Lesson Plan 2: Pilots

Title: Pilots, Wings, and Flying Things!

Aerospace Workforce Educator Program lessons are designed to help students build the foundational skills needed for aviation careers while gaining early awareness of the many professions that support our aviation system. Each lesson introduces core concepts—such as navigation, communication, safety, design, or problem-solving—and connects them directly to the real work of pilots, air traffic controllers, drone operators, maintenance technicians, airport specialists, and other aviation professionals. By making these connections visible and age-appropriate, educators can help students see how classroom learning links to real careers and inspires interest in fields they may not yet know exist.

Grade Level: Varies
Primary STEM Skill Focus Area: Engineering-Design Thinking
NextGen Science Standard: 3-5-ETS1 Engineering Design

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1. Lesson Objectives

Students will be able to:

- Identify different types of pilots that work in aviation, aerospace, and other industries
- Define which skills and training are needed to become a pilot
- Identify the various jobs pilots perform and the solutions they provide

2. Overview

This lesson introduces students to various pilot careers and the solutions they provide. The lesson will review the different types of training and skill requirements for pilots, the types of aircraft they fly, and the different work they perform.

The presenter, an Educator, will engage the students in a two-way discussion on the topics listed above. The Educator will ask the students what kinds of solutions pilots provide, what skills are needed to become a pilot, and why pilot careers are important to local communities and the nation.

3. Resources

This section includes resources for the Educator to review in preparation for delivering the lesson. These tables are intended to provide pertinent background information. Table 1 includes a list of basic terms to know. Table 2 lists the possible resources that can be shared with the students as part of the lesson.

Educators should review the resources and links in advance of the lessons to ensure the content aligns with school policies and security protocols before presenting it to students.

Table 1. Terms to Know

Term	Definition
Agriculture	The science or practice of farming.
Airline	An organization providing a regular public service of air transportation on one or more routes.
Astronaut	A person trained, equipped, and deployed by a human spaceflight program to serve as a commander or crew member aboard a spacecraft.
Drone	An aircraft without a human pilot on board.
Pilot	A person who operates the aircraft.
FAA	Federal Aviation Administration

Table 2. Potential Materials for Use During the Lesson

Title	Length	Source	Platform	Description
1. This Pilot Teaches Children How to Fly	2:49	Smithsonian	YouTube	Pilot Robin Petgrave believes that kids who can handle aircraft and helicopters will be better equipped to handle life.
2. Before He Was an Astronaut, Victor Glover Was Stocking Shelves at 7-Eleven – My Path	3:44	Smithsonian	YouTube	Today he is an astronaut, engineer, and pilot, but his early days started with some quite common jobs.
3. The Four Forces of Flight (How Things Fly Demonstration) - YouTube	5:02	Smithsonian	YouTube	Annie, an Explainer at the Air & Space Museum, teaches us about the four forces of flight.
4. An Empowered Couple Empowering Kids	2:34	EAA	YouTube	EAA's Young Eagles program helped this young couple pay it forward.

4. Activate Prior Knowledge (5 minutes)

The questions below are suggested prompts to introduce the lesson. Educators should modify these questions to align with their audience, community, and personal experiences.

- Today, we will be talking about **pilots**. What are the different jobs pilots can have?
  - *[Pilots can work for the military, airlines, businesses, hospitals, transportation companies, sports organizations, and much more!]*
- Does anyone know a pilot? What kind of pilot are they?
- Have you seen a plane or a helicopter recently? What was it doing?
- Can you think of some reasons why pilots and aircraft are important?
  - *[Pilots and aircraft are so important because they solve all kinds of different problems for our communities]*
  - *[Pilots help get us the clothes and accessories we have, they help study our environment, and they help us get from place to place]*
- What would happen if we had no pilots or aircraft?
  - *[Many of our daily tasks and jobs would be much harder]*
  - *[Going to another country could take much longer]*
  - *[Large farms would not be able to produce as much]*
- What kind of training do you think you need to become a pilot?
  - *[Attend flight school]*
  - *[Complete flight and written exams]*
  - *[Obtain flying hours]*

5. Instructional Sections

The lesson sections listed below provide talking points to help Educators deliver a consistent message about pilots and the solutions they provide.

Educators should modify these sections and adjust the suggested timing to align the content with their audience, community, and their own experiences.

