

Southern York County School District Instructional Plan

STEAM8

Grade 8

Textbook(s)/Instructional Materials Used: droneology - online course designed by edventures.com

Dates: 9 weeks (45 days)

Unit Plan: Droneology

Stage 1 – Desired Results

PA Standard(s)/Assessment Anchors Addressed:

- 3.4.8 B3. Explain how throughout history, new **technologies** have resulted from the demands, values, and interests of individuals, businesses, industries, and societies.
- 3.4.8.C1. Evaluate the criteria and constraints of a design.

Understanding(s):

Students will understand

1. The components of a drone that make flight possible.

Essential Question(s):

- What are the components of a drone?

Learning Objectives:

Students will know...

- The parts of a drone and their functions.

Students will be able to:

- Identify the parts of a drone and explain the function they perform.

Dates: Day 1 and 2

Unit Plan:

Register each student in the online course, "Droneology."

Watch the introduction videos in section 1-1.

Complete the drone resource page while viewing the "Components of a Drone" video

View the "Drone History" video and complete an exit ticket describing three drone facts learned.

Stage 1 – Desired Results

PA Standard(S)/Assessment Anchors Addressed:

- 3.4.8.A2. Explain how controls are steps that people perform using information about the **system** that causes **systems** to change.
- 3.4.8.B4. Explain how societal and cultural priorities and values are reflected in technological devices.
- 3.4.8.C1. Evaluate the criteria and constraints of a design.

Understanding(s):

Students will understand

1. How to assemble the parts of a drone.
2. The laws governing the use of drones.
3. The difference between a recreational and commercial pilot.

Essential Question(s):

- How do I assemble a drone?
- What laws must be followed to legally fly drones?
- Are the requirements different for a commercial pilot?

Learning Objectives:

Students will know...

- How to connect the components of the drone to the flight controller.
- How to safely operate their drone within the limits of the law.

Students will be able to:

- Fully assemble the RubiQ drone.
- Demonstrate an understanding of the laws governing the use of drones.
- Demonstrate knowledge of the commercial pilot license requirements.

<ul style="list-style-type: none"> The difference between a commercial and recreational pilot. 	
<p>Dates: Days 3 through 13</p>	<p>Unit Plan:</p> <p>Students will follow the steps in the Flight Manual to build the drone over the next 10 days. Students will work with a partner to complete each build step.</p> <p>During the build students will be independently working to complete sections 1-1 through 2-3 in Droneology.</p> <p>Students will complete the proficiency quizzes for section 1 and 2:</p> <p>1-1 Introduction to Drones Quiz</p> <p>1-2 Essential Knowledge Quiz</p> <p>1-4 Laws, Regs, and Groups Quiz</p> <p>2-1 Basic Piloting</p> <p>2-3 Ethical Operations</p>
<p>Stage 1 – Desired Results</p>	
<p>PA Standard(S)/Assessment Anchors Addressed:</p> <ul style="list-style-type: none"> 3.4.8.E5. Describe how government regulations influence the design, operation and efficiency of transportation systems. 3.4.8.B3. Explain how throughout history, new technologies have resulted from the demands, values, and interests of individuals, businesses, industries, and societies. 	
<p>Understanding(s): Students will understand...</p> <ol style="list-style-type: none"> How to obtain a pilot’s license from the FAA. The regulations established by the FAA controlling drone use. 	<p>Essential Question(s):</p> <ul style="list-style-type: none"> What are the requirements to obtain a license from the FAA? What are the limitations on flying recreational drones?
<p>Learning Objectives: Students will know . . .</p> <ul style="list-style-type: none"> How to obtain a pilot’s license from the FAA. How to safely and legally operate recreational drones. 	<p>Students will be able to:</p> <ul style="list-style-type: none"> Describe the requirements needed to obtain a pilot’s license from the FAA. Explain how to obtain a license from the FAA. Describe the regulations restricting recreational drone use.
<p>Dates: Days 14 and 15</p>	<p>Unit Plan:</p> <p>Students will use the FAA website to complete the resource page, “FAA Requirements for Drone Pilots.”</p> <p>Then students will choose a stance on drone use in State Parks. They will use reputable internet source to find evidence to support their stance.</p> <p>The conclusion of Day 15 will include students sharing their view points. Students will debate in small groups their side of the topic.</p>
<p>Stage 1 – Desired Results</p>	

