



# CREATE AN AIRCRAFT DESIGN CHALLENGE

*Students create a “flying” vehicle with limited time and resources*

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## LESSON PLAN

### Introduction

In a fast paced, timed format, teams of students will create, develop, and test a “flying” vehicle capable of traveling a given distance using only the provided materials. Students will need a basic understanding of Newton’s Laws of Motion and engineering principles.

### Lesson Objective

In this lesson, students will learn how to apply Newton’s Laws of Motion to a given design challenge. They will work in teams to build their own “flying” vehicle given a set of materials and parameters that meets the challenge.

### Problem

Given a limited number of materials including a basic propulsion system and limited time, students will create a vehicle that must travel on a set trajectory, slow down and stop before it crashes.

### Learning Objectives

The students will

- Work cooperatively in teams to create appropriate designs for their aircraft.
- Apply Newton’s Laws of Motion.
- Build a team aircraft within a given set of parameters.
- Test and run simulations of the “flight.”
- Re-design as necessary.
- Compete in a final challenge.

**Grade Level:** 6—8

### National Math Standards:

Number and Operations, Geometry, Measurement, Problem Solving, Communications and Connections.

### National Science Education Standards:

Unifying Concepts and Processes, Science as Inquiry, Physical Science, Earth and Space Science, Science and Technology, Science in Personal and Social Perspective, History and Nature of Science.

### Technology Content Standards (from STL):

Technology and Society, Design, Abilities for a Technological World, and The Designed World.

### Materials Required:

- Basic propulsion system for each team consisting of a rubber-band powered propeller mounted on a balsa wood stick
- Straw for each “line” with monofilament fish line (20+ ft.) threaded through the straw as the trajectory
- Two chairs or poles for each line as the anchors for the monofilament fish line
- Paper, craft sticks, straws, string, Styrofoam plates, cups, bubble wrap, balloons, paper clips, etc. Each team should have the same materials.
- Tape measure
- Tape, scissors, glue
- Safety glasses
- Caution tape