5.1 Types of Pilots and Where They Work (10 minutes)

- Pilots fly different aircraft and carry out different jobs and responsibilities with the help of their aircraft
- Here are some types of pilots [select 3 to 5 to highlight, based on students' interests, knowledge, local community]

Table 3. Types of Pilots

Type / Job	Where they work
1. Agricultural Pilot	Farms
2. Airline Pilot	Airlines
3. Astronaut	Companies that bring people and things into space
4. Drone Pilot	Private companies, power companies, fire and police departments, scientists, and many more
5. Flight Instructor	Airports and colleges that teach flying
6. Helicopter Pilot	Police, fire departments, sightseeing businesses, and even radio and TV stations
7. Military Pilot	Navy, Air Force, Marines, Coast Guard, and the Army
8. Seaplane Pilot	Businesses that want to be able to fly people or supplies to remote places

- **Agriculture pilots** help farmers keep their crops healthy and safe
- **Airline pilots** provide transportation for people across the world
- **Astronauts** are pilots who are trained to travel in spacecraft for research and exploration
- **Drone pilots** do a lot of different things, including helping the military, working with films and TV stations, and helping the environment
- **Flight instructors** help teach people how to fly aircraft safely
- **Helicopter pilots** help many businesses and industries, including TV reporting, transportation, and emergency services
- **Military pilots** help keep our country safe and also help with research and surveying
- **Seaplane pilots** often fly in remote areas, like areas with a lot of open water

Suggested Visual and Videos:
Show slides with photos of the different types of pilots and their aircraft
Show sample My Path Videos:

- *Before He Was an Astronaut, Victor Glover Was Stocking Shelves at 7-Eleven [3 min 44 sec]*

5.2 Pilots and Their Machines! (5 minutes)

- Agricultural aircraft
  - Agricultural aircraft are an important part of the farming industry
  - They control pests, increase crop production, and provide water
  - Originally, agricultural aircraft used dry chemicals to treat crops, which is how they earned the name "crop dusters."
- Airliner
  - Airline aircraft are used to transport people and things
  - If you want to go visit your family in other parts of the world, you hop on an airliner to get there
  - Airliners also help you get some of the everyday things you need like clothes and food
- Spacecraft
  - A spacecraft is a vehicle or machine designed to fly in outer space
  - Spacecraft have a lot of different uses, including tracking the Earth, science and exploration, researching, and travel
  - When we want to know what's out there, spacecraft help us navigate and investigate
  - Spacecraft can take the form of satellites, space stations, rockets, and much more
- Drones
  - Drone pilots fly aircraft without a human pilot on board, they are called UAV (Unmanned Aircraft Vehicles)
  - Drones can be as large as an aircraft or small enough to fit in your pocket
  - Drones have lots of different uses, including delivering packages or putting out fires
- Training aircraft
  - Training aircraft are important because they are made to ensure safety and instruction
  - Training aircraft are used for all kinds of pilots, including airline pilots and military pilots
  - Training aircraft have special equipment that make them great tools for newer pilots
- Helicopters
  - Helicopters take on all different shapes and sizes and have lots of different functions

    - Helicopters can do things that planes cannot because they fly straight up and down
    - Helicopters are used for many things, including reporting traffic or rescuing people
- Military aircraft
    - Military aircraft can be drones, aircraft, or helicopters, and are used for different things
    - Some military aircraft are used to gather information or research
    - All military aircraft are used to help keep us safe
- Seaplane
    - Seaplanes are aircraft with features that allow them to take off and land in the water
    - Seaplanes are used to transport people and things to remote areas
    - Seaplanes are a great example of how aircraft technology can help provide solutions

Suggested Visual:
Show slides with photos of the different types of aircraft solving different problems

5.3 How to Become a Pilot (10 minutes)

What you need to know

- Pilots need to take lessons with an instructor to learn how to safely operate aircraft
- Pilots sometimes train in a flight simulator
    - Flight simulators help pilots get practice skills safely
    - Flight simulators give pilots a feel for what it is like to fly in all kinds of conditions
- The best pilots never stop learning
    - Practicing flying skills, learning new rules, and using cool technologies always keep the pilots learning
- As a pilot, you want to be aware of everything that is happening around you to be safe
    - This could mean learning about a new instrument in the aircraft

Optional Pilots & Aircraft Fun Facts:
Show slides with photo

1. Pilots and co-pilots do not eat the same meals in case one of them gets sick
2. You can be a pilot even if you have vision issues if you have the right glasses
3. Your taste buds don't work well on planes because of how high up in the air you are
4. To be a pilot, you need a good understanding of math including geometry, physics, algebra, and arithmetic

What skills and abilities are required?

