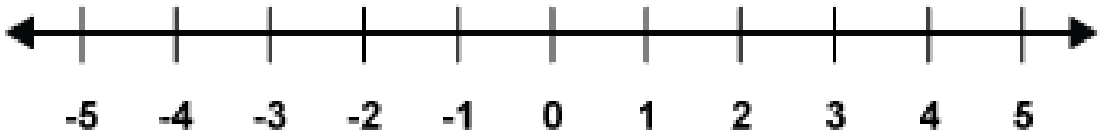
1-D Motion Vocabulary

Scalar vs. Vector Quantities

- Scalar: only has magnitude.
- Vector: has magnitude and direction. In physics, direction is given by the sign (+/-).

Distance and Displacement



- Distance: total distance traveled. Think of this as the odometer on your car, it always counts up.
  - SI Unit: meters (m)
  - Scalar (direction/sign doesn't matter)
- Displacement: change in position.
  - SI unit: meters (m)
  - Vector (direction/sign does matter)
- Equation:

$$d = \Delta x$$

$$d = x_f - x_i$$

Question 2.1 Walking the Dog

You and your dog go for a walk to the park. On the way, your dog takes many side trips to chase squirrels or examine fire hydrants. When you arrive at the park, do you and your dog have the same displacement?

a) yes

b) no

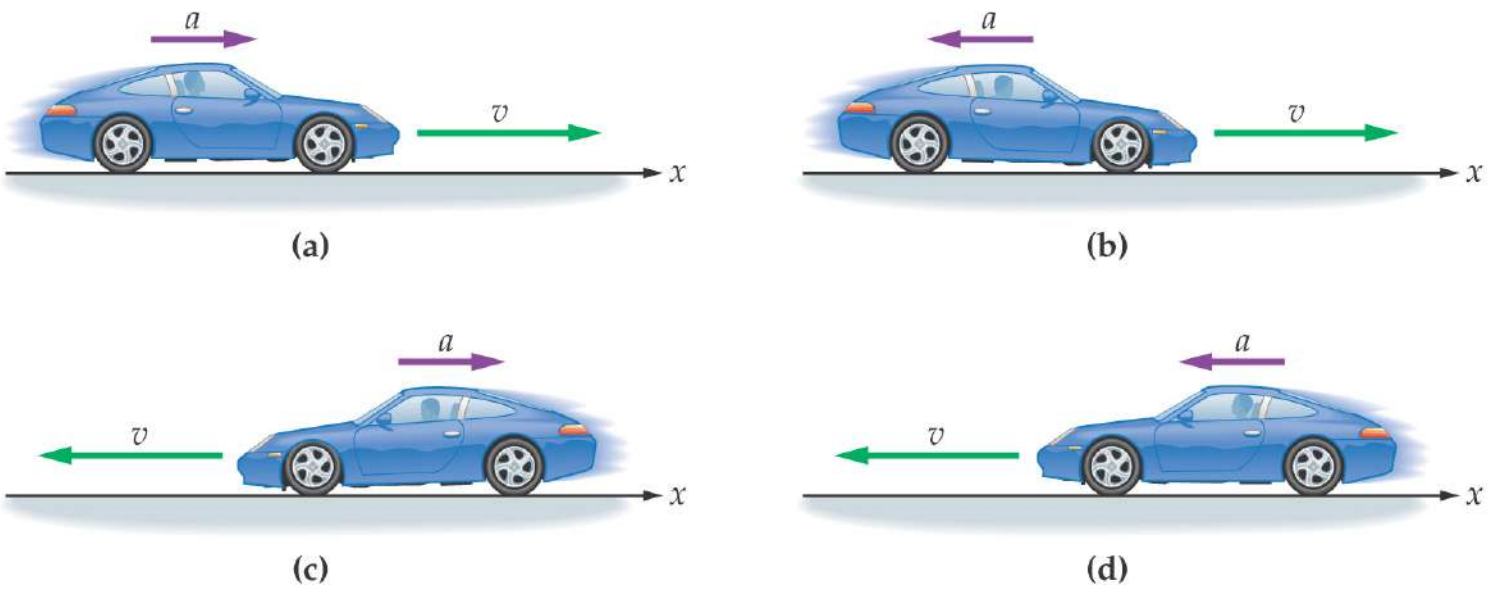
Speed and Velocity

- Speed: the change in **distance** over the change in time
  - Symbol: s
  - SI unit: m/s
- $average\ speed = \frac{distance}{time}$

- Velocity: the change in **displacement** over the change in time
  - Symbol: v
  - SI Unit: m/s
- $average\ velocity = \frac{\Delta d}{\Delta t}$

Acceleration

- Acceleration is the change in velocity over the change in time. It is a vector quantity.
  - Symbol: a
  - Unit: $^{m}/_{s^2}$
- $a = \frac{\Delta v}{\Delta t}$



1D Motion Vocab Flipped Lesson Follow Up Questions

1) What is the difference between a scalar and a vector?
2) I walk around the track exactly 4 times. Each lap is 400 m. What is the distance I traveled? What is the displacement?
3) For the following vocab words, determine whether they are scalars or vectors: Acceleration, speed, velocity, displacement, distance
4) What are the units for velocity and speed? What is the unit for acceleration?