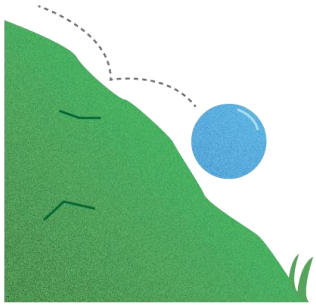
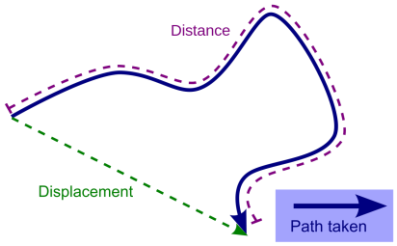
Force & Motion

Section I: Describing Motion



If you take a look around you, you will probably notice a lot of things in motion: a fellow classmate chewing gum, a ball rolling across the floor, an airplane flying in the sky as you look out the window, etc. In science, **motion** occurs when an object changes its position relative to a reference point. When describing the motion of an object, you should refer to its **distance**, or how far it has moved. The SI unit of distance or length is the meter (m).

Displacement is the distance and direction of an object's change in position from its starting point.



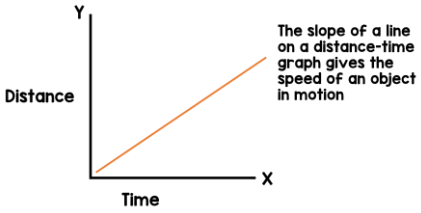
Average Speed (v) = total distance (d) / total time (t)

V= d/t

What is the speed of a plane that travels 1500 miles in 8 hours?

To measure the motion of an object, you must know how fast and in what direction it is moving. How fast something moves is called its **speed**. This is the distance an object travels per unit of time. The SI unit for speed is meters per second (m/s). To calculate the average speed, you take the total distance and divide it by the total time.

There are three types of speed: instantaneous speed, average speed, and constant speed. **Instantaneous speed** is speed at any given time, for example, the speed a car is moving when you look down at the speedometer. The **average speed** is the total distance traveled divided by the time, which can be calculated when you take a road trip with your family. **Constant speed** is speed that does not vary. The speed of a car driving in cruise control is an example of constant speed.



The motion of an object can be plotted on a distance–time graph. To graph the motion of an object over a period of time you would plot the time on the x–axis and the distance on the y–axis.

Review:

1. What is displacement?
2. Identify the equation used to determine the average speed of an object.
3. Compare instantaneous speed to constant speed.