

## Chapter 13 Section 1 Motion

### What is motion?

- One way you can describe the motion of an object is by how it changes position.
- There are two ways to describe the entire path the object travels.
  1. Describe the entire path the object travels.
  2. To give only the starting and stopping points.
- Displacement is the distance and direction between starting and ending position.

### Relative Motion

- Something that is in motion changes its position.
- Reference point**-The position of an object is described relative to another object, which is assumed to be not moving.

### Speed

- When you are moving, your position is changing. How quickly your position changes depends on your speed.
- Speed**-describes movement from one place to another over time.
- Speed**-is the distance traveled divided by the time needed to travel that distance.

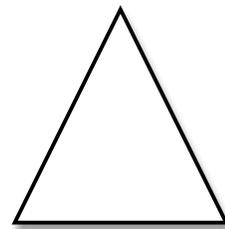
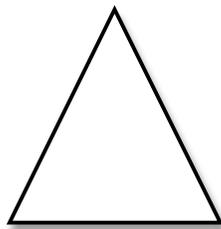
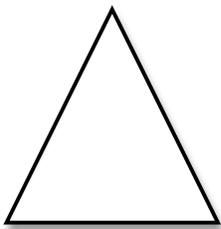
### Constant Speed

- For an object traveling at constant speed, the object's speed at any instant of time doesn't change. (Example- riding in a car with the cruise control on)

### Average Speed

- The speed of the car at one instant of time is the car's instantaneous speed.
- When you read a speedometer, you're finding your instantaneous speed.
- Average speed can be calculated from this equation:**

$$\text{average speed} = \frac{\text{total distance}}{\text{total time}} \quad s = \frac{d}{t} \quad \text{symbol for average speed } \overline{V}$$

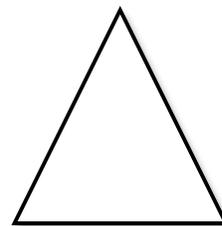


### Velocity (Speed)

- Velocity**-describes movement from one place to another over time and in a certain **DIRECTION**.

**Acceleration**-is the change in velocity divided by the amount of time required for the change to occur.

$$\text{velocity} = \frac{\text{distance}}{\text{time}} \quad \text{velocity} = \frac{d}{t}$$



## **Acceleration**

-**Acceleration**-is the change of speed over time.

-**Acceleration**-if an object changes its speed, its direction, or both, it is accelerating.

## **Speeding Up and Slowing Down**

-An object is accelerating when its velocity changes.

-Velocity can change if the speed of an object changes, whether the speed increases or decreases, or if it changes direction.

-If an object slows down, its speed changes. Therefore, if an object is speeding up or slowing down, its accelerating.

## **Turning**

-When an object turns or changes direction, its velocity changes. This means that any object that changes direction is accelerating.