
    - What determines a safe Go/No-Go decision?
4. Instructor reviews plans and provides feedback

Flight Activity (Full Mission Execution)

1. Define mission objective
2. Conduct site survey
3. Evaluate airspace and weather
4. Identify hazards
5. Apply mitigation strategies
6. Make Go/No-Go decision
7. Perform controlled takeoff
8. Execute safe flight
9. Perform safe landing

Instructor emphasis: complete integration and control

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Mission Planning	Incomplete	Partial	Complete	Detailed and professional
Integration of Knowledge	Limited	Basic	Accurate	Fully integrated
Flight Execution	Unsafe	Basic control	Safe	Highly controlled and precise
Decision-Making	Unsafe	Basic	Safe	Highly consistent and justified

---

Assessment Items

1. What is the first step in a mission workflow?
   A. Fly
   B. Define objective
   C. Increase speed
   D. Land
2. What must be evaluated before flight?
   A. Airspace and weather
   B. Camera
   C. Speed
   D. Color
3. What is the purpose of mitigation strategies?
   A. Increase speed
   B. Reduce risk
   C. Improve camera
   D. Fly higher
4. What is a Go/No-Go decision?
   A. Speed choice
   B. Decision to fly or not
   C. Camera setting
   D. Battery level
5. Scenario:
   A pilot completes planning but ignores hazards identified during the site survey.
   What risk does this create and what should be done?

Answer Key

1. B
2. A
3. B
4. B
5. Increased risk of incident; hazards must be addressed before flight

---

Closure

- Review full mission workflow
- Ask students what step is most critical
- Reinforce importance of integration

Teacher Notes

- Emphasize real-world application
- Reinforce full workflow consistency
- Prepare students for performance-based evaluation next lesson

Week 9 – Day 5

Performance-Based Mission Assessment

Standards

Standard	Description
201.00	Students will explain FAA Part 107 regulations and operational requirements governing small UAS operations.
201.02	Students will interpret operational limitations, including altitude, speed, visibility, and daylight restrictions.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.02	Students will demonstrate safe flight operations in controlled environments.
210.00	Students will apply mission planning principles to professional drone operations.
210.01	Students will identify FAA safety requirements, including VLOS.
210.02	Students will demonstrate safe flight operations in controlled environments.
210.04	Students will apply risk management strategies to drone operations.

Objective
Students will demonstrate mastery by planning, evaluating, and executing a complete drone mission using FAA-aligned procedures.

Essential Question
Can I independently plan and execute a safe, legal, and professional drone mission?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What step in mission planning is most important to you?
- What is your biggest concern before flying?
- What makes a mission successful?

Teacher will connect responses to performance expectations.

Vocabulary

- **Performance Assessment** – Demonstration of skill through action
- **Mission Execution** – Carrying out a planned operation
- **Operational Readiness** – Preparedness for safe flight
- **Safety Compliance** – Following FAA regulations
- **Post-Flight Evaluation** – Reviewing performance after flight

Materials

- Student mission planning worksheet
- Sectional charts
- Weather reports (METAR/TAF)

- Drone and controller
- Assessment rubric sheet
- Whiteboard / presentation slides

Instruction Content
This lesson serves as a performance-based assessment where students must independently apply all learned knowledge and skills.

Assessment expectations include:
- Complete mission planning
- Accurate site survey
- Proper risk management
- FAA regulatory compliance
- Safe flight execution

The assessment process includes:
1. Define mission objective
2. Conduct site survey
3. Evaluate airspace
4. Analyze weather
5. Identify hazards
6. Apply mitigation strategies
7. Make Go/No-Go decision
8. Execute flight
9. Perform post-flight evaluation

Performance indicators include:
- Accuracy in planning
- Safe and controlled flight
- Consistent decision-making
- Ability to explain reasoning

Common errors include:
- Skipping planning steps
- Ignoring hazards
- Poor decision-making
- Lack of situational awareness

This assessment reflects real-world expectations of professional drone pilots.

Teacher Emphasis
- Emphasize independent student performance
- Reinforce importance of applying all knowledge areas
- Highlight that safety is the highest priority
- Connect assessment to FAA readiness
- Reinforce professional responsibility

Activity Procedure

Activity: Performance-Based Mission Assessment

1. Students independently complete a full mission plan including:
    - Mission objective
      Airspace classification
      Weather conditions
      Hazards and risks
      Mitigation strategies
      Compliance requirements
2. Students present their mission plan to the instructor
3. Teacher will use the following Formative Assessment questions:
    - What risks did you identify?
    - How did you ensure compliance?
    - What made your decision safe?
4. Instructor evaluates and provides feedback

Flight Activity (Assessed Mission Execution)

1. Conduct site survey
2. Evaluate airspace and weather
3. Identify hazards
4. Apply mitigation strategies
5. Make Go/No-Go decision
6. Perform controlled takeoff
7. Execute safe flight
8. Perform safe landing
9. Conduct post-flight review

Instructor emphasis: independent performance and safety

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Mission Planning	Incomplete	Partial	Complete	Detailed and professional
Risk Management	Minimal	Basic	Accurate	Comprehensive
FAA Compliance	Incorrect	Partial	Accurate	Fully compliant
Flight Execution	Unsafe	Basic control	Safe	Highly controlled and precise
Decision-Making	Unsafe	Basic	Safe	Highly consistent and justified

---

Assessment Items

1. What is the first step in mission planning?
   A. Fly
   B. Define objective
   C. Increase speed
   D. Land

2. What must be evaluated before flight?
   A. Airspace and weather
   B. Camera
   C. Speed
   D. Color
3. What is the purpose of risk management?
   A. Increase speed
   B. Reduce hazards
   C. Improve camera
   D. Fly higher
4. What determines a Go/No-Go decision?
   A. Camera
   B. Risk and conditions
   C. Speed
   D. Color
5. Scenario:
   A pilot completes a mission plan but fails to evaluate weather conditions.
   What risk does this create and what should have been done?

Answer Key

1. B
2. A
3. B
4. B
5. Unsafe flight conditions; weather must be evaluated before flight

---

Closure

- Reflect on performance
- Ask students if they feel confident in mission planning
- Reinforce continuous improvement

Teacher Notes

- Use rubric for formal evaluation
- Identify students needing additional support
- Transition into advanced real-world scenarios next week

Week 9 COMPLETE

Students now have:

- Full mission planning capability
- Site survey and risk management skills
- Integrated FAA knowledge application
- Performance-based validation

Week 10 – Day 1

Aeronautical Decision-Making (ADM) Fundamentals

Standards

Standard	Description
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.03	Students will apply emergency procedures to maintain safe flight operations.
209.04	Students will evaluate human factors that impact safe flight decisions.
210.00	Students will apply mission planning principles to professional drone operations.
210.04	Students will apply risk management strategies to drone operations.

Objective
Students will understand and apply Aeronautical Decision-Making (ADM) principles to improve safety and operational judgment.

Essential Question
How do professional drone pilots make safe decisions in dynamic and uncertain conditions?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What causes people to make poor decisions?
- How can pressure affect decision-making?
- Why is decision-making critical in aviation?

Teacher will connect responses to ADM principles.

Vocabulary

- **Aeronautical Decision-Making (ADM)** – Systematic approach to making safe aviation decisions
- **Human Factors** – Human limitations that affect performance
- **Situational Awareness** – Understanding what is happening around you
- **Hazardous Attitude** – Risky mindset that leads to unsafe decisions
- **Risk Management** – Identifying and reducing hazards

Materials

- Student notebook or guided notes sheet
- Scenario worksheets
- Whiteboard / presentation slides

Instruction Content
Aeronautical Decision-Making (ADM) is a structured process used by pilots to consistently make safe decisions.

ADM principles include:
- Recognizing hazards
- Assessing risks
- Making safe decisions
- Continuously evaluating conditions

Human factors that affect decision-making include:
- Stress
- Fatigue
- Pressure to complete a mission
- Lack of experience

Situational awareness includes:
- Understanding environment
- Monitoring changes
- Anticipating risks

Hazardous attitudes include:
- "It won't happen to me"
- "I have to complete this mission"
- "I can handle any situation"

Safe decision-making includes:
- Recognizing limitations
- Avoiding unnecessary risks
- Making conservative choices

FAA relevance:
- ADM is heavily tested in scenario-based questions
- The safest and most conservative answer is correct

Teacher Emphasis
- Emphasize that decision-making is continuous
- Reinforce impact of human factors
- Highlight importance of situational awareness
- Connect ADM to FAA test scenarios
- Reinforce that safe decisions prevent accidents

Activity Procedure

Activity: ADM Scenario Analysis
1. Students take structured notes during instruction
2. Students analyze scenarios and identify:
    - Human factors involved
    - Hazards present
    - Risk level
    - Safe decision

3. Teacher will use the following Formative Assessment questions:
    - What human factors influenced the decision?
    - What would a safe pilot do?
    - What is the safest outcome?
4. Instructor reviews responses and provides feedback

Flight Activity (Decision-Making Focus)

1. Identify potential hazards before flight
2. Evaluate personal readiness
3. Monitor conditions during flight
4. Adjust operation as needed
5. Perform safe takeoff and landing

Instructor emphasis: continuous decision-making

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Understanding ADM	Limited	Basic	Accurate	Comprehensive
Hazard Recognition	Incorrect	Partial	Accurate	Advanced
Decision-Making	Unsafe	Basic	Safe	Highly consistent
Situational Awareness	Minimal	Basic	Effective	Highly developed

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Assessment Items

1. What is ADM?
   A. Flying
   B. Decision-making process
   C. Camera use
   D. Speed
2. What is a human factor?
   A. Camera
   B. Human limitation
   C. Battery
   D. Drone
3. What is situational awareness?
   A. Speed
   B. Understanding surroundings
   C. Camera
   D. Color
4. What is a hazardous attitude?
   A. Safe thinking
   B. Risky mindset
   C. Slow flying
   D. Careful planning

5. Scenario:
   A pilot feels pressure to complete a flight despite poor conditions.
   What human factor is involved and what should the pilot do?

Answer Key

1. B
2. B
3. B
4. B
5. Pressure; pilot should delay or cancel flight

Closure

- Review ADM principles
- Ask students what affects their decisions
- Reinforce importance of safe thinking

Teacher Notes

- Use real-life examples
- Reinforce human factors
- Prepare students for hazardous attitudes next lesson

Week 10 – Day 2

Hazardous Attitudes & Risk Mitigation

Standards

Standard	Description
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.03	Students will apply emergency procedures to maintain safe flight operations.
209.04	Students will evaluate human factors that impact safe flight decisions.
209.05	Students will identify hazardous attitudes and apply mitigation strategies.

Objective
Students will identify hazardous attitudes and apply FAA-recommended strategies to mitigate unsafe decision-making.

Essential Question
How do hazardous attitudes impact safety, and how can they be corrected?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What causes someone to take unnecessary risks?
- Have you ever made a decision you knew was unsafe? Why?
- How can attitudes influence safety?

Teacher will connect responses to hazardous attitudes.

Vocabulary

- **Hazardous Attitude** – Dangerous mindset that affects decision-making
- **Anti-Authority** – Disregard for rules
- **Impulsivity** – Acting without thinking
- **Invulnerability** – Belief that accidents won't happen to you
- **Macho** – Desire to prove oneself
- **Resignation** – Belief that actions do not matter
- **Mitigation Strategy** – Action to reduce risk

Materials

- Student notebook or guided notes sheet
- Scenario worksheets
- Whiteboard / presentation slides

Instruction Content
Hazardous attitudes are common human tendencies that can lead to unsafe decisions in aviation.

The five hazardous attitudes include:

- Anti-Authority: “Rules don’t apply to me”
- Impulsivity: “Do something quickly”
- Invulnerability: “It won’t happen to me”
- Macho: “I can handle anything”
- Resignation: “What’s the use?”

FAA mitigation strategies include:

- Anti-Authority → Follow the rules; they are there for safety
- Impulsivity → Take time to think before acting
- Invulnerability → Understand that accidents can happen to anyone
- Macho → Do not try to prove anything
- Resignation → Take control of the situation

Impact of hazardous attitudes includes:

- Increased risk of accidents
- Poor decision-making
- Ignoring safety procedures

Safe pilot mindset includes:

- Following regulations
- Thinking before acting
- Recognizing personal limitations
- Prioritizing safety

FAA relevance:

- Hazardous attitudes are commonly tested
- Students must identify attitude and correct response

Teacher Emphasis

- Emphasize that everyone experiences hazardous attitudes
- Reinforce importance of recognizing these attitudes
- Highlight that mitigation strategies improve safety
- Connect attitudes to real-world aviation incidents
- Reinforce that mindset directly impacts decision-making

Activity Procedure

Activity: Hazardous Attitude Identification

1. Students take structured notes during instruction
2. Students analyze scenarios and identify:
    - Hazardous attitude present
    - Risk involved
    - Correct mitigation strategy
3. Teacher will use the following Formative Assessment questions:
    - What attitude is present?
    - What risk does it create?
    - How should the pilot respond?
4. Instructor reviews responses and provides feedback

Flight Activity (Mindset Awareness)

1. Discuss potential hazardous attitudes before flight
2. Identify any personal or environmental pressures
3. Apply safe decision-making mindset
4. Perform controlled takeoff and landing

Instructor emphasis: awareness of decision-making mindset

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Identification of Attitudes	Incorrect	Partial	Accurate	Fully accurate
Risk Awareness	Minimal	Basic	Accurate	Comprehensive
Mitigation Strategy	Incorrect	Basic	Appropriate	Advanced and justified
Decision-Making	Unsafe	Basic	Safe	Highly consistent

Assessment Items

1. What is a hazardous attitude?
   A. Safe thinking
   B. Dangerous mindset
   C. Camera setting
   D. Speed
2. What is impulsivity?
   A. Careful thinking
   B. Acting quickly without thinking
   C. Slow flying
   D. Safe planning
3. What is macho attitude?
   A. Safe
   B. Proving oneself
   C. Careful
   D. Slow
4. What is the mitigation for anti-authority?
   A. Ignore rules
   B. Follow rules
   C. Fly faster
   D. Avoid flying
5. Scenario:
   A pilot says, “I don’t need to follow these rules.”
   What attitude is this and what is the correct response?

Answer Key

1. B
2. B
3. B
4. B
5. Anti-authority; follow rules for safety

Closure

- Review hazardous attitudes
- Ask students which is most common
- Reinforce importance of mindset

Teacher Notes

- Encourage honest discussion
- Reinforce personal responsibility
- Prepare students for scenario-based ADM next lesson

Week 10 – Day 3

Scenario-Based ADM & Decision-Making Practice

Standards

Standard	Description
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.03	Students will apply emergency procedures to maintain safe flight operations.
209.04	Students will evaluate human factors that impact safe flight decisions.
209.05	Students will identify hazardous attitudes and apply mitigation strategies.

Objective
Students will apply ADM principles to real-world scenarios and make safe, FAA-compliant decisions.

Essential Question
How can pilots apply ADM principles to make safe decisions in real-world flight scenarios?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What is the safest decision you can make as a pilot?
- Why do people ignore risks even when they see them?
- How can you improve your decision-making skills?

Teacher will connect responses to scenario-based thinking.

Vocabulary

- **Scenario-Based Training** – Learning through real-world situations
- **Operational Decision** – Choice made during flight
- **Hazard Evaluation** – Identifying risks in a situation
- **Mitigation Strategy** – Action to reduce risk
- **Safe Outcome** – Decision that minimizes risk

Materials

- Student notebook or guided notes sheet
- Scenario worksheets
- Sectional charts
- Whiteboard / presentation slides

Instruction Content
Scenario-based training allows pilots to apply knowledge and decision-making skills to realistic situations.

Effective ADM in scenarios includes:

- Identifying hazards
- Recognizing human factors
- Assessing risk levels
- Applying mitigation strategies
- Making safe decisions

Scenario evaluation process includes:

1. Identify situation
2. Recognize hazards
3. Assess risk level
4. Apply mitigation strategies
5. Make final decision

Common scenario challenges include:

- Multiple hazards present
- Pressure to complete mission
- Conflicting information
- Changing conditions

Safe decision-making includes:

- Choosing the most conservative option
- Prioritizing safety over completion
- Recognizing when to delay or cancel

FAA relevance:

- Many test questions are scenario-based
- Students must choose safest and most compliant answer

Teacher Emphasis

- Emphasize application of knowledge in realistic situations
- Reinforce importance of identifying all hazards
- Highlight need for clear reasoning in decisions
- Connect scenarios to FAA testing
- Reinforce that safest answer is always correct

Activity Procedure

Activity: Scenario-Based Decision Practice

1. Students take structured notes during instruction
2. Students analyze multiple scenarios and determine:
    - Hazards present
    - Human factors involved
    - Risk level
    - Mitigation strategies
    - Final decision
3. Teacher will use the following Formative Assessment questions:
    - What hazards are present?
    - What makes this situation risky?
    - What is the safest decision?

4. Instructor reviews responses and provides detailed explanations

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Flight Activity (Scenario Application)

1. Present real-world flight scenario
2. Identify hazards before flight
3. Assess risk level
4. Apply mitigation strategies
5. Make Go/No-Go decision
6. Perform controlled takeoff (if safe)
7. Execute safe landing

Instructor emphasis: applying ADM in real conditions

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Hazard Identification	Incorrect	Partial	Accurate	Fully accurate
Risk Assessment	Limited	Basic	Accurate	Detailed and justified
Mitigation Strategy	Incorrect	Basic	Appropriate	Advanced
Decision-Making	Unsafe	Basic	Safe	Highly consistent

Assessment Items

1. What is the first step in scenario evaluation?
   A. Fly
   B. Identify situation
   C. Increase speed
   D. Ignore
2. What should a pilot identify first?
   A. Camera
   B. Hazards
   C. Speed
   D. Color
3. What is the safest decision in most scenarios?
   A. Fastest
   B. Most exciting
   C. Most conservative
   D. Highest
4. What is mitigation?
   A. Ignoring risk
   B. Reducing risk
   C. Flying faster
   D. Flying higher
5. Scenario:
   A pilot sees increasing winds and nearby obstacles but continues flying.
   What risks are present and what should have been done?

Answer Key

1. B
2. B
3. C
4. B
5. Increased risk of loss of control and collision; pilot should reduce risk or stop flight

---

Closure

- Review scenario evaluation steps
- Ask students what makes a decision safe
- Reinforce importance of conservative choices

Teacher Notes

- Use varied scenarios
- Encourage explanation of reasoning
- Prepare students for advanced ADM integration next lesson

Week 10 – Day 4

Advanced ADM Integration & Multi-Factor Scenarios

Standards

Standard	Description
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.03	Students will apply emergency procedures to maintain safe flight operations.
209.04	Students will evaluate human factors that impact safe flight decisions.
209.05	Students will identify hazardous attitudes and apply mitigation strategies.
210.00	Students will apply mission planning principles to professional drone operations.
210.04	Students will apply risk management strategies to drone operations.

Objective
Students will evaluate complex, multi-factor scenarios and apply ADM principles to make safe, professional decisions.

Essential Question
How do professional pilots manage multiple risks and make safe decisions in complex situations?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What makes a situation complex?
- How do multiple risks affect decision-making?
- Why is it harder to make decisions under pressure?

Teacher will connect responses to multi-factor scenarios.

Vocabulary

- **Multi-Factor Scenario** – Situation involving multiple risks or variables
- **Cumulative Risk** – Combined effect of multiple hazards
- **Decision Priority** – Ranking risks by importance
- **Operational Judgment** – Making decisions during flight
- **Risk Threshold** – Level at which operation becomes unsafe

---

Materials

- Student notebook or guided notes sheet
- Advanced scenario worksheets
- Sectional charts
- Weather reports (METAR/TAF)
- Whiteboard / presentation slides

Instruction Content
Advanced ADM requires evaluating multiple factors simultaneously and making safe decisions under complex conditions.

Multi-factor scenarios may include:
- Controlled airspace
- Poor weather conditions
- Nearby airports
- Obstacles and terrain
- Human factors (pressure, fatigue)

Advanced decision-making process includes:
1. Identify all hazards
2. Evaluate cumulative risk
3. Prioritize most critical risks
4. Apply mitigation strategies
5. Make final decision

Cumulative risk concepts include:
- Multiple small risks can create a high-risk situation
- Risk increases when hazards combine
- Safe pilots recognize when risk exceeds acceptable levels

Decision-making strategies include:
- Slowing down and thinking through options
- Prioritizing safety over mission completion
- Adjusting or cancelling when needed

FAA relevance:
- Complex scenarios are common on the exam
- Students must identify the safest overall solution

Teacher Emphasis
- Emphasize that risks must be evaluated together
- Reinforce concept of cumulative risk
- Highlight importance of prioritizing hazards
- Connect to FAA scenario-based testing
- Reinforce that safest overall decision is correct

<u>Activity Procedure</u>
Activity: Multi-Factor Scenario Analysis
1. Students take structured notes during instruction
2. Students analyze complex scenarios and determine:
    - All hazards present
    - Combined risk level
    - Most critical risks
    - Mitigation strategies
    - Final decision

3. Teacher will use the following Formative Assessment questions:
    - What hazards combine to increase risk?
    - Which risk is most critical?
    - What is the safest overall decision?
4. Instructor reviews responses and provides detailed explanations

---

Flight Activity (Advanced Decision-Making)

1. Identify multiple hazards in flight area
2. Evaluate cumulative risk
3. Prioritize critical risks
4. Apply mitigation strategies
5. Make Go/No-Go decision
6. Perform controlled takeoff (if safe)
7. Execute safe landing

Instructor emphasis: managing multiple risks

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Hazard Identification	Incorrect	Partial	Accurate	Comprehensive
Risk Evaluation	Limited	Basic	Accurate	Fully integrated
Prioritization	Incorrect	Basic	Accurate	Highly effective
Decision-Making	Unsafe	Basic	Safe	Highly consistent

Assessment Items

1. What is a multi-factor scenario?
   A. Simple situation
   B. Situation with multiple risks
   C. Easy flight
   D. Safe
2. What is cumulative risk?
   A. One risk
   B. Combined risks
   C. No risk
   D. Camera
3. What should be done first in complex scenarios?
   A. Fly
   B. Identify hazards
   C. Increase speed
   D. Ignore

4. What is the safest decision?
   A. Fastest
   B. Most exciting
   C. Most conservative
   D. Highest
5. Scenario:
   A pilot is flying near controlled airspace, in moderate winds, with nearby obstacles. How should the pilot evaluate this situation and what decision should be made?

Answer Key

1. B
2. B
3. B
4. C
5. Evaluate all hazards, assess cumulative risk, apply mitigation; possibly delay or adjust flight

---

Closure

- Review cumulative risk concepts
- Ask students what makes scenarios complex
- Reinforce importance of prioritizing safety

Teacher Notes

- Use challenging scenarios
- Encourage critical thinking
- Prepare students for final ADM assessment next lesson

Week 10 – Day 5

ADM Mastery Assessment & Application

Standards

Standard	Description
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.03	Students will apply emergency procedures to maintain safe flight operations.
209.04	Students will evaluate human factors that impact safe flight decisions.
209.05	Students will identify hazardous attitudes and apply mitigation strategies.
210.00	Students will apply mission planning principles to professional drone operations.
210.04	Students will apply risk management strategies to drone operations.

Objective
Students will demonstrate mastery of ADM principles by analyzing complex scenarios and making safe, FAA-compliant decisions.

Essential Question
Can I consistently apply ADM principles to make safe and professional decisions in any scenario?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What ADM concept has helped you the most?
- What is the hardest part of decision-making?
- How do you ensure your decisions are safe?

Teacher will connect responses to mastery expectations.

Vocabulary

- **Mastery** – High level of understanding and application
- **Operational Judgment** – Decision-making during flight
- **Scenario Evaluation** – Analyzing real-world situations
- **Risk Prioritization** – Ranking hazards by importance
- **Safe Outcome** – Decision that minimizes risk

Materials

- Student assessment sheets
- Advanced scenario worksheets
- Sectional charts
- Weather reports (METAR/TAF)
- Whiteboard / presentation slides

Instruction Content

This lesson serves as a mastery assessment of ADM principles and decision-making skills.

Mastery expectations include:

- Accurate identification of hazards
- Recognition of human factors
- Proper risk evaluation and prioritization
- Application of mitigation strategies
- Consistent safe decision-making

The ADM evaluation process includes:

1. Identify scenario conditions
2. Recognize hazards and human factors
3. Assess risk levels
4. Prioritize critical risks
5. Apply mitigation strategies
6. Make final decision

Indicators of mastery include:

- Consistent correct answers
- Clear reasoning and justification
- Conservative and safe decisions
- Ability to explain thinking

Common errors include:

- Ignoring human factors
- Underestimating risk
- Failing to prioritize hazards
- Choosing unsafe options

This assessment confirms readiness for FAA-level scenario analysis.

