

LESSON PLAN – Slope-intercept Form Project

Class: Seventh Grade Math

Date to be taught:

OBJECTIVES: (List as 1, 2, etc)

1. Students will be able to discover how slope affects the graph of a line.
2. Students will be able to relate b to the y-intercept of a line.
3. Students will be able to determine the equation of a line given m and b .

MICHIGAN BENCHMARKS:

1. Describe, analyze and generalize patterns arising in a variety of contexts and express them in general terms
2. Represent and record patterns in a variety of ways including tables, charts, graphs, and translate between various representations.
3. Use patterns and their generalizations to make and justify inferences and predictions.

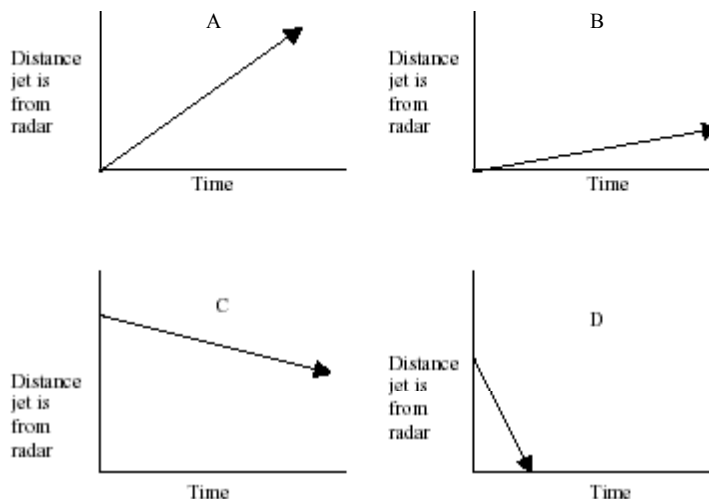
TECHNOLOGY INTEGRATION: (List websites, software, or other computer technology used in this lesson.)

Computers, the Internet, and the website www.explorelarning.com

OPENER:

Place a sign on the door that all students are to report to the computer lab. Make sure to bring rulers to the computer lab.

Prepare the following graphs for the students before beginning the lesson on an overhead projector or on a worksheet.



Summarize in your own words the following scenario:

Radar sends out a wave that bounces off an object then returns to the radar. The radar is able to determine the distance an object is away from it at a given time. The radar takes several readings at slightly different times to calculate the speed of an object. If these readings were graphed on a time-distance graph, they may look like these (display the four graphs).

Ask the students which graphs show jets that are moving away from the radar. Have students explain why jet D is not the correct answer. Ask students which jet is going the fastest. Have students explain answers. Ask students which jet was the farthest away from the radar when the timing started. Try to lead students towards answers that involve the concept of slope and y-intercept. Ask students to predict the graph of a helicopter that is hovering **100** yards away from the radar. Discuss the various answers.

PROCEDURE:

Go to www.explorellearning.com and show the students the Slope-Intercept form of a Line (<http://www.explorellearning.com/index.cfm?method=cResource.dspView&ResourceID=166>) activity in action. Give each student the worksheet.

Finding the meaning of m

Instruct students to go to the right of the slope bar and type in (one at a time) the following values for m : $\frac{1}{3}$, $\frac{1}{2}$, **1**, **2**, **4**, **6**. Ask students to describe the changes in the line, as the value of m gets larger. Now have students to type in the numbers in reverse order. Ask students to describe the changes in the line, as m gets closer to zero.

Now instruct students to type in some negative values for m . Ask students how lines with positive slope differ from lines with negative slope. Ask students to make conjectures about m . Students should see that m represents slope and should be able to describe how different values of m change the graph of a line.

Finding the meaning of ' b '

On the y-axis of the graph is a green point. Have students drag the green point up the y-axis to the coordinates **(0, 4)**. Ask students what the value of b is next to the b slide bar. Now have students move the green point to **(0, -2)**. Ask the students to explain what happened to the value of b .

Now have students change the value of the slope to by dragging the indicator on the slope slide bar to the right, then to the left. Ask students what happened to the value of b when the slope value was changed.

Ask students to predict the value of b for the line $y = -4x + 6$. Instruct students to type in the equation for this line and check their answer. Have students make conjectures about the meaning of b . Students should be able to see that b represents the y-intercept of a line.

Putting it all together

Give students the equations of several lines. Have them graph the lines on their worksheet. Once students complete this task, they should type in the equation for each line and check their answer.

Now give students the graphs of several lines and have the students find the proper equations. (The clipboard feature allows you to copy and paste graphs into word processing documents.) Have students explain their answers for each graph.

CLOSURE (and Evaluation of Student Progress):

Lines can be defined given m and b . The value of b determines where a line crosses the y-axis. The value of m determines the slope of the line. Both can be put together to make an equation for the line: $y = mx + b$. This form of a linear equation is called the slope-intercept form.