**acceleration**: rate of increase of speed or velocity (example: accelerator pedal on a car)

**air resistance (drag)**: force of air pushing against the motion of an object

**balanced force**: an object remains in place, no movement occurs

**control**: part of an experiment that does not change, serves as the standard to compare other observations

**direction**: the way the force is applied determines this way an object moves

**energy**: ability to do work

**energy, kinetic**: energy of motion (moving ball going down a ramp)

**energy, potential**: stored energy (ball positioned at the top of the ramp)

**fair test**: changing only one variable and keeping the other conditions the same

**force**: any push or pull on an object

**friction**: force that resists motion between two touching surfaces, slows things down and can also produce heat, acts in the opposite direction of the force

**gravity, gravitational force**: force that brings objects toward earth

**inertia**: the tendency of an object to resist a change in motion or keep doing what it is doing

Note: the greater the mass of an object, the greater the inertia

mass: how much matter an object contains

**momentum**: force or speed of movement; mass in motion, example: a moving train has much more than a moving soccer ball

Note: momentum = mass of an object x velocity

(increasing the mass or speed increases the momentum)

motion: an object changing position over time; change in position is measured by distance and time

**Newton’s 1st law of motion**: \*An object tends to stay at rest and an object tends to stay in motion with the same speed and in the same direction unless acted on by an unbalanced force.

\* Objects tend to keep doing what they are doing.

\* If the forces acting upon an object are balanced, the acceleration of that object will be zero (no motion).

\*also known as the “law of inertia”

**Newton’s 2nd law of motion**: \* Acceleration is always in the direction of the unbalanced force.

\*If you want something to accelerate faster, you need to decrease its mass.

\* Acceleration of an object depends upon two variables—the net force acting upon the object and the mass of the object.

\* Force = mass x acceleration or F = ma

**Newton’s 3rd law of motion**: \*Explains why forces act in pairs.

\* For every action, there is an equal and opposite reaction.

\* When one object exerts a force on a second object, the second object exerts the same amount of force back on the first object (but in the opposite direction).

\* Equal forces acting in opposite directions create a net force of zero.

\* Action and reaction forces are equal forces acting in opposite directions. The reason they can’t cancel each other out is because they are acting on different objects.

**propeller**: two or more twisted blades that rotate around a central point or shaft (shaft: pipe or tube)

**recursive**: consequential steps

**resistance**: force pushing against the motion of an object

**speed (rate)**: distance divided by time (or d/t), example: 25 mph

**unbalanced force**: motion occurs; the movement goes in the direction of the greater force (example: winning a tug-of-war game)

**validity**: conducting a fair test

**variable**: something in an experiment that can be changed

**velocity**: speed with direction (ex.: 45 mph NW)

**weight**: force of gravity pulling down on an object

**work**: moving an object over a distance

\*\*\*And all of the simple machines

**Lever**

**Pulley**

**Screw**

**Inclined Plane**

**Wedge**

**Wheel and Axle**

**Compound Machine**

**Simple Machine**