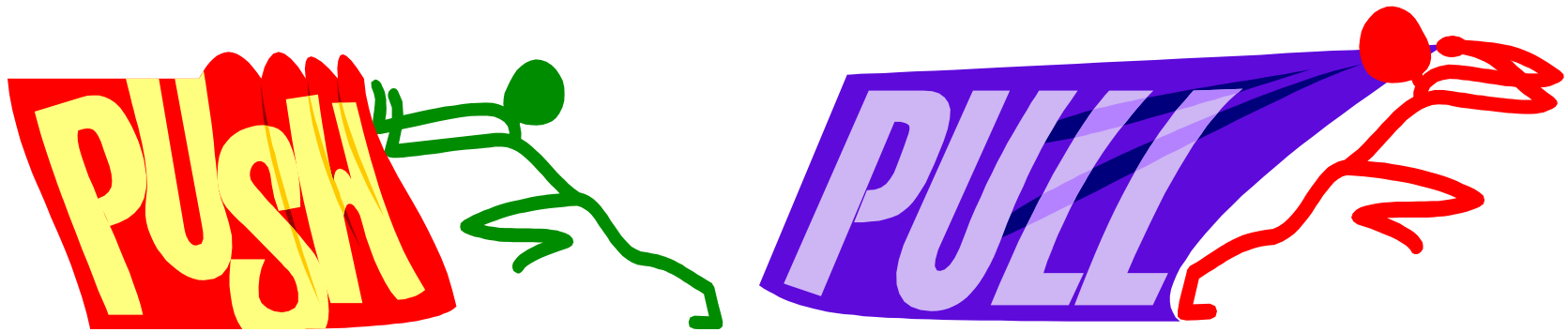


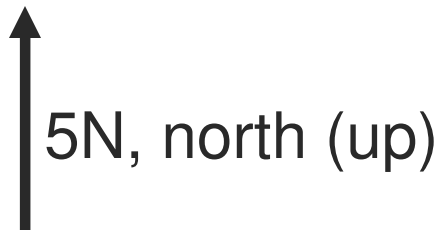
[What is a force?]



- A force is a push or pull that causes an object to move, stop, or change direction
- The SI unit of measurements for force is Newtons (n)

[Force]

- Forces come in pairs
- Forces have a magnitude and direction
- The length and thickness of the arrows represent the magnitude of the force
 - The longer the arrow, the greater the force
 - The smaller the arrow, the smaller the force



Magnitude: 5N
Direction: north (up)

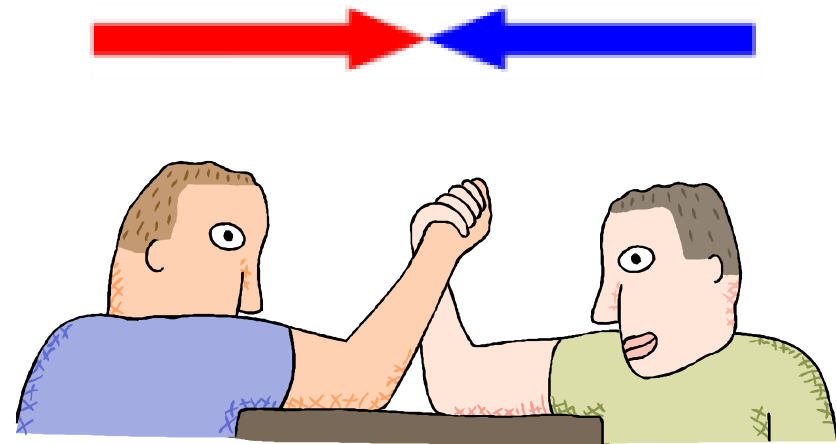
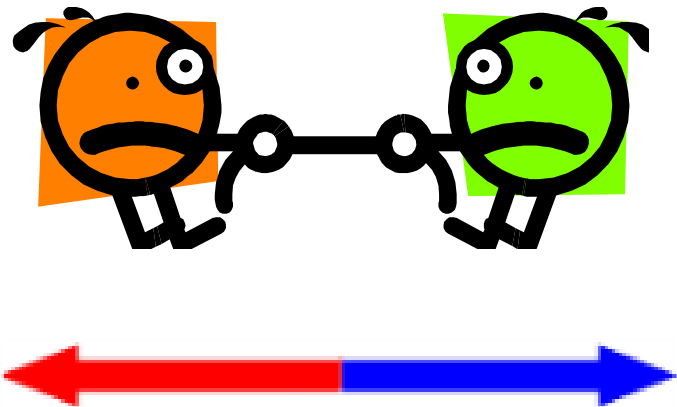
Balanced and Unbalanced Forces

