Lesson Plan Summary (lessons for PBI unit) for Individual Lessons

(Please use brief statements for each item)

Name: Heather McNeill

Benchmark/~~Investigation~~

**Title/Opening Question (supports driving question):** Slope Intercept Form: Today we are going to learn a specific form of linear equations that will help us tomorrow when we figure out which companies are the best to order our food supplies from.

**Performance Objectives (SWBAT)**

**-** Identify an equation that is in slope-intercept form.

**-** state what is information is given by an equation in slope-intercept form.

**-** state the linear equation of a graphed line.

**NGSSS**

**MA.912.A.2.2** Interpret a graph representing a real-world situation.

**MA.912. A.3.5** Symbolically represent and solve multi-step and real-world applications that involve linear equations ~~and inequalities~~.

**MA.912.A.3.9** Determine the slope, x-intercept, y-intercept of a line given its graph, its equation, or two points on the line.

**MA.912.A.3.11** Write an equation of a line that models a data set, and use the equation or graph to make predictions. Describe the slope of the line in terms of the data, recognizing that the slope is the rate of change.

**Instructional Components (include rational on how each E supports the overall goals of the lesson and the larger goals of the project)**:

**Engage**

Since the students probably have had minimal interaction with the graphing calculators have the students spend some time completing a scavenger hunt of the keys and applications on the calculator. This way come time to work with the calculator in the exploration the student will have already had a chance to ‘play’ with the technology and also become familiar with it. IN the long run, having experience with the calculator now, early on in the PBI unit, the students will be better able to use the technology at a later part of the project.

**Explore**

The teacher will send out the calculator activity to each student and with the calculator activity projected at the front of the class room the teacher will walk the students through what they are to do as well as how to use the program.

The following link is where teachers can download all the activities and any software updates they may need.

http://education.ti.com/calculators/downloads/US/Activities/Detail?id=10624&ref=%2fcalculators%2fdownloads%2fUS%2fActivities%2fSearch%2fKeywords%3fk%3dSLope-intercept+form

This will support the goals of the lesson by providing students with an exploratory way of learning how a line in slope-intercept form is graphed and what happens when certain numbers, the slope or the y-intercept) change. This lesson supports the larger goals of the project by preparing the students to work with slope intersect in the future when they will need to decide which food supply companies offer the best deal for their pizza joint.

**Explain**

During the explanation the teacher will ask for students to show/tell the class what they found during the activity. The teacher will guide the discussion and the questions so that the students compare their findings and share their new knowledge with their companies. This helps the students to reflect on what they just explored and the information will be applied the following class day.

**Elaborate**

For the elaboration the students will need to each write the equation of a line in slope intercept form given the slope and the y-intercept. They then will pass their equation to their neighbor and the neighbor will graph the equation of the line. For the next round the students will not be given the required slope and y-intercept, they are to create their own and write the equation of the line in slope-intercept form. They will then pass to their neighbor who will then graph the line. Repeat this round as many times as necessary. This will give the students extra practice with coming up with equations in a specific form and then graphing them. This sort of round robin game will appear later on in the PBI unit and since the students will learn how the process works now, they will be familiar with it in the coming weeks.

**Evaluate (formative)**

The evaluation at the end of the period will be a final class discussion, summing up what we had talked about and learned from the lesson. In asking various students different questions, the teacher can make a judgment call about the amount of material the students gain from the lesson. The students will then spend ten minutes reflecting on their own in their journal. Following this review of the lesson the teacher will distribute an exit slip which will be collected at the end of the period and will better help the teacher in knowing where to pick up on the next day when the students are determining what company is the best to order food supplies from.

**Resource Requirements:**

- Class set of either: TI-83 Plus Family, TI-84 Plus Family, or TI-Navigators for exploration activity.

- Projector to show the class calculator activity at the front of the room.

- Class set of Entrance and Exit slips.

- Blank paper and graph paper for the elaboration.

**Assessment(s): (Formative and/or Summative)**

- Entrance slip at the beginning of the period. (See below)

- Exit slip at the end of the period. (See below)

- Varying levels of questions, including HO questions throughout the period.

**Entrance Slip: Slope Intercept Benchmark Lesson**

Find the slope if you are given the points (1, 3) and (5, -3).

Explain how you find the slope by looking at a graphed line.

What is an intercept?

What is the y-intercept?