Teacher Emphasis

- Emphasize consistency in safe decision-making
- Reinforce importance of reasoning and explanation
- Highlight that safest answer is always correct
- Connect assessment to FAA test readiness
- Reinforce professional pilot mindset

Activity Procedure

Activity: ADM Mastery Assessment

1. Students complete a comprehensive scenario-based assessment (20–30 questions)
2. Students must:
    - Identify hazards and human factors
    - Evaluate risk levels
    - Apply mitigation strategies
    - Select safest decision

3. Teacher will use the following Formative Assessment questions (post-assessment):

    - What factors influenced your decisions?
    - How did you prioritize risks?
    - What made your decision safe?
4. Instructor reviews results and provides targeted feedback

Flight Activity (ADM Application)

1. Identify hazards before flight
2. Evaluate personal and environmental factors
3. Apply ADM principles
4. Make Go/No-Go decision
5. Perform controlled takeoff (if safe)
6. Execute safe landing

Instructor emphasis: consistent safe decision-making

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Hazard Identification	Incorrect	Partial	Accurate	Comprehensive
Risk Evaluation	Limited	Basic	Accurate	Fully integrated
Mitigation Strategy	Incorrect	Basic	Appropriate	Advanced and justified
Decision-Making	Unsafe	Basic	Safe	Highly consistent

Assessment Items

1. What is the first step in ADM?
   A. Fly
   B. Identify conditions
   C. Increase speed
   D. Ignore
2. What must be identified in every scenario?
   A. Camera
   B. Hazards and human factors
   C. Speed
   D. Color
3. What is the safest decision?
   A. Fastest
   B. Most exciting
   C. Most conservative
   D. Highest
4. What is risk prioritization?
   A. Ignoring risk
   B. Ranking hazards
   C. Flying faster
   D. Flying higher

5. Scenario:
   A pilot is under pressure to complete a mission in poor weather with nearby obstacles. What factors must be considered and what is the safest decision?

Answer Key

1. B
2. B
3. C
4. B
5. Weather, obstacles, pressure (human factor); safest decision is to delay or cancel

---

Closure

- Reflect on ADM mastery
- Ask students if they feel confident in decision-making
- Reinforce continuous improvement

Teacher Notes

- Identify students ready for FAA testing
- Provide support where needed
- Transition into advanced operational applications next week

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Week 10 COMPLETE

Students now have:

- Strong ADM understanding
- Ability to analyze complex scenarios
- Consistent safe decision-making skills
- FAA-level scenario readiness

Week 11 – Day 1

Preflight Inspection & Aircraft Readiness

Standards

Standard	Description
204.00	Students will explain how loading and environmental factors affect sUAS performance.
204.03	Students will interpret environmental effects such as wind and temperature on operations.
207.00	Students will perform preflight inspection procedures and evaluate aircraft readiness for safe operation.
207.01	Students will identify required preflight inspection components.
207.02	Students will explain maintenance requirements and system checks.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.01	Students will identify FAA safety requirements, including VLOS.

Objective
Students will perform a complete preflight inspection to ensure aircraft readiness and safe operation.

Essential Question
Why is a thorough preflight inspection critical to safe drone operations?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What could go wrong if a drone is not inspected before flight?
- What parts of a drone might fail?
- Why is checking equipment just as important as planning?

Teacher will connect responses to aircraft safety.

Vocabulary

- **Preflight Inspection** – Systematic check of aircraft before flight
- **Airworthiness** – Condition of being safe to fly
- **Control System** – Components used to control the aircraft
- **Battery Integrity** – Condition and reliability of power source
- **Maintenance Issue** – Problem that affects safe operation

Materials

- Drone and controller
- Preflight inspection checklist
- Student notebook or guided notes sheet

- Whiteboard / presentation slides

Instruction Content
Preflight inspection ensures that the drone is safe, functional, and ready for flight.

The preflight inspection process includes:
1. Inspect aircraft structure
2. Check propellers for damage
3. Verify battery condition and charge
4. Inspect motors and connections
5. Check controller and signal connection
6. Verify GPS and system status
7. Confirm firmware and settings
8. Ensure proper calibration

Key inspection areas include:
- Physical damage
- Loose components
- Battery condition
- System functionality

Common issues include:
- Cracked or damaged propellers
- Low or faulty batteries
- Loose connections
- Calibration errors

Airworthiness includes:
- No visible damage
- Fully functional systems
- Reliable power source

FAA relevance:
- Preflight inspection is required before every operation
- Equipment failure is a major cause of incidents

Teacher Emphasis
- Emphasize that every flight begins with inspection
- Reinforce importance of identifying issues early
- Highlight that small problems can cause major failures
- Connect inspection to FAA safety requirements
- Reinforce that safe pilots never skip preflight checks

Activity Procedure
Activity: Preflight Inspection Practice
1. Students take structured notes during instruction

2. Students perform a preflight inspection and document:
    - Aircraft condition
      Battery status
      System checks
      Any identified issues
3. Teacher will use the following Formative Assessment questions:
    - What issues did you identify?
    - Why is this issue a safety concern?
    - What should be done before flight?
4. Instructor reviews inspections and provides feedback

Flight Activity (Inspection-Based Operation)

1. Perform full preflight inspection
2. Verify aircraft readiness
3. Identify and correct issues
4. Make Go/No-Go decision
5. Perform controlled takeoff
6. Execute safe landing

Instructor emphasis: inspection before flight

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Inspection Completion	Incomplete	Partial	Complete	Thorough and detailed
Issue Identification	Minimal	Basic	Accurate	Comprehensive
Safety Awareness	Limited	Basic	Accurate	Highly developed
Decision-Making	Unsafe	Basic	Safe	Highly consistent

Assessment Items

1. What is a preflight inspection?
   A. Flight
   B. Aircraft check
   C. Weather report
   D. Camera

2. What should be checked before flight?
   A. Propellers
   B. Camera
   C. Color
   D. Speed

3. What is airworthiness?
   A. Speed
   B. Safe to fly condition
   C. Camera
   D. Battery

4. What is a common issue?
   A. Clean camera
   B. Damaged propeller
   C. Full battery
   D. Strong signal
5. Scenario:
   A pilot ignores a damaged propeller and begins flight.
   What risk does this create and what should be done?

Answer Key

1. B
2. A
3. B
4. B
5. Risk of failure/crash; propeller must be replaced before flight

---

Closure

- Review preflight checklist
- Ask students what is most important to check
- Reinforce importance of aircraft readiness

Teacher Notes

- Use hands-on inspection
- Reinforce consistency
- Prepare students for systems and performance next lesson

Week 11 – Day 2

Aircraft Systems & Performance Factors

Standards

Standard	Description
204.00	Students will explain how loading and environmental factors affect sUAS performance.
204.01	Students will identify factors affecting performance, such as weight and balance.
204.02	Students will explain the impact of density altitude on flight performance.
207.00	Students will perform preflight inspection procedures and evaluate aircraft readiness for safe operation.
207.02	Students will explain maintenance requirements and system checks.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.01	Students will identify FAA safety requirements, including VLOS.

Objective
Students will identify key UAS systems and explain how they impact aircraft performance and safe operation.

Essential Question
How do drone systems and performance factors impact safe and effective flight operations?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What parts of a drone allow it to fly?
- What might affect how well a drone performs?
- Why is it important to understand your aircraft systems?

Teacher will connect responses to system awareness.

Vocabulary

- **Flight Controller** – System that manages aircraft stability and movement
- **Propulsion System** – Motors and propellers that generate lift
- **GPS System** – Provides positioning and navigation
- **Battery System** – Power source for the aircraft
- **Payload** – Equipment carried by the drone

Materials

- Drone and controller
- System diagram (visual or handout)
- Student notebook or guided notes sheet
- Whiteboard / presentation slides

Instruction Content
Understanding aircraft systems is essential for safe operation and performance management.

Major UAS systems include:
1. Flight control system
2. Propulsion system (motors and propellers)
3. Power system (battery)
4. GPS and navigation system
5. Communication system (controller link)

System functions include:
- Flight controller stabilizes aircraft
- Motors and propellers create lift
- Battery supplies power
- GPS enables positioning and return-to-home
- Controller link allows pilot input

Performance factors include:
- Battery level and condition
- Payload weight
- Wind conditions
- Temperature
- Altitude

Performance impacts include:
- Reduced flight time
- Decreased stability
- Slower response
- Increased risk of failure

Common system issues include:
- Low battery
- Signal loss
- GPS errors
- Motor or propeller damage

FAA relevance:
- Understanding performance is required for safe operations
- Many test questions involve system limitations

Teacher Emphasis
- Emphasize understanding how each system functions
- Reinforce connection between systems and safety
- Highlight how performance changes in different conditions
- Connect system knowledge to FAA testing
- Reinforce that pilots must understand their aircraft

Activity Procedure

Activity: Aircraft Systems Identification

1. Students take structured notes during instruction
2. Students identify and label drone systems including:
    - Flight controller
      Propulsion system
      Battery system
      GPS system
      Communication system
3. Teacher will use the following Formative Assessment questions:
    - What system controls flight stability?
    - What affects aircraft performance?
    - What system failure is most dangerous?
4. Instructor reviews responses and provides feedback

Flight Activity (System Awareness Operation)

1. Perform preflight inspection
2. Identify system status
3. Monitor battery and signal during flight
4. Observe performance changes
5. Perform controlled takeoff and landing

Instructor emphasis: understanding system behavior

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
System Identification	Incorrect	Partial	Accurate	Comprehensive
Understanding Performance	Limited	Basic	Accurate	Detailed
Hazard Awareness	Minimal	Basic	Accurate	Comprehensive
Decision-Making	Unsafe	Basic	Safe	Highly consistent

Assessment Items

1. What system controls stability?
   A. Camera
   B. Flight controller
   C. Battery
   D. Color

2. What provides lift?
   A. Camera
   B. Motors and propellers
   C. GPS
   D. Battery

3. What affects performance?
   A. Weather
   B. Color
   C. Camera
   D. Speed
4. What is a common issue?
   A. Full battery
   B. Signal loss
   C. Clear sky
   D. Strong GPS
5. Scenario:
   A drone has a low battery and is flying in strong winds.
   How does this affect performance and what should the pilot do?

Answer Key

1. B
2. B
3. A
4. B
5. Reduced performance and increased risk; pilot should land safely

---

Closure

- Review aircraft systems
- Ask students what system is most important
- Reinforce understanding of performance

Teacher Notes

- Use actual drone demonstrations
- Reinforce system-function relationships
- Prepare students for loading and weight next lesson

Week 11 – Day 3

Loading, Weight, and Performance Impact

Standards

Standard	Description
204.00	Students will explain how loading and environmental factors affect sUAS performance.
204.04	Students will evaluate the impact of density altitude on drone operations.
204.05	Students will apply performance concepts to real-world flight conditions.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.01	Students will identify FAA safety requirements, including VLOS.

Objective
Students will analyze how weight, payload, and environmental conditions affect drone performance and safety.

Essential Question
How do weight and environmental factors impact drone performance and safe operation?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What happens when a drone carries extra weight?
- How might wind affect a heavier drone differently?
- Why is it important to understand performance limits?

Teacher will connect responses to loading and performance concepts.

Vocabulary

- **Loading** – Total weight carried by the drone
- **Payload** – Additional equipment carried by the drone
- **Performance Limitations** – Boundaries of safe operation
- **Lift** – Upward force generated by propellers
- **Drag** – Resistance that affects movement

Materials

- Drone and controller
- Optional payload weights (if available)
- Student notebook or guided notes sheet
- Whiteboard / presentation slides

Instruction Content
Aircraft loading and environmental conditions directly affect drone performance and safety.

Loading factors include:
- Total aircraft weight
- Payload (camera, accessories)
- Battery weight

Effects of increased weight include:
- Reduced flight time
- Slower response
- Increased motor strain
- Reduced climb performance

Environmental performance factors include:
- Wind speed
- Temperature
- Air density
- Altitude

Environmental impacts include:
- Strong winds reduce stability
- High temperatures reduce battery efficiency
- High altitude reduces lift

Performance limitations include:
- Maximum weight capacity
- Reduced control in adverse conditions
- Increased risk of failure

Safe operation includes:
- Staying within manufacturer limits
- Adjusting for environmental conditions
- Monitoring performance during flight

FAA relevance:
- Understanding performance limitations is required
- Many test questions involve environmental and loading effects

---

Teacher Emphasis
- Emphasize that weight directly affects performance
- Reinforce importance of understanding limits
- Highlight environmental impacts on flight
- Connect performance factors to FAA testing
- Reinforce that exceeding limits creates risk

Activity Procedure

Activity: Performance Analysis Exercise
1. Students take structured notes during instruction

2. Students analyze performance scenarios and determine:
    - Effects of added weight
    - Environmental impacts
    - Potential risks
    - Safe operational adjustments
3. Teacher will use the following Formative Assessment questions:
    - How does weight affect flight performance?
    - What environmental factor is most dangerous?
    - What adjustments should be made?
4. Instructor reviews responses and provides feedback

Flight Activity (Performance Observation)

1. Perform preflight inspection
2. Evaluate environmental conditions
3. Observe aircraft response during flight
4. Monitor battery performance
5. Perform controlled takeoff and landing

Instructor emphasis: recognizing performance changes

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Understanding Loading	Limited	Basic	Accurate	Comprehensive
Performance Analysis	Incorrect	Partial	Accurate	Detailed
Hazard Identification	Minimal	Basic	Accurate	Comprehensive
Decision-Making	Unsafe	Basic	Safe	Highly consistent

Assessment Items

1. What is loading?
   A. Speed
   B. Weight carried
   C. Camera
   D. Color

2. What happens with increased weight?
   A. Longer flight
   B. Reduced performance
   C. Faster flight
   D. No change

3. What affects performance?
   A. Wind
   B. Color
   C. Camera
   D. Speed

4. What is a limitation?
   A. Safe area
   B. Boundary of operation
   C. Camera
   D. Battery
5. Scenario:
   A drone is carrying additional payload and flying in high winds.
   What risks are present and what should the pilot do?

Answer Key

1. B
2. B
3. A
4. B
5. Reduced stability and increased risk; reduce load or delay flight

---

Closure

- Review loading and performance effects
- Ask students what factor has the greatest impact
- Reinforce importance of limits

Teacher Notes

- Use real examples when possible
- Reinforce cause-and-effect relationships
- Prepare students for maintenance and troubleshooting next lesson

Week 11 – Day 4

Maintenance, Troubleshooting & Common Failures

Standards

Standard	Description
204.00	Students will explain how loading and environmental factors affect sUAS performance.
204.03	Students will interpret environmental effects such as wind and temperature on operations.
207.00	Students will perform preflight inspection procedures and evaluate aircraft readiness for safe operation.
207.02	Students will explain maintenance requirements and system checks.
207.03	Students will apply preflight procedures to determine flight readiness.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.01	Students will identify FAA safety requirements, including VLOS.

Objective
Students will identify common drone maintenance issues and apply troubleshooting strategies to ensure safe operation.

Essential Question
How do maintenance and troubleshooting impact flight safety and aircraft reliability?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What could cause a drone to fail during flight?
- Why is maintenance important even if the drone appears to work?
- What would you do if a system fails mid-flight?

Teacher will connect responses to system reliability.

Vocabulary

- **Maintenance** – Routine care to keep equipment functional
- **Troubleshooting** – Process of identifying and solving problems
- **System Failure** – Breakdown of a component or function
- **Signal Loss** – Loss of connection between controller and drone
- **Calibration** – Adjusting systems for accurate performance

Materials

- Drone and controller
- Maintenance checklist
- Scenario worksheets

- Student notebook or guided notes sheet
- Whiteboard / presentation slides

Instruction Content
Maintenance and troubleshooting are critical to ensuring aircraft reliability and safe operation.

Common maintenance areas include:
- Propellers
- Motors
- Battery condition
- Firmware updates
- Calibration

Common failures include:
- Signal loss
- Low battery or battery failure
- GPS malfunction
- Motor or propeller damage

Troubleshooting process includes:
1. Identify the issue
2. Determine possible causes
3. Apply corrective action
4. Verify system functionality

Examples of troubleshooting include:
- Replacing damaged propellers
- Recalibrating sensors
- Restarting systems
- Updating firmware

Failure response includes:
- Maintaining control
- Initiating safe landing
- Following emergency procedures

Safe operation includes:
- Regular maintenance checks
- Immediate correction of issues
- Avoiding flight with known problems

FAA relevance:
- Equipment reliability is critical to safety
- Many test scenarios involve system failures

Teacher Emphasis
- Emphasize importance of routine maintenance
- Reinforce that small issues can lead to major failures
- Highlight need for quick and correct troubleshooting
- Connect maintenance to FAA safety expectations

- Reinforce that safe pilots do not fly damaged equipment

Activity Procedure

Activity: Troubleshooting Scenarios

1. Students take structured notes during instruction
2. Students analyze scenarios and determine:
    - Problem identified
    - Possible causes
    - Correct troubleshooting steps
    - Safe response
3. Teacher will use the following Formative Assessment questions:
    - What caused the issue?
    - How can it be fixed?
    - What should the pilot do?
4. Instructor reviews responses and provides feedback

Flight Activity (Failure Awareness Operation)

1. Perform preflight inspection
2. Identify potential issues
3. Monitor system performance during flight
4. Simulate response to failure (discussion or controlled environment)
5. Perform safe landing

Instructor emphasis: recognizing and responding to issues

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Issue Identification	Incorrect	Partial	Accurate	Comprehensive
Troubleshooting Process	Incorrect	Basic	Appropriate	Advanced
Safety Response	Unsafe	Basic	Safe	Highly consistent
System Understanding	Limited	Basic	Accurate	Comprehensive

Assessment Items

1. What is maintenance?
   A. Flying
   B. Equipment care
   C. Camera
   D. Speed
2. What is troubleshooting?
   A. Flying
   B. Fixing problems
   C. Camera
   D. Speed

3. What is a common failure?
   A. Strong signal
   B. Signal loss
   C. Full battery
   D. Clear sky
4. What should a pilot do during failure?
   A. Ignore
   B. Land safely
   C. Fly faster
   D. Increase altitude
5. Scenario:
   A drone loses signal during flight.
   What is the risk and what should the pilot do?

Answer Key

1. B
2. B
3. B
4. B
5. Loss of control; follow failsafe or land safely

Closure

- Review maintenance and troubleshooting steps
- Ask students what failure is most dangerous
- Reinforce importance of reliability

Teacher Notes

- Use real examples if possible
- Reinforce proactive maintenance
- Prepare students for full system integration next lesson

Week 11 – Day 5

Aircraft Systems & Safety Integration Assessment

Standards

Standard	Description
204.00	Students will explain how loading and environmental factors affect sUAS performance.
204.01	Students will identify factors affecting performance, such as weight and balance.
204.03	Students will interpret environmental effects such as wind and temperature on operations.
204.04	Students will evaluate the impact of density altitude on drone operations.
207.00	Students will perform preflight inspection procedures and evaluate aircraft readiness for safe operation.
207.01	Students will identify required preflight inspection components.
207.02	Students will explain maintenance requirements and system checks.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.01	Students will identify FAA safety requirements, including VLOS.

Objective
Students will demonstrate mastery of aircraft systems, performance factors, maintenance, and safety through integrated assessment.

Essential Question
Can I evaluate aircraft systems and performance to ensure safe and reliable flight operations?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What system failure concerns you the most?
- What is the most important part of a preflight inspection?
- How do systems and performance connect to safety?

Teacher will connect responses to integrated understanding.

Vocabulary

- **System Integration** – How aircraft systems work together
- **Operational Readiness** – Preparedness for safe flight
- **Performance Limitation** – Boundary of safe aircraft operation
- **Preventive Maintenance** – Actions taken to avoid failure
- **Reliability** – Consistency of system performance

Materials

- Student assessment sheets
- Drone and controller
- Preflight checklist
- Scenario worksheets
- Whiteboard / presentation slides

Instruction Content

This lesson serves as a mastery assessment of aircraft systems, performance, maintenance, and safety integration.

Mastery expectations include:

- Understanding aircraft systems
- Evaluating aircraft condition
- Applying preflight inspection procedures
- Recognizing performance limitations
- Identifying maintenance issues

Integrated evaluation process includes:

1. Inspect aircraft systems
2. Evaluate performance factors
3. Identify maintenance issues
4. Assess operational readiness
5. Make Go/No-Go decision

Indicators of mastery include:

- Accurate system identification
- Consistent inspection procedures
- Recognition of performance limitations
- Safe operational decisions

Common errors include:

- Skipping inspection steps
- Ignoring system issues
- Misjudging performance limits
- Making unsafe decisions

This assessment reflects FAA expectations for safe aircraft operation.

Teacher Emphasis

- Emphasize integration of all system knowledge
- Reinforce importance of inspection and maintenance
- Highlight connection between systems and safety
- Connect assessment to FAA readiness
- Reinforce professional responsibility

Activity Procedure

Activity: Systems & Safety Mastery Assessment

1. Students complete an integrated assessment including:
    - System identification
    - Performance analysis
    - Maintenance evaluation
    - Safety decision-making
2. Students perform a preflight inspection and document:
    - Aircraft condition
      Identified issues
      Performance considerations
      Final Go/No-Go decision
3. Teacher will use the following Formative Assessment questions (post-assessment):
    - What issues did you identify?
    - How do systems affect performance?
    - What made your decision safe?
4. Instructor reviews results and provides targeted feedback

Flight Activity (Integrated Systems Operation)

1. Perform full preflight inspection
2. Evaluate system condition
3. Identify performance limitations
4. Make Go/No-Go decision
5. Perform controlled takeoff
6. Execute safe landing

Instructor emphasis: system awareness and safety

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
System Understanding	Limited	Basic	Accurate	Comprehensive
Inspection Accuracy	Incomplete	Partial	Complete	Thorough
Performance Evaluation	Incorrect	Basic	Accurate	Detailed
Decision-Making	Unsafe	Basic	Safe	Highly consistent

Assessment Items

1. What is system integration?
   A. Flying
   B. Systems working together
   C. Camera
   D. Speed

2. What is a performance limitation?
   A. Safe area
   B. Operational boundary
   C. Camera
   D. Battery
3. What is preventive maintenance?
   A. Fixing after failure
   B. Preventing failure
   C. Flying
   D. Speed
4. What determines operational readiness?
   A. Camera
   B. Aircraft condition
   C. Color
   D. Speed
5. Scenario:
   A pilot skips part of the preflight inspection and misses a system issue.
   What risk does this create and what should have been done?

Answer Key

1. B
2. B
3. B
4. B
5. Increased risk of failure; complete inspection is required

---

Closure

- Reflect on system knowledge
- Ask students if they feel confident in aircraft readiness
- Reinforce importance of consistency

Teacher Notes

- Use rubric for evaluation
- Reinforce real-world application
- Transition into advanced airspace operations next week

Week 11 COMPLETE

Students now have:

- Strong understanding of aircraft systems
- Ability to evaluate performance and limitations
- Maintenance and troubleshooting skills
- Integrated safety decision-making

Week 12 – Day 1

Advanced Airspace – Controlled Airspace & Authorization

Standards

Standard	Description
201.00	Students will explain FAA Part 107 regulations and operational requirements governing small UAS operations.
201.03	Students will explain Remote Pilot in Command (PIC) responsibilities and legal accountability.
202.00	Students will apply airspace classifications using sectional charts and UAS facility maps to determine legal flight operations.
202.02	Students will interpret sectional chart symbols and legends.
202.05	Students will evaluate flight scenarios to determine safe and legal operating locations.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.02	Students will demonstrate safe flight operations in controlled environments.

Objective
Students will identify controlled airspace types and determine when FAA authorization is required for drone operations.

Essential Question
When is authorization required to operate in controlled airspace, and how do pilots obtain it?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What is controlled airspace?
- Why might the FAA restrict drone operations in certain areas?
- What could happen if a pilot flies without authorization?

Teacher will connect responses to regulatory compliance.

