Aerospace Engineering

Day 4

Lesson Overview

This lesson introduces students to Aerospace Engineering, focusing on core principles like (lift), dihedrals, and center of gravity. Students will also engage in a hands-on activity where they construct a balsa wood glider and apply the concepts they've learned about flight and stability.

Lesson Objectives

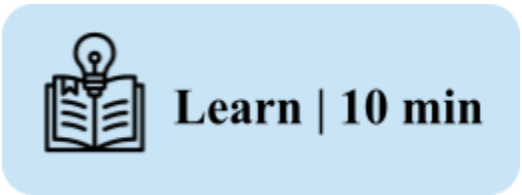
By the end of this lesson, students will be able to:

- Explain what aerospace engineers do and provide real-world examples.
- Understand why airplane wings are shaped the way they are, including the role of Bernoulli's principle in generating lift.
- Describe how dihedrals and center of gravity (CG) affect an aircraft's stability and flight.

Vocabulary

1. **Bernoulli's Principle / Lift**: Bernoulli's principle explains that as the speed of a fluid (air) increases, its pressure decreases, creating lift as air moves faster over the top of a plane's wing than below it.
2. **Dihedral**: The upward angle of an aircraft's wings relative to the horizontal, helping with stability and roll control.
3. **Center of Gravity (CG)**: The point where the mass of the object is evenly distributed. In aircraft, the CG is critical for maintaining stability and controlling flight.

Lesson Plan

AEROSPACE ENGINEERING PRESENTATION 	**Objective**: Introduce students to the field of Aerospace Engineering and key principles that they will apply in the hands-on activity. **Materials**: PowerPoint Presentation ("Day 4 - Aerospace Engineering.pptx")

	Topics covered: What aerospace engineers do, Bernoulli's principle and lift, dihedrals, center of gravity, and examples of their application in aviation.
BALSA WOOD GLIDER PROJECT 	**Objective**: Students will work in teams to design and construct a balsa wood glider that flies as far (and straight) as possible. **Materials**: • Pre-cut balsa wood pieces (wing/tail/body) • Wood glue • Measuring tape • Rubber band-powered glider launcher **Instructions**: • Divide students into groups of 3-4. • Provide each group with a selection of pre-cut balsa wood kits/parts. • Students will select their parts and construct their glider. • Ensure students understNd the factors that will influence their planes stability/flgiht (Bernoulli's principle, dihedrals, and CG to their designs) and how they relate to part choice. • Facilitate the use of materials and assist groups as needed, but allow students to problem-solve independently.

BALSA WOOD GLIDER COMPETITION  	**Competition**: Test how far each glider can fly and evaluate the designs. **Instructions**: • Set up a measuring tape along the launch area. • Use a rubber band-powered glider launcher to launch each plane. • The goal is for each team's plane to fly the farthest distance and land closest to the measuring tape. • After the competition, discuss how their design choices influenced the flight and performance.

Additional Resources

- Pre-cut Balsa Wood Kits: Ensure the kits provide a variety of wings, fuselage lengths, and other components to encourage creative design.
- Glider Launcher: A rubber band-powered launcher helps ensure a fair and consistent launch for each team's glider.