Speed and Motion

Motion

- Occurs whenever the position of an object is changing.
- Described in terms of how fast the object is moving, direction, and whether the motion is constantly changing or not.
- Reference objects are used as a point of comparison against which an object's motion is measured.

Speed $s = \frac{d}{t}$

- Describes how fast an object is moving in relation to a reference object.
- Velocity – distinguished from speed because it indicates a direction.
- Many objects can have the same speed, but different velocities. (Think of ants moving outside an anthill).
- Formula – s is speed, d is distance, and t is time.

Problems

- What is the speed of a biker who travels 45.0 km in 6.2 hr?

$$s = \frac{d}{t}$$

$$s = \frac{45.0}{6.2} = 7.3 \frac{km}{hr}$$

Problems

- How far does a train moving at 110 km/hr travel in 3.1 hr?

$$s = \frac{d}{t}$$

$$110 = \frac{d}{3.1} = 341km$$

Problems

- How long will it take a woman running 3.88 m/s to run 1500 m?

$$s = \frac{d}{t} \qquad 3.88 = \frac{1500}{t}$$

$$3.88t = 1500 \qquad t = \frac{1500}{3.88} = 386.5s$$