- Forces occur in pairs and they can be either balanced or unbalanced



Balanced Forces

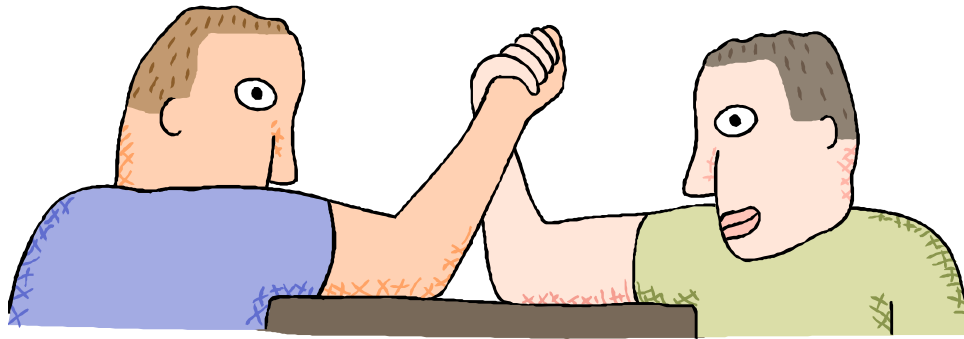
- Balanced forces do not cause change in motion
- They are equal in size, and opposite in direction



[Unbalanced Forces]

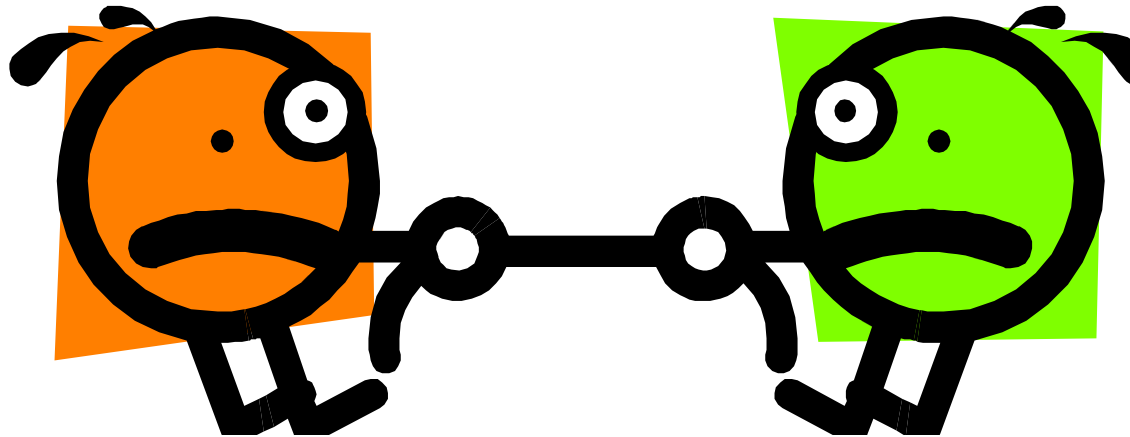
- An unbalanced force always causes a change in motion
- One force is bigger than the other
- When there are unbalanced forces, there is a net force acting on an object
 - Net force
 - Magnitude
 - The difference or addition between two forces
 - Direction
 - The object always moves in the direction of the greater force (net force)

[Unbalanced Forces]



$$3 \text{ N, right} - 6 \text{ N, left} = 3 \text{ N, left}$$

[Unbalanced Forces]



$$4 \text{ N, left} - 10 \text{ N, right} = 6 \text{ N, right}$$

[Unbalanced Forces]



5 N, right + 10 N, right = 15N, right

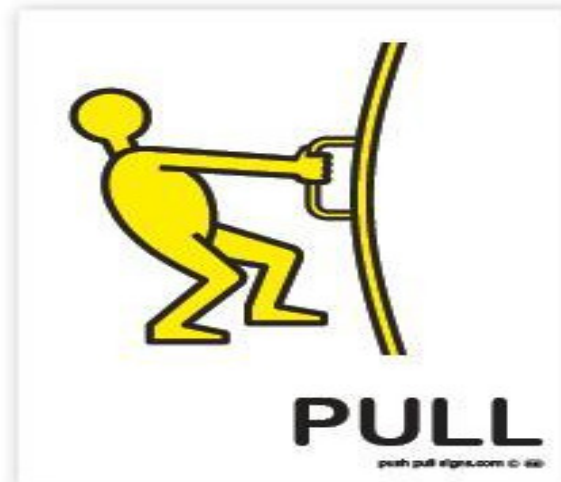
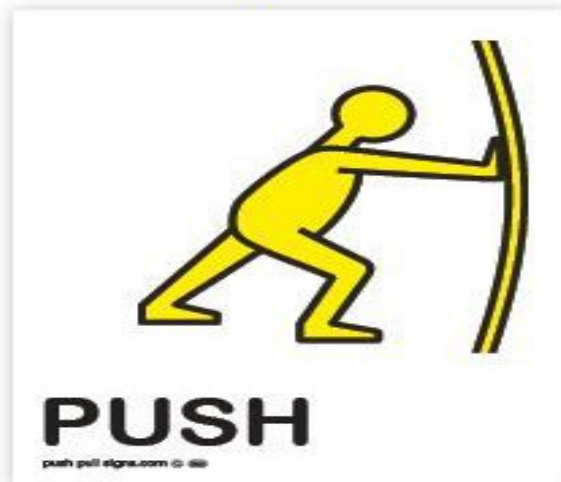