**Exit Slip: Slope Intercept Benchmark Lesson**

What information do you know when given the equation of a line in slope intercept form?

What information can you find about the line given the equation in slope intercept form?

Circle the equation(s) that are in slope intercept form:

y = 4x + 3 -y = -3x -1 y +2x = 7 y = x

Write the equation of this line in slope intercept form.

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Lesson Plan Summary (lessons for PBI unit) for Individual Lessons

(Please use brief statements for each item)

Name: Heather McNeill

~~Benchmark~~/Investigation

**Title/Opening Question (supports driving question):** Discovering Slope Intercept Form: Today we need to decide on which company will be the best to order our supplies from for our pizza joint.

**Performance Objectives (SWBAT)**

- create equations in slope intercept form

- graph lines in slope intercept form

- compare graphs of lines in slope intercept form

**NGSSS**

**MA.912.A.2.2** Interpret a graph representing a real-world situation.

**MA.912. A.3.5** Symbolically represent and solve multi-step and real-world applications that involve linear equations ~~and inequalities~~.

**MA.912.A.3.9** Determine the slope, x-intercept, y-intercept of a line given its graph, its equation, or two points on the line.

**MA.912.A.3.11** Write an equation of a line that models a data set, and use the equation or graph to make predictions. Describe the slope of the line in terms of the data, recognizing that the slope is the rate of change.

**Instructional Components (include rational on how each E supports the overall goals of the lesson and the larger goals of the project)**:

**Engage**

Have the students work with their fellow employees to create a list of food items they will need to make their pizzas. Example: dough, marinara sauce, cheese, pepperonis, pineapple, sausage, etc. This will get the students started on considering what they will need to order for the exploration. For the main PBI project this will be another thing they would need to consider when starting a pizza joint and they can then add these things to their menu.

**Explore**

In the exploration the companies are to work together and come up with the amount they are willing to pay for each type of food item they will need to order. (At least three items.) From that information they are to then come up with an amount they consider reasonable for the company to charge per pound for each specific food item. (This obviously will change depending on the item.) With this information the students are to graph what the lines of for each item will look like, probably with price on the y-axis and amount on the x-axis. Through this exploration the students are considering an aspect of opening a business they hadn’t thought of and putting themselves in the other person’s shoes when trying to figure out what a fair price would be for both parties. In working together to come to a consensus the members of the groups are learning to speak professionally to one another and productively make decisions with others.

**Explain**

In the explanation the different companies will present to the class what they came up with for each food item. These will most likely vary from group to group, however many of the food items will be duplicated, thus allowing the students to compare their thinking to that of other groups. By having each group share with the class what conclusions they came to not only shows students other aspects they may not have considered, but it also provides students with a chance to speak before the class, similarly to what they will have to do when presenting their final project.

**Elaborate**

In the elaboration each student will receive a “Business Proposals” W.S. where they will initially on their own consider each of the proposals from the different businesses that wish to become the pizza joint’s food supplier. After the students have had time to rank the businesses by which ones are the best deal and/or which ones most closely match what the company had already talked about the company members will discuss together their findings. The students must consider the starting price, any additional cost and how much they might need to sell each pizza for to make a profit, etc. This step in the lesson

**Evaluate (formative)**

Have a class discussion about which businesses the companies chose to go with and why. Through the discussion the teacher will be able to see where the students’ understanding is. The choices the students make in this lesson will be presented during their formal presentation at the end of the unit. The students will then spend ten minutes reflecting on their own in their journal.

**Resource Requirements:**

- Entrance slip and quiz for each student.

- Class set of “Business Proposals” for the elaboration.

- Blank paper and graph paper.

**Assessment(s): (Formative and/or Summative)**

- Entrance slip at the beginning of the period. (See below)

- Quiz at the end of the period. (See below)

- Varying levels of questions, including HO questions throughout the period.

**Entrance Slip: Slope Intercept Investigation Lesson**

Write down what you know about the equations of lines in Slope intercept form.

Write down what you know about the graphs of lines in Slope intercept form.

When is slope intercept form useful?

**Quiz: Slope Intercept Investigation Lesson**

Write the equation of the line that has a slope of –½ and a y-intercept of 6.

Graph this equation.



What is the slope of the graphed line?

What is the y-intercept of the graphed line?

What is the equation of the graphed line in slope intercept form?

Circle the graph of the company offering the better deal? (Price is on the y-axis, amount is on the x-axis)