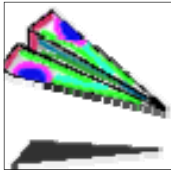


Paper Airplanes: Grade 6

Understanding Structures and Mechanisms - Flight



Introduction: Fasten your seat belts! With this project students will learn about aerodynamics principles. They will decide which type of airplane best represents their group while applying their technical literacy skills to create this paper airplane.

Prior Knowledge and Skills Students will need to be familiar with in order to complete this activity: The Bernoulli's Principle

Materials: Paper 8.5" X 11" recycled or origami paper (coloured differently on each side), Greatest Paper Airplanes software (see page 2) or use this alternate web site <http://www.paperairplanes.co.uk/nickplan.php> "Nicks Airplane", measuring tape, paper strips 5x15 cm, pencils and paper for recording observations, hula-Hop, jumbo paper clip, scissors, ruler

Pre Activity: The Bernoulli effect is an explanation of how the wings of airplanes help generate lift for an airplane. Students can perform this activity to help understand this concept. Directions: Using a strip of paper about 5x15 cm. Student should place the narrow edge just below their lips so the paper arches down. Blowing over top the paper students will notice that the fast moving air on top has caused a lift. The faster the air, the stronger the lift. Compare this to an airplane by looking at the side view of the wing.

Scenario: This challenge is based on design issues for a passenger airplane. Passengers want to go far, fast, and remain safely in the airplane. Airplane operators want the planes to travel the shortest route (straight) in order to save fuel. You will construct a paper airplane which will hold it's passenger safely in place during flight. The plane which travels the farthest distance, in the shortest time, demonstrating relative accuracy while keeping the passenger safely on board will be deemed the successful. Score = velocity x distance.

Task Description: Using The Greatest Paper Airplanes (Kitty Hawk) Software, or visiting <http://www.paperairplanes.co.uk/nickplan.php> "Nick's Airplane" or <http://www.paperairplanes.co.uk/fish.php> "Flying Fish" students follow the step by step video and the pictorial directions to create their plane. Students may also choose to freely design their airplane.

Design Specifications:

- The airplane must be made from only the paper provided. No other materials.
- The "passenger" will be a jumbo sized metal paper clip.
- The plane will be hand-launch from behind the starting line.
- Only one person may throw the plane per flight. Total of five (5) flights.
- The plane must pass through the hula-hoop (accuracy) to be counted.
- The plane will be timed from start of flight until it comes to a full stop to determine its distance traveled. This measurement is used to determine the planes speed ($V = D \times T$).
- Paper clip must remain attached or inside the airplane for flight to count.
- Each plane must have the team number on it. It may also have a name on it.
- The plane must resemble a plane (two wings, and a nose). Paper balls do not count.



Assessment and Evaluation:

Evidence of Student Learning: design notes and drawings, accurate terminology (lift, drag, etc.) design model and oral presentation show understanding of key learnings, plane performance.