Balanced and Unbalanced Forces

Vocabulary

Force

- A push or a pull that causes an object to move, stop, or change direction



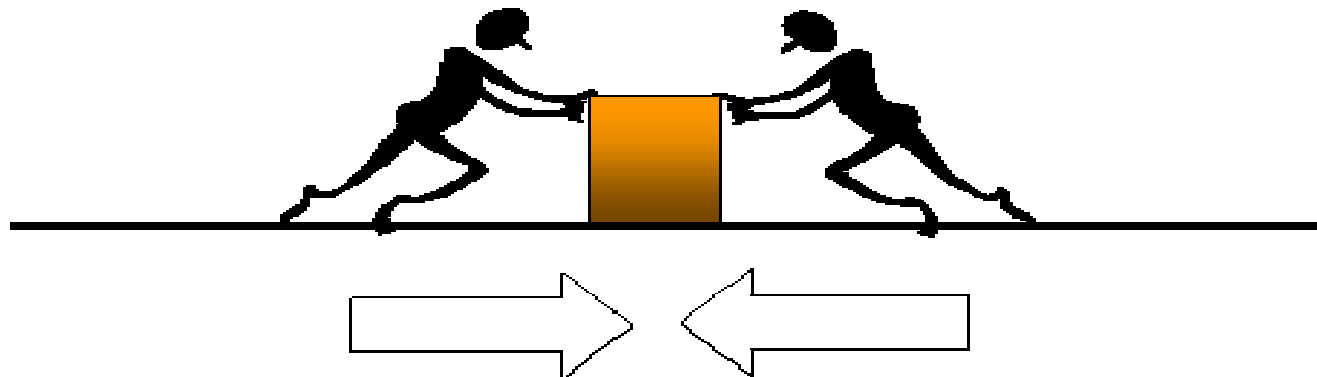
Newton

- The SI unit of measurements for force is Newtons (N)
- A spring scale is used to measure the amount of force



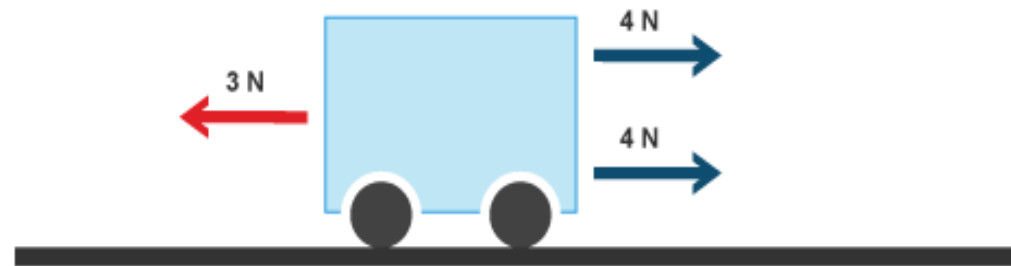
Balanced forces

- A set of forces exerted on an object that cancel each other out and where the combined forces is equal to zero force
- Balanced forces do not cause change in the motion of the object
- Stationary object (objects not moving) are an example of balanced forces



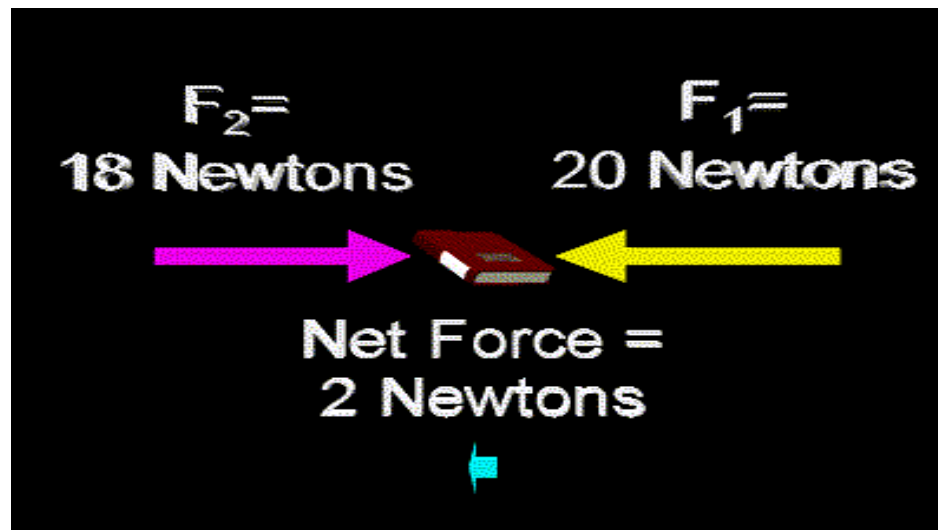
Unbalanced forces

- A set of forces exerted on an object that change the motion of that object
- One force is greater than the other
- They cause object to start moving, speed up, slowdown, or change direction



Net force

- The combination of all forces acting on an object
- The remaining force after adding or subtracting the forces involved



Gravity

- A force of attraction between two objects that have mass.



Friction

- A force that opposes motion between two surfaces that are in contact