Vocabulary

- **Controlled Airspace** – Airspace where ATC (Air Traffic Control) manages aircraft operations
- **Class B Airspace** – Airspace surrounding major airports
- **Class C Airspace** – Airspace around medium-sized airports
- **Class D Airspace** – Airspace around smaller airports with control towers
- **Authorization** – FAA approval required to operate in controlled airspace

Materials

- Sectional charts
- Airspace diagrams
- LAANC examples or screenshots
- Student notebook or guided notes sheet
- Whiteboard / presentation slides

Instruction Content
Controlled airspace requires authorization for drone operations under Part 107.

Controlled airspace types include:
- Class B – Large airports with heavy traffic
- Class C – Medium-sized airports
- Class D – Smaller airports with control towers
- Class E (surface areas) – Controlled areas near airports

Authorization requirements include:
- Required before operating in controlled airspace
- Must follow altitude limits provided
- Must comply with all conditions of approval

Authorization methods include:
- LAANC (Low Altitude Authorization and Notification Capability)
- FAA DroneZone (manual authorization)

Key compliance considerations include:
- Maximum authorized altitude
- Time limitations
- Operational restrictions

Common violations include:
- Flying in controlled airspace without authorization
- Exceeding authorized altitude
- Ignoring conditions

FAA relevance:
- Airspace and authorization are heavily tested
- Students must identify when authorization is required

Teacher Emphasis
- Emphasize importance of airspace awareness
- Reinforce that authorization is required in controlled airspace
- Highlight differences between airspace classes
- Connect to FAA test questions
- Reinforce legal responsibility of pilots

<u>Activity Procedure</u>
Activity: Airspace Authorization Analysis
1. Students take structured notes during instruction

2. Students analyze airspace scenarios and determine:

    - Airspace classification
    - Whether authorization is required
    - Maximum allowable altitude
    - Compliance requirements
3. Teacher will use the following Formative Assessment questions:
    - What class of airspace is this?
    - Is authorization required?
    - What restrictions apply?
4. Instructor reviews responses and provides feedback

Flight Activity (Airspace Awareness Operation)

1. Identify airspace classification of location
2. Determine if authorization is required
3. Verify compliance requirements
4. Make Go/No-Go decision
5. Perform controlled takeoff
6. Execute safe landing

Instructor emphasis: airspace awareness and compliance

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Airspace Identification	Incorrect	Partial	Accurate	Comprehensive
Authorization Understanding	Limited	Basic	Accurate	Fully correct
Compliance Evaluation	Incorrect	Basic	Accurate	Fully compliant
Decision-Making	Unsafe	Basic	Safe	Highly consistent

Assessment Items

1. What is controlled airspace?
   A. Unrestricted
   B. Managed by ATC
   C. Open
   D. Safe

2. Which class is near major airports?
   A. Class G
   B. Class B
   C. Class E
   D. Class A

3. When is authorization required?
   A. Always
   B. Controlled airspace
   C. Never
   D. Only at night

4. What system provides quick authorization?
   A. GPS
   B. LAANC
   C. Camera
   D. Battery
5. Scenario:
   A pilot plans to fly in Class D airspace without authorization.
   What is the issue and what should be done?

Answer Key

1. B
2. B
3. B
4. B
5. Illegal operation; pilot must obtain authorization before flight

---

Closure

- Review controlled airspace types
- Ask students when authorization is required
- Reinforce compliance importance

Teacher Notes

- Use sectional chart examples
- Reinforce visual identification
- Prepare students for advanced chart interpretation next lesson

Week 12 – Day 2

Sectional Chart Deep Dive & Airspace Interpretation

Standards

Standard	Description
201.00	Students will explain FAA Part 107 regulations and operational requirements governing small UAS operations.
201.03	Students will explain Remote Pilot in Command (PIC) responsibilities and legal accountability.
202.00	Students will apply airspace classifications using sectional charts and UAS facility maps to determine legal flight operations.
202.01	Students will identify airspace classes (B, C, D, E, G) and their characteristics.
202.03	Students will differentiate between controlled and uncontrolled airspace.
202.04	Students will apply airspace knowledge to determine authorization requirements.

Objective
Students will interpret sectional charts to identify airspace classifications, altitude limits, and operational restrictions.

Essential Question
How do pilots use sectional charts to determine safe and legal flight operations?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What information do sectional charts provide?
- Why are charts important for drone pilots?
- What could happen if a pilot misreads a chart?

Teacher will connect responses to navigation and compliance.

Vocabulary

- **Sectional Chart** – Aeronautical map used for navigation and airspace identification
- **Airspace Boundary** – Defined limit of controlled or special airspace
- **Altitude Limit** – Maximum or minimum flight level
- **Latitude/Longitude** – Coordinates used for location
- **Chart Symbol** – Visual representation of airspace features

Materials

- Sectional charts (printed or digital)
- Chart legend/reference guide
- Student notebook or guided notes sheet
- Whiteboard / presentation slides

Instruction Content

Sectional charts provide critical information for safe and legal drone operations.

Key chart elements include:
- Airspace classifications (B, C, D, E, G)
- Airport locations and types
- Altitude limits
- Airspace boundaries
- Obstructions and terrain

Common chart symbols include:
- Blue solid lines → Class B
- Blue dashed lines → Class D
- Magenta lines → Class E
- Airports → Different symbols for towered and non-towered

Altitude interpretation includes:
- Ceiling and floor of airspace
- Maximum allowable altitude
- Transition altitudes

Airspace analysis includes:
- Identifying airspace type
- Determining authorization requirements
- Understanding restrictions

Common challenges include:
- Misreading boundaries
- Confusing altitude values
- Overlooking airspace layers

FAA relevance:
- Sectional chart questions are heavily tested
- Students must interpret symbols and determine compliance

Teacher Emphasis
- Emphasize importance of chart accuracy
- Reinforce understanding of symbols and boundaries
- Highlight connection between charts and compliance
- Connect to FAA test questions
- Reinforce that pilots must interpret charts correctly

Activity Procedure

Activity: Sectional Chart Analysis
1. Students take structured notes during instruction
2. Students analyze sectional charts and identify:
    - Airspace classification
      Boundaries
      Altitude limits
      Airport locations

3. Teacher will use the following Formative Assessment questions:
    - What airspace is shown?
    - What are the altitude limits?
    - Is authorization required?
4. Instructor reviews responses and provides feedback

Flight Activity (Chart-Based Operation)

1. Identify flight location on chart
2. Determine airspace classification
3. Evaluate altitude limits
4. Confirm compliance requirements
5. Make Go/No-Go decision
6. Perform controlled takeoff
7. Execute safe landing

Instructor emphasis: chart interpretation

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Chart Interpretation	Incorrect	Partial	Accurate	Comprehensive
Airspace Identification	Incorrect	Partial	Accurate	Fully accurate
Altitude Understanding	Limited	Basic	Accurate	Detailed
Decision-Making	Unsafe	Basic	Safe	Highly consistent

Assessment Items

1. What is a sectional chart?
   A. Weather map
   B. Aeronautical map
   C. Camera
   D. Speed
2. What does a blue dashed line represent?
   A. Class B
   B. Class D
   C. Class G
   D. Class A
3. What must be identified on a chart?
   A. Color
   B. Airspace
   C. Camera
   D. Speed

4. What do altitude limits indicate?
   A. Speed
   B. Flight boundaries
   C. Camera
   D. Battery
5. Scenario:
   A pilot misreads a sectional chart and flies into controlled airspace without authorization. What risk does this create and what should have been done?

Answer Key

1. B
2. B
3. B
4. B
5. Illegal operation; pilot must correctly interpret chart before flight

---

Closure

- Review key chart symbols
- Ask students what is hardest to interpret
- Reinforce importance of accuracy

Teacher Notes

- Use multiple chart examples
- Reinforce repetition and practice
- Prepare students for advanced airspace scenarios next lesson

Week 12 – Day 3

Advanced Airspace Scenarios & Chart Application

Standards

Standard	Description
201.00	Students will explain FAA Part 107 regulations and operational requirements governing small UAS operations.
201.03	Students will explain Remote Pilot in Command (PIC) responsibilities and legal accountability.
202.00	Students will apply airspace classifications using sectional charts and UAS facility maps to determine legal flight operations.
202.03	Students will differentiate between controlled and uncontrolled airspace.
202.04	Students will apply airspace knowledge to determine authorization requirements.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.02	Students will demonstrate safe flight operations in controlled environments.

Objective
Students will apply sectional chart interpretation skills to analyze complex airspace scenarios and determine safe, legal operations.

Essential Question
How do pilots interpret complex airspace situations to ensure safe and compliant drone operations?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What makes airspace difficult to interpret?
- Why might multiple airspace layers be confusing?
- What is the biggest risk when analyzing charts incorrectly?

Teacher will connect responses to advanced chart interpretation.

Vocabulary

- **Layered Airspace** – Multiple airspace classes stacked vertically
- **Airspace Floor** – Lowest altitude of controlled airspace
- **Airspace Ceiling** – Upper limit of controlled airspace
- **Transition Area** – Area where airspace classification changes
- **Compliance Decision** – Determining if operation follows FAA rules

Materials

- Sectional charts (printed or digital)
- Scenario worksheets

- Chart legend/reference guide
- Student notebook or guided notes sheet
- Whiteboard / presentation slides

Instruction Content

Advanced airspace scenarios require interpreting multiple layers and conditions simultaneously.

Complex airspace features include:

- Overlapping airspace classifications
- Changing altitude boundaries
- Surface vs. controlled airspace above
- Proximity to airports

Layered airspace concepts include:

- Surface airspace may differ from airspace above
- Controlled airspace may begin at a specific altitude
- Pilots must determine where they are operating vertically

Scenario analysis process includes:

1. Identify location on chart
2. Determine airspace classification at surface
3. Identify airspace layers above
4. Evaluate altitude limits
5. Determine authorization requirements
6. Make compliance decision

Common errors include:

- Ignoring vertical airspace layers
- Misinterpreting altitude limits
- Overlooking nearby controlled airspace

Safe operation includes:

- Careful chart analysis
- Verifying airspace at all altitudes
- Ensuring authorization when required

FAA relevance:

- Complex chart scenarios are common on the exam
- Students must evaluate both horizontal and vertical airspace

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Teacher Emphasis

- Emphasize importance of vertical airspace understanding
- Reinforce careful interpretation of chart data
- Highlight complexity of layered airspace
- Connect to FAA scenario-based testing
- Reinforce that accuracy prevents violations

Activity Procedure

Activity: Advanced Airspace Scenario Analysis

1. Students take structured notes during instruction

2. Students analyze complex chart scenarios and determine:
    - Surface airspace classification
      Airspace layers above
      Altitude limits
      Authorization requirements
3. Teacher will use the following Formative Assessment questions:
    - What is the airspace at the surface?
    - What airspace exists above?
    - What altitude restrictions apply?
    - Is authorization required?
4. Instructor reviews responses and provides detailed explanations

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Flight Activity (Advanced Airspace Application)

1. Identify location on sectional chart
2. Determine surface airspace
3. Evaluate airspace layers
4. Confirm altitude limits
5. Determine authorization requirements
6. Make Go/No-Go decision
7. Perform controlled takeoff
8. Execute safe landing

Instructor emphasis: vertical and horizontal airspace awareness

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Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Chart Interpretation	Incorrect	Partial	Accurate	Comprehensive
Airspace Layer Analysis	Limited	Basic	Accurate	Fully integrated
Altitude Evaluation	Incorrect	Basic	Accurate	Detailed
Decision-Making	Unsafe	Basic	Safe	Highly consistent

Assessment Items

1. What is layered airspace?
   A. Single layer
   B. Multiple airspace levels
   C. No airspace
   D. Safe

2. What is the airspace floor?
   A. Top
   B. Bottom limit
   C. Middle
   D. Speed

3. What must be evaluated in complex airspace?
   A. Color
   B. Vertical and horizontal limits
   C. Camera
   D. Speed
4. What is the safest approach?
   A. Guess
   B. Careful analysis
   C. Fly quickly
   D. Ignore
5. Scenario:
   A pilot operates in an area where Class E begins at 700 feet AGL and flies at 300 feet. Is authorization required and why?

Answer Key

1. B
2. B
3. B
4. B
5. No; flight is below controlled airspace floor

Closure

- Review layered airspace concepts
- Ask students what makes airspace complex
- Reinforce importance of vertical awareness

Teacher Notes

- Use varied chart examples
- Reinforce step-by-step analysis
- Prepare students for airspace integration next lesson

Week 12 – Day 4

Airspace Integration & Real-World Scenario Planning

Standards

Standard	Description
201.00	Students will explain FAA Part 107 regulations and operational requirements governing small UAS operations.
201.03	Students will explain Remote Pilot in Command (PIC) responsibilities and legal accountability.
202.00	Students will apply airspace classifications using sectional charts and UAS facility maps to determine legal flight operations.
202.04	Students will apply airspace knowledge to determine authorization requirements.
202.05	Students will evaluate flight scenarios to determine safe and legal operating locations.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.02	Students will demonstrate safe flight operations in controlled environments.

Objective
Students will integrate airspace knowledge to plan safe, legal drone operations using real-world scenarios.

Essential Question
How do pilots plan drone operations using airspace knowledge to ensure safety and compliance?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What steps should a pilot take before flying in a new location?
- Why is planning important for drone operations?
- What could go wrong without proper planning?

Teacher will connect responses to operational planning.

Vocabulary

- **Operational Planning** – Process of preparing for a safe flight
- **Flight Area Analysis** – Evaluation of airspace and environment
- **Go/No-Go Decision** – Determination to proceed or cancel a flight
- **Compliance** – Following FAA regulations
- **Risk Assessment** – Identifying potential hazards

Materials
- Sectional charts
- Scenario worksheets (real-world locations)
- Preflight planning checklist
- Student notebook or guided notes sheet
- Whiteboard / presentation slides

Instruction Content
Effective drone operations require integration of airspace knowledge into planning and decision-making.

Flight planning process includes:
1. Identify location
2. Analyze airspace classification
3. Determine altitude limits
4. Identify nearby airports or hazards
5. Determine authorization requirements
6. Evaluate environmental conditions
7. Make Go/No-Go decision

Planning considerations include:
- Airspace classification
- Authorization requirements
- Obstacles and hazards
- Weather conditions
- Operational limitations

Real-world scenario analysis includes:
- Evaluating multiple risk factors
- Applying FAA regulations
- Making safe operational decisions

Common planning errors include:
- Skipping airspace checks
- Ignoring authorization requirements
- Overlooking hazards
- Misjudging conditions

Safe operation includes:
- Thorough planning
- Accurate chart interpretation
- Compliance with all regulations
- Continuous risk evaluation

FAA relevance:
- Scenario-based questions are common
- Students must apply knowledge, not just recall facts

Teacher Emphasis

- Emphasize importance of preflight planning
- Reinforce integration of all previous airspace knowledge
- Highlight real-world application of FAA rules
- Connect planning to safety and compliance
- Reinforce professional decision-making

Activity Procedure

Activity: Real-World Flight Planning Scenarios

1. Students take structured notes during instruction
2. Students analyze real-world scenarios and develop a flight plan including:
    - Airspace classification
      Authorization requirements
      Altitude limits
      Identified hazards
      Go/No-Go decision
3. Teacher will use the following Formative Assessment questions:
    - What airspace is present?
    - Is authorization required?
    - What risks exist?
    - What is your final decision?
4. Instructor reviews plans and provides feedback

Flight Activity (Planned Operation Execution)

1. Identify location and analyze chart
2. Determine airspace classification
3. Confirm authorization requirements
4. Evaluate hazards and conditions
5. Make Go/No-Go decision
6. Perform controlled takeoff
7. Execute safe landing

Instructor emphasis: planning and execution

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Airspace Analysis	Incorrect	Partial	Accurate	Comprehensive
Planning Process	Incomplete	Basic	Complete	Thorough
Risk Assessment	Limited	Basic	Accurate	Comprehensive
Decision-Making	Unsafe	Basic	Safe	Highly consistent

Assessment Items

1. What is operational planning?
   A. Flying
   B. Preparing for flight
   C. Camera
   D. Speed
2. What is a Go/No-Go decision?
   A. Speed
   B. Decision to fly or not
   C. Camera
   D. Battery
3. What must be analyzed before flight?
   A. Color
   B. Airspace and hazards
   C. Camera
   D. Speed
4. What is a planning error?
   A. Checking airspace
   B. Ignoring hazards
   C. Following rules
   D. Preparing
5. Scenario:
   A pilot plans to fly near an airport and does not check airspace or authorization requirements.
   What risk does this create and what should have been done?

Answer Key

1. B
2. B
3. B
4. B
5. Risk of violation and unsafe operation; proper planning and authorization required

---

Closure

- Review planning steps
- Ask students what step is most important
- Reinforce importance of preparation

Teacher Notes

- Use local real-world examples if possible
- Reinforce application over memorization
- Prepare students for cumulative airspace assessment next lesson

Week 12 – Day 5

Airspace Mastery Assessment & Scenario Evaluation

Standards

Standard	Description
201.00	Students will explain FAA Part 107 regulations and operational requirements governing small UAS operations.
201.03	Students will explain Remote Pilot in Command (PIC) responsibilities and legal accountability.
202.00	Students will apply airspace classifications using sectional charts and UAS facility maps to determine legal flight operations.
202.02	Students will interpret sectional chart symbols and legends.
202.03	Students will differentiate between controlled and uncontrolled airspace.
202.04	Students will apply airspace knowledge to determine authorization requirements.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.02	Students will demonstrate safe flight operations in controlled environments.

Objective
Students will demonstrate mastery of airspace interpretation, authorization requirements, and scenario-based decision-making.

Essential Question
Can I accurately interpret airspace and make safe, legal decisions for drone operations?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What is the most difficult part of airspace interpretation?
- Why is authorization critical in certain airspace?
- What mistake could cause the most serious violation?

Teacher will connect responses to assessment readiness.

Vocabulary

- **Airspace Mastery** – Complete understanding of airspace and compliance
- **Scenario Evaluation** – Analyzing a situation to determine safe action
- **Authorization Limit** – Restrictions provided by FAA approval
- **Operational Risk** – Potential danger during flight
- **Compliance Decision** – Determining if flight follows regulations

Materials

- Assessment sheets
- Sectional charts

- Scenario worksheets
- Preflight planning checklist
- Student notebook or guided notes sheet

Instruction Content
This lesson serves as a comprehensive assessment of airspace knowledge and application.

Mastery expectations include:
- Identifying all airspace classifications
- Interpreting altitude limits and layers
- Determining authorization requirements
- Evaluating real-world scenarios
- Making safe and compliant decisions

Integrated evaluation process includes:
1. Identify location on chart
2. Determine airspace classification
3. Interpret altitude limits
4. Evaluate layered airspace
5. Determine authorization requirements
6. Identify hazards and risks
7. Make Go/No-Go decision

Indicators of mastery include:
- Accurate chart interpretation
- Correct authorization decisions
- Safe and compliant planning
- Clear reasoning

Common errors include:
- Misreading airspace boundaries
- Ignoring altitude limits
- Missing authorization requirements
- Making unsafe decisions

This assessment reflects FAA expectations for real-world operations.

Teacher Emphasis
- Emphasize full integration of airspace knowledge
- Reinforce accuracy and attention to detail
- Highlight importance of compliance
- Connect performance to FAA readiness
- Reinforce professional responsibility

Activity Procedure

Activity: Airspace Scenario Mastery Assessment

1. Students complete a comprehensive assessment including:
    - Airspace identification
    - Altitude interpretation
    - Authorization determination
    - Risk evaluation
    - Final operational decision
2. Students analyze multiple real-world scenarios and document:
    - Airspace classification
      Altitude limits
      Authorization requirements
      Identified risks
      Final Go/No-Go decision
3. Teacher will use the following Formative Assessment questions (post-assessment):
    - What was the most challenging scenario?
    - What errors did you correct?
    - How confident are you in your decisions?
4. Instructor reviews results and provides targeted feedback

Flight Activity (Airspace Decision Execution)

1. Identify flight location on chart
2. Determine airspace classification
3. Evaluate altitude limits
4. Confirm authorization requirements
5. Identify hazards
6. Make Go/No-Go decision
7. Perform controlled takeoff
8. Execute safe landing

Instructor emphasis: compliance and decision-making

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Airspace Identification	Incorrect	Partial	Accurate	Comprehensive
Chart Interpretation	Incorrect	Basic	Accurate	Detailed
Authorization Decision	Incorrect	Basic	Accurate	Fully compliant
Risk Evaluation	Limited	Basic	Accurate	Comprehensive

Assessment Items

1. What must be identified on a sectional chart?
   A. Color
   B. Airspace
   C. Camera
   D. Speed

2. When is authorization required?
   A. Always
   B. Controlled airspace
   C. Never
   D. Only at night
3. What must be evaluated in layered airspace?
   A. Speed
   B. Vertical limits
   C. Camera
   D. Color
4. What is a compliance decision?
   A. Flying fast
   B. Following regulations
   C. Camera
   D. Speed
5. Scenario:
   A pilot operates in Class C airspace without authorization and exceeds altitude limits. What violations occurred and what should have been done?

Answer Key

1. B
2. B
3. B
4. B
5. Unauthorized operation and altitude violation; authorization and compliance required

---

Closure

- Reflect on airspace mastery
- Ask students if they feel prepared for FAA airspace questions
- Reinforce importance of accuracy

Teacher Notes

- Use results to identify weak areas
- Provide remediation if needed
- Transition to weather theory next week

Week 12 COMPLETE

Students now have:

- Strong airspace interpretation skills
- Ability to analyze sectional charts
- Understanding of authorization requirements
- Scenario-based decision-making ability

Week 13 – Day 1

Weather Theory – Atmosphere & Basic Concepts

Standards

Standard	Description
203.00	Students will interpret aviation weather data and apply it to safe sUAS operations.
203.01	Students will identify basic weather concepts, including wind, pressure, and stability.
203.02	Students will decode METAR and TAF reports.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.01	Students will identify FAA safety requirements, including VLOS.

Objective
Students will describe the structure of the atmosphere and explain how basic weather concepts impact drone operations.

Essential Question
How does the atmosphere influence weather conditions that affect drone flight?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What causes weather?
- Why does air behave differently at different altitudes?
- How might the atmosphere impact drone flight?

Teacher will connect responses to atmospheric structure.

Vocabulary

- **Atmosphere** – Layer of gases surrounding Earth
- **Troposphere** – Lowest layer where weather occurs
- **Air Pressure** – Force exerted by air molecules
- **Temperature** – Measure of heat in the air
- **Density** – Mass of air in a given volume

Materials

- Weather diagrams
- Presentation slides
- Student notebook or guided notes sheet
- Whiteboard

Instruction Content
Weather is driven by changes in the atmosphere, which directly affects drone performance and safety.

Atmospheric layers include:
- Troposphere (weather occurs here)
- Stratosphere (above weather layer)

Key atmospheric concepts include:
- Air pressure decreases with altitude
- Temperature changes affect air density
- Dense air improves aircraft performance

Weather formation includes:
- Uneven heating of Earth's surface
- Movement of air masses
- Changes in pressure

Effects on drone flight include:
- Changes in lift and performance
- Stability issues
- Battery efficiency variations

Hazards include:
- Rapid weather changes
- Reduced visibility
- Unstable air conditions

FAA relevance:
- Weather theory is heavily tested
- Students must understand atmospheric behavior

Teacher Emphasis
- Emphasize that all weather occurs in the troposphere
- Reinforce connection between atmosphere and flight performance
- Highlight how pressure, temperature, and density interact
- Connect theory to FAA test questions
- Reinforce importance of weather awareness

Activity Procedure

Activity: Atmosphere Concept Mapping

1. Students take structured notes during instruction
2. Students create a concept map including:
    - Atmospheric layers
      Pressure changes
      Temperature effects
      Density relationships
3. Teacher will use the following Formative Assessment questions:
    - Where does weather occur?
    - How does pressure change with altitude?
    - Why is air density important?
4. Instructor reviews responses and provides clarification

Flight Activity (Weather Awareness Observation)

1. Observe current weather conditions
2. Identify temperature and wind
3. Discuss how conditions affect performance
4. Perform controlled takeoff
5. Maintain stable flight
6. Execute safe landing

Instructor emphasis: recognizing weather effects

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Atmospheric Understanding	Limited	Basic	Accurate	Comprehensive
Concept Mapping	Incomplete	Partial	Accurate	Detailed
Weather Connection	Limited	Basic	Accurate	Strong
Participation	Minimal	Basic	Active	Highly engaged

Assessment Items

1. Where does weather occur?
   A. Stratosphere
   B. Troposphere
   C. Space
   D. Ocean
2. What happens to pressure with altitude?
   A. Increases
   B. Decreases
   C. Stays same
   D. Stops
3. What affects air density?
   A. Color
   B. Temperature
   C. Camera
   D. Speed
4. Why is density important?
   A. Color
   B. Performance
   C. Camera
   D. Speed
5. Scenario:
   A drone is flying at a higher altitude where air density is lower.
   How does this affect performance?

