Motion

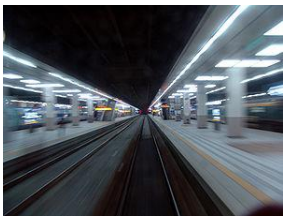
Physical Science
Module 2

Motion

- **Motion described by**
  - Speed (rate)
  - Velocity
    - Speed & direction
  - Acceleration
  - Distance/Displacement
    - How far it moved
- **Types of motion**
  - Accelerated motion
  - Irregular motion
  - Uniform (constant motion)

Motion

- **Motion**
  - A change in position relative to a ***point of reference***
  - An object is in motion when its distance from another object is changing
- **Reference point**
  - Any object used to detect motion
  - A reference point is a place or object used for comparison to determine if something is in motion
  - All reference points must be stationary



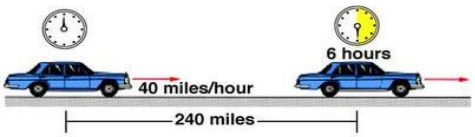
- **Speed (Rate)**
  - Any change over time
    - Amount of rain per hour (inches/hr)
    - Amount of sleep each night (hrs/night)
    - Amount of distance covered in an hour (miles/hr)

Speed

- **Speed**
  - The rate at which something moves a given distance.
  - Faster speeds = greater distances
- **General formula for speed:**
  - Speed = distance / time
  - Abbreviations commonly used:

    d = distance t = time v = speed
    - SI units, meters/second (m/s)

$$\mathbf{s = d/t}$$



Speed vs. Velocity

- **Speed** – how fast an object is moving
  - escribed by a ***Magnitude*** alone
  - Example: car moving 25 miles/hour

- **Velocity –** how fast an object is moving in a given direction
  - described by both a ***Magnitude*** and ***Direction***
  - Example: Car moving 25 miles/hour to the north

Speed $s = \left(\frac{d}{t}\right)$

Speed

Soln:

Given:
D= 100 miles
Time = 2.5 hours
S =?

Distance

Soln:

Given:
D= ?
Time = 6 hours
S =30 miles/hr

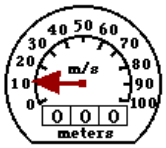
Time

Soln:

Given:
D= 100 miles
Time = ?
s=40 miles/hr

3 common types of speed

- **Average speed**
  - Total distance divided by total time
  - Example: Speed you drive from home to school
- **Instantaneous speed**
  - The speed on an object at any given moment
  - Example: speed indicated on speedometer



- **Constant speed**
  - The speed of the object does not change
  - Example: Speed of a train traveling without stops