What is Force?

Introduction to Force and FBD.

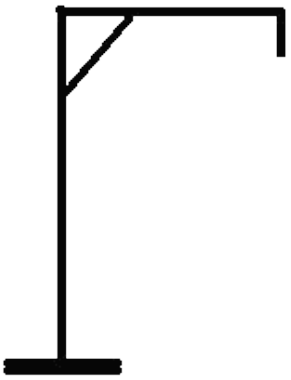
Name _____

Teacher _____

When two objects interact there is a force applied to each object. Both objects experience a force that will either _____ or _____ the objects.

An easy way to represent the forces applied to an object is to draw a free-body diagram or FBD.

1. To begin, draw a dot.
2. Next, draw arrows that point away from the dot in the direction of each applied force.
3. Lastly, label each arrow with the type of force. At this point in your study of physics, the choice of forces is limited to:
    - force of gravity, F_g,
    - force of air resistance, F_f, and
    - force applied, F_A.



___ ___ ___ ___ or ___ ___ ___ ___

An FBD produces a simply representation of all the forces applied to an object. The FBD helps identify and explain the object's subsequent motion.

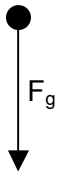
- If the forces are **balanced**, (two forces equal in magnitude and opposite in direction), the object will remain in a state of constant motion.
- If the forces are **unbalanced** the object will accelerate.

In what direction will the object accelerate?

_____

The **force of gravity**, $\mathbf{F_g}$, is present anytime an object is on or near the surface of the earth.

- In the absence of air resistance it is the only force acting on an object while in the air.
- The force of gravity points down towards the earth.
- The force of gravity is also known as the weight of an object.



The **force of air resistance**, $\mathbf{F_f}$, is present when it's necessary to consider how the air impacts the motion of an object.

- The majority of the time air resistance will be ignored but only through careful reading of the problem can this be determined.
- The force of air resistance points in the direction opposite the motion of the object.

The **force applied**, $\mathbf{F_A}$, is present when an object is pushed, pulled or thrusted by someone or something. More specific forces will be introduced in the next unit.

Force is measured in newtons; abbreviation is N. 1 N is approximately equal to ¼ of a pound.