

# Speed and Velocity

$$\text{speed} = \frac{\text{distance}}{\text{time}} \quad \longrightarrow \quad v = \frac{l}{t}$$

$$\overrightarrow{\text{velocity}} = \frac{\overrightarrow{\text{displacement}}}{\text{time}} \quad \longrightarrow \quad \vec{v} = \frac{\vec{d}}{t}$$

**Uniform motion:**  $\vec{v} = \overrightarrow{\text{const}}$

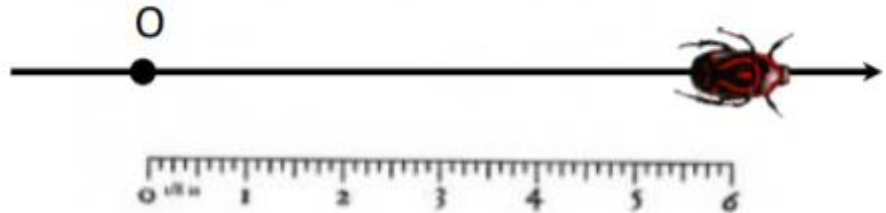
**Rectilinear motion:**  $\vec{v} \parallel \text{straight line}$

# Average quantities

$$\text{average speed} = \frac{\text{total distance}}{\text{total time}}$$

$$\overrightarrow{\text{average velocity}} = \frac{\overrightarrow{\text{total displacement}}}{\text{total time}}$$

**Positive direction  
on a line:**



# Homework 2

**Problem 1.** Describe an example where rectilinear motion is not a uniform motion.

**Problem 2.** A car passed 30 km at a speed of 15 m/s. Then, it turned back and spent 1 hour to pass 40 km. Find the car's average speed and average velocity. Make a picture.

**Problem 3.** A ship is sailing north for 80 km with speed 20 km/h. After that it turns west and sails for 2 hours with speed 15 km/h. Finally, it turns south and travels 40 km with speed 10 km/h. Find the average speed and the average velocity of the ship.

