

Co-Teaching Planning Guide

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Co-Teachers: Roy Herpin III & Damien Loveless

Grade Level / Content: 8th Grade / Creating Linear Equations

Lesson Objectives: Throughout this lesson the students will learn the steps to take to create a linear equation from a set of data.

- The student will be able to solve for the slope of a line by hand and graphically.
- The student will be able to identify the y-intercept of a line by looking at a graph.
- The student will be able to put equation into slope-intercept form.

Content Standards Addressed:

8.F.A.3- Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. *For example, the function $A = s^2$ giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line.*

8.F.B.4- Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.

8.F.B.5- Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.

Co-Teaching Model(s) used: (check all that apply)

- Parallel
- Station
- Alternative
- Team

Materials needed for the lesson:

Graphing Calculators
Rulers
Graphing Paper
Pencils
Ruler
Blank Frame Routines

Scaffolds needed for the lesson:

For this lesson the students should be proficient at basic arithmetic. They should also know and understand the basic principles of linear equations; slope, y-intercept. The student will also need to know how to plot points on a Cartesian plane (graph) and interpret data from a table.

UDL Principles used for the lesson:

- + Vary demands and resources to optimize challenge – student will have different methods to use as well as needing to interpret data from formats varying in difficulty; graph (easy), list of points (moderate), data points given in a word problem (difficult).
- + Support decoding of text, mathematical notation, and symbols – students will have to break down and contextual the symbols for the equation; m =slope, b =y-intercept.
- + Use multiple tools for construction and composition – students will be creating the equations using three different methods that they later will have the option to use whichever they feel most comfortable; algebraically, graphically (by hand), and graphically (with a calculator).

How is the student learning assessed?

Formative: by their ability to solve for the appropriate values; m , b .

Summative: Exit Slips; sample problem and they need to go through the steps, put into proper slope-intercept form.

Guide for expectations for each teacher during the lesson

	Teacher: Roy	Teacher: Damien
What are the specific tasks that I do BEFORE the lesson?	<ul style="list-style-type: none"> - Print out blank frames and make sure rest of materials are available - Create two separate lists of data to use for both stations - Create worksheets for the students to complete with separate data points as practice to reinforce the concepts learned in each of the three sections. 	<ul style="list-style-type: none"> - Deliberately organize groups to be split once stations start - Prepare the exit slips using different data sets than the ones Roy created
What are the specific tasks that I do DURING the lesson?	<ol style="list-style-type: none"> 1. Roy we will conduct a brief recap with the students to reinforce some of the principles needed to begin the lesson. 	<ol style="list-style-type: none"> 1. While Roy conducts the recap, Damien will navigate the room answering any side questions and

This is when we will clear up any loose ends and holes in understanding.

CUE: Roy will pass out the frame skeletons.

DO: We will begin with having the student fill in the Key Topic and the “is about” portion. Next, Roy will review with the students the process of filling out the frame as the lesson progresses.

DO: Roy will take group 1 and start by introducing them to the topic; creating equations **algebraically**.

DO: Roy will walk the students through the process of picking two points, solving for slope, and solving for y-intercept using the example made before class. *(Note: the algebraic section takes a significantly longer amount of time than the graphical portions so the two sections covered by Damien will take approximately the same amount of time as this one.)*

DO: Explicitly walk students through filling out the frame as they learn the method. Students will collectively decide what to put in

helping students clarify concepts. This will be especially important for those students who are shy or lack communication skills to get their misunderstandings cleared up before the lesson begins.

CUE: Damien will go over the lesson objectives with the students so that they know what to expect from the lesson

CUE: After Roy explains the process for completing the frame Damien will explain why using the frame is useful; using a frame will help us to organize the proper steps to take in order to find the appropriate parts of a linear equation and not mix up the process.

DO: Damien will take group 2 and start by introducing them to both topics covered in his station; creating equations **graphically (by hand) and (with a calculator)**.

DO: Damien will walk the students through the process of picking two points, finding slope, and finding y-intercept for the **(by hand)** section.

DO: Explicitly walk students through filling out the frame as they learn the method. Students will collectively decide what to put in each of the portions through Damien leading them through a discussion as the lesson progresses.

each of the portions through Roy leading them through a discussion as the lesson progresses.

DO: Roy will hand out the practice worksheet for his group to complete. *(Note: while students complete the practice worksheet Roy will be navigating the group answering questions, clarifying misunderstandings, and assessing students' ability.)*

After students have made significant progress on worksheet we will switch groups and repeat the process.

DO: After completing instruction and before the practice worksheet Roy will have brief discussion with students on "Why/So What". Now students will be able to compare what they learned in both stations and why it is important.

After a significant amount of time on the worksheet we will reconvene as a whole class to review.

DO: Damien will walk the students through the process of picking two points, finding slope, and finding y-intercept for the **(with a calculator)** section.

DO: Explicitly walk students through filling out the frame as they learn the method. Students will collectively decide what to put in each of the portions through Damien leading them through a discussion as the lesson progresses.

DO: Damien will hand out the practice worksheet Roy made before class. *(Note: while students complete the practice worksheet Roy will be navigating the group answering questions, clarifying misunderstandings, and assessing students' ability.)*

After students have made significant progress on worksheet we will switch groups and repeat the process.

DO: After completing instruction and before the practice worksheet Damien will have brief discussion with students on "Why/So What". Now students will be able to compare what they learned in both stations and why it is important.

After a significant amount of time on the worksheet we will reconvene as a whole class to review.

	<p>REVIEW: As Damien walks the students through the frame review Roy will navigate the room and help students clarify questions and ensure that students have filled out the frame completely and correctly.</p> <p>REVIEW: Hand out exit slips.</p>	<p>REVIEW: Damien will walk students through the sections of the frame and have different students explain to the class the steps for each section.</p> <p>REVIEW: Hand out exit slips!</p>
<p>What are the specific tasks that I do AFTER the lesson?</p>	<ul style="list-style-type: none"> - Roy will monitor the students from the door ensuring that each student completes an exit slip and successfully cleans up their work area 	<ul style="list-style-type: none"> - Damien will collect the exit slips from the students (<i>Note: students can complete the exit slips in pairs.</i>)

The FRAME Routine

Key Topic

Creating Linear Equations

is about...

Using given information (data points) to determine a linear model for two given quantities.

Main idea

Algebraically

Main idea

Graphically (by hand)

Main idea

Graphically (calculator)

Essential details

Pick two points:
 $(x_1, y_1), (x_2, y_2)$

Essential details

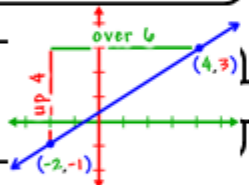
Pick two points:
 $(x_1, y_1), (x_2, y_2)$

Essential details

Pick two points:
 $(x_1, y_1), (x_2, y_2)$

Slope m : $\frac{y_2 - y_1}{x_2 - x_1}$

Slope m :



Slope m : 2nd \rightarrow Trace \rightarrow 6

Y-int solve for b :
 $y_2 = mx_2 + b$

Y-int b : Connect two points.
Where does line cross y-axis?

Y-int b : 2nd \rightarrow Graph, $x=0$

Equation $y = mx + b$

Equation $y = mx + b$

Equation $y = mx + b$

So What? (What's important to understand about this?)

Being able to recognize patterns, understanding differences in increasing/decreasing relationships, and weighing options in the decision making process