

## Designing An Experiment

You will design an experiment to find the relationship between time and displacement of an object moving at various velocities and not always having the same acceleration. You must identify variables and express their relationship in paragraph and algebraic form. You will use digital video, i-movie and logger pro to analysis the motion of your object.

Things to consider:

- direction(s)
- distance interval
- precision
- accuracy
- units
- how to measure time
- how to change acceleration
- size and speed of object

### Lab report (suggest PowerPoint but not required)

Must be word processed with graphs and pictures cut and pasted in proper order. You will present your findings to the class using the video projector.

Rubric

Section	Possible	Earned
Name and Partners Names	1	
Date, Title of Lab, Purpose	2	
Procedure (include the independent and dependent variable you are studying)	2	
Picture or Movie clip from the lab	2	
Data table(s)-titled, units	3	
Graph(s) Displacement vs Time, Velocity vs Time, Acceleration vs Time(titled, axes labeled with units, appropriate scaling, appropriate fit line)	5	
Conclusion of this lab in paragraph and algebraic form. Concentrate on your specific findings. Explain any error sources and how you tried to control them. Use significant figures. Carefully use terminology such as distance versus displacement. Explain the fit lines.	5	
Summary (what is the universal scientific idea supported by this experiment)	2	

## Advanced Physics

### Movie Analysis

Shoot Movie (Shoot perpendicular to the movement and have a size reference such as a meterstick.)

Edit in i-movie to minimum clip

- connect camera via firewire turn camera on to play/edit and set to just prior to your clip
- start i-move
- a blue screen with camera connected should appear
- click on import
- let play until you have your clip on the computer and click stop
- Edit by dragging the small right triangles to positions at the beginning and end of your clip **KEEP IT SMALL**, then go to edit, crop.
- Drag the clip to the timeline area at the bottom, go to file, export, to QuickTime, full DV

Open Logger Pro 3.4 or higher

Insert Movie

Open menu bottom right(three red dots and arrowhead)

Set axis third button down

Set scale

Click on red dot in cross-hair (second from top)

Click on object

Do this over and over. (may want to advance several frames each time.)

Graph and data table fill itself

Save and work with data