

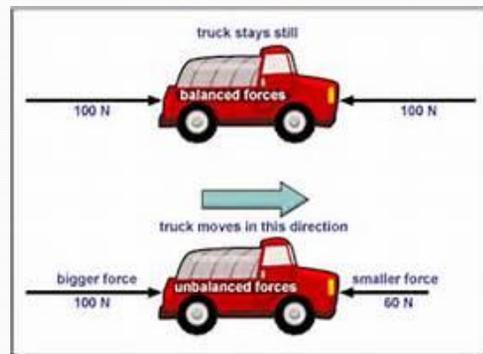
Forces and Newton's Laws

Forces

- A. Newton- (N) the SI unit for the magnitude of a force. Also called weight.
- B. Force- a push or a pull. Described by its magnitude and direction.



- 1. Net Force- The combination of all forces. Determines whether an object moves and in which direction.
- 2. Unbalanced Forces- can cause the velocity of an object to change.
- 3. Balanced Forces- equal forces acting on one object in opposite directions. Balanced forces acting on an object do not change the object's velocity.



II. Friction

- A. Friction- a force that acts in a direction opposite to the motion of objects. The strength of friction depends on the type of surface. Without friction, a moving object would not stop without hitting another object.



- 1. Static Friction- friction that acts on objects that are not moving. Ex. Begin to push an object.
- 2. Sliding Friction- occurs when two solid objects slide over each other. Ex. Ice skating
- 3. Rolling Friction- when an object rolls across a surface. Ex. bowling
- 4. Fluid Friction- when a solid object moves through a fluid.



B. Gravity- a force that pulls objects toward each other.

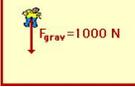
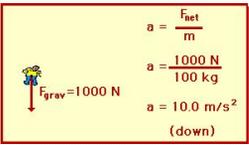
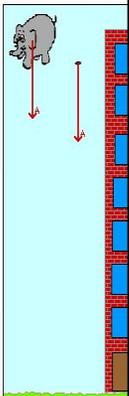
C. Mass- the amount of matter in an object.

D. Weight- the gravitational force exerted on a person or object at the surface of a planet.

1. Weight= Mass x acceleration due to gravity
2. Acceleration due to gravity= 9.8 m/s^2



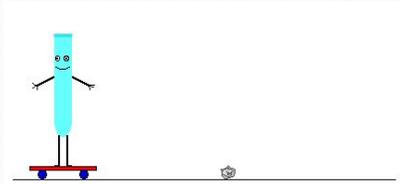

E. Free Fall- when the only force acting on an object is gravity.

III. Newton's Laws

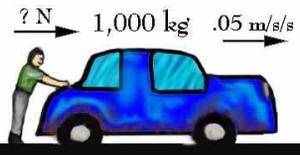
A. Newton's 1st law of motion- an object will remain at rest or moving unless it is acted upon by an unbalanced force.

1. Inertia- resistance to a change in motion.
2. Momentum- mass • velocity



B. Newton's Second Law of Motion- acceleration depends on the net force of the object and its mass.

Acceleration = $\frac{\text{Net force}}{\text{Mass}}$ OR Net force= Mass x acceleration



$F = 1,000 \times 0.05$

Answer= 50 newtons

A. Newton's Third Law of Motion- for every action there is an equal and opposite reaction.

