Graphing Quiz 1B

Name _____

Period _____

In his physics class, Mr. S decides to have his students design a lab to find the effect of force applied to a rubber band and the amount that the rubber band stretches. The students decide that they can pull on the rubber band with a force meter and measure how much it stretches. They decide to use forces of 2, 4, 6, 8, 10, and 12 newtons (N). The corresponding amounts that the rubber band stretched were measured as 5.2, 11.1, 19.2, 24.7, 29.1, and 35.2 cm respectively.

1) What relationship are the students looking at in this lab?

   The students are trying to find the relationship between the force applied to a rubber band and the amount that the rubber band stretches.

2) Which variable is the independent variable and why?

   The independent variable is the force applied to the rubber band. It is the independent variable because it is the variable that the students manipulate.

3) Which variable is the dependent variable?

   The dependent variable is the amount that the rubber band stretches because it depends on the force on the rubber band.

Force (N)	Stretch (cm)
2	5.2
4	11.1
6	19.2
8	24.7
10	29.1
12	35.2

4) Fill out the Data table to the right

5) Calculate the scale for both the independent and dependent axes.

Independent-axis	Dependent-axis
$Scale = \dfrac{12\ N}{28\ boxes}$	$Scale = \dfrac{35.2\ cm}{38\ boxes}$
0.42 use 0.5	0.92 use 1
2 boxes = 1.0 N	5 boxes = 5 cm

6) Properly graph the data and draw a best fit line. Make sure to include axis labels with units and a title for your graph.

7) Show all of your data analysis on your graph. Make sure to show your equation for the slope, the slope calculation, the units for your slope and your equation.
   (Use F for force and L for the amount of stretch)

LENGTH of STRETCH Vs Force
FOR A Rubber band

$$\text{SLOPE} = \frac{\Delta L}{\Delta F} = \frac{36-4}{12-1.5} = \frac{32}{10.5} = 3.0 \frac{cm}{N}$$

$$L = 3.0 \, F$$

LENGTH of STRETCH (cm)

FORCE (N)