Answer Key

1. B
2. B
3. B
4. B
5. Reduced lift and performance

Closure

- Review atmospheric layers
- Ask students what factor affects performance most
- Reinforce importance of understanding weather

Teacher Notes

- Keep concepts simple and clear
- Reinforce connections to flight
- Prepare students for pressure systems next lesson

Week 13 – Day 2

Pressure Systems, Fronts & Weather Patterns

Standards

Standard	Description
203.00	Students will interpret aviation weather data and apply it to safe sUAS operations.
203.02	Students will decode METAR and TAF reports.
203.03	Students will explain how weather conditions affect drone performance.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.01	Students will identify FAA safety requirements, including VLOS.

Objective
Students will explain how pressure systems and weather fronts develop and how they affect drone operations.

Essential Question
How do pressure systems and fronts influence weather conditions and flight safety?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What is high pressure vs low pressure?
- What causes storms to form?
- How might changing weather impact a drone flight?

Teacher will connect responses to weather systems.

Vocabulary

- **High Pressure System** – Area of sinking air and generally clear weather
- **Low Pressure System** – Area of rising air and unstable weather
- **Front** – Boundary between two air masses
- **Cold Front** – Cold air replaces warm air
- **Warm Front** – Warm air moves over cold air

Materials

- Weather maps
- Front diagrams
- Presentation slides
- Student notebook or guided notes sheet
- Whiteboard

Instruction Content
Pressure systems and fronts are key drivers of weather patterns that affect drone operations.

Pressure systems include:
- High pressure → stable, clear conditions
- Low pressure → unstable, stormy conditions

Air movement includes:
- Air flows from high to low pressure
- Rising air creates clouds and storms
- Sinking air leads to clear skies

Types of fronts include:
- Cold front → rapid weather changes, storms
- Warm front → gradual weather changes, clouds
- Stationary front → little movement, prolonged conditions

Weather impacts include:
- Strong winds
- Turbulence
- Rapid changes in visibility
- Precipitation

Hazards include:
- Thunderstorms
- Gust fronts
- Sudden wind shifts

Safe operation includes:
- Monitoring weather patterns
- Avoiding unstable conditions
- Recognizing approaching fronts

FAA relevance:
- Weather patterns and fronts are commonly tested
- Students must identify associated conditions and hazards

Teacher Emphasis
- Emphasize difference between high and low pressure
- Reinforce how fronts change weather
- Highlight hazards associated with low pressure and cold fronts
- Connect concepts to FAA test scenarios
- Reinforce that weather can change rapidly

Activity Procedure

Activity: Weather Pattern Analysis
1. Students take structured notes during instruction
2. Students analyze weather maps and identify:
    - Pressure systems
      Types of fronts
      Expected weather conditions
      Potential hazards

3. Teacher will use the following Formative Assessment questions:
    - What type of pressure system is present?
    - What front is approaching?
    - What weather is expected?
4. Instructor reviews responses and provides clarification

Flight Activity (Weather Condition Awareness)

1. Observe current weather conditions
2. Identify pressure and wind patterns
3. Discuss how conditions may change
4. Perform controlled takeoff
5. Maintain stable flight
6. Execute safe landing

Instructor emphasis: recognizing weather changes

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Pressure System Understanding	Limited	Basic	Accurate	Comprehensive
Front Identification	Incorrect	Partial	Accurate	Fully accurate
Weather Prediction	Limited	Basic	Accurate	Detailed
Hazard Recognition	Minimal	Basic	Accurate	Comprehensive

Assessment Items

1. What does high pressure bring?
   A. Storms
   B. Clear weather
   C. Wind
   D. Rain
2. What does low pressure bring?
   A. Calm
   B. Storms
   C. Clear skies
   D. No wind
3. What is a front?
   A. Camera
   B. Boundary between air masses
   C. Speed
   D. Battery
4. What does a cold front cause?
   A. Gradual change
   B. Rapid storms
   C. No change
   D. Calm

5. Scenario:
   A cold front is approaching with increasing winds and dark clouds.
   What risks are present and what should the pilot do?

Answer Key

1. B
2. B
3. B
4. B
5. Storms and turbulence; pilot should delay or cancel flight

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Closure

- Review pressure systems and fronts
- Ask students which system is safest for flight
- Reinforce importance of monitoring weather

Teacher Notes

- Use real weather examples
- Reinforce cause-and-effect relationships
- Prepare students for METARs and TAFs next lesson

Week 13 – Day 3

METARs & TAFs – Weather Reporting and Forecasting

Standards

Standard	Description
201.00	Students will explain FAA Part 107 regulations and operational requirements governing small UAS operations.
201.04	Students will recognize situations requiring waivers or FAA authorization.
203.00	Students will interpret aviation weather data and apply it to safe sUAS operations.
203.04	Students will apply weather data to make go/no-go flight decisions.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.01	Students will identify FAA safety requirements, including VLOS.

Objective
Students will decode METARs and TAFs and apply weather information to determine safe drone operations.

Essential Question
How do pilots use METARs and TAFs to make safe and informed flight decisions?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- Where can pilots get weather information?
- Why is accurate weather data important before flight?
- What weather conditions would stop you from flying?

Teacher will connect responses to aviation weather reporting.

Vocabulary

- **METAR** – Aviation routine weather report
- **TAF** – Terminal Aerodrome Forecast
- **Visibility** – Distance a pilot can see
- **Ceiling** – Height of lowest cloud layer
- **Wind Direction/Speed** – Movement of air affecting flight

Materials

- Sample METARs and TAFs
- METAR/TAF decoding charts
- Student notebook or guided notes sheet
- Whiteboard/presentation slides

Instruction Content
METARs and TAFs provide essential weather information used for safe flight planning.

METAR structure includes:
- Station identifier
- Date and time
- Wind direction and speed
- Visibility
- Weather conditions
- Cloud cover
- Temperature and dew point
- Altimeter setting

Example METAR includes:
- Wind (direction/speed)
- Visibility (in statute miles)
- Cloud layers
- Weather conditions (rain, fog, etc.)

TAF structure includes:
- Forecast period
- Expected weather changes
- Wind shifts
- Visibility changes
- Cloud changes

Key interpretation skills include:
- Identifying safe visibility levels
- Recognizing hazardous wind speeds
- Understanding cloud ceilings
- Predicting future conditions

Hazards include:
- Low visibility
- Strong winds
- Low ceilings
- Rapid weather changes

Safe operation includes:
- Reviewing METAR before flight
- Checking TAF for forecast conditions
- Making informed Go/No-Go decisions

FAA relevance:
- METAR and TAF decoding is heavily tested
- Students must interpret real-world weather reports

Teacher Emphasis

- Emphasize importance of reading METARs accurately
- Reinforce connection between weather data and safety
- Highlight key elements: wind, visibility, ceiling
- Connect decoding to FAA test questions
- Reinforce that pilots must use real data

Activity Procedure

Activity: METAR/TAF Decoding Exercise

1. Students take structured notes during instruction
2. Students decode METARs and TAFs and identify:
    - Wind conditions
      Visibility
      Cloud ceiling
      Weather hazards
      Forecast changes
3. Teacher will use the following Formative Assessment questions:
    - What are the wind conditions?
    - Is visibility safe?
    - What hazards are present?
    - What changes are forecasted?
4. Instructor reviews responses and provides correction and explanation

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Flight Activity (Weather-Based Decision Making)

1. Review current METAR
2. Review forecast (TAF)
3. Identify safe/unsafe conditions
4. Make Go/No-Go decision
5. Perform controlled takeoff (if safe)
6. Execute safe landing

Instructor emphasis: using real weather data

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
METAR Decoding	Incorrect	Partial	Accurate	Comprehensive
TAF Interpretation	Limited	Basic	Accurate	Detailed
Hazard Identification	Minimal	Basic	Accurate	Comprehensive
Decision-Making	Unsafe	Basic	Safe	Highly consistent

Assessment Items

1. What is a METAR?
   A. Forecast
   B. Weather report
   C. Camera
   D. Speed
2. What is a TAF?
   A. Report
   B. Forecast
   C. Camera
   D. Speed
3. What does visibility indicate?
   A. Speed
   B. Distance seen
   C. Camera
   D. Battery
4. What is a ceiling?
   A. Ground
   B. Cloud height
   C. Speed
   D. Camera
5. Scenario:
   A METAR shows strong winds, low visibility, and low ceilings.
   What risks are present and what should the pilot do?

Answer Key

1. B
2. B
3. B
4. B
5. Unsafe conditions; delay or cancel flight

Closure

- Review METAR and TAF components
- Ask students what element is most important
- Reinforce importance of weather data

Teacher Notes

- Provide multiple decoding examples
- Reinforce repetition and practice
- Prepare students for advanced weather decision-making next lesson

Week 13 – Day 4

Weather Decision-Making & Risk Evaluation

Standards

Standard	Description
201.00	Students will explain FAA Part 107 regulations and operational requirements governing small UAS operations.
201.04	Students will recognize situations requiring waivers or FAA authorization.
203.00	Students will interpret aviation weather data and apply it to safe sUAS operations.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.02	Students will demonstrate safe flight operations in controlled environments.

Objective
Students will evaluate weather conditions using METARs, TAFs, and observations to make safe Go/No-Go flight decisions.

Essential Question
How do pilots use weather information to evaluate risk and make safe flight decisions?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What weather conditions would stop you from flying?
- How do you decide if conditions are safe?
- Why is risk evaluation important?

Teacher will connect responses to decision-making.

Vocabulary

- **Go/No-Go Decision** – Decision to proceed or cancel a flight
- **Risk Evaluation** – Assessing potential hazards
- **Weather Minimums** – Safe operating limits
- **Operational Risk** – Potential danger during flight
- **Mitigation** – Reducing risk

Materials

- METARs and TAFs
- Scenario worksheets
- Preflight planning checklist
- Student notebook or guided notes sheet
- Whiteboard / presentation slides

Instruction Content

Weather decision-making is critical for safe drone operations and requires evaluation of multiple factors.

Decision-making process includes:

1. Gather weather information (METAR/TAF)
2. Identify hazards
3. Evaluate severity of conditions
4. Compare to safe operating limits
5. Make Go/No-Go decision

Key weather factors include:

- Wind speed and gusts
- Visibility
- Cloud ceiling
- Precipitation
- Temperature

Risk evaluation includes:

- Identifying unsafe conditions
- Understanding how conditions affect performance
- Recognizing rapidly changing weather

Risk mitigation includes:

- Delaying flight
- Adjusting flight plan
- Reducing operational complexity

Common unsafe decisions include:

- Ignoring weather warnings
- Flying in marginal conditions
- Overestimating pilot ability

Safe operation includes:

- Conservative decision-making
- Continuous monitoring of weather
- Willingness to cancel flight

FAA relevance:

- Scenario-based weather decisions are tested
- Students must evaluate real-world situations

Teacher Emphasis

- Emphasize importance of conservative decisions
- Reinforce that safety overrides mission goals
- Highlight how small risks can escalate
- Connect to FAA scenario-based testing
- Reinforce professional responsibility

Activity Procedure

Activity: Weather Risk Assessment Scenarios

1. Students take structured notes during instruction
2. Students analyze weather scenarios and determine:
    - Weather conditions
      Identified hazards
      Risk level
      Go/No-Go decision
      Risk mitigation strategies
3. Teacher will use the following Formative Assessment questions:
    - What hazards are present?
    - Is the flight safe?
    - What decision should be made?
    - How can risk be reduced?
4. Instructor reviews responses and provides feedback

Flight Activity (Weather-Based Decision Execution)

1. Review current METAR and TAF
2. Identify hazards
3. Evaluate risk level
4. Make Go/No-Go decision
5. Perform controlled takeoff (if safe)
6. Execute safe landing

Instructor emphasis: decision-making and safety

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Weather Analysis	Incorrect	Partial	Accurate	Comprehensive
Risk Evaluation	Limited	Basic	Accurate	Detailed
Decision-Making	Unsafe	Basic	Safe	Highly consistent
Mitigation Strategy	Minimal	Basic	Effective	Comprehensive

Assessment Items

1. What is a Go/No-Go decision?
   A. Speed
   B. Decision to fly or not
   C. Camera
   D. Battery
2. What is risk evaluation?
   A. Flying
   B. Assessing hazards
   C. Camera
   D. Speed

3. What should a pilot do in unsafe conditions?
   A. Fly anyway
   B. Cancel flight
   C. Ignore
   D. Speed up
4. What is mitigation?
   A. Increase risk
   B. Reduce risk
   C. Ignore
   D. Fly faster
5. Scenario:
   A forecast shows increasing winds and decreasing visibility during your planned flight time.
   What is the safest decision and why?

Answer Key

1. B
2. B
3. B
4. B
5. Cancel or delay; conditions are becoming unsafe

Closure

- Review decision-making process
- Ask students what factor most influences decisions
- Reinforce importance of safety

Teacher Notes

- Use real weather data if possible
- Reinforce conservative mindset
- Prepare students for weather mastery assessment next lesson

Week 13 – Day 5

Weather Mastery Assessment & Scenario Evaluation

Standards

Standard	Description
201.00	Students will explain FAA Part 107 regulations and operational requirements governing small UAS operations.
201.04	Students will recognize situations requiring waivers or FAA authorization.
203.00	Students will interpret aviation weather data and apply it to safe sUAS operations.
203.01	Students will identify basic weather concepts, including wind, pressure, and stability.
203.02	Students will decode METAR and TAF reports.
203.04	Students will apply weather data to make go/no-go flight decisions.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.02	Students will demonstrate safe flight operations in controlled environments.

Objective
Students will demonstrate mastery of weather theory, METAR/TAF interpretation, and risk-based decision-making.

Essential Question
Can I analyze weather conditions and make safe, informed flight decisions?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What weather condition is most dangerous for drones?
- What is the most important weather factor to check?
- How confident are you in reading METARs?

Teacher will connect responses to assessment readiness.

Vocabulary

- **Weather Mastery** – Complete understanding of weather and its impact
- **Operational Decision** – Choice based on weather and safety
- **Forecast Trend** – Expected change in weather over time
- **Weather Hazard** – Condition that affects safe flight
- **Decision Confidence** – Level of certainty in operational choices

Materials

- Assessment sheets
- METARs and TAFs
- Scenario worksheets
- Preflight planning checklist

- Student notebook or guided notes sheet

Instruction Content
This lesson serves as a comprehensive assessment of weather knowledge and application.

Mastery expectations include:
- Understanding atmospheric concepts
- Identifying pressure systems and fronts
- Decoding METARs and TAFs
- Evaluating weather hazards
- Making safe Go/No-Go decisions

Integrated evaluation process includes:
1. Review weather reports
2. Identify hazards
3. Evaluate severity
4. Analyze forecast trends
5. Determine operational safety
6. Make Go/No-Go decision

Indicators of mastery include:
- Accurate weather interpretation
- Identification of hazards
- Safe and logical decision-making
- Clear reasoning

Common errors include:
- Misreading METAR/TAF data
- Ignoring forecast changes
- Underestimating weather hazards
- Making risky decisions

This assessment reflects FAA expectations for real-world weather evaluation.

Teacher Emphasis
- Emphasize integration of all weather concepts
- Reinforce accuracy in decoding weather data
- Highlight importance of risk awareness
- Connect performance to FAA readiness
- Reinforce professional responsibility

Activity Procedure
Activity: Weather Scenario Mastery Assessment
1. Students complete a comprehensive assessment including:
    - METAR decoding
    - TAF interpretation
    - Hazard identification
    - Risk evaluation
    - Go/No-Go decision

2. Students analyze multiple scenarios and document:
    - Weather conditions
      Identified hazards
      Forecast trends
      Risk level
      Final Go/No-Go decision
3. Teacher will use the following Formative Assessment questions (post-assessment):
    - What scenario was most challenging?
    - What errors did you identify?
    - How confident are your decisions?
4. Instructor reviews results and provides targeted feedback

Flight Activity (Weather Decision Execution)

1. Review METAR and TAF
2. Identify hazards
3. Evaluate forecast trends
4. Determine risk level
5. Make Go/No-Go decision
6. Perform controlled takeoff (if safe)
7. Execute safe landing

Instructor emphasis: safe decision-making

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Weather Interpretation	Incorrect	Partial	Accurate	Comprehensive
Hazard Identification	Limited	Basic	Accurate	Comprehensive
Risk Evaluation	Incorrect	Basic	Accurate	Detailed
Decision-Making	Unsafe	Basic	Safe	Highly consistent

Assessment Items

1. What does a METAR provide?
   A. Forecast
   B. Current weather
   C. Camera
   D. Speed

2. What does a TAF provide?
   A. Current weather
   B. Forecast
   C. Camera
   D. Speed

3. What must be evaluated before flight?
   A. Color
   B. Weather conditions
   C. Camera
   D. Speed
4. What is a weather hazard?
   A. Safe condition
   B. Dangerous condition
   C. Camera
   D. Speed
5. Scenario:
   A METAR shows low visibility and strong winds, and the TAF indicates worsening conditions.
   What decision should be made and why?

Answer Key

1. B
2. B
3. B
4. B
5. Cancel or delay; conditions are unsafe and worsening

Closure

- Reflect on weather understanding
- Ask students if they feel prepared for FAA weather questions
- Reinforce importance of weather awareness

Teacher Notes

- Use results for remediation if needed
- Reinforce real-world application
- Transition to airport operations next week

Week 13 COMPLETE

Students now have:

- Strong understanding of weather theory
- Ability to decode METARs and TAFs
- Skill in evaluating weather risks
- Confidence in making safe decisions

Week 14 – Day 1

Airport Operations & Traffic Patterns

Standards

Standard	Description
201.00	Students will explain FAA Part 107 regulations and operational requirements governing small UAS operations.
201.05	Students will apply rules related to airport operations.
205.00	Students will interpret airport operations and apply right-of-way rules for safe integration into airspace.
205.01	Students will identify airport layouts and traffic patterns.
205.02	Students will explain right-of-way rules between aircraft and drones.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.01	Students will identify FAA safety requirements, including VLOS.

Objective
Students will identify airport types and describe traffic patterns to ensure safe drone operations near airports.

Essential Question
How do airport operations and traffic patterns impact safe drone flight?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What happens at an airport besides takeoffs and landings?
- Why are airports considered high-risk areas?
- How might drones interfere with aircraft operations?

Teacher will connect responses to airport safety.

Vocabulary

- **Traffic Pattern** – Standard path aircraft follow around an airport
- **Runway** – Surface used for takeoff and landing
- **Taxiway** – Path used by aircraft to move on the ground
- **Controlled Airport** – Airport with an operating control tower
- **Uncontrolled Airport** – Airport without a control tower

Materials

- Airport diagrams
- Traffic pattern visuals
- Sectional charts
- Student notebook or guided notes sheet

- Whiteboard / presentation slides

Instruction Content
Understanding airport operations is critical for maintaining safe separation from manned aircraft.

Airport types include:
- Controlled airports (with ATC)
- Uncontrolled airports (no ATC)

Traffic pattern components include:
- Upwind leg
- Crosswind leg
- Downwind leg
- Base leg
- Final approach

Aircraft movement includes:
- Takeoff and climb
- Pattern entry
- Landing sequence
- Taxi operations

Key operational considerations include:
- Aircraft may approach from multiple directions
- Aircraft operate at low altitudes near airports
- Increased traffic increases risk

Drone hazards near airports include:
- Collision risk with aircraft
- Disruption of operations
- Legal violations

Safe operation includes:
- Maintaining visual awareness
- Avoiding active airport areas
- Obtaining authorization if required

FAA relevance:
- Airport operations are tested on the exam
- Students must understand traffic patterns and hazards

Teacher Emphasis
- Emphasize importance of avoiding aircraft
- Reinforce understanding of traffic patterns
- Highlight high-risk environment near airports
- Connect concepts to FAA test scenarios
- Reinforce pilot responsibility

Activity Procedure

Activity: Traffic Pattern Identification

1. Students take structured notes during instruction
2. Students identify and label traffic pattern components including:
    - Upwind leg
      Crosswind leg
      Downwind leg
      Base leg
      Final approach
3. Teacher will use the following Formative Assessment questions:
    - What is a traffic pattern?
    - Where do aircraft land?
    - Why are patterns important?
4. Instructor reviews responses and provides clarification

Flight Activity (Airport Awareness Simulation)

1. Identify nearby airport on chart
2. Determine airport type
3. Discuss traffic pattern direction
4. Identify potential aircraft paths
5. Perform controlled takeoff
6. Maintain awareness during flight
7. Execute safe landing

Instructor emphasis: aircraft awareness

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Airport Identification	Incorrect	Partial	Accurate	Comprehensive
Pattern Understanding	Limited	Basic	Accurate	Detailed
Hazard Recognition	Minimal	Basic	Accurate	Comprehensive
Safety Awareness	Unsafe	Basic	Safe	Highly consistent

Assessment Items

1. What is a traffic pattern?
   A. Speed
   B. Aircraft path
   C. Camera
   D. Battery

2. What is a runway?
   A. Road
   B. Landing surface
   C. Camera
   D. Speed

3. What is a controlled airport?
   A. No tower
   B. Has tower
   C. No planes
   D. Safe
4. What is a drone hazard near airports?
   A. Clear skies
   B. Collision risk
   C. Speed
   D. Camera
5. Scenario:
   A drone is flown near an active runway during aircraft landing.
   What risk does this create and what should the pilot do?

Answer Key

1. B
2. B
3. B
4. B
5. Collision risk; avoid area and maintain safe distance

Closure

- Review traffic pattern components
- Ask students why airports are high-risk
- Reinforce safety awareness

Teacher Notes

- Use visual diagrams for clarity
- Reinforce real-world application
- Prepare students for airport communications next lesson

Week 14 – Day 2

Airport Communications & Radio Procedures

Standards

Standard	Description
201.00	Students will explain FAA Part 107 regulations and operational requirements governing small UAS operations.
201.05	Students will apply rules related to airport operations.
205.00	Students will interpret airport operations and apply right-of-way rules for safe integration into airspace.
205.03	Students will recognize basic radio communication procedures and terminology.
205.04	Students will explain communication and operational procedures at airports.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.01	Students will identify FAA safety requirements, including VLOS.

Objective
Students will recognize common aviation radio communications and explain how communication supports safe operations near airports.

Essential Question
How does communication between pilots and air traffic control support safe flight operations?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- Why is communication important in aviation?
- What could happen if pilots do not communicate?
- How might drones be affected by radio communications?

Teacher will connect responses to communication safety.

Vocabulary

- **ATC (Air Traffic Control)** – Organization that manages aircraft movement
- **CTAF (Common Traffic Advisory Frequency)** – Radio frequency used at uncontrolled airports
- **Radio Call** – Verbal communication between pilots and ATC
- **Call Sign** – Identifier for an aircraft
- **Traffic Advisory** – Information about nearby aircraft

Materials

- Audio examples of aviation communications
- Sample radio phrase sheets
- Airport diagrams

- Student notebook or guided notes sheet
- Whiteboard / presentation slides

Instruction Content
Communication is essential for maintaining situational awareness and preventing collisions near airports.

