Aerospace/Aeronautical Engineering: K.I.2

Build a paper airplane

Grade Level
K

Sessions
Part 1: 30 min
Part 2: 30 min

Seasonality
Anytime

Instructional Mode(s)
Individual projects following instructions as a class

Team Size
Individual

WPS Benchmarks
0K.SC.IS.01
0K.SC.IS.02
0K.SC.IS.03
0K.SC.IS.06
0K.SC.TE.01

MA Frameworks
K-2.ES.2
K-2.TE.2.0
K-2.TE.1.1
K-2.TE.1.2
K-2.TE.1.3

Key Words
Aeronautical Engineer, Airplane, Wings

Summary
In this lesson, students will become Aeronautical Engineers as they design their own paper airplanes. Instructors will discuss flying and airplanes with the students, as well as the important parts of an airplane (e.g. wings, wheels, engine, etc.). Students will then be given a template with dotted lines showing where to fold their papers to create their paper airplanes. Students will then fly their airplanes and see whose airplane travels the farthest.

Learning Objectives
2002 Worcester Public Schools (WPS) Benchmarks for Kindergarten

0K.SC.IS.01: Ask questions about objects, organisms, and events in the environment.
0K.SC.IS.02: Tell about why and what would happen if?
0K.SC.IS.03: Make predictions based on observed patterns.
0K.SC.IS.06: Discuss observations with others.
0K.SC.TE.01: Identify and describe the characteristics of natural materials (e.g., wood, cotton, fur, wool) and human-made materials (e.g., plastic, Styrofoam).

2001 Massachusetts Science and Technology/Engineering Curriculum Framework
K-2.ES.2: Understand that air is a mixture of gases that is all around us and that wind is moving air.
K-2.TE.2.0: Engineering Design.
K-2.TE.1.1: Identify and describe characteristics of natural materials (e.g., wood, cotton, fur, wool) and human-made materials (e.g., plastic, Styrofoam).
K-2.TE.1.2: Identify and explain some possible uses for natural materials (e.g., wood, cotton, fur, wool) and human-made materials (e.g., plastic, Styrofoam).
K-2.TE.1.3: Identify and describe the safe and proper use of tools and materials (e.g., glue, scissors, tape, ruler, paper, toothpicks, straws, spools) to construct simple structures.

Additional Learning Objectives
1. Understand the functions of an Aeronautical Engineer
2. Understand the important parts of an airplane (e.g. wing, wheels, etc.)

Required Background Knowledge
None

Essential Questions
1. What does an Aeronautical Engineer do?
2. What parts of an airplane help us fly?
3. Why do we need to be careful when designing our airplane?

Introduction / Motivation
The instructor should ask the students if they have ever been on an airplane before and what it felt like when they were flying. They should then discuss flying with the students and discuss what parts of an airplane help it to fly.

Procedure

Part I – 30 Minutes
The instructor will:
1. Discuss the concept of flying with the students and ask them if any of them has ever been in an airplane before.
2. Discuss the important parts of an airplane (e.g. wings, wheels, engine).
3. Send students to their desks and hand out the paper airplane template (attached to lesson plan).
4. Have the students decorate their papers, drawing in the windows on the plane and the cockpit windows.
5. Show the students how to fold their paper airplanes along the dotted lines.
6. Once students have completed their airplanes, find an area with enough space to fly the airplanes.
7. Have a competition to see whose airplane will fly the farthest.

**Materials List**

<table>
<thead>
<tr>
<th>Materials per student</th>
<th>Amount</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paper Airplane Template</td>
<td>One per student</td>
<td>Attached to lesson</td>
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</tbody>
</table>

**Vocabulary with Definitions**

1. **Aeronautical Engineer** – Someone who designs and builds airplanes.
2. **Airplane** – A vehicle designed to fly passengers through the air.
3. **Wings** – The parts of an airplane which allow the plane to fly and change directions.

**Assessment / Evaluation of Students**

The instructor may assess the students in any/all of the following manners:

1. Observe prototypes: ensure that the students have completed their paper airplanes correctly.
2. Ask students to explain the importance of each part of their airplanes.
3. Ask students the role of Aeronautical Engineers.

**Lesson Extensions**

The instructor might use this lesson as part of a more general discussion of space and the planets. The instructor might also choose to use this lesson as part of a larger unit on flying or birds. If there is a school vacation coming up, the instructor might consider...
asking the students if they are going on an airplane for their vacation and ask them to make observations to tell the class when they come back.

**Attachments**

1. “Paper Airplane Template”

**Troubleshooting Tips**

The instructor should be sure that students have enough room to fly their planes without hitting any objects or people in the room.

**Safety Issues**

Students should not throw their airplanes at one another or at any objects in the classroom.

**Additional Resources**

None

**Key Words**

Aeronautical Engineer, Airplane, Wings

**Directions for Airplane Template**

- Straight line = Fold in towards center
- Dotted line = Fold out away from center
- Triple line = Fold on line and then unfold again, leaving crease