LEQ: How can equations be used to describe the motion of an object?

Objective: Given appropriate information, calculate the acceleration of an object (including units).

Acceleration

Changing Velocity

Acceleration

◆ Galileo developed the concept of **acceleration** in his experiments with inclined planes.

◆ http://www.teachersdomain.org/resources/lsps07/sci/phys/maf/ballincline/index.html

◆ http://www.msad49.org/ljhs/WonWorld/Inter2/lsps07_vid_ballincline/lsps07_vid_ballincline.html

Acceleration

◆ Galileo defined acceleration as the rate of change of **velocity**

◆ Acceleration = $\dfrac{\text{Change of velocity}}{\text{Time interval}}$

◆ $a = \dfrac{\Delta v}{\Delta t} = \dfrac{v_f - v_i}{t}$

Acceleration

- There are three ways a velocity can change:
  1. Increase velocity (**speed up**)
  2. Decrease velocity (**slow down**)
  3. Change directions (**turn**)
- All three of these changes in velocity are forms of **acceleration**.

Acceleration

- A car's speed increases from 30 km/hr to 60 km/hr in 5 sec. What is its acceleration?

Acceleration

- A runner starts from rest and reaches a speed of 6 m/s in 2 sec. What is his acceleration?

Acceleration

◆ A car starting from rest reaches a speed of 40 km/hr in 2 sec. What is its acceleration?

Acceleration

- A car traveling 60 km/hr stops in 3 sec. What is its acceleration?

Acceleration

◆ A car starts from rest and reaches a speed of 125 km/hr in 5 sec. What is its acceleration?