Designing a Measurement Lab

Pre-Lab

1. What can we measure on the different balls? Make a list of as many things as possible.

2. Identify each of the following (there may be more than one):

Independent Variables	Dependent Variables	Control Variables

Purpose

Write down one sentence explainging the purpose of the lab that includes all the independent and dependent variable.

Procedure

Materials:

- two different balls
- one meter stick

When you're ready to start the experiment:

1. Drop the ball
2. Stand back and watch how high the ball bounces
3. Record the Data.

Name: Date: Period:

Data

Experiment #1

Constant(s): _____

Drop Height (cm)	Bounce Height (cm)			
	Trial #1	Trial #2	Trial #3	Average

Experiment #2

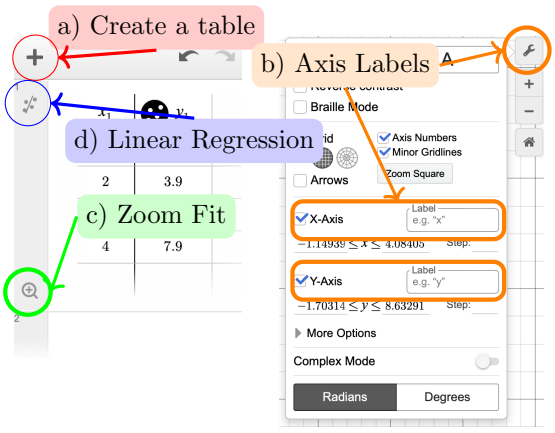
Constant(s): _____

Drop Height (cm)	Bounce Height (cm)			
	Trial #1	Trial #2	Trial #3	Average

Graphs

Go to `www.desmos.com/calculator` to graph your data.

a) Start by making a table by clicking the "+" icon at the top left. You will need to create two separate tables.
b) Make sure to label the axes using the wrench icon at the right.
c) Zoom out so that you can see the whole graph and so that it fills the page. You can do this using the "Zoom Fit" option , but be careful that your fit does not cut off one of the graphs
d) Create best fit lines for each graph using the "Linear Regression" tool
e) Copy a link to your graph using the export button and clicking "Share a Snapshot". Paste this link on the appropriate place in Schoology.



Write down the equations for each of the best fit lines below:

Experiment #1:

Experiment #2:

Conclusion Questions:

1. How do the two best fit lines represent what happened when you were taking data?

2. What is the physical meaning of these best fit lines?

3. The expected values for the "bounciness" of the balls are as follows:
   Golf ball: 0.8; Ping pong ball: 0.5; Plastic ball: 0.3.
   Calculate the percent error for the bounciness of each ball that you tested.

4. Comment on the accuracy and precision of your data.