- Let's talk about what skills you need to become a pilot
- The table below lists key skills [Select two to three to discuss with the classroom, based on student interest or teacher recommendation]

Table 4. Skills and Abilities used by Pilots

Skill / Ability	Details	Examples
1. Communication	Pilots need to talk with people on the ground and with their crew	• Pilots talk to air traffic controllers to know when they should take off or land • Pilots need to know where other aircraft are flying nearby • Pilots share important information like weather with air traffic controllers
2. Thinking & Reasoning	Pilots need to understand the instruments and data in their aircraft and use this information to be safe	• Having and understanding information helps pilots react to changing conditions around them • Pilots use lots of information to increase safety • This understanding of information helps pilots make important decisions on whether it is safe to fly
3. Math	Pilots need to have good math skills to figure out fuel use, the weight of their aircraft, and timing	• Pilots get a lot of numbers and information before they fly • Pilots must be able to understand the importance of the information they get • Pilots use math to make their decisions, for example, how much fuel they will need to get to where they are going
4. Attention to Detail	Pilots need to pay attention to things around them	• Pilots need to decide how to use information to be safe • Pilots must pay attention to what their aircraft is doing before, during, and after their flight • Pilots must always learn about this information and pass it on to others so we can all learn to fly safely
5. Teamwork and Patience	Piloting an aircraft takes a lot of focus, so it is important to work together	• Pilots often rely on their crew and support on the ground, and they need to work together with everyone

Suggested Videos:

- Weather Technology in the Cockpit [2 min 22 sec]

How the FAA helps keep pilots safe

- The Federal Aviation Administration is abbreviated as FAA
- The FAA makes sure pilots get the proper training and instruction they need to succeed

- Safety is the number one priority of the FAA
- The FAA creates rules and guidelines for all kinds of pilots and aircraft to make sure they, their passengers, and their communities are safe
- The FAA makes sure pilots know how to fly each type of aircraft safely
- FAA issues pilot licenses, controls air traffic, enforces safety rules, and makes sure pilots have the information they need to have a safe flight
- The FAA makes sure the aircraft, helicopters, drones, and rockets are safe

5.4 Pilots Help Solve Problems (10 minutes)

- Pilots and the aircraft they fly are important to their communities because they support many things we do
- A few ways pilots make life easier:
    - Transporting people and things
    - Helping farmers keep their plants healthy
    - Helping us understand weather and help firefighters put out forest fires
    - Flying people to and from space
    - Protecting our country
    - Tracking or watching wildlife
    - Taking photos of things on the ground
    - Teaching others to fly
    - Capturing cool videos for TV, sports, or movies

5.5 Activity (15 minutes)

The table below includes sample activities that can be used as part of the lesson. Please select one or two, depending on the time available:

Table 5. Sample Activities

Activity	Objectives	Educator Actions	Student Actions	Closing
Which pilot will solve that problem?	Identify the best pilot and aircraft for specific problems Compare /contrast solutions	List a few problems such as: ○ Saving people *[A: Helicopter, Medevac]* ○ Protecting our country *[A: Military]* ○ Exploring the environment *[A: Agriculture, weather]* ○ Growing food and protecting crops *[A: Agricultural pilot]* ○ Helping people travel safely *[A: Airliner, Airline Pilot]*	Investigate and identify the best pilot and aircraft to address each problem	Ask the students to explain why a skilled pilot and the right aircraft would be important for different situations

Activity	Objectives	Educator Actions	Student Actions	Closing
Which pilot am I?	Match a pilot to an aircraft and a day on the job	Pretend to be one of the types of pilots by giving the class clues related to: ○ The aircraft you fly ○ The job you have ○ The solution you provide	Guess which pilot is being depicted Explain why that pilot and aircraft are the best fit	Compare different pilots, aircraft used, and situations to explain why some fit and others do not

6. What Did You Learn? (5 minutes)

For closing and wrap-up, ask your students the following questions:

- What are 3 problems that pilots help solve?
- What was your favorite problem that a pilot helps solve?
- What type of aircraft would you like to pilot, and what would you have to learn to fly it?
- Which pilot career would interest you the most, and why?

Suggested Game:
10 question knowledge check game

7. Extension Activities

- Have the students draw the type of aircraft they would want to pilot.
- Ask the students to interview a pilot they know.
- Watch a video about certain pilot careers and capture 2-3 important parts of their job.

8. Supplies

- Access to the Internet to view and share videos and slides on screen
- 3 or 4 small model aircraft or pictures of different types of aircraft (Jet, Airline, Drone, etc.)
- 3 or 4 pilot uniform or pictures of different kinds of pilot gear
- 5 or 6 pictures of unique pilots
- 8.5 x 11 blank paper sheet (enough for the whole class)
- 20-30 different colored markers (enough for the whole class)
- Spark sheet (PDF) for students to have as a reference