

## Object Motion

# Motion, Speed & Direction

*If an object is moving in a way that changes its position, then the object is in motion. **Motion** is a change in position relative to a frame of reference.*

The position of an object that is in motion is always changing. It does not stay in the same place. The direction that an object is moving might change or it might stay the same.

## Force

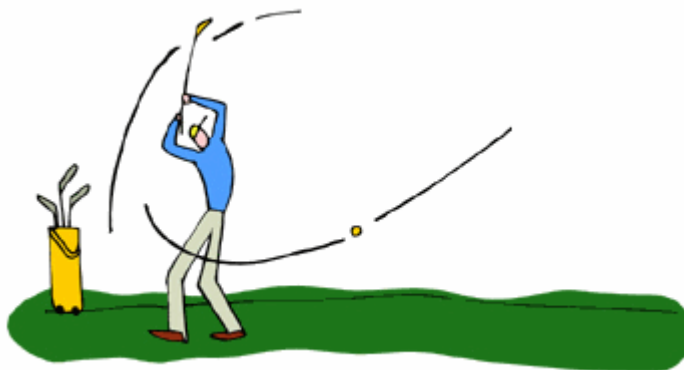
A **force** is a push or a pull that can start, stop, or change the direction of an object's motion.

All motion begins with a force. For example, a person must apply a force to a book in order to pick it up.

Force is needed to stop an object's motion. For example, the brakes of a car apply a force to the car's wheels in order to help the car stop.

Force is also needed to change the direction of an object's motion.

The golf ball in the picture below begins moving because of the force of the golf club hitting it. As it flies through the air, the direction that the golf ball is moving might be changed by the force of the wind pushing on it.



## Speed

The **speed** of an object is a measurement of how the position of the object is changing over time. This shows how fast the object is moving.

Objects can move at different speeds. To figure out the speed, you need to measure how long it takes for the object to travel a certain distance.

If two objects are moving for the same amount of time, the faster object will travel farther. In the same way, if two objects move the same distance, the faster object will take less time.

## Direction

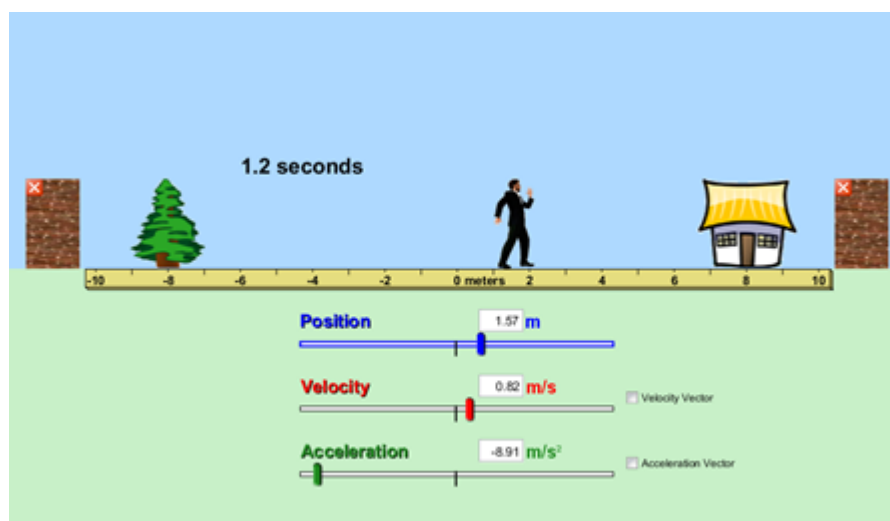
**Direction** is the path along which something is moving.

Words that can be used to describe the direction of an object's movement include:

- up or down
- left or right
- north, south, east, or west

## Object Motion

*Click on the image below to explore the movement of objects.*



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