Acceleration of Gravity

Name _____ **Date** _____

Title:

The Acceleration of Gravity.

Purpose:

To experimentally find the acceleration of gravity, and compare it to the accepted value of 9.8 m/s^2.

Materials & Procedure:

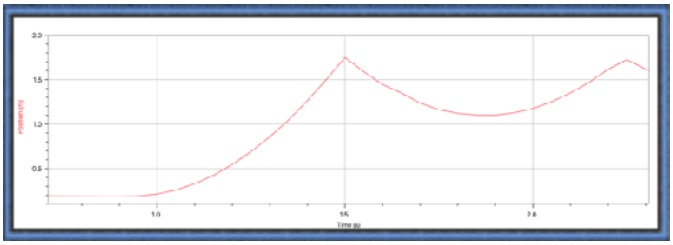
In this experiment, you may use one of two accepted methods. The first, is to use the **motion sensor** and have it graph the position of a falling object. If you choose this method, you must decide which object to drop as well as how far to allow it to fall. The second method is to use a **photogate** and picket fence combination. This method simplifies your decisions, however it only records a few data points.

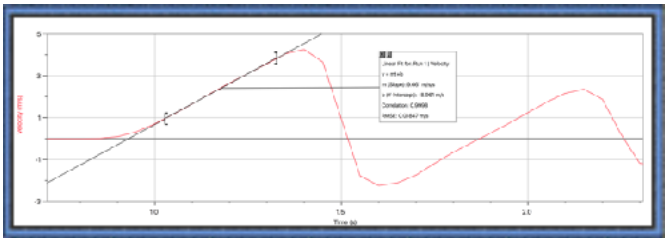
You and your partners must **write** a complete list of all materials used as well as all major procedure steps. This list must be complete enough so that another student could follow the procedure and get the same results.

You and your partners will probably need to do several **trial** runs before you are satisfied with your graph. Do not delete these practice trials.

Data:

Capture the screen for a successful trial and include this in your lab report.





The data section of your lab should also include **qualitative observations**. This might include the reason for skipping a single trial that did not work. If you have changed your procedure in the middle of the experiment, observations would also include the reasons for this decision.

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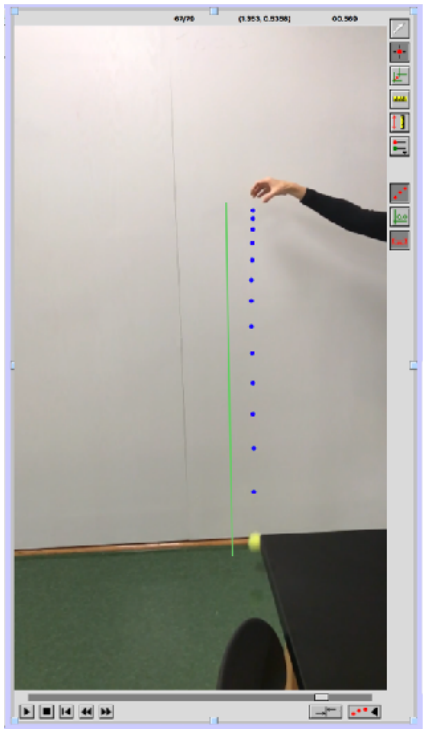
Procedure, part 2.



The Logger Pro software also allows for an interpretation of the motion of an object recorded with video. With a little care to keep the camera stationary, and a good reference point, you can get great results.

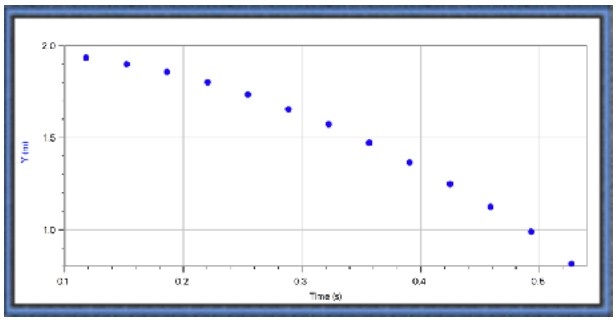
- Use the menu options to **Insert, Movie...**
- A button with 3 red dots will **Enable Video Analysis**
- Use the **Set Scale** button to allow for distance calculations.
- Use the menu options for **Options, Movie Options...** to set the frame rate if you used a slow motion feature to record the video.
- A button with one red dot will let you **Add Points.**

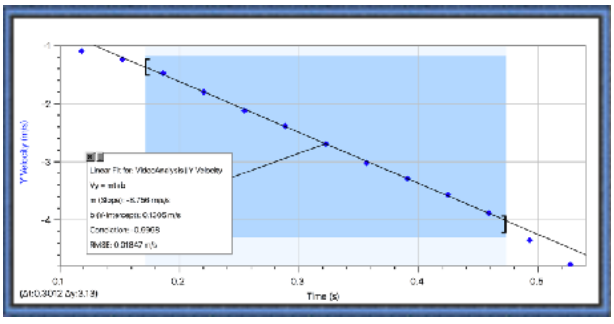
Advance the video as you select each point, and you will see a graph forming from the motion in your video.

- Grab an image of the video with the dots you placed.

Data:

Copy the position and velocity graphs for the freefall in the video. Find the acceleration of your falling object by using the slope of the velocity graph.





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Calculations:

When you select linear fit from the options in data studio, the computer will do the calculation of slope for you. Because this is an interpretation of data, this result still belongs in the calculations section of your report. For the data table, record the slope of a linear fit for five consecutive trials.
Calculate the average result from your five tiles as well as a percent error for your average.

Actual Trial Number	***Slope of a linear fit***
Average Result	
Percent Error	

Conclusions:

In a short paragraph, discuss the possible sources for error in your experiment.
Do not invent errors that did not occur.

Grade