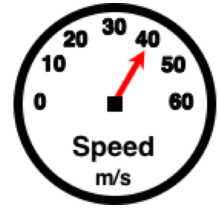


## Speed vs. Velocity

### Lesson Notes

**Speed**      A measure of how fast an object is moving.  
Distance covered per unit of time.  
A scalar quantity (magnitude ONLY).



**Velocity**      The rate at which the velocity changes.  
A vector quantity (magnitude AND direction).  
At any given instant, velocity = the speed + the direction.

**Instantaneous Speed:** the speed at any given instant in time

**Average Speed:** the time-based average of all instantaneous speeds.

Ave. Speed = distance/time

$$V_{\text{ave}} = \frac{d}{t}$$

Ave. Velocity = displacement per time

**Example 1:** If a car travels 5.0 miles in 0.20 hours (12 minutes), then what is its average speed?

**Big Idea:** If a person walks to the right and then changes its direction and walks back to the left, the direction change will cause the average \_\_\_\_\_ to decrease but have no effect upon the average \_\_\_\_\_.

**Example 2:** Coach Ulcer paces the sidelines. Starting at the 10 yd line (**A**), he moves to the 40 yd line (**B**), back to the 0 yd line (**C**) and finally to the 30 yd line (**D**) in 100 seconds. Determine his average speed and average velocity.

**Your Turn:** Coach Ulcer paces the sidelines. Starting at the 30 yd line (**A**), he moves to the 10 yd line (**B**), back to the 50 yd line (**C**) and finally to the 20 yd line (**D**) in 200 seconds. Determine his average speed and average velocity.