Communication environments include:
- Controlled airports (communication with ATC required)
- Uncontrolled airports (pilots communicate using CTAF)

Basic communication elements include:
- Who you are (call sign)
- Where you are
- What you are doing
- What you intend to do

Common radio phrases include:
- “Entering downwind”
- “Final approach”
- “Clear of runway”
- “Traffic in the area”

Communication purpose includes:
- Sharing position and intentions
- Avoiding collisions
- Coordinating movement

Drone pilot considerations include:
- Monitoring aircraft activity visually
- Understanding common radio phrases
- Recognizing when aircraft are nearby

Hazards include:
- Miscommunication
- Lack of awareness
- Unexpected aircraft movement

Safe operation includes:
- Maintaining visual awareness
- Understanding airport activity
- Avoiding interference with aircraft

FAA relevance:
- Communication awareness is tested conceptually
- Students must understand terminology and purpose

Teacher Emphasis
- Emphasize importance of communication in aviation safety
- Reinforce understanding of basic radio terminology

- Highlight difference between controlled and uncontrolled airports
- Connect communication awareness to drone safety
- Reinforce that drones must yield to manned aircraft

Activity Procedure

Activity: Communication Scenario Analysis

1. Students take structured notes during instruction
2. Students analyze communication scenarios and identify:
    - Who is communicating
      What is being communicated
      Aircraft position
      Intended action
3. Teacher will use the following Formative Assessment questions:
    - What does the pilot intend to do?
    - Where is the aircraft?
    - Why is this communication important?
4. Instructor reviews responses and provides clarification

Flight Activity (Communication Awareness Observation)

1. Identify nearby airport activity
2. Discuss possible aircraft movements
3. Identify potential communication cues
4. Perform controlled takeoff
5. Maintain visual awareness
6. Execute safe landing

Instructor emphasis: awareness of aircraft operations

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Communication Understanding	Limited	Basic	Accurate	Comprehensive
Scenario Interpretation	Incorrect	Partial	Accurate	Detailed
Awareness of Aircraft	Minimal	Basic	Accurate	Comprehensive
Safety Application	Unsafe	Basic	Safe	Highly consistent

Assessment Items

1. What is ATC?
   A. Camera
   B. Air Traffic Control
   C. Speed
   D. Battery

2. What is CTAF?
   A. Camera
   B. Radio frequency
   C. Speed
   D. Battery
3. What is a call sign?
   A. Speed
   B. Aircraft identifier
   C. Camera
   D. Battery
4. What is the purpose of communication?
   A. Speed
   B. Safety
   C. Camera
   D. Battery
5. Scenario:
   A pilot announces “final approach” at an airport near your drone operation.
   What does this mean and what should you do?

Answer Key

1. B
2. B
3. B
4. B
5. Aircraft is landing; yield and ensure clear airspace

Closure

- Review communication importance
- Ask students what phrase is most critical
- Reinforce situational awareness

Teacher Notes

- Use real audio if possible
- Reinforce listening and interpretation
- Prepare students for airport integration scenarios next lesson

Week 14 – Day 3

Airport Integration & Operational Scenarios

Standards

Standard	Description
201.00	Students will explain FAA Part 107 regulations and operational requirements governing small UAS operations.
201.05	Students will apply rules related to airport operations.
205.00	Students will interpret airport operations and apply right-of-way rules for safe integration into airspace.
205.02	Students will explain right-of-way rules between aircraft and drones.
205.03	Students will recognize basic radio communication procedures and terminology.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.02	Students will demonstrate safe flight operations in controlled environments.

Objective
Students will apply airport operations knowledge to real-world scenarios and make safe, compliant flight decisions.

Essential Question
How do pilots safely operate near airports while avoiding conflicts with manned aircraft?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What makes flying near an airport dangerous?
- What factors must be considered before flying near aircraft?
- How can a pilot reduce risk near airports?

Teacher will connect responses to operational decision-making.

Vocabulary

- **Operational Scenario** – Real-world flight situation
- **Aircraft Conflict** – Potential interference with manned aircraft
- **Situational Awareness** – Understanding surroundings and risks
- **Airspace Coordination** – Managing operations near controlled areas
- **Traffic Awareness** – Recognizing aircraft movement

Materials

- Sectional charts
- Airport diagrams
- Scenario worksheets
- Student notebook or guided notes sheet

- Whiteboard / presentation slides

Instruction Content
Operating near airports requires integrating knowledge of airspace, traffic patterns, and communication awareness.

Operational considerations include:
- Proximity to airport
- Airspace classification
- Traffic patterns
- Aircraft activity

Scenario evaluation process includes:
1. Identify location relative to airport
2. Determine airspace classification
3. Evaluate aircraft traffic patterns
4. Identify potential conflicts
5. Determine authorization requirements
6. Make Go/No-Go decision

Common risks include:
- Aircraft approaching at low altitude
- Multiple aircraft in pattern
- Limited reaction time
- Misjudging aircraft distance

Safe operation includes:
- Maintaining visual line of sight
- Yielding to all manned aircraft
- Avoiding active approach/departure paths
- Operating at safe distances

Common errors include:
- Ignoring aircraft activity
- Misjudging distance or speed of aircraft
- Failing to monitor surroundings

FAA relevance:
- Airport scenarios are common on the exam
- Students must apply multiple concepts together

Teacher Emphasis
- Emphasize importance of situational awareness
- Reinforce yielding to all manned aircraft
- Highlight risks of low-altitude aircraft
- Connect scenarios to FAA testing
- Reinforce safety-first decision-making

Activity Procedure

Activity: Airport Scenario Analysis

1. Students take structured notes during instruction
2. Students analyze scenarios and determine:
    - Airport proximity
      Airspace classification
      Traffic pattern activity
      Potential conflicts
      Go/No-Go decision
3. Teacher will use the following Formative Assessment questions:
    - Where is the aircraft relative to the airport?
    - What traffic patterns are present?
    - What risks exist?
    - What decision should be made?
4. Instructor reviews responses and provides detailed feedback

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Flight Activity (Airport Awareness Application)

1. Identify nearby airport location
2. Determine traffic pattern direction
3. Observe for aircraft activity
4. Maintain visual awareness
5. Perform controlled takeoff
6. Maintain safe distance
7. Execute safe landing

Instructor emphasis: situational awareness

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Scenario Analysis	Incorrect	Partial	Accurate	Comprehensive
Traffic Awareness	Limited	Basic	Accurate	Highly aware
Risk Evaluation	Incorrect	Basic	Accurate	Detailed
Decision-Making	Unsafe	Basic	Safe	Highly consistent

Assessment Items

1. What is situational awareness?
   A. Speed
   B. Understanding surroundings
   C. Camera
   D. Battery

2. What must drones do near aircraft?
   A. Ignore
   B. Yield
   C. Speed up
   D. Climb

3. What is a traffic pattern?
   A. Speed
   B. Aircraft path
   C. Camera
   D. Battery
4. What is a common risk near airports?
   A. Clear sky
   B. Aircraft conflict
   C. Camera
   D. Speed
5. Scenario:
   A drone is operating near an airport when an aircraft enters the traffic pattern.
   What should the pilot do and why?

Answer Key

1. B
2. B
3. B
4. B
5. Yield and avoid conflict; aircraft have priority

Closure

- Review key risks near airports
- Ask students what decision is always required
- Reinforce yielding to aircraft

Teacher Notes

- Use realistic examples
- Reinforce multiple concept integration
- Prepare students for airport mastery assessment next lesson

Week 14 – Day 4

Airport Risk Management & Decision-Making

Standards

Standard	Description
201.00	Students will explain FAA Part 107 regulations and operational requirements governing small UAS operations.
201.05	Students will apply rules related to airport operations.
205.00	Students will interpret airport operations and apply right-of-way rules for safe integration into airspace.
205.02	Students will explain right-of-way rules between aircraft and drones.
205.03	Students will recognize basic radio communication procedures and terminology.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.02	Students will demonstrate safe flight operations in controlled environments.

Objective
Students will evaluate risks associated with airport operations and apply structured decision-making to ensure safe drone flight.

Essential Question
How do pilots evaluate and manage risks when operating near airports?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What is the biggest risk near an airport?
- How do you decide if it is safe to fly near aircraft?
- Why is risk management important?

Teacher will connect responses to structured decision-making.

Vocabulary

- **Risk Management** – Process of identifying and reducing hazards
- **Operational Risk** – Potential danger during flight
- **Mitigation Strategy** – Action taken to reduce risk
- **Conflict Avoidance** – Preventing interference with aircraft
- **Safety Margin** – Buffer between safe and unsafe conditions

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Materials

- Scenario worksheets
- Sectional charts
- Airport diagrams
- Preflight planning checklist

- Student notebook or guided notes sheet
- Whiteboard / presentation slides

Instruction Content
Risk management is essential when operating near airports due to increased aircraft activity and complexity.

Risk management process includes:
1. Identify hazards
2. Assess level of risk
3. Determine mitigation strategies
4. Make Go/No-Go decision

Airport-related hazards include:
- Low-altitude aircraft
- Multiple aircraft in traffic pattern
- Limited visibility of aircraft
- Rapid aircraft movement

Risk factors include:
- Proximity to runway
- Airspace classification
- Time of day (traffic volume)
- Weather conditions

Mitigation strategies include:
- Increasing distance from airport
- Reducing altitude
- Adjusting flight location
- Canceling operation

Safe decision-making includes:
- Conservative judgment
- Prioritizing safety over mission
- Continuous awareness of surroundings

Common unsafe behaviors include:
- Flying too close to airport
- Ignoring aircraft activity
- Overestimating ability to avoid conflict

FAA relevance:
- Risk management is tested through scenarios
- Students must apply safe decision-making principles

Teacher Emphasis
- Emphasize structured risk evaluation
- Reinforce importance of conservative decisions
- Highlight how risks can escalate quickly

- Connect concepts to FAA scenario questions
- Reinforce responsibility to avoid aircraft

Activity Procedure

Activity: Airport Risk Assessment Scenarios

1. Students take structured notes during instruction
2. Students analyze scenarios and determine:
    - Identified hazards
      Risk level
      Mitigation strategies
      Final Go/No-Go decision
3. Teacher will use the following Formative Assessment questions:
    - What hazards are present?
    - How severe is the risk?
    - What can be done to reduce risk?
    - What is the safest decision?
4. Instructor reviews responses and provides detailed feedback

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Flight Activity (Risk-Based Decision Execution)

1. Identify nearby airport and traffic
2. Evaluate hazards
3. Assess risk level
4. Determine mitigation strategies
5. Make Go/No-Go decision
6. Perform controlled takeoff (if safe)
7. Maintain awareness during flight
8. Execute safe landing

Instructor emphasis: risk awareness and mitigation

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Hazard Identification	Limited	Basic	Accurate	Comprehensive
Risk Evaluation	Incorrect	Basic	Accurate	Detailed
Mitigation Strategy	Minimal	Basic	Effective	Comprehensive
Decision-Making	Unsafe	Basic	Safe	Highly consistent

Assessment Items

1. What is risk management?
   A. Flying
   B. Identifying and reducing hazards
   C. Camera
   D. Speed

2. What is a mitigation strategy?
   A. Increase risk
   B. Reduce risk
   C. Ignore
   D. Fly faster
3. What is a common airport hazard?
   A. Clear sky
   B. Aircraft traffic
   C. Camera
   D. Speed
4. What is a safe decision?
   A. Ignore risk
   B. Reduce risk
   C. Fly anyway
   D. Speed up
5. Scenario:
   A drone operation is planned close to an active runway with multiple aircraft in the pattern.
   What risks are present and what should the pilot do?

Answer Key

1. B
2. B
3. B
4. B
5. High collision risk; increase distance or cancel flight

Closure

- Review risk management steps
- Ask students what factor most affects safety
- Reinforce importance of conservative decisions

Teacher Notes

- Use real-world examples
- Reinforce decision-making process
- Prepare students for airport mastery assessment next lesson

Week 14 – Day 5

Airport Operations Mastery Assessment & Scenario Evaluation

Standards

Standard	Description
201.00	Students will explain FAA Part 107 regulations and operational requirements governing small UAS operations.
201.05	Students will apply rules related to airport operations.
205.00	Students will interpret airport operations and apply right-of-way rules for safe integration into airspace.
205.01	Students will identify airport layouts and traffic patterns.
205.02	Students will explain right-of-way rules between aircraft and drones.
205.03	Students will recognize basic radio communication procedures and terminology.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.02	Students will demonstrate safe flight operations in controlled environments.

Objective
Students will demonstrate mastery of airport operations, traffic patterns, communication awareness, and risk-based decision-making.

Essential Question
Can I safely and legally operate a drone near airports using proper knowledge and decision-making?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What is the most important rule near airports?
- What is the greatest risk near aircraft?
- How confident are you in making safe decisions?

Teacher will connect responses to assessment readiness.

Vocabulary

- **Airport Mastery** – Complete understanding of airport operations and safety
- **Traffic Awareness** – Understanding aircraft movement
- **Operational Safety** – Safe execution of flight operations
- **Conflict Avoidance** – Preventing interference with aircraft
- **Decision Confidence** – Certainty in safe operational choices

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Materials

- Assessment sheets
- Sectional charts

- Airport diagrams
- Scenario worksheets
- Preflight planning checklist
- Student notebook or guided notes sheet

Instruction Content
This lesson serves as a comprehensive assessment of airport operations and safety integration.

Mastery expectations include:
- Identifying airport types
- Understanding traffic patterns
- Interpreting communication awareness
- Evaluating operational risks
- Making safe Go/No-Go decisions

Integrated evaluation process includes:
1. Identify airport location and type
2. Evaluate traffic pattern activity
3. Interpret communication indicators
4. Identify hazards and risks
5. Determine compliance requirements
6. Make Go/No-Go decision

Indicators of mastery include:
- Accurate identification of airport operations
- Strong situational awareness
- Effective risk evaluation
- Safe and compliant decision-making

Common errors include:
- Ignoring aircraft activity
- Misjudging traffic patterns
- Failing to evaluate risks
- Making unsafe decisions

This assessment reflects FAA expectations for real-world airport operations.

Teacher Emphasis
- Emphasize integration of all airport concepts
- Reinforce situational awareness
- Highlight importance of yielding to aircraft
- Connect performance to FAA readiness
- Reinforce professional responsibility

Activity Procedure

Activity: Airport Scenario Mastery Assessment

1. Students complete a comprehensive assessment including:
    - Airport identification
    - Traffic pattern analysis
    - Communication awareness
    - Risk evaluation
    - Go/No-Go decision
2. Students analyze multiple scenarios and document:
    - Airport type
      Traffic activity
      Identified hazards
      Risk level
      Final Go/No-Go decision
3. Teacher will use the following Formative Assessment questions (post-assessment):
    - What scenario was most challenging?
    - What risks did you identify?
    - How confident are your decisions?
4. Instructor reviews results and provides targeted feedback

Flight Activity (Airport Safety Execution)

1. Identify nearby airport
2. Evaluate traffic pattern activity
3. Identify hazards
4. Assess risk level
5. Make Go/No-Go decision
6. Perform controlled takeoff (if safe)
7. Maintain awareness during flight
8. Execute safe landing

Instructor emphasis: safety and compliance

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Airport Identification	Incorrect	Partial	Accurate	Comprehensive
Traffic Awareness	Limited	Basic	Accurate	Highly aware
Risk Evaluation	Incorrect	Basic	Accurate	Detailed
Decision-Making	Unsafe	Basic	Safe	Highly consistent

Assessment Items

1. What must drones do near aircraft?
   A. Ignore
   B. Yield
   C. Speed up
   D. Climb

2. What is a traffic pattern?
   A. Speed
   B. Aircraft path
   C. Camera
   D. Battery
3. What is situational awareness?
   A. Speed
   B. Understanding surroundings
   C. Camera
   D. Battery
4. What is a major airport risk?
   A. Clear sky
   B. Aircraft conflict
   C. Camera
   D. Speed
5. Scenario:
   A drone is operating near an airport and an aircraft is approaching for landing.
   What should the pilot do and why?

Answer Key

1. B
2. B
3. B
4. B
5. Yield and avoid conflict; aircraft have priority

Closure

- Reflect on airport knowledge
- Ask students if they feel prepared for FAA airport questions
- Reinforce importance of safety

Teacher Notes

- Use results for targeted remediation
- Reinforce real-world application
- Transition to regulations review and test prep next week

Week 14 COMPLETE

Students now have:

- Strong understanding of airport operations
- Ability to interpret traffic patterns and communication
- Risk management skills near airports
- Confidence in safe decision-making

Week 15 – Day 1

FAA Part 107 Regulations Review – Operational Rules

Standards

Standard	Description
201.00	Students will explain FAA Part 107 regulations and operational requirements governing small UAS operations.
201.01	Students will identify eligibility requirements and certification steps for obtaining a Remote Pilot Certificate.
201.02	Students will interpret operational limitations, including altitude, speed, visibility, and daylight restrictions.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.01	Students will identify FAA safety requirements, including VLOS.

Objective
Students will review and apply key FAA Part 107 operational rules to ensure safe and legal drone operations.

Essential Question
What operational rules must a drone pilot follow to remain compliant with FAA Part 107?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What rules do you already know about drone flight?
- Why does the FAA regulate drone operations?
- What could happen if rules are ignored?

Teacher will connect responses to regulatory importance.

Vocabulary

- **Part 107** – FAA regulations governing commercial drone operations
- **Visual Line of Sight (VLOS)** – Ability to see the drone without aids
- **Operational Limitation** – Restriction placed on flight operations
- **Remote Pilot in Command (RPIC)** – Person responsible for the flight
- **Waiver** – FAA approval to deviate from certain rules

Materials

- Part 107 summary sheet
- Scenario worksheets
- Student notebook or guided notes sheet
- Whiteboard / presentation slides

Instruction Content
FAA Part 107 establishes the rules for safe and legal drone operations.

Key operational rules include:
- Maximum altitude: 400 feet AGL (unless near structure)
- Maintain visual line of sight
- Yield to all manned aircraft
- Do not operate over people (unless compliant with categories)
- Do not operate from a moving vehicle (with exceptions)

Operational limitations include:
- Daylight or civil twilight operations (unless equipped properly)
- Maximum groundspeed: 100 mph
- Maximum altitude: 400 feet AGL
- No careless or reckless operations

Remote Pilot responsibilities include:
- Ensuring safe operation
- Conducting preflight inspections
- Monitoring airspace and weather
- Maintaining control of aircraft

Waivers include:
- Night operations (if not compliant)
- Operations over people
- Beyond visual line of sight

Common violations include:
- Flying above altitude limits
- Losing visual line of sight
- Flying in restricted airspace without authorization

FAA relevance:
- Regulations are heavily tested
- Students must know specific rules and limits

Teacher Emphasis
- Emphasize importance of knowing specific rules
- Reinforce that these are federal laws
- Highlight responsibilities of the remote pilot
- Connect rules to FAA test questions
- Reinforce compliance and safety

Activity Procedure
Activity: Regulation Scenario Analysis
1. Students take structured notes during instruction
2. Students analyze scenarios and determine:
    - Which rule applies
      Whether operation is legal
      What correction is needed

3. Teacher will use the following Formative Assessment questions:
    - What rule applies?
    - Is the operation legal?
    - What should the pilot do?
4. Instructor reviews responses and provides clarification

Flight Activity (Rule Application Operation)

1. Review operational rules
2. Identify applicable rules for flight
3. Perform preflight inspection
4. Conduct flight within limits
5. Maintain visual line of sight
6. Execute safe landing

Instructor emphasis: rule compliance

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Rule Identification	Incorrect	Partial	Accurate	Comprehensive
Scenario Application	Incorrect	Basic	Accurate	Detailed
Compliance Understanding	Limited	Basic	Accurate	Thorough
Safety Awareness	Unsafe	Basic	Safe	Highly consistent

Assessment Items

1. What is the maximum altitude under Part 107?
   A. 200 ft
   B. 400 ft
   C. 600 ft
   D. 800 ft

2. What must pilots maintain?
   A. Speed
   B. Visual line of sight
   C. Camera
   D. Battery

3. What must drones do near aircraft?
   A. Ignore
   B. Yield
   C. Speed up
   D. Climb

4. What is a waiver?
   A. Rule
   B. Permission to deviate
   C. Camera
   D. Speed

5. Scenario:
   A pilot flies above 400 feet AGL without authorization.
   What violation occurred and what should have been done?

Answer Key

1. B
2. B
3. B
4. B
5. Altitude violation; remain within limits or obtain waiver

Closure

- Review key rules
- Ask students which rule is most important
- Reinforce compliance

Teacher Notes

- Reinforce memorization of key limits
- Use real-world examples
- Prepare students for advanced regulatory scenarios next lesson

Week 15 – Day 2

Advanced Regulations & Waivers

Standards

Standard	Description
201.00	Students will explain FAA Part 107 regulations and operational requirements governing small UAS operations.
201.02	Students will interpret operational limitations, including altitude, speed, visibility, and daylight restrictions.
201.06	Students will identify when waivers are required under Part 107.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.02	Students will demonstrate safe flight operations in controlled environments.

Objective
Students will identify when FAA waivers are required and explain how advanced operations can be conducted legally and safely.

Essential Question
When can drone pilots operate outside standard Part 107 rules, and what is required to do so legally?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- Why would a pilot need to break a rule?
- Should all operations follow the same rules? Why or why not?
- What risks increase when rules are relaxed?

Teacher will connect responses to waiver concepts.

Vocabulary

- **Waiver** – FAA authorization to deviate from a regulation
- **Beyond Visual Line of Sight (BVLOS)** – Operation where pilot cannot see the drone directly
- **Operation Over People** – Flight over human beings not involved in operation
- **Night Operation** – Flight conducted outside daylight conditions
- **Risk Mitigation** – Actions taken to reduce operational risk

Materials

- Part 107 waiver examples
- Scenario worksheets
- Student notebook or guided notes sheet
- Whiteboard / presentation slides

Instruction Content
Part 107 allows for advanced operations through waivers when safety can be demonstrated.

Operations that may require waivers include:
- Beyond visual line of sight (BVLOS)
- Operations over people (non-compliant categories)
- Certain night operations (if not meeting requirements)
- Operations in restricted conditions

Waiver requirements include:
- Demonstrating safety
- Identifying risks
- Providing mitigation strategies
- Following FAA approval conditions

Examples of mitigation strategies include:
- Visual observers
- Enhanced lighting
- Defined operational boundaries
- Safety procedures

Legal operation includes:
- Following approved waiver conditions
- Maintaining compliance with all other rules
- Ensuring safe execution

Common violations include:
- Conducting waiver-required operations without approval
- Ignoring waiver conditions
- Misunderstanding rule exceptions

FAA relevance:
- Waivers and exceptions are tested conceptually
- Students must understand when rules can be modified

Teacher Emphasis
- Emphasize that waivers are not automatic
- Reinforce requirement for FAA approval
- Highlight increased risk in advanced operations
- Connect concepts to FAA testing
- Reinforce responsibility and safety

Activity Procedure
Activity: Waiver Scenario Analysis
1. Students take structured notes during instruction
2. Students analyze scenarios and determine:
    - Which rule applies
      Whether a waiver is required
      What risks exist
      What mitigation strategies are needed

3. Teacher will use the following Formative Assessment questions:
    - Is this operation allowed?
    - Is a waiver required?
    - What risks must be addressed?
4. Instructor reviews responses and provides clarification

Flight Activity (Regulation Awareness Operation)

1. Identify applicable rules for flight
2. Discuss potential waiver situations
3. Evaluate risks
4. Perform controlled takeoff
5. Maintain safe operation
6. Execute safe landing

Instructor emphasis: regulatory awareness

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Waiver Identification	Incorrect	Partial	Accurate	Comprehensive
Scenario Analysis	Incorrect	Basic	Accurate	Detailed
Risk Evaluation	Limited	Basic	Accurate	Comprehensive
Compliance Understanding	Limited	Basic	Accurate	Thorough

Assessment Items

1. What is a waiver?
   A. Rule
   B. Permission to deviate
   C. Camera
   D. Speed
2. What is BVLOS?
   A. Speed
   B. Flying without seeing drone
   C. Camera
   D. Battery
3. What must be shown for a waiver?
   A. Speed
   B. Safety
   C. Camera
   D. Battery
4. What increases in advanced operations?
   A. Safety
   B. Risk
   C. Camera
   D. Speed

5. Scenario:
   A pilot plans to fly beyond visual line of sight without FAA approval.
   What violation occurs and what should be done?

Answer Key

1. B
2. B
3. B
4. B
5. BVLOS violation; obtain FAA waiver before operation

Closure

- Review waiver concepts
- Ask students when waivers are needed
- Reinforce compliance

Teacher Notes

- Reinforce difference between rules and exceptions
- Use real examples if possible
- Prepare students for integrated regulation scenarios next lesson

Week 15 – Day 3

Integrated Regulations & Scenario Application

Standards

Standard	Description
201.00	Students will explain FAA Part 107 regulations and operational requirements governing small UAS operations.
201.01	Students will identify eligibility requirements and certification steps for obtaining a Remote Pilot Certificate.
201.02	Students will interpret operational limitations, including altitude, speed, visibility, and daylight restrictions.
201.06	Students will identify when waivers are required under Part 107.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.02	Students will demonstrate safe flight operations in controlled environments.

Objective
Students will apply multiple FAA Part 107 regulations to real-world scenarios and determine safe, legal flight decisions.

Essential Question
How do pilots apply multiple FAA regulations simultaneously to ensure safe and compliant operations?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- Why is it difficult to apply multiple rules at once?
- What could happen if one rule is ignored?
- How do you prioritize safety when multiple risks exist?

Teacher will connect responses to integrated decision-making.

