**Station 1: Analyzing Proportional relationships- 1/20/15**
 Directions: To receive credit for this assignment, you must show every step you take to find the solution for each of the problems. This assignment is DUE at the end of the class.
1. Each step of the stairs leading from room 9 to room 107 in the Academy Building has a vertical rise of 7 inches and a horizontal run of 12 inches. Each step of the marble staircase leading to the Assembly Hall has a vertical rise of 5.5 inches and a horizontal run of 13 inches.
 (a) Which flight of stairs do you think is steeper? Why?
 (b) Calculate the ratio $\frac{rise}{run}$ for each flight of stairs, and verify that the greater ratio belongs to the flight you thought to be steeper.
 (c) The slope of a line is a measure of how steep the line is. It is calculated by dividing the change in y-coordinates by the corresponding change in x-coordinates between two points on the line: slope = $\frac{changeiny}{changeinx}$. Calculate the slope of the line that goes through the two points $(1,3)$ and $(7,6)$. Calculate the slope of the line that goes through the two points $(0,0)$ and $(9,6)$. Which line is steeper?

**Don’t forget to use the video link!!**

2. Nia and Trey both had a sore throat so their mom told them to gargle with warm salt water. Nia mixed 1 teaspoon salt with 3 cups water. Trey mixed $\frac{1}{2}$ teaspoon salt with 1$\frac{1}{2}$ cups of water. Nia tasted Trey’s salt water. She said,
"I added more salt so I expected that mine would be more salty, but they taste the same."
 (a) Explain why the salt water mixtures taste the same.
 (b) Find an equation that relates s, the number of teaspoons of salt, with w, the number of cups of water, for both of these mixtures.
 (c) Draw the graph of your equation from part b.
 (d) Your graph in part c should be a line. Interpret the slope as a unit rate.

3. Kell works at an after-school program at an elementary school. The table below shows how much money he earned every day last week.
  
Mariko has a job mowing lawns that pays $7 per hour.
(a) Who would make more money for working 10 hours? Explain or show work.
(b) Draw a graph that represents y, the amount of money Kell would make for working x hours, assuming he made the same hourly rate he was making last week.
(c) Using the same coordinate axes, draw a graph that represents y, the amount of money Mariko would make for working x hours.
(d) How can you see who makes more per hour just by looking at the graphs? Explain.

4. Each beat of your heart pumps approximately 0.006 liter of blood.
(a) If your heart beats 50 times, how much blood is pumped?
(b) How many beats does it take for your heart to pump $0.45$ liters?
(c) Direct-variation equations can be written in the form $y=kx$, and it is customary to say that $y$ depends on $x$. Find an equation that shows how the volume $V$ pumped depends on the number of beats $n$. Graph this equation, using an appropriate scale, and calculate its slope. What does the slope represent in this context?