



Principles of Flight



Lesson Plan: Flying Disc

Grade Level: 4

Subject Areas: Science and Math

Time Required: *Preparation:* 1 hour
Activity: 40 minutes

**National Standards
Correlation:**

Math (grades 3-5)

- Measurement Standard: Apply appropriate techniques, tools, and formulas to determine measurements.

Science (grades K-4)

- Unifying Concepts and Processes Standard: Evidence, models, and explanation.
- Unifying Concepts and Processes Standard: Change, constancy, and measurement.

Objectives:

Students will:

- Record measurements
- Look for a pattern in own flight
- Compare flights
- Discuss variables

Materials:

You will need:

- Measuring devices (tape measure, meter stick etc.)
- Orange cone or something to mark a starting point
- Paper plates – the cheaper the better
- Masking tape
- Scissors
- Clipboard, paper, and pencils

Background:

At one time, children threw tin pie plates at each other. Being metal objects, a safer disc was needed. Fortunately someone invented a plastic-flying disc that today is called a Frisbee™. Frisbees™ come in various sizes, generally defined by weight. A lighter disc will travel faster and be more maneuverable than a heavier one. A heavier disc, however, will be more stable, and travel farther than a lighter one. They come in all different colors and sizes.

Procedure:

A. Warm-up

1. Discuss the information given in the Background.
2. Discuss different ways to measure distance i.e., meters, yards, feet, or counting off using their feet, etc.
3. Discuss factors that can affect the flight of a Frisbee® (wind, weight, etc.).

B. Activity

1. Have students create a flying disc by following these steps:



- a. Give each student a stack of 4-5 paper plates. The best way is to not pull apart the plates, but just give each student what is in the stack.
 - b. Take one plate off the stack and set it aside.
 - c. Cut the center out of the remaining stack of plates.
 - d. Put the first plate back on the bottom.
 - e. Using masking tape, tape around the edges to hold all the plates together.
 - f. After a demonstration, have each student gently try to fly their disc in the classroom before moving to a larger area.
2. Find an area with enough room to fly the disc. Mark off a starting point so that you have accurate measurements to compare. (Take extra rolls of masking tape with you to create variables and also clipboards, paper and pencils to record flight measurements).
 3. Have students work with a partner. One will fly while the other records distance flown. Have all students start flying at the same time to avoid risk of injury.
 4. Once all students have flown their disc two times, have them gather around to discuss how they could make the disc go a shorter or longer distance.
 5. After all students have tested a variable, return to class for discussion.

C. Wrap-Up

1. Have students share their observations after they have created a chart with their information.
2. List the distances traveled by the flying discs on the board and compare.
3. Have students identify variables they think affected the flight. Encourage students to look for patterns in the flight of their disc as well as those of their classmates.
4. Review Bernoulli's Principle (see background information in this section).
5. Conclude with journal writing. Be sure students explain their observations and include measurements.

Assessment/ Evaluation:

Use student charts and journal writings to evaluate understanding of the activity and to be sure that objectives were met.

Extensions:

1. Make discs of various masses or sizes and compare flights to previous activity.
2. Play games with the flying disc (golf, softball, pickle, relay races, etc.).
3. Decorate the flying disc.
4. Have students explain how the disk is like an airplane wing and how it is different.



**Resources/
References:**

Frisbees (Internet search), <http://bvsd.k12.co.us/~hendrya/Disc.html>

How Things Work: Balls, Birdies, and Frisbees (Internet search),
http://landau1.phys.virginia.edu/Education/Teaching/HowThingsWork/balls_birdies_frisbees.html

Frisbees Replace Hubcaps (Internet search),
<http://www.lps.org/schools/hs/lse/publications/clarion110397/frisbees-replace-hubcaps.html>