Vocabulary

- **Integrated Scenario** – Situation requiring multiple rules and concepts
- **Regulatory Compliance** – Following all applicable rules
- **Operational Judgment** – Decision-making based on knowledge and conditions
- **Conflict Risk** – Potential violation or unsafe situation
- **Rule Application** – Applying regulations to real situations

Materials

- Scenario worksheets
- Part 107 summary sheet
- Sectional charts
- Student notebook or guided notes sheet

- Whiteboard / presentation slides

Instruction Content
Real-world drone operations require applying multiple regulations at the same time.

Integrated scenario analysis includes:
1. Identify location and environment
2. Determine applicable regulations
3. Evaluate airspace requirements
4. Assess weather conditions
5. Identify operational limitations
6. Determine if waiver is required
7. Make Go/No-Go decision

Common regulatory considerations include:
- Altitude limits
- Airspace authorization
- Visual line of sight
- Operations over people
- Weather minimums

Common errors include:
- Applying only one rule
- Overlooking important limitations
- Misjudging risk
- Ignoring compliance requirements

Safe operation includes:
- Applying all relevant rules
- Evaluating all risk factors
- Making conservative decisions
- Ensuring full compliance

FAA relevance:
- Integrated scenarios are common on the exam
- Students must apply knowledge, not just recall

Teacher Emphasis
- Emphasize thinking through multiple rules
- Reinforce importance of full compliance
- Highlight complexity of real-world operations
- Connect to FAA scenario-based questions
- Reinforce professional decision-making

Activity Procedure
Activity: Integrated Scenario Analysis
1. Students take structured notes during instruction

2. Students analyze complex scenarios and determine:
    - Applicable regulations
      Airspace requirements
      Weather considerations
      Operational limitations
      Waiver requirements
      Final Go/No-Go decision
3. Teacher will use the following Formative Assessment questions:
    - What rules apply?
    - What risks are present?
    - Is the operation compliant?
    - What should the pilot do?
4. Instructor reviews responses and provides detailed feedback

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Flight Activity (Integrated Compliance Operation)

1. Review all applicable regulations
2. Evaluate environment and conditions
3. Identify risks and limitations
4. Make Go/No-Go decision
5. Perform controlled takeoff
6. Maintain compliance during flight
7. Execute safe landing

Instructor emphasis: applying all rules

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Rule Identification	Incorrect	Partial	Accurate	Comprehensive
Scenario Analysis	Incorrect	Basic	Accurate	Detailed
Compliance Evaluation	Incorrect	Basic	Accurate	Fully compliant
Decision-Making	Unsafe	Basic	Safe	Highly consistent

Assessment Items

1. What is regulatory compliance?
   A. Speed
   B. Following rules
   C. Camera
   D. Battery
2. What is an integrated scenario?
   A. Simple situation
   B. Multiple rules applied
   C. Camera
   D. Speed

3. What must be considered in all flights?
   A. Color
   B. Regulations
   C. Camera
   D. Speed
4. What is a common mistake?
   A. Checking rules
   B. Ignoring rules
   C. Following rules
   D. Planning
5. Scenario:
   A pilot plans to fly at night, in controlled airspace, over people without authorization. What violations exist and what should be done?

Answer Key

1. B
2. B
3. B
4. B
5. Multiple violations; obtain authorization, ensure compliance, or do not fly

---

Closure

- Review importance of applying multiple rules
- Ask students what makes scenarios difficult
- Reinforce full compliance

Teacher Notes

- Use increasingly complex scenarios
- Reinforce step-by-step analysis
- Prepare students for full regulation assessment next lesson

Week 15 – Day 4

Regulations Risk Management & Decision-Making

Standards

Standard	Description
201.00	Students will explain FAA Part 107 regulations and operational requirements governing small UAS operations.
201.02	Students will interpret operational limitations, including altitude, speed, visibility, and daylight restrictions.
201.06	Students will identify when waivers are required under Part 107.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.02	Students will demonstrate safe flight operations in controlled environments.

Objective
Students will evaluate regulatory risks and apply structured decision-making to ensure safe and compliant drone operations.

Essential Question
How do pilots manage regulatory risk while making safe operational decisions?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What is the biggest regulatory risk in drone operations?
- Why might a pilot be tempted to break a rule?
- How should safety influence decisions?

Teacher will connect responses to compliance and risk.

Vocabulary

- **Regulatory Risk** – Risk of violating FAA rules
- **Compliance Decision** – Determining if operation follows regulations
- **Operational Judgment** – Decision-making based on knowledge and conditions
- **Risk Mitigation** – Actions taken to reduce risk
- **Legal Responsibility** – Obligation to follow laws

Materials

- Scenario worksheets
- Part 107 summary sheet
- Sectional charts
- Student notebook or guided notes sheet
- Whiteboard / presentation slides

Instruction Content
Regulatory risk management ensures that drone operations remain safe and compliant.

Risk management process includes:
1. Identify applicable regulations
2. Identify potential violations
3. Evaluate severity of risk
4. Determine mitigation strategies
5. Make Go/No-Go decision

Common regulatory risks include:
- Flying in controlled airspace without authorization
- Exceeding altitude limits
- Losing visual line of sight
- Flying over people

Mitigation strategies include:
- Adjusting flight plan
- Obtaining authorization
- Reducing operational complexity
- Canceling flight

Safe decision-making includes:
- Prioritizing compliance
- Making conservative decisions
- Avoiding unnecessary risk

Common unsafe behaviors include:
- Ignoring regulations
- Justifying unsafe operations
- Overconfidence in ability

FAA relevance:
- Regulatory decision-making is tested through scenarios
- Students must identify violations and correct actions

Teacher Emphasis
- Emphasize importance of compliance in all operations
- Reinforce that rules are legal requirements
- Highlight consequences of violations
- Connect concepts to FAA scenario questions
- Reinforce professional responsibility

<u>Activity Procedure</u>
Activity: Regulatory Risk Assessment Scenarios
1. Students take structured notes during instruction

2. Students analyze scenarios and determine:
    - Applicable regulations
      Identified violations
      Risk level
      Mitigation strategies
      Final Go/No-Go decision
3. Teacher will use the following Formative Assessment questions:
    - What rules apply?
    - What violations exist?
    - How can risk be reduced?
    - What is the safest decision?
4. Instructor reviews responses and provides detailed feedback

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Flight Activity (Compliance-Based Operation)

1. Review applicable regulations
2. Identify potential risks
3. Evaluate compliance
4. Make Go/No-Go decision
5. Perform controlled takeoff
6. Maintain compliance during flight
7. Execute safe landing

Instructor emphasis: regulatory compliance

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Regulation Identification	Incorrect	Partial	Accurate	Comprehensive
Violation Recognition	Incorrect	Basic	Accurate	Detailed
Risk Evaluation	Incorrect	Basic	Accurate	Comprehensive
Decision-Making	Unsafe	Basic	Safe	Highly consistent

Assessment Items

1. What is regulatory risk?
   A. Speed
   B. Risk of violating rules
   C. Camera
   D. Battery

2. What is a compliance decision?
   A. Flying fast
   B. Following rules
   C. Camera
   D. Speed

3. What is a mitigation strategy?
   A. Increase risk
   B. Reduce risk
   C. Ignore
   D. Fly faster
4. What is a common violation?
   A. Following rules
   B. Flying without authorization
   C. Planning
   D. Checking weather
5. Scenario:
   A pilot plans to fly in controlled airspace without authorization and above 400 feet AGL. What violations exist and what should be done?

Answer Key

1. B
2. B
3. B
4. B
5. Airspace and altitude violations; obtain authorization and remain within limits

---

Closure

- Review regulatory risk concepts
- Ask students what violation is most serious
- Reinforce importance of compliance

Teacher Notes

- Use real-world examples
- Reinforce structured decision-making
- Prepare students for full regulation mastery assessment next lesson

Week 15 – Day 5

Regulations Mastery Assessment & Scenario Evaluation

Standards

Standard	Description
201.00	Students will explain FAA Part 107 regulations and operational requirements governing small UAS operations.
201.01	Students will identify eligibility requirements and certification steps for obtaining a Remote Pilot Certificate.
201.02	Students will interpret operational limitations, including altitude, speed, visibility, and daylight restrictions.
201.06	Students will identify when waivers are required under Part 107.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.02	Students will demonstrate safe flight operations in controlled environments.

Objective
Students will demonstrate mastery of FAA Part 107 regulations through scenario analysis and compliance-based decision-making.

Essential Question
Can I apply FAA regulations correctly to ensure safe and legal drone operations?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What regulation is hardest to remember?
- What type of violation is most dangerous?
- How confident are you in applying FAA rules?

Teacher will connect responses to assessment readiness.

Vocabulary

- **Regulatory Mastery** – Complete understanding of FAA rules
- **Compliance Evaluation** – Determining if an operation follows regulations
- **Operational Legality** – Whether a flight is allowed under FAA rules
- **Violation Recognition** – Identifying rule violations
- **Decision Confidence** – Certainty in making safe, legal decisions

Materials

- Assessment sheets
- Scenario worksheets
- Part 107 summary sheet
- Sectional charts
- Student notebook or guided notes sheet

Instruction Content
This lesson serves as a comprehensive assessment of FAA Part 107 regulatory knowledge and application.

Mastery expectations include:
- Identifying applicable regulations
- Understanding operational limitations
- Recognizing violations
- Determining waiver requirements
- Making safe and compliant decisions

Integrated evaluation process includes:
1. Identify applicable regulations
2. Determine operational limitations
3. Identify violations
4. Evaluate risks
5. Determine if authorization or waiver is required
6. Make Go/No-Go decision

Indicators of mastery include:
- Accurate regulation identification
- Strong compliance awareness
- Effective risk evaluation
- Safe and legal decision-making

Common errors include:
- Missing key regulations
- Misinterpreting rules
- Ignoring compliance requirements
- Making unsafe decisions

This assessment reflects FAA expectations for real-world operations.

Teacher Emphasis
- Emphasize full integration of regulatory knowledge
- Reinforce importance of compliance
- Highlight connection to FAA exam readiness
- Encourage careful analysis of each scenario
- Reinforce professional responsibility

Activity Procedure

Activity: Regulations Scenario Mastery Assessment

1. Students complete a comprehensive assessment including:
    - Regulation identification
    - Operational limitation analysis
    - Violation recognition
    - Risk evaluation
    - Go/No-Go decision
2. Students analyze multiple scenarios and determine:
    - Applicable regulations
      Identified violations
      Risk level
      Required authorizations or waivers
      Final Go/No-Go decision
3. Teacher will use the following Formative Assessment questions (post-assessment):
    - What scenario was most challenging?
    - What violations were hardest to identify?
    - How confident are your decisions?
4. Instructor reviews results and provides targeted feedback

Flight Activity (Regulatory Compliance Execution)

1. Review applicable regulations
2. Identify potential violations
3. Evaluate compliance
4. Make Go/No-Go decision
5. Perform controlled takeoff
6. Maintain compliance during flight
7. Execute safe landing

Instructor emphasis: safe and legal operation

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Regulation Identification	Incorrect	Partial	Accurate	Comprehensive
Violation Recognition	Incorrect	Basic	Accurate	Detailed
Compliance Evaluation	Incorrect	Basic	Accurate	Fully compliant
Decision-Making	Unsafe	Basic	Safe	Highly consistent

Assessment Items

1. What is compliance evaluation?
   A. Speed
   B. Determining if rules are followed
   C. Camera
   D. Battery
2. What is a violation?
   A. Following rules

B. Breaking rules
C. Planning
D. Checking weather

3. What must be identified in every scenario?
   A. Color
   B. Regulations
   C. Camera
   D. Speed
4. What is a safe decision?
   A. Ignore rules
   B. Follow regulations
   C. Fly anyway
   D. Speed up
5. Scenario:
   A pilot plans to fly at night, above 400 feet AGL, and in controlled airspace without authorization.
   What violations exist and what should be done?

Answer Key

1. B
2. B
3. B
4. B
5. Multiple violations; obtain authorization, remain within limits, ensure compliance, or do not fly

---

Closure

- Reflect on regulatory knowledge
- Ask students if they feel prepared for FAA regulation questions
- Reinforce importance of compliance

Teacher Notes

- Use results to guide review
- Reinforce real-world application
- Transition to final FAA test preparation phase

Week 15 COMPLETE

Students now have:

- Strong understanding of FAA Part 107 regulations
- Ability to identify violations and apply rules
- Integrated decision-making skills
- Readiness for FAA-style scenario questions

Week 16 – Day 1

FAA Part 107 Comprehensive Review – Airspace & Regulations

Standards

Standard	Description
201.00	Students will explain FAA Part 107 regulations and operational requirements governing small UAS operations.
201.02	Students will interpret operational limitations, including altitude, speed, visibility, and daylight restrictions.
203.00	Students will interpret aviation weather data and apply it to safe sUAS operations.
203.01	Students will identify basic weather concepts, including wind, pressure, and stability.
203.02	Students will decode METAR and TAF reports.

Objective
Students will review and apply airspace classifications and FAA regulations to prepare for the Part 107 knowledge test.

Essential Question
How do airspace classifications and regulations work together to ensure safe drone operations?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What airspace types do you remember?
- Which airspace requires authorization?
- Why is airspace knowledge critical for safety?

Teacher will connect responses to FAA testing expectations.

Vocabulary

- **Class B Airspace** – Controlled airspace surrounding major airports
- **Class C Airspace** – Controlled airspace around mid-sized airports
- **Class D Airspace** – Controlled airspace around smaller airports
- **Class E Airspace** – Controlled airspace not classified as B, C, or D
- **Class G Airspace** – Uncontrolled airspace
- **Authorization** – FAA permission to operate in controlled airspace

Materials

- Sectional charts
- Airspace diagrams
- Scenario worksheets
- Student notebook or guided notes sheet
- Whiteboard / presentation slides

Instruction Content
Airspace classification determines where drones can operate and what authorization is required.

Controlled airspace includes:
- Class B
- Class C
- Class D
- Class E (surface areas)

Uncontrolled airspace includes:
- Class G

Authorization requirements include:
- Required in controlled airspace
- Not required in Class G (with exceptions)

Airspace considerations include:
- Altitude restrictions
- Proximity to airports
- Air traffic activity

Common errors include:
- Misidentifying airspace
- Failing to obtain authorization
- Misreading sectional charts

FAA relevance:
- Airspace questions are heavily tested
- Students must interpret sectional charts accurately

Teacher Emphasis
- Reinforce identification of airspace types
- Emphasize authorization requirements
- Connect airspace knowledge to safety
- Prepare students for chart-based questions
- Reinforce FAA testing importance

Activity Procedure
Activity: Airspace Identification & Application
1. Students take structured notes during instruction
2. Students analyze sectional charts and determine:
    - Airspace classification
      Authorization requirements
      Altitude limitations
3. Teacher will use the following Formative Assessment questions:
    - What airspace is shown?
    - Is authorization required?
    - What altitude restrictions apply?
4. Instructor reviews responses and provides clarification

Flight Activity (Airspace Awareness Operation)

1. Review local airspace classification
2. Identify operational limits
3. Evaluate need for authorization
4. Perform controlled takeoff
5. Maintain compliance
6. Execute safe landing

Instructor emphasis: airspace awareness

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Airspace Identification	Incorrect	Partial	Accurate	Comprehensive
Authorization Determination	Incorrect	Basic	Accurate	Detailed
Chart Interpretation	Incorrect	Basic	Accurate	Advanced
Compliance Understanding	Limited	Basic	Accurate	Thorough

Assessment Items

1. What airspace requires authorization?
   A. Class G
   B. Class B
   C. None
   D. All
2. What is Class G?
   A. Controlled
   B. Uncontrolled
   C. Restricted
   D. Military
3. What must pilots check before flight?
   A. Color
   B. Airspace
   C. Camera
   D. Speed
4. What is a common mistake?
   A. Checking charts
   B. Misreading airspace
   C. Planning
   D. Following rules
5. Scenario:
   A pilot plans to fly in Class C airspace without authorization.
   What is required and what should be done?

Answer Key

1. B
2. B
3. B
4. B
5. Authorization required; obtain FAA authorization before flight

---

Closure

- Review airspace classifications
- Ask students what airspace is most complex
- Reinforce importance of chart interpretation

Teacher Notes

- Use real sectional charts
- Reinforce repeated practice
- Prepare students for weather review next lesson

Week 16 – Day 2

Weather Review & METAR/TAF Interpretation

Standards

Standard	Description
205.00	Students will interpret airport operations and apply right-of-way rules for safe integration into airspace.
205.01	Students will identify airport layouts and traffic patterns.
205.02	Students will explain right-of-way rules between aircraft and drones.
205.03	Students will recognize basic radio communication procedures and terminology.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.02	Students will demonstrate safe flight operations in controlled environments.

Objective
Students will interpret METAR and TAF reports and evaluate weather conditions to determine safe flight operations.

Essential Question
How does weather information influence safe and legal drone flight decisions?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What weather conditions make flying unsafe?
- What weather information should pilots check before flight?
- Why is visibility important?

Teacher will connect responses to aviation weather data.

Vocabulary

- **METAR** – Aviation routine weather report
- **TAF** – Terminal Aerodrome Forecast
- **Visibility** – Distance a pilot can see
- **Ceiling** – Height of lowest cloud layer
- **Wind Speed** – Rate of air movement
- **Weather Minimums** – Required conditions for safe operation

Materials

- Sample METAR and TAF reports
- Weather decoding charts
- Scenario worksheets
- Student notebook or guided notes sheet
- Whiteboard / presentation slides

Instruction Content
Weather is a critical factor in safe drone operations.

METAR reports provide:
- Current weather conditions
- Wind direction and speed
- Visibility
- Cloud coverage
- Temperature and dew point

TAF reports provide:
- Forecasted weather conditions
- Changes over time
- Expected visibility and wind

Key weather considerations include:
- Visibility minimums
- Wind limitations
- Cloud clearance
- Precipitation

Common hazards include:
- Strong winds
- Low visibility
- Low cloud ceilings
- Rapid weather changes

Common errors include:
- Misreading METAR/TAF
- Ignoring changing conditions
- Underestimating wind effects

FAA relevance:
- Weather interpretation is heavily tested
- Students must decode METAR/TAF accurately

Teacher Emphasis
- Emphasize decoding accuracy
- Reinforce importance of weather awareness
- Connect weather to safety decisions
- Prepare students for FAA test questions
- Reinforce conservative decision-making

Activity Procedure
Activity: METAR/TAF Decoding & Analysis
1. Students take structured notes during instruction

2. Students decode METAR and TAF reports and determine:
    - Wind conditions
      Visibility
      Cloud ceiling
      Overall flight safety
3. Teacher will use the following Formative Assessment questions:
    - What does the METAR indicate?
    - What conditions are expected?
    - Is the flight safe?
4. Instructor reviews responses and provides clarification

Flight Activity (Weather Awareness Operation)

1. Review current weather conditions
2. Evaluate wind and visibility
3. Determine Go/No-Go decision
4. Perform controlled takeoff
5. Maintain safe operation
6. Execute safe landing

Instructor emphasis: weather-based decisions

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
METAR Decoding	Incorrect	Partial	Accurate	Comprehensive
TAF Interpretation	Incorrect	Basic	Accurate	Detailed
Weather Evaluation	Incorrect	Basic	Accurate	Comprehensive
Decision-Making	Unsafe	Basic	Safe	Highly consistent

Assessment Items

1. What does a METAR provide?
   A. Forecast
   B. Current weather
   C. Camera
   D. Speed

2. What does a TAF provide?
   A. Current weather
   B. Forecast
   C. Camera
   D. Battery

3. What is visibility?
   A. Speed
   B. Distance seen
   C. Temperature
   D. Pressure

4. What is a weather hazard?
   A. Clear skies
   B. Strong winds
   C. Calm air
   D. Clear visibility
5. Scenario:
   A METAR shows low visibility and strong winds.
   Is it safe to fly and why?

Answer Key

1. B
2. B
3. B
4. B
5. No; unsafe conditions due to low visibility and high winds

---

Closure

- Review weather interpretation
- Ask students what condition is most dangerous
- Reinforce importance of weather checks

Teacher Notes

- Use real METAR/TAF examples
- Reinforce repeated decoding practice
- Prepare students for loading and performance review next lesson

Week 16 – Day 3

Loading & Performance Review

Standards

Standard	Description
206.00	Students will apply aeronautical decision-making (ADM) principles to assess risk and ensure safe operations.
206.01	Students will identify hazards related to the environment, equipment, and human factors.
206.02	Students will explain risk management models used in aviation.
206.03	Students will apply ADM principles to real-world flight scenarios.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.02	Students will demonstrate safe flight operations in controlled environments.

Objective
Students will evaluate how weight, altitude, and environmental conditions affect drone performance and flight safety.

Essential Question
How do loading and environmental conditions impact drone performance and safety?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What happens when a drone carries extra weight?
- How does hot weather affect performance?
- Why might altitude impact flight?

Teacher will connect responses to performance factors.

Vocabulary

- **Weight Load** – Total weight carried by the drone
- **Performance** – How well the drone operates in flight
- **Density Altitude** – Air density based on temperature and altitude
- **Lift** – Force that keeps the drone in the air
- **Thrust** – Force that propels the drone
- **Environmental Factors** – Conditions affecting flight

Materials

- Performance scenario worksheets
- Environmental condition charts
- Student notebook or guided notes sheet
- Whiteboard / presentation slides

Instruction Content
Drone performance is affected by weight and environmental conditions.

Weight effects include:
- Reduced flight time
- Increased power demand
- Decreased maneuverability
- Increased risk of failure

Density altitude effects include:
- Reduced lift in high temperatures
- Reduced motor efficiency
- Increased takeoff difficulty

Environmental factors include:
- Temperature
- Altitude
- Humidity
- Wind

Performance risks include:
- Overloading the drone
- Flying in high temperatures
- Operating in thin air conditions
- Reduced battery efficiency

Safe operation includes:
- Maintaining proper weight limits
- Monitoring environmental conditions
- Adjusting flight plans accordingly

Common errors include:
- Ignoring weight limits
- Underestimating environmental effects
- Failing to adjust operations

FAA relevance:
- Performance questions appear on the exam
- Students must understand cause-and-effect relationships

Teacher Emphasis
- Emphasize importance of weight limits
- Reinforce environmental awareness
- Connect performance to safety
- Prepare students for FAA test scenarios
- Reinforce conservative decision-making

Activity Procedure

Activity: Performance Scenario Analysis

1. Students take structured notes during instruction
2. Students analyze scenarios and determine:
    - Weight impact
      Environmental conditions
      Performance limitations
      Safety risks
3. Teacher will use the following Formative Assessment questions:
    - How does weight affect performance?
    - What environmental factors are present?
    - Is the operation safe?
4. Instructor reviews responses and provides clarification

Flight Activity (Performance Awareness Operation)

1. Evaluate environmental conditions
2. Review drone weight and load
3. Identify performance limitations
4. Perform controlled takeoff
5. Maintain stable flight
6. Execute safe landing

Instructor emphasis: performance awareness

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Weight Understanding	Incorrect	Partial	Accurate	Comprehensive
Environmental Awareness	Incorrect	Basic	Accurate	Detailed
Performance Evaluation	Incorrect	Basic	Accurate	Comprehensive
Decision-Making	Unsafe	Basic	Safe	Highly consistent

Assessment Items

1. What does weight affect?
   A. Color
   B. Performance
   C. Camera
   D. Speed
2. What is density altitude?
   A. Weight
   B. Air density
   C. Speed
   D. Camera

3. What happens in high temperatures?
   A. Better performance
   B. Reduced performance
   C. No change
   D. Faster flight
4. What is a performance risk?
   A. Safe flying
   B. Overloading
   C. Planning
   D. Checking weather
5. Scenario:
   A drone is heavily loaded and flown on a hot day.
   What risks exist and what should be done?

Answer Key

1. B
2. B
3. B
4. B
5. Reduced performance and increased risk; reduce load or delay flight

---

Closure

- Review performance factors
- Ask students what factor is most critical
- Reinforce importance of safe operation

Teacher Notes

- Use real-world examples
- Reinforce cause-and-effect relationships
- Prepare students for ADM review next lesson

Week 16 – Day 4

Aeronautical Decision-Making (ADM) Review

Standards

Standard	Description
201.00	Students will explain FAA Part 107 regulations and operational requirements governing small UAS operations.
201.02	Students will interpret operational limitations, including altitude, speed, visibility, and daylight restrictions.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).
209.01	Students will identify FAA safety requirements, including VLOS.
209.02	Students will demonstrate safe flight operations in controlled environments.
209.03	Students will apply emergency procedures to maintain safe flight operations.

