

## **Unit 1: Newtonian Mechanics – Kinematics in One Dimension**

### **LAB 1: Uniform vs. Accelerated Motion**

Objectives: Students will...

- Compare uniform and accelerated one-dimensional motion in inertial reference frames using graphical analysis.
- Gain competency using lab software and equipment.
- Gain competency in communicating effectively as a scientist when writing lab reports.

Equipment:

- PASCO system with Smart Cart and track

Data:

- Print graphs of position v time, velocity v time, and acceleration v time for both uniform and accelerated motion. Attach them to this document.
- Measure the slopes and means of each graph and record in a data table of your own design in the space below.

Conclusion:

- Contrast the graphs of acceleration  $v$  time for uniform motion and accelerated motion:
  - Cite evidence (in this case by describing the shapes of the graphs and any relevant quantitative data.)
  
  
  
  
  
  
  
  
  
  
  - Draw a conclusion about what this evidence shows regarding the motion of each car.)
  
  
  
  
  
  
  
  
  
  
- Contrast the graphs of velocity  $v$  time for uniform motion and accelerated motion:
  - Cite evidence (in this case by describing the shapes of the graphs and any relevant quantitative data.)
  
  
  
  
  
  
  
  
  
  
  - Draw a conclusion about what this evidence shows regarding the motion of each car.)

