



Principles of Flight



Lesson Plan: Which Way Does He Go? Which Way Does She Go?

Grade Level: 4

Subject Area: Math

Time Required: *Preparation:* 5 minutes
Activity: 30 minutes

**National Standards
Correlation:**

Mathematics (Grades K-4)

- Problem Solving Standard: Build new mathematical knowledge through problem solving.
- Problem Solving Standard: Solve problems that arise in mathematics and other contexts.
- Problem Solving Standard: Apply and adapt a variety of appropriate strategies to solve problems.
- Problem Solving Standard: Monitor and reflect on the processes of mathematical problem solving.
- Data Analysis and Probability Standard: Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them.
- Data Analysis and Probability Standard: Develop and evaluate inferences and predictions that are based on data.

Summary: Students will choose the appropriate direction of flight an aircraft would need to fly.

Objectives: Students will:

- Interpret data from a chart
- Choose the correct direction of flight
- Determine the correct direction of flight based on the assigned altitude

Background: Thousands of aircraft fly across the United States each hour of the day. To keep the aircraft from running into each other, a formula was devised to ensure proper separation of aircraft is maintained. Aviation rules require aircraft flying on an instrument flight rules (IFR) flight plan be separated by at least one thousand feet. This formula, as basic as it seems, provides compliance of these rules. Any aircraft flying a heading of north through east (360 degrees through 179 degrees) must be at an odd altitude (3000', 5000', 13000', etc). Any aircraft flying a heading of south through west (180 degrees through 359 degrees) must be at an even altitude (4000', 8000', 16000, etc). This procedure helps both pilots and air traffic controllers in the event a radio outage or some other situation develops that could jeopardize the rule.

Materials: You will need:

- Worksheet
- 360 degree compass
- Pencil



Procedure:

A. Warm-up

1. Review the concepts of even and odd numbers.
2. Explain the importance of the formula and its ramifications should these rules be violated.
3. Review concept of 360 degree circle and the applicable cardinal points of the compass. Give students compass for reference.

B. Activity

1. Write five or six altitudes on the board. Also draw compass on board.
2. Select a student for each altitude.
3. Have the students determine whether the altitudes are even or odd.
4. Pass out the worksheet and read directions to the students.
5. Allow the students to work on the sheet, completing each question.

**Assessment/
Evaluation:**

Students will complete worksheet. Check worksheets for correct answers.

**Resources/
References:**

Attached worksheet

FAA Handbook 7110.65



Name _____

Which Way Does He Go? Which Way Does He Go?

Freddy Fighter can't decide which way he wants to go! He wants to fly at a particular altitude, but he's not sure about the correct altitude for his direction of flight! Study the chart below and see if you can answer Freddy's questions.

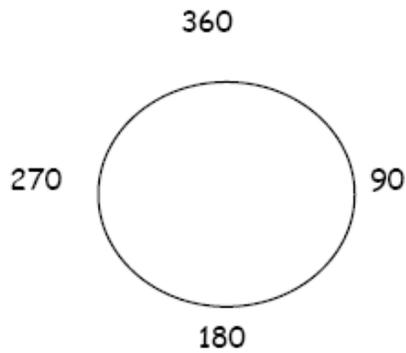
Altitude For Direction Of Flight	
Compass reading: From 360 degrees to 179 degrees.....	Odd Altitudes (3,000', 5,000', 17,000')
From 180 degrees to 359 degrees....	Even Altitudes (4,000', 8,000', 16,000')

Circle the correct altitude, even or odd, for the direction of flight.

Freddy wants to go on a heading of:

- | | |
|----------------|----------------------------------|
| a. 090 degrees | His altitude should be: even/odd |
| b. 270 degrees | His altitude should be: even/odd |
| c. 350 degrees | His altitude should be: even/odd |
| d. 010 degrees | His altitude should be: even/odd |
| e. 175 degrees | His altitude should be: even/odd |
| f. 290 degrees | His altitude should be: even/odd |
| g. 360 degrees | His altitude should be: even/odd |
| h. 120 degrees | His altitude should be: even/odd |
| i. 001 degrees | His altitude should be: even/odd |
| j. 359 degrees | His altitude should be: even/odd |





Determine whether the altitudes below are appropriate for the direction of flight.

- | | |
|----------------------------------|-----------------|
| a. 10,000 ft heading 330 degrees | correct / wrong |
| b. 7,000 ft heading 070 degrees | correct/wrong |
| c. 6,000 ft heading 010 degrees | correct/wrong |
| d. 15,000 ft heading 270 degrees | correct/wrong |
| c. 11,000 ft heading 190 degrees | correct/wrong |
| d. 23,000 ft heading 140 degrees | correct/wrong |
| e. 16,000 ft heading 220 degrees | correct/wrong |
| f. 3,000 ft heading 030 degrees | correct/wrong |
| e. 18,000 ft heading 300 degrees | correct/wrong |
| f. 19,000 ft heading 170 degrees | correct/wrong |