Objective
Students will apply Aeronautical Decision-Making (ADM) principles to evaluate risk and make safe, compliant drone operation decisions.

Essential Question
How do pilots use structured decision-making to manage risk and ensure safe drone operations?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What is a poor decision a pilot could make?
- What factors influence decision-making?
- Why is safety more important than completing a mission?

Teacher will connect responses to ADM principles.

Vocabulary

- **Aeronautical Decision-Making (ADM)** – Systematic approach to making safe flight decisions
- **Hazard** – Condition that can lead to unsafe operation
- **Risk** – Probability and severity of harm
- **Risk Mitigation** – Actions taken to reduce risk
- **Go/No-Go Decision** – Determination to proceed or cancel flight

Materials

- ADM scenario worksheets
- Risk assessment charts
- Student notebook or guided notes sheet
- Whiteboard / presentation slides

Instruction Content
Aeronautical Decision-Making (ADM) is the process pilots use to ensure safe operations.

ADM process includes:
1. Identify hazards
2. Assess risks
3. Analyze options
4. Implement decision
5. Evaluate outcome

Common hazards include:
- Weather conditions
- Airspace restrictions
- Equipment issues
- Human factors

Risk evaluation includes:
- Probability of occurrence
- Severity of consequences

Risk mitigation strategies include:
- Delaying or canceling flight
- Adjusting flight plan
- Reducing operational complexity
- Increasing situational awareness

Human factors include:
- Fatigue
- Stress
- Overconfidence
- Distraction

Common ADM errors include:
- Ignoring risks
- Rushing decisions
- Continuing unsafe operations

Safe decision-making includes:
- Using structured process
- Prioritizing safety
- Making conservative decisions

FAA relevance:
- ADM is tested through scenario-based questions
- Students must demonstrate sound judgment

Teacher Emphasis
- Emphasize structured decision-making
- Reinforce importance of identifying hazards
- Highlight role of human factors
- Connect ADM to FAA exam scenarios

- Reinforce safety-first mindset

Activity Procedure

Activity: ADM Scenario Evaluation

1. Students take structured notes during instruction
2. Students analyze scenarios and determine:
    - Identified hazards
      Risk level
      Mitigation strategies
      Go/No-Go decision
3. Teacher will use the following Formative Assessment questions:
    - What hazards are present?
    - What is the level of risk?
    - What action should the pilot take?
4. Instructor reviews responses and provides clarification

Flight Activity (ADM-Based Operation)

1. Identify potential hazards
2. Evaluate risks
3. Make Go/No-Go decision
4. Perform controlled takeoff
5. Maintain safe operation
6. Execute safe landing

Instructor emphasis: decision-making and safety

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Hazard Identification	Incorrect	Partial	Accurate	Comprehensive
Risk Evaluation	Incorrect	Basic	Accurate	Detailed
Mitigation Strategy	Incorrect	Basic	Accurate	Comprehensive
Decision-Making	Unsafe	Basic	Safe	Highly consistent

Assessment Items

1. What is ADM?
   A. Speed
   B. Decision-making process
   C. Camera
   D. Battery

2. What is a hazard?
   A. Safe condition
   B. Risk factor

C. Planning
D. Camera

3. What is risk?
   A. Safety
   B. Probability and severity
   C. Speed
   D. Color
4. What is mitigation?
   A. Increase risk
   B. Reduce risk
   C. Ignore risk
   D. Speed
5. Scenario:
   A pilot notices strong winds and low battery but continues the flight.
   What ADM errors occurred and what should have been done?

Answer Key

1. B
2. B
3. B
4. B
5. Ignored hazards and risks; should delay or cancel flight

Closure

- Review ADM process
- Ask students what factor is most important
- Reinforce safe decision-making

Teacher Notes

- Use real-world examples
- Reinforce structured thinking
- Prepare students for full practice exam next lesson

Week 16 – Day 5

FAA Part 107 Practice Exam #1

Standards

Standard	Description
201.00	Students will explain FAA Part 107 regulations and operational requirements governing small UAS operations.
203.00	Students will interpret aviation weather data and apply it to safe sUAS operations.
205.00	Students will interpret airport operations and apply right-of-way rules for safe integration into airspace.
206.00	Students will apply aeronautical decision-making (ADM) principles to assess risk and ensure safe operations.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).

Objective
Students will demonstrate FAA Part 107 knowledge through a comprehensive practice exam aligned to FAA testing standards.

Essential Question
Am I prepared to successfully pass the FAA Part 107 knowledge test?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What area do you feel most confident in?
- What area needs the most improvement?
- What strategy will you use during the test?

Teacher will connect responses to testing strategies.

Vocabulary

- **Knowledge Test** – FAA written exam
- **Passing Score** – Minimum required score (70%)
- **Test Strategy** – Approach to answering questions
- **Scenario-Based Question** – Question requiring application
- **Time Management** – Efficient use of test time

Materials

- Practice exam sheets
- Sectional chart supplement
- Scratch paper
- Pencils

Instruction Content
This lesson simulates the FAA Part 107 knowledge test.

Exam expectations include:
- Multiple-choice questions
- Scenario-based questions
- Airspace interpretation
- Weather decoding
- Regulatory application

Testing strategies include:
- Read each question carefully
- Eliminate incorrect answers
- Use provided charts
- Manage time effectively
- Review answers if time allows

FAA relevance:
- Practice exams prepare students for real testing conditions
- Emphasis on application and understanding

Teacher Emphasis
- Emphasize test-taking strategies
- Reinforce importance of careful reading
- Encourage use of elimination methods
- Maintain a quiet testing environment
- Reinforce professionalism

Activity Procedure
Activity: FAA Practice Exam #1
1. Students complete a timed practice exam
2. Students answer all questions independently
3. Teacher will use the following Formative Assessment questions (post-exam):
    - Which questions were most difficult?
    - What topics need review?
    - How confident do you feel?
4. Instructor reviews results and identifies trends

Flight Activity (Optional – Time Permitting)
1. Perform standard preflight check
2. Execute controlled flight
3. Maintain stable operation
4. Execute safe landing

Instructor emphasis: maintaining skill during testing phase

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Test Completion	Incomplete	Partial	Complete	Complete + reviewed
Accuracy	Below 60%	60–69%	70–85%	86%+
Concept Understanding	Limited	Basic	Accurate	Comprehensive
Test Strategy	Ineffective	Basic	Effective	Highly effective

Assessment Items – Practice Exam #1 (Sample Set)

1. What is the maximum altitude under Part 107?
   A. 200 ft
   B. 400 ft
   C. 600 ft
2. What airspace requires authorization?
   A. Class G
   B. Class B
   C. None
3. What does a METAR report provide?
   A. Forecast
   B. Current weather
   C. Flight plan
4. What is a hazard?
   A. Safe condition
   B. Risk factor
   C. Planning
5. What is required to fly in controlled airspace?
   A. Nothing
   B. Authorization
   C. Camera
6. What does TAF provide?
   A. Current weather
   B. Forecast
   C. Speed
7. What is a common weather hazard?
   A. Clear skies
   B. Strong winds
   C. Calm air
8. What must pilots maintain?
   A. Speed
   B. Visual line of sight
   C. Camera

9. What is a waiver?
   A. Rule
   B. Permission to deviate
   C. Speed
10. What is density altitude?
    A. Weight
    B. Air density
    C. Speed

Answer Key

1. B
2. B
3. B
4. B
5. B
6. B
7. B
8. B
9. B
10. B

Closure

- Review test performance
- Identify areas for improvement
- Reinforce confidence

Teacher Notes

- Review missed questions
- Target weak areas next week
- Prepare for Practice Exam #2

Week 16 COMPLETE

Students now have:

- Full FAA content review
- Real test experience
- Identified strengths and weaknesses
- Increased confidence

Week 17 – Day 1

FAA Part 107 Targeted Review – Weak Areas & Remediation

Standards

Standard	Description
201.00	Students will explain FAA Part 107 regulations and operational requirements governing small UAS operations.
203.00	Students will interpret aviation weather data and apply it to safe sUAS operations.
205.00	Students will interpret airport operations and apply right-of-way rules for safe integration into airspace.
206.00	Students will apply aeronautical decision-making (ADM) principles to assess risk and ensure safe operations.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).

Objective
Students will analyze performance from Practice Exam #1 and strengthen weak areas through targeted review and application.

Essential Question
How can I improve my performance on the FAA Part 107 test by addressing weak areas?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What was your lowest scoring topic?
- What mistakes did you make?
- What will you do differently next time?

Teacher will connect responses to improvement strategies.

Vocabulary

- **Remediation** – Targeted improvement of weak areas
- **Error Analysis** – Reviewing mistakes to understand why they occurred
- **Knowledge Gap** – Area of misunderstanding
- **Concept Reinforcement** – Strengthening understanding
- **Test Correction** – Fixing incorrect responses

Materials

- Practice exam results
- Targeted review worksheets
- Sectional charts
- Weather reports
- Student notebook or guided notes sheet

Instruction Content
Review and remediation are critical to improving FAA test performance.

Common weak areas include:
- Airspace classification
- Weather decoding
- Regulations
- Performance factors
- Scenario interpretation

Error analysis includes:
- Identifying incorrect answers
- Determining why the answer was wrong
- Understanding the correct concept

Improvement strategies include:
- Relearning concepts
- Practicing similar questions
- Applying knowledge to scenarios
- Reviewing FAA materials

Effective test preparation includes:
- Focusing on weak areas
- Practicing regularly
- Using real FAA-style questions

Teacher Emphasis
- Emphasize learning from mistakes
- Reinforce targeted improvement
- Encourage active participation
- Connect review to test success
- Reinforce confidence-building

Activity Procedure
Activity: Targeted Review & Error Correction
1. Students review incorrect answers from Practice Exam #1
2. Students analyze errors and determine:
    - Correct answer
      Reason for mistake
      Correct concept
3. Students complete targeted practice questions
4. Teacher will use the following Formative Assessment questions:
    - Why was your answer incorrect?
    - What concept did you misunderstand?
    - How will you correct it?
5. Instructor provides targeted instruction and feedback

Flight Activity (Optional – Time Permitting)

1. Perform preflight check
2. Execute controlled flight
3. Maintain stability
4. Execute safe landing

Instructor emphasis: maintaining flight proficiency

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Error Identification	Incorrect	Partial	Accurate	Comprehensive
Concept Correction	Incorrect	Basic	Accurate	Thorough
Participation	Minimal	Limited	Active	Highly engaged
Improvement Effort	Minimal	Basic	Consistent	Highly consistent

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Assessment Items

1. What is remediation?
   A. Ignoring mistakes
   B. Improving weak areas
   C. Testing
   D. Flying
2. What is error analysis?
   A. Guessing
   B. Reviewing mistakes
   C. Skipping
   D. Ignoring
3. What is a knowledge gap?
   A. Strong area
   B. Weak understanding
   C. Perfect score
   D. Speed
4. What improves test performance?
   A. Ignoring errors
   B. Practicing weak areas
   C. Guessing
   D. Skipping
5. Scenario:
   A student repeatedly misses airspace questions.
   What should they do to improve?

Answer Key

1. B
2. B
3. B
4. B
5. Focus on airspace review and practice questions

Closure

- Reflect on improvement
- Ask students what they improved
- Reinforce progress

Teacher Notes

- Use data to guide instruction
- Focus on major weak areas
- Prepare for advanced practice exam next lesson

Week 17 – Day 2

Advanced Scenario Practice – FAA Style Questions

Standards

Standard	Description
201.00	Students will explain FAA Part 107 regulations and operational requirements governing small UAS operations.
203.00	Students will interpret aviation weather data and apply it to safe sUAS operations.
205.00	Students will interpret airport operations and apply right-of-way rules for safe integration into airspace.
206.00	Students will apply aeronautical decision-making (ADM) principles to assess risk and ensure safe operations.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).

Objective
Students will apply FAA Part 107 knowledge to advanced scenario-based questions requiring multi-step analysis and decision-making.

Essential Question
How do I apply FAA knowledge to complex, real-world drone operation scenarios?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- Why are scenario questions more difficult than recall questions?
- What strategy helps solve complex questions?
- What mistakes should be avoided?

Teacher will connect responses to FAA testing strategies.

Vocabulary

- **Scenario-Based Question** – Question requiring application of multiple concepts
- **Multi-Step Analysis** – Evaluating several factors before deciding
- **Operational Decision** – Final action taken by the pilot
- **Critical Thinking** – Analyzing information to make decisions
- **FAA Context Question** – Question based on real-world application

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Materials

- Scenario worksheets
- Sectional charts
- METAR/TAF reports
- Student notebook or guided notes sheet

Instruction Content
FAA Part 107 questions often require applying multiple concepts at once.

Scenario analysis process includes:
1. Identify key information
2. Determine applicable regulations
3. Evaluate airspace
4. Assess weather conditions
5. Identify performance limitations
6. Determine safe and legal action

Key strategies include:
- Read questions carefully
- Eliminate incorrect answers
- Focus on safety and compliance
- Apply all relevant knowledge

Common errors include:
- Rushing through questions
- Ignoring key details
- Applying only one concept
- Choosing unsafe answers

FAA relevance:
- Scenario questions are heavily used
- Emphasis on application over memorization

Teacher Emphasis
- Emphasize careful reading of questions
- Reinforce multi-step thinking
- Highlight importance of safety decisions
- Connect to FAA testing format
- Encourage confidence in reasoning

Activity Procedure
Activity: Advanced Scenario Analysis
1. Students take structured notes during instruction
2. Students analyze FAA-style scenarios and determine:
    - Applicable regulations
      Airspace classification
      Weather conditions
      Performance considerations
      Final safe decision
3. Teacher will use the following Formative Assessment questions:
    - What information is critical?
    - What rules apply?
    - What is the safest action?
4. Instructor reviews responses and provides detailed feedback

---

Flight Activity (Decision-Based Operation)

1. Evaluate conditions
2. Identify risks
3. Apply regulations
4. Make Go/No-Go decision
5. Perform controlled takeoff
6. Maintain safe operation
7. Execute safe landing

Instructor emphasis: decision-making

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Scenario Analysis	Incorrect	Partial	Accurate	Comprehensive
Rule Application	Incorrect	Basic	Accurate	Detailed
Decision Accuracy	Unsafe	Basic	Safe	Highly consistent
Critical Thinking	Limited	Basic	Effective	Advanced

Assessment Items

1. What is a scenario-based question?
   A. Simple recall
   B. Application question
   C. Guessing
   D. Speed
2. What is the first step in analysis?
   A. Guess
   B. Identify information
   C. Skip
   D. Answer
3. What should be prioritized?
   A. Speed
   B. Safety
   C. Camera
   D. Color
4. What is a common mistake?
   A. Reading carefully
   B. Ignoring details
   C. Planning
   D. Reviewing
5. Scenario:
   A pilot plans to fly in controlled airspace, with low visibility and high winds.
   What factors must be evaluated and what should the pilot do?

Answer Key

1. B
2. B
3. B
4. B
5. Evaluate airspace, weather, and safety; likely delay or cancel flight

---

Closure

- Review scenario strategies
- Ask students what was most difficult
- Reinforce confidence

Teacher Notes

- Use increasingly complex scenarios
- Reinforce multi-step thinking
- Prepare students for Practice Exam #2

Week 17 – Day 3

FAA Part 107 Practice Exam #2

Standards

Standard	Description
201.00	Students will explain FAA Part 107 regulations and operational requirements governing small UAS operations.
203.00	Students will interpret aviation weather data and apply it to safe sUAS operations.
205.00	Students will interpret airport operations and apply right-of-way rules for safe integration into airspace.
206.00	Students will apply aeronautical decision-making (ADM) principles to assess risk and ensure safe operations.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).

Objective
Students will demonstrate improved FAA Part 107 knowledge through a second comprehensive practice exam.

Essential Question
Am I improving my ability to successfully pass the FAA Part 107 test?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What did you improve since the last test?
- What strategy worked best?
- What still needs improvement?

Teacher will connect responses to performance growth.

Vocabulary

- **Practice Exam** – Simulated FAA test
- **Performance Improvement** – Measurable progress in results
- **Accuracy Rate** – Percentage of correct answers
- **Confidence Level** – Student belief in performance
- **Test Consistency** – Reliable performance across attempts

---

Materials

- Practice exam sheets
- Sectional chart supplement
- Scratch paper
- Pencils

Instruction Content
This second practice exam measures improvement and readiness.

Exam expectations include:
- FAA-style multiple-choice questions
- Scenario-based questions
- Airspace interpretation
- Weather decoding
- Regulation application

Performance focus includes:
- Increased accuracy
- Improved decision-making
- Better time management

Testing strategies include:
- Read carefully
- Eliminate incorrect answers
- Apply multiple concepts
- Stay focused

FAA relevance:
- Practice exams build readiness
- Improvement indicates test preparedness

Teacher Emphasis
- Emphasize improvement over perfection
- Reinforce use of strategies
- Encourage confidence
- Maintain testing environment
- Reinforce professionalism

Activity Procedure
Activity: FAA Practice Exam #2
1. Students complete a timed practice exam
2. Students answer all questions independently
3. Teacher will use the following Formative Assessment questions (post-exam):
    - Did your score improve?
    - What strategies helped most?
    - What areas still need work?
4. Instructor reviews results and identifies trends

Flight Activity (Optional – Time Permitting)
1. Perform preflight check
2. Execute controlled flight
3. Maintain stable operation
4. Execute safe landing

Instructor emphasis: maintaining skill consistency

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Test Completion	Incomplete	Partial	Complete	Complete + reviewed
Accuracy	Below 60%	60–69%	70–85%	86%+
Concept Understanding	Limited	Basic	Accurate	Comprehensive
Test Strategy	Ineffective	Basic	Effective	Highly effective

Assessment Items – Practice Exam #2 (Sample Set)

1. What is the maximum groundspeed under Part 107?
   A. 50 mph
   B. 75 mph
   C. 100 mph
2. What must a pilot yield to?
   A. Other drones
   B. Manned aircraft
   C. Cars
3. What is a METAR used for?
   A. Forecast
   B. Current weather
   C. Navigation
4. What is Class D airspace?
   A. Uncontrolled
   B. Controlled
   C. Restricted
5. What is a common hazard?
   A. Clear skies
   B. Strong winds
   C. Calm air
6. What does TAF provide?
   A. Current weather
   B. Forecast
   C. Speed
7. What must be maintained at all times?
   A. Speed
   B. Visual line of sight
   C. Camera

8. What is density altitude affected by?
   A. Color
   B. Temperature
   C. Speed
9. What is required in controlled airspace?
   A. Nothing
   B. Authorization
   C. Camera
10. What is ADM?
    A. Speed
    B. Decision-making process
    C. Camera

Answer Key

1. C
2. B
3. B
4. B
5. B
6. B
7. B
8. B
9. B
10. B

Closure

- Review improvements
- Discuss strategies
- Reinforce readiness

Teacher Notes

- Compare results with previous exam
- Identify remaining weak areas
- Prepare students for final review

Week 17 – Day 4

Final Targeted Review & High-Level FAA Concepts

Standards

Standard	Description
201.00	Students will explain FAA Part 107 regulations and operational requirements governing small UAS operations.
203.00	Students will interpret aviation weather data and apply it to safe sUAS operations.
205.00	Students will interpret airport operations and apply right-of-way rules for safe integration into airspace.
206.00	Students will apply aeronautical decision-making (ADM) principles to assess risk and ensure safe operations.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).

Objective
Students will reinforce high-priority FAA Part 107 concepts and finalize preparation for successful test performance.

Essential Question
What key concepts must I fully understand to confidently pass the FAA Part 107 exam?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What concept do you still struggle with?
- What concept is most important for safety?
- What will you review before the test?

Teacher will connect responses to final preparation.

Vocabulary

- **Concept Mastery** – Strong understanding of key topics
- **Priority Content** – Most frequently tested material
- **Operational Awareness** – Understanding of flight environment
- **Test Readiness** – Preparedness for assessment
- **Confidence Level** – Belief in performance ability

Materials

- Review worksheets
- Sectional charts
- METAR/TAF samples
- Student notebook or guided notes sheet

Instruction Content
This lesson focuses on high-priority FAA concepts that are frequently tested.

Priority topics include:
- Airspace classification and authorization
- Weather interpretation (METAR/TAF)
- Part 107 regulations
- Loading and performance
- Aeronautical Decision-Making (ADM)

High-level review includes:
- Identifying key rules and limits
- Interpreting real-world scenarios
- Applying multiple concepts
- Making safe decisions

Common high-level errors include:
- Confusing airspace types
- Misinterpreting weather data
- Forgetting key regulations
- Making unsafe decisions

Final preparation strategies include:
- Reviewing weak areas
- Practicing scenario questions
- Reinforcing key concepts
- Staying confident

FAA relevance:
- These concepts appear frequently on the exam
- Mastery improves test success

Teacher Emphasis
- Emphasize key concepts and patterns
- Reinforce understanding over memorization
- Highlight common mistakes
- Connect review to test success
- Reinforce confidence and readiness

Activity Procedure
Activity: High-Level Concept Review & Application
1. Students take structured notes during instruction
2. Students complete targeted review activities including:
    - Airspace identification
      Weather decoding
      Regulation application
      Scenario analysis

3. Teacher will use the following Formative Assessment questions:
    - What concept is most important?
    - What mistakes should be avoided?
    - What strategies will you use?
4. Instructor provides targeted clarification and reinforcement

---

Flight Activity (Confidence Flight Operation)

1. Perform standard preflight check
2. Execute controlled flight
3. Maintain stable operation
4. Execute safe landing

Instructor emphasis: confidence and consistency

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Concept Understanding	Limited	Basic	Accurate	Comprehensive
Scenario Application	Incorrect	Basic	Accurate	Detailed
Participation	Minimal	Limited	Active	Highly engaged
Confidence Level	Low	Moderate	Confident	Highly confident

Assessment Items

1. What is a priority topic?
   A. Rare concept
   B. Frequently tested concept
   C. Optional
   D. Speed
2. What improves test success?
   A. Guessing
   B. Concept mastery
   C. Skipping
   D. Ignoring
3. What is a common error?
   A. Studying
   B. Misinterpreting data
   C. Planning
   D. Reviewing
4. What should be emphasized?
   A. Speed
   B. Understanding
   C. Camera
   D. Color

5. Scenario:
   A student consistently misreads airspace charts.
   What should they focus on to improve?

Answer Key

1. B
2. B
3. B
4. B
5. Practice chart interpretation and review airspace concepts

---

Closure

- Review key concepts
- Ask students if they feel ready
- Reinforce confidence

Teacher Notes

- Focus on final clarification
- Encourage confidence
- Prepare students for final practice exam

Week 17 – Day 4

Final Targeted Review & High-Level FAA Concepts

Standards

Standard	Description
201.00	Students will explain FAA Part 107 regulations and operational requirements governing small UAS operations.
203.00	Students will interpret aviation weather data and apply it to safe sUAS operations.
205.00	Students will interpret airport operations and apply right-of-way rules for safe integration into airspace.
206.00	Students will apply aeronautical decision-making (ADM) principles to assess risk and ensure safe operations.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).

Objective
Students will reinforce high-priority FAA Part 107 concepts and finalize preparation for successful test performance.

Essential Question
What key concepts must I fully understand to confidently pass the FAA Part 107 exam?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What concept do you still struggle with?
- What concept is most important for safety?
- What will you review before the test?

Teacher will connect responses to final preparation.

Vocabulary

- **Concept Mastery** – Strong understanding of key topics
- **Priority Content** – Most frequently tested material
- **Operational Awareness** – Understanding of flight environment
- **Test Readiness** – Preparedness for assessment
- **Confidence Level** – Belief in performance ability

Materials

- Review worksheets
- Sectional charts
- METAR/TAF samples
- Student notebook or guided notes sheet

Instruction Content
This lesson focuses on high-priority FAA concepts that are frequently tested.

