# Forces and Motion Study Guide

Below are some vocabulary words and concepts that are important to know.

The **position** of an object is its location. You know when it has moved because it has changed position. You can measure how far an object moves by measuring the **distance**, or length between two places. While an object changes position, the object is in **motion**. Objects move at different **speeds**. To measure speed, you need to measure distance and time.

**Force** is a push or pull. Forces always work in pairs. If you push or pull on something, it will push or pull back at you. **Gravity** is a pulling force between two objects. There is gravity on Earth. The pull of gravity creates weight. **Weight** is how much gravity pulls on an object. Scientists measure weight in **newtons**. In the US, we use **pounds** to measure weight. The larger planets have a stronger pull of gravity, and smaller planets have less. You will weigh more on Saturn and less on Mars.

Objects can change motion. Changes in motion occur when an object starts or stops, or when it speeds up, slows down, or changes direction. **Friction** is the force that occurs when one object rubs on another object. Friction can change the motion of an object. Different materials can change the amount of friction on an object. Slippery things reduce friction and rough or sticky things increase friction.

**Work** is done when you apply force and the motion of the object changes. If the motion does not change, it is not work. To do work, you need energy. **Energy** is the ability to do work. Moving things have energy of motion. Things that are still have stored energy. A rock at the top of a hill has stored energy. It can fall down the hill. Other forms of energy are heat, light, sound, and electricity.

Work can be made easier with the use of simple machines. A **simple machine** is a machine with no or few moving parts. Some examples of simple machines are levers, pulleys, and wheel and axles.