PA Standard(S)/Assessment Anchors Addressed: <ul style="list-style-type: none"> 3.4.8.D2 Operate and maintain systems in order to achieve a given purpose. 	
Understanding(s): <i>Students will understand . . .</i> <ol style="list-style-type: none"> The basic operation of a drone. How to practice operating a drone in a flight simulator. 	Essential Question(s): <ul style="list-style-type: none"> What is the function of each control on my transmitter? How do I fly drones?
Learning Objectives: <i>Students will know . . .</i> <ul style="list-style-type: none"> How to pilot a drone. Flight safety procedures. 	Students will be able to: <ul style="list-style-type: none"> Pilot a drone in different settings such as a park, field, or urban setting on a flight simulator.
Dates: Days 16 through 26	Unit Plan: <p>Students will use the Freerider flight simulator over the next 10 days of class. After adjusting the settings to match their transmitters, students will begin to work at mastering skills. The skills are outlined on this document: Flight Simulator Benchmarks</p> <p>During the simulation days students also complete section 3-1 through 3-4 in Droneology.</p> <p>Students will complete the proficiency quizzes for section 3:</p> <p>3-1 Drone Futures..</p> <p>3-2 Fright Safety - Buckle Up!</p>
Stage 1 – Desired Results	
PA Standard(S)/Assessment Anchors Addressed: <ul style="list-style-type: none"> 3.4.8.A1. Analyze the development of technology based on affordability or urgency. 3.4.8.A3. Compare how a product, system, or environment developed for one setting may be applied to another setting. 3.4.8.B2. Compare and contrast decisions to develop and use technologies as related to environmental and economic concerns. 3.4.8.D2 Operate and maintain systems in order to achieve a given purpose. 3.4.8.D3. Interpret and evaluate the accuracy of the information obtained and determine its usefulness. 	
Understanding(s): <i>Students will understand . . .</i> <ol style="list-style-type: none"> How to operate a drone. How drones are applied to different settings. How drones impact the environment. How to evaluate sources of information. 	Essential Question(s): <ul style="list-style-type: none"> How do I fly a drone? What careers use drones? How are drones used to improve our environment?
Learning Objectives: <i>Students will know . . .</i> <ul style="list-style-type: none"> How to pilot a drone. How drones are used in different careers. How drones are used in environmental applications. 	Students will be able to: <ul style="list-style-type: none"> Pilot an indoor BetaFPV drone. Investigate careers that use drones. Explain the impact drone use has on the environment.
Dates: Days 27 through 39	Unit Plan:

	<p>Students will practice their skills flying indoor BetaFPV drones for 12 days. During these 12 days students will practice the following skills:</p> <ul style="list-style-type: none"> - Take off and landing - Flying in a circle around a vertical gate - Flying in an oval around 2 vertical gates - Flying in a figure 8 around 2 vertical gates <p>These skills will be completed both line of sight and with the use of FPV goggles.</p> <p>In addition to practicing flying, students will work on completing a career project each day. The project is due at the end of the 12 days. Career Project</p> <p>The career projects will be shared in small groups on day 12.</p> <p>Students will also be assigned the completion of article assignments to investigate the use of drones:</p> <p>Agricultural Use</p> <p>Emergency Response Use</p> <p>Pandemic Response Use</p> <p>Forest Fire Control</p> <p>These article assignments will be completed when students do not have access to a drone for flight practice.</p> <p>On day 11, students will complete an emergency response mission with their drone. Teams of students will take turns flying their drone over a simulated emergency scene. Students will use the FPV camera to identify the location of a simulated hazardous leak.</p>
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Stage 1 – Desired Results

PA Standard(S)/Assessment Anchors Addressed:

- 3.4.8.D2 Operate and maintain systems in order to achieve a given purpose.

<p>Understanding(s): <i>Students will understand . . .</i></p> <p>1. How to pilot a racing FPV drone that they assembled.</p>	<p>Essential Question(s)</p> <ul style="list-style-type: none"> ● How do I safely pilot a racing drone?
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<p>Learning Objectives: <i>Students will know . . .</i></p> <ul style="list-style-type: none"> ● How to set up a safe flying zone. ● How to complete a pre-flight check list ● How to safely pilot the racing FPV drone. ● How to complete a post-flight checklist. 	<p>Students will be able to:</p> <ul style="list-style-type: none"> ● Set up a safe flying zone. ● Complete a pre-flight check list ● Safely pilot the racing FPV drone. ● Complete a post-flight checklist.
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<p>Dates: Days 40 through 45</p>	<p>Unit Plan:</p> <p>The final five days will be spent flying the RubiQ drones the students assembled. Students will</p>
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practice the flight safety procedures they learned. Each day students will complete the following tasks:

Setup a safe flyzone with an established Safety Line, Pilot Line 15 ft away, and Spectator Line 25 ft away.

Perform a pre-flight checklist.

Fly the RubIQ drone linked to the instructor.

Perform a post-flight checklist.