Priority topics include:
- Airspace classification and authorization
- Weather interpretation (METAR/TAF)
- Part 107 regulations
- Loading and performance
- Aeronautical Decision-Making (ADM)

High-level review includes:
- Identifying key rules and limits
- Interpreting real-world scenarios
- Applying multiple concepts
- Making safe decisions

Common high-level errors include:
- Confusing airspace types
- Misinterpreting weather data
- Forgetting key regulations
- Making unsafe decisions

Final preparation strategies include:
- Reviewing weak areas
- Practicing scenario questions
- Reinforcing key concepts
- Staying confident

FAA relevance:
- These concepts appear frequently on the exam
- Mastery improves test success

Teacher Emphasis
- Emphasize key concepts and patterns
- Reinforce understanding over memorization
- Highlight common mistakes
- Connect review to test success
- Reinforce confidence and readiness

Activity Procedure
Activity: High-Level Concept Review & Application
1. Students take structured notes during instruction
2. Students complete targeted review activities including:
    - Airspace identification
      Weather decoding
      Regulation application
      Scenario analysis

3. Teacher will use the following Formative Assessment questions:
    - What concept is most important?
    - What mistakes should be avoided?
    - What strategies will you use?
4. Instructor provides targeted clarification and reinforcement

---

Flight Activity (Confidence Flight Operation)

1. Perform standard preflight check
2. Execute controlled flight
3. Maintain stable operation
4. Execute safe landing

Instructor emphasis: confidence and consistency

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Concept Understanding	Limited	Basic	Accurate	Comprehensive
Scenario Application	Incorrect	Basic	Accurate	Detailed
Participation	Minimal	Limited	Active	Highly engaged
Confidence Level	Low	Moderate	Confident	Highly confident

Assessment Items

1. What is a priority topic?
   A. Rare concept
   B. Frequently tested concept
   C. Optional
   D. Speed
2. What improves test success?
   A. Guessing
   B. Concept mastery
   C. Skipping
   D. Ignoring
3. What is a common error?
   A. Studying
   B. Misinterpreting data
   C. Planning
   D. Reviewing
4. What should be emphasized?
   A. Speed
   B. Understanding
   C. Camera
   D. Color

5. Scenario:
   A student consistently misreads airspace charts.
   What should they focus on to improve?

Answer Key

1. B
2. B
3. B
4. B
5. Practice chart interpretation and review airspace concepts

---

Closure

- Review key concepts
- Ask students if they feel ready
- Reinforce confidence

Teacher Notes

- Focus on final clarification
- Encourage confidence
- Prepare students for final practice exam

Week 17 – Day 5

FAA Part 107 Practice Exam #3 (Final Readiness Assessment)

Standards

Standard	Description
201.00	Students will explain FAA Part 107 regulations and operational requirements governing small UAS operations.
203.00	Students will interpret aviation weather data and apply it to safe sUAS operations.
205.00	Students will interpret airport operations and apply right-of-way rules for safe integration into airspace.
206.00	Students will apply aeronautical decision-making (ADM) principles to assess risk and ensure safe operations.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).

Objective
Students will demonstrate final readiness for the FAA Part 107 exam through a comprehensive practice assessment.

Essential Question
Am I fully prepared to pass the FAA Part 107 knowledge test?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- How confident are you right now?
- What strategy will you use today?
- What is your goal score?

Teacher will connect responses to performance mindset.

Vocabulary

- **Final Assessment** – Last evaluation before testing
- **Test Readiness** – Preparedness for official exam
- **Confidence Strategy** – Approach to maintaining focus
- **Accuracy Goal** – Target performance level
- **Performance Consistency** – Reliable results

Materials

- Practice exam sheets
- Sectional chart supplement
- Scratch paper
- Pencils

Instruction Content
This final practice exam simulates the FAA testing experience and measures readiness.

Exam expectations include:
- FAA-style multiple-choice questions
- Scenario-based analysis
- Airspace interpretation
- Weather decoding
- Regulatory application

Performance focus includes:
- Accuracy
- Confidence
- Time management
- Decision-making

Testing strategies include:
- Read each question carefully
- Eliminate incorrect answers
- Apply all relevant knowledge
- Stay focused and confident

FAA relevance:
- Final assessment indicates readiness for certification testing
- Students should aim for consistent passing scores

Teacher Emphasis
- Emphasize confidence and focus
- Reinforce use of strategies
- Maintain testing environment
- Encourage best effort
- Reinforce professionalism

Activity Procedure
Activity: FAA Practice Exam #3
1. Students complete a timed practice exam
2. Students answer all questions independently
3. Teacher will use the following Formative Assessment questions (post-exam):
    - Did you meet your goal score?
    - What improved the most?
    - Are you ready for the FAA test?
4. Instructor reviews results and confirms readiness

Flight Activity (Optional – Time Permitting)
1. Perform standard preflight check
2. Execute controlled flight
3. Maintain stable operation
4. Execute safe landing

Instructor emphasis: maintaining confidence

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Test Completion	Incomplete	Partial	Complete	Complete + reviewed
Accuracy	Below 60%	60–69%	70–85%	86%+
Concept Understanding	Limited	Basic	Accurate	Comprehensive
Test Strategy	Ineffective	Basic	Effective	Highly effective

Assessment Items – Practice Exam #3 (Sample Set)

1. What is the maximum altitude under Part 107?
   A. 200 ft
   B. 400 ft
   C. 600 ft
2. What airspace requires authorization?
   A. Class G
   B. Class B
   C. None
3. What does a METAR report provide?
   A. Forecast
   B. Current weather
   C. Flight plan
4. What must a pilot yield to?
   A. Other drones
   B. Manned aircraft
   C. Cars
5. What is a hazard?
   A. Safe condition
   B. Risk factor
   C. Planning
6. What is density altitude affected by?
   A. Color
   B. Temperature
   C. Speed
7. What must be maintained at all times?
   A. Speed
   B. Visual line of sight
   C. Camera

8. What is required in controlled airspace?
   A. Nothing
   B. Authorization
   C. Camera
9. What is a waiver?
   A. Rule
   B. Permission to deviate
   C. Speed
10. What is ADM?
    A. Speed
    B. Decision-making process
    C. Camera

Answer Key

1. B
2. B
3. B
4. B
5. B
6. B
7. B
8. B
9. B
10. B

Closure

- Reflect on readiness
- Discuss confidence levels
- Reinforce final preparation

Teacher Notes

- Confirm student readiness
- Provide encouragement
- Prepare for final week (course wrap-up and certification readiness)

Week 17 COMPLETE

Students now have:

- Multiple full practice exam experiences
- Strong FAA content mastery
- High confidence and readiness
- Consistent passing-level performance

Week 18 – Day 1

Final Comprehensive Review – FAA Part 107 Domains

Standards

Standard	Description
201.00	Students will explain FAA Part 107 regulations and operational requirements governing small UAS operations.
203.00	Students will interpret aviation weather data and apply it to safe sUAS operations.
205.00	Students will interpret airport operations and apply right-of-way rules for safe integration into airspace.
206.00	Students will apply aeronautical decision-making (ADM) principles to assess risk and ensure safe operations.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).

Objective
Students will complete a final comprehensive review of all FAA Part 107 content areas in preparation for course completion.

Essential Question
What knowledge and skills must I demonstrate to successfully complete this course and pass the FAA Part 107 exam?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What topic do you feel strongest in?
- What topic still needs review?
- What is your goal for the final assessment?

Teacher will connect responses to final preparation.

Vocabulary

- **Comprehensive Review** – Review of all major content areas
- **Domain** – Category of FAA knowledge
- **Operational Knowledge** – Understanding of drone operation requirements
- **Test Preparedness** – Readiness for final assessment
- **Concept Integration** – Combining multiple knowledge areas

---

Materials

- Review packets
- Sectional charts
- METAR/TAF samples
- Student notebook or guided notes sheet

Instruction Content
This lesson reinforces all FAA Part 107 domains.

Core domains include:
- Regulations (Part 107 rules)
- Airspace classification
- Weather interpretation
- Loading and performance
- Aeronautical Decision-Making (ADM)

Comprehensive review includes:
- Key rules and limits
- Chart interpretation
- Weather decoding
- Scenario analysis
- Decision-making

Common errors to avoid:
- Misidentifying airspace
- Misreading weather data
- Forgetting key limitations
- Making unsafe decisions

Final preparation includes:
- Reviewing weak areas
- Practicing key concepts
- Reinforcing understanding
- Maintaining confidence

FAA relevance:
- All domains are tested
- Integration of knowledge is required

Teacher Emphasis
- Emphasize full content integration
- Reinforce key concepts and patterns
- Highlight common mistakes
- Encourage confidence
- Reinforce readiness

Activity Procedure
Activity: Comprehensive Review Stations
1. Students rotate through review stations including:
    - Airspace interpretation
      Weather decoding
      Regulation review
      Scenario analysis
2. Students complete review tasks at each station

3. Teacher will use the following Formative Assessment questions:
    - Which station was most challenging?
    - What concept needs more review?
    - How prepared do you feel?
4. Instructor provides targeted clarification

Flight Activity (Confidence & Consistency Operation)

1. Perform preflight check
2. Execute controlled flight
3. Maintain stability
4. Execute safe landing

Instructor emphasis: consistency

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Concept Understanding	Limited	Basic	Accurate	Comprehensive
Participation	Minimal	Limited	Active	Highly engaged
Scenario Application	Incorrect	Basic	Accurate	Detailed
Confidence Level	Low	Moderate	Confident	Highly confident

Assessment Items

1. What is a domain?
   A. Speed
   B. Category of knowledge
   C. Camera
   D. Color
2. What improves test success?
   A. Guessing
   B. Comprehensive review
   C. Ignoring
   D. Skipping
3. What is a common error?
   A. Studying
   B. Misinterpreting charts
   C. Planning
   D. Reviewing
4. What is required for success?
   A. Speed
   B. Integration of knowledge
   C. Camera
   D. Color

5. Scenario:
   A student struggles with multiple topics across domains.
   What strategy should they use?

Answer Key

1. B
2. B
3. B
4. B
5. Focus on comprehensive review and practice across all domains

---

Closure

- Reflect on readiness
- Identify final review needs
- Reinforce confidence

Teacher Notes

- Focus on weak areas
- Encourage final preparation
- Prepare students for final assessment

Week 18 – Day 2

FAA Part 107 Practice Exam #4 (Full Simulation)

Standards

Standard	Description
201.00	Students will explain FAA Part 107 regulations and operational requirements governing small UAS operations.
203.00	Students will interpret aviation weather data and apply it to safe sUAS operations.
205.00	Students will interpret airport operations and apply right-of-way rules for safe integration into airspace.
206.00	Students will apply aeronautical decision-making (ADM) principles to assess risk and ensure safe operations.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).

Objective
Students will complete a full-length FAA Part 107 practice exam to simulate real testing conditions and confirm readiness.

Essential Question
Can I demonstrate consistent success on a full FAA Part 107 practice exam?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What is your goal score today?
- What strategy will you use?
- What will you do if unsure of an answer?

Teacher will connect responses to test readiness.

Vocabulary

- **Full Simulation** – Practice under real test conditions
- **Consistency** – Reliable performance
- **Test Strategy** – Approach to answering questions
- **Confidence** – Belief in ability to succeed
- **Performance Goal** – Target score

Materials

- Full practice exam (60 questions)
- Sectional chart supplement
- Scratch paper
- Pencils

Instruction Content
This assessment simulates the full FAA Part 107 exam experience.

Exam expectations include:
- 60 multiple-choice questions
- Scenario-based analysis
- Airspace interpretation
- Weather decoding
- Regulation application

Testing conditions include:
- Timed environment
- Independent work
- Use of chart supplement

Performance expectations include:
- Passing score: 70% or higher
- Consistent application of knowledge
- Effective time management

Testing strategies include:
- Read each question carefully
- Eliminate incorrect answers
- Apply multiple concepts
- Stay focused

FAA relevance:
- Closely mirrors actual FAA exam
- Confirms readiness for certification

Teacher Emphasis
- Emphasize realistic testing conditions
- Reinforce strategy use
- Encourage confidence
- Maintain testing environment
- Reinforce professionalism

Activity Procedure
Activity: FAA Practice Exam #4 (Full Simulation)
1. Students complete a timed 60-question exam
2. Students work independently
3. Teacher will use the following Formative Assessment questions (post-exam):
    - Did you meet your goal score?
    - What improved?
    - Are you ready for the FAA exam?
4. Instructor reviews results and confirms readiness

Flight Activity (Optional – Time Permitting)

1. Perform preflight check
2. Execute controlled flight
3. Maintain stable operation
4. Execute safe landing

Instructor emphasis: maintaining proficiency

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Test Completion	Incomplete	Partial	Complete	Complete + reviewed
Accuracy	Below 60%	60–69%	70–85%	86%+
Concept Understanding	Limited	Basic	Accurate	Comprehensive
Test Strategy	Ineffective	Basic	Effective	Highly effective

Assessment Items – Practice Exam #4 (Sample Set)

1. What is the minimum passing score?
   A. 60%
   B. 65%
   C. 70%
2. What airspace requires authorization?
   A. Class G
   B. Class B
   C. None
3. What does a METAR provide?
   A. Forecast
   B. Current weather
   C. Speed
4. What must a pilot yield to?
   A. Other drones
   B. Manned aircraft
   C. Cars
5. What is a hazard?
   A. Safe condition
   B. Risk factor
   C. Planning
6. What is density altitude affected by?
   A. Color
   B. Temperature
   C. Speed

7. What must be maintained?
   A. Speed
   B. Visual line of sight
   C. Camera
8. What is required in controlled airspace?
   A. Nothing
   B. Authorization
   C. Camera
9. What is a waiver?
   A. Rule
   B. Permission to deviate
   C. Speed
10. What is ADM?
    A. Speed
    B. Decision-making process
    C. Camera

Answer Key

1. C
2. B
3. B
4. B
5. B
6. B
7. B
8. B
9. B
10. B

Closure

- Reflect on performance
- Confirm readiness
- Reinforce confidence

Teacher Notes

- Use results to finalize readiness
- Encourage students
- Prepare for final course wrap-up

Week 18 – Day 3

Final Review & Individual Remediation Plans

Standards

Standard	Description
201.00	Students will explain FAA Part 107 regulations and operational requirements governing small UAS operations.
203.00	Students will interpret aviation weather data and apply it to safe sUAS operations.
205.00	Students will interpret airport operations and apply right-of-way rules for safe integration into airspace.
206.00	Students will apply aeronautical decision-making (ADM) principles to assess risk and ensure safe operations.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).

Objective
Students will analyze final assessment results and develop individualized plans to address remaining knowledge gaps.

Essential Question
What specific steps must I take to ensure I am fully prepared to pass the FAA Part 107 exam?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What is your current score level?
- What area still needs improvement?
- What is your plan to improve it?

Teacher will connect responses to targeted improvement.

Vocabulary

- **Remediation Plan** – Strategy for improving weak areas
- **Targeted Review** – Focused study on specific topics
- **Performance Gap** – Difference between current and desired performance
- **Improvement Strategy** – Plan to increase understanding
- **Self-Assessment** – Evaluating personal performance

Materials

- Practice exam results
- Remediation planning worksheet
- Sectional charts
- METAR/TAF samples
- Student notebook or guided notes sheet

Instruction Content
Final preparation requires identifying and addressing individual weaknesses.

Remediation process includes:
1. Review assessment results
2. Identify weak areas
3. Determine causes of errors
4. Develop improvement strategies
5. Practice targeted concepts

Common focus areas include:
- Airspace interpretation
- Weather decoding
- Regulations
- Performance factors
- Scenario analysis

Effective strategies include:
- Reviewing notes
- Practicing FAA-style questions
- Using visual aids (charts, reports)
- Asking for clarification

Indicators of readiness include:
- Consistent passing scores
- Accurate scenario analysis
- Strong confidence

Teacher Emphasis
- Emphasize individualized improvement
- Reinforce responsibility for learning
- Encourage focused effort
- Support student confidence
- Connect preparation to success

Activity Procedure
Activity: Individual Remediation Planning
1. Students review final practice exam results
2. Students identify:
    - Weak areas
      Causes of errors
      Required improvement strategies
3. Students develop a written remediation plan including:
    - Topics to review
      Study strategies
      Practice goals

4. Teacher will use the following Formative Assessment questions:
    - What is your weakest area?
    - What caused your errors?
    - What is your plan to improve?
5. Instructor provides individualized guidance

Flight Activity (Optional – Skill Reinforcement)

1. Perform preflight check
2. Execute controlled flight
3. Maintain stability
4. Execute safe landing

Instructor emphasis: consistency

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Self-Assessment Accuracy	Incorrect	Partial	Accurate	Highly accurate
Plan Development	Incomplete	Basic	Clear	Detailed
Strategy Effectiveness	Ineffective	Basic	Effective	Highly effective
Engagement	Minimal	Limited	Active	Highly engaged

Assessment Items

1. What is a remediation plan?
   A. Ignore mistakes
   B. Plan to improve
   C. Skip test
   D. Guess
2. What is a performance gap?
   A. Strong area
   B. Weak area
   C. Perfect score
   D. Speed
3. What improves performance?
   A. Ignoring
   B. Targeted review
   C. Guessing
   D. Skipping
4. What is self-assessment?
   A. Testing others
   B. Evaluating yourself
   C. Ignoring
   D. Planning

5. Scenario:
   A student struggles with weather interpretation.
   What should their remediation plan include?

Answer Key

1. B
2. B
3. B
4. B
5. Focused practice on METAR/TAF and weather concepts

Closure

- Reflect on improvement plans
- Ask students if they feel prepared
- Reinforce final preparation

Teacher Notes

- Provide individualized support
- Encourage final review
- Prepare for course completion

Week 18 – Day 4

Course Completion & FAA Certification Readiness

Standards

Standard	Description
201.00	Students will explain FAA Part 107 regulations and operational requirements governing small UAS operations.
203.00	Students will interpret aviation weather data and apply it to safe sUAS operations.
205.00	Students will interpret airport operations and apply right-of-way rules for safe integration into airspace.
206.00	Students will apply aeronautical decision-making (ADM) principles to assess risk and ensure safe operations.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).

Objective
Students will finalize preparation for the FAA Part 107 certification process and demonstrate readiness for testing and real-world drone operations.

Essential Question
What steps must I take to successfully obtain my FAA Part 107 Remote Pilot Certificate?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What is your plan after completing this course?
- When will you take the FAA test?
- What steps are required after passing the test?

Teacher will connect responses to certification readiness.

Vocabulary

- **IACRA** – FAA system for certification application
- **Knowledge Test** – FAA written exam
- **TSA Vetting** – Background check required for certification
- **Temporary Certificate** – Issued after passing test
- **Permanent Certificate** – Official FAA certification

Materials

- Certification process guide
- IACRA instructions
- Testing center information
- Student notebook or guided notes sheet

Instruction Content
Students must follow specific steps to obtain FAA Part 107 certification.

Certification process includes:
1. Create IACRA account
2. Schedule FAA knowledge test
3. Pass test with 70% or higher
4. Complete FAA Form 8710-13
5. Pass TSA background check
6. Receive temporary certificate
7. Receive permanent certificate

Testing preparation includes:
- Scheduling exam
- Bringing required identification
- Using test strategies
- Managing time

Post-certification responsibilities include:
- Following all FAA regulations
- Maintaining currency
- Completing recurrent training

Professional expectations include:
- Operating safely
- Maintaining compliance
- Continuing education

FAA relevance:
- Students must understand certification process
- Knowledge supports transition to real-world operations

Teacher Emphasis
- Emphasize importance of certification steps
- Reinforce legal requirements
- Encourage students to schedule test
- Highlight professional responsibility
- Reinforce confidence

Activity Procedure
Activity: Certification Planning & Readiness Checklist
1. Students review certification steps
2. Students create a personal plan including:
    - Test scheduling timeline
      Study plan
      Required steps after passing

3. Teacher will use the following Formative Assessment questions:
    - What is your next step?
    - When will you test?
    - What do you need to complete?
4. Instructor reviews plans and provides guidance

Flight Activity (Professional Operation Simulation)

1. Perform full preflight inspection
2. Evaluate environment
3. Apply all regulations
4. Execute controlled flight
5. Maintain safe operation
6. Execute safe landing

Instructor emphasis: professional-level operation

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Certification Understanding	Limited	Basic	Accurate	Comprehensive
Planning	Incomplete	Basic	Clear	Detailed
Readiness	Low	Moderate	Ready	Highly prepared
Professional Awareness	Limited	Basic	Accurate	Strong understanding

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Assessment Items

1. What is IACRA?
   A. Weather system
   B. FAA certification system
   C. Drone type
   D. Camera

2. What is the passing score?
   A. 60%
   B. 65%
   C. 70%
   D. 75%

3. What is TSA vetting?
   A. Flight test
   B. Background check
   C. Weather check
   D. Inspection

4. What is required after passing the test?
   A. Nothing
   B. Application completion
   C. Flying
   D. Camera

5. Scenario:
   A student passes the FAA test but does not complete IACRA.
   Can they operate commercially? Why or why not?

Answer Key

1. B
2. C
3. B
4. B
5. No; certification process must be completed

Closure

- Review certification steps
- Ask students if they are ready
- Reinforce next steps

Teacher Notes

- Encourage immediate action
- Provide testing resources
- Prepare for final course closure

Week 18 – Day 5

Course Wrap-Up, Final Reflection, and Program Completion

Standards

Standard	Description
201.00	Students will explain FAA Part 107 regulations and operational requirements governing small UAS operations.
203.00	Students will interpret aviation weather data and apply it to safe sUAS operations.
205.00	Students will interpret airport operations and apply right-of-way rules for safe integration into airspace.
206.00	Students will apply aeronautical decision-making (ADM) principles to assess risk and ensure safe operations.
209.00	Students will apply safe flight practices while maintaining situational awareness and visual line of sight (VLOS).

Objective
Students will reflect on their learning, demonstrate course completion readiness, and finalize their transition toward FAA certification and real-world drone operations.

Essential Question
How has this course prepared me to operate drones safely and successfully pursue FAA certification?

Bellringer / Warm-Up (5–7 minutes)
Students respond in writing:

- What is the most important thing you learned?
- What skill improved the most?
- How will you use this knowledge in the future?

Teacher will connect responses to course outcomes.

Vocabulary

- **Reflection** – Reviewing personal learning and growth
- **Skill Development** – Improvement of abilities
- **Certification Readiness** – Preparedness for FAA testing
- **Professional Responsibility** – Accountability in operations
- **Operational Confidence** – Ability to perform safely

Materials

- Reflection worksheet
- Course completion checklist
- Student notebook or guided notes sheet

Instruction Content
This lesson concludes the course and reinforces student readiness.

Course outcomes include:
- Understanding FAA Part 107 regulations
- Interpreting airspace and weather
- Evaluating performance factors
- Applying Aeronautical Decision-Making (ADM)
- Demonstrating safe drone operation

Student growth includes:
- Increased knowledge
- Improved decision-making
- Enhanced confidence
- Professional awareness

Next steps include:
- Scheduling FAA test
- Continuing practice
- Applying knowledge in real-world situations

Professional expectations include:
- Safe operation
- Regulatory compliance
- Continued learning

Teacher Emphasis
- Emphasize student growth and achievement
- Reinforce readiness for certification
- Encourage continued learning
- Highlight professional responsibility
- Celebrate completion

Activity Procedure
Activity: Final Reflection & Course Completion
1. Students complete a written reflection including:
    - Key knowledge gained
      Skills developed
      Areas of confidence
      Next steps
2. Students complete course completion checklist
3. Teacher will use the following Formative Assessment questions:
    - What are you most proud of?
    - What is your next goal?
    - How prepared do you feel?
4. Instructor facilitates final discussion and recognition

Flight Activity (Final Demonstration – Optional)

1. Perform full preflight inspection
2. Execute controlled flight
3. Demonstrate stable operation
4. Execute safe landing

Instructor emphasis: confidence and professionalism

Performance Rubric

Criteria	1 - Beginning	2 - Developing	3 - Proficient	4 - Advanced
Reflection Quality	Limited	Basic	Thoughtful	Insightful
Participation	Minimal	Limited	Active	Highly engaged
Readiness	Low	Moderate	Ready	Highly prepared
Professional Awareness	Limited	Basic	Accurate	Strong understanding

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Assessment Items

1. What is reflection?
   A. Ignoring
   B. Reviewing learning
   C. Testing
   D. Flying
2. What is certification readiness?
   A. Not prepared
   B. Prepared for FAA test
   C. Flying
   D. Camera
3. What is professional responsibility?
   A. Ignoring rules
   B. Following rules
   C. Speed
   D. Color
4. What is the next step?
   A. Stop learning
   B. Schedule FAA test
   C. Ignore
   D. Quit
5. Scenario:
   A student completes the course but does not apply their knowledge.
   What is missing and what should they do?

Answer Key

1. B
2. B
3. B
4. B
5. Application of knowledge; continue practicing and pursue certification

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Closure

- Celebrate course completion
- Reinforce student success
- Encourage next steps

Teacher Notes

- Recognize student achievement
- Encourage certification follow-through
- Provide continued support resources