**Title** Lesson 6: Let ‘em Fly

**Project title** If You Build It, Will It Fly??????

**Grade Band Team:** Grades 6-8 ,Team C

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**Key Terms:**

Math terms Science terms

angles, aerodynamics, angle of attack,

measurement, airfoil, center of gravity, drag,

symmetry fuselage, gravity, high pressure,

 lift, low pressure, rudder,

 vertical stabilizer(fin), wing, thrust

**Learning Objectives:**

Student will be able to…

1. Identify the four forces affecting flight.
2. Give examples of and test how aircraft models can be modified to improve flight.

**Common Core Standards in Math**

**Solve real-life and mathematical problems involving angle measure, area, surface area, and volume**

7.G.6. Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.

**Wisconsin** **Model Academic Standards in Science**

*POSITION AND MOTION OF OBJECTS*

D.4.6 Observe and describe physical events in objects at rest or in motion

D.4.7 Observe and describe physical events involving objects and develop record-keeping systems to follow these events by measuring and describing changes in their properties, including:

* position relative to another object
* motion over time
* and position due to forces

D.8.5 While conducting investigations, explain the motion of objects by describing the forces acting on them

 D.8.6 While conducting investigations, explain the motion of objects using concepts of speed, velocity, acceleration, friction, momentum, and changes over time, among others, and apply these concepts and explanations to real-life situations outside the classroom

**Wisconsin Model Academic Standards in Information and Technology Literacy**

* B.8.2 Analyze various systems and identify the ways in which they are controlled to produce a desired outcome.
* C.8.2 Explain and demonstrate several solutions to a problem or opportunity using technological design, tools, careful planning, experimentation, and testing.

**Career Cluster Pathways in Manufacturing**

* Production
* Manufacturing production process development
* Installation and repair

**Materials**

Materials and tools for constructing styrofoam glider;

Various types of styrofoam containers, food trays,



Paper clips

poster putty or other weighted and attachable materials

adhesive tapes

**Tools**

Razor Knife

Cutting Board

Cardboard or backer material

 rulers/straight edge

 pencil

lab notebooks

measuring tape

meter stick (for starting line)

**Procedure** – Students will be placed on teams to participate in a flight contest to test the flight distance and accuracy of their gliders.

1. Set up a distance test course by rolling out a tape measure and marking a starting line.
2. Place students on random teams.
3. Teams will take turns flying their gliders. Each team member will fly their glider once. Distances will be measured by using the formula below. Record distances on the table (separate document attached).

A

To find the total flight distance, subtract distance A from distance B.

B

Starting Line

1. Teams will work together to modify their gliders for more successful flight.
2. Teams will fly each member’s glider 2 more times. Record distances on table and find the average of each student’s 3 flights. Total each student’s average distance to find a total team average distance.
3. Discussion (see discussion topics below), and awards (possibly longest flight, least modification of plane, coolest glider, most consistent in 3 flights…) ☺.

**Assessment**

 **Formative Assessment**

Discuss the variability of wing size (cm)/shape, fuselage length (cm)/shape, weight of glider (g), and the correlation of each with flight distance.

 **Summative Assessment**

In your lab book, explain one or two problem(s) you had with their glider’s design, construction and/or flight, and how you corrected the problem.

**REACT Model of Contextual Teaching**

**Relating** – Students will be able to relate their new/increased understanding of how to modify a product to make it work more efficiently to solving everyday problems like how to adjust/fix the breaks on their bike.

**Experiencing** – Students will be experiencing how making modifications to their gliders will help them have more success in their flights.

**Applying** – Students will apply what they have learned about flight by helping others on their team to modify their planes in order to increase flight distance.

**Cooperating** – Students will have the opportunity to work with others on their team to solve their “engineering problems” and by competing with them during the flight competition.

**Transferring** – Students will transfer their new knowledge by understanding and using the problem solving method to solve problems in all areas of their lives.