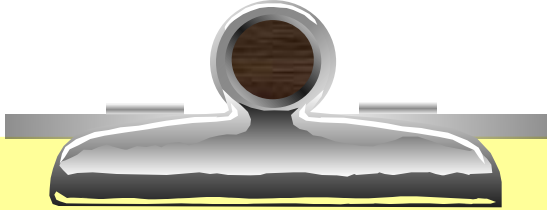
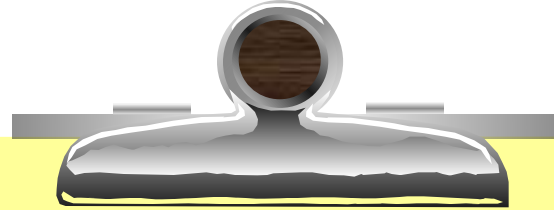


# Chapter 4-2 Notes

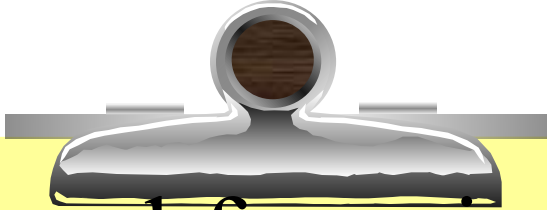
- Newton's First Law



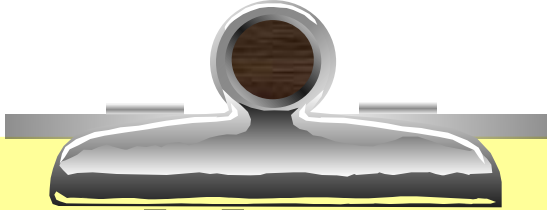
- Newton's First Law – An object at rest remains at rest and an object in motion continues in motion with a constant velocity unless acted on by an outside force.
- The tendency of an object not to accelerate is called inertia.
- When the net external force on an object is zero, its acceleration is zero.



Demo



- The net external force is the vector sum of all the forces acting on an object.
- A simple problem occurs when all forces act directly along the x and y axis. You would just add and subtract and use Pythagorean theorem.
- However, most of the time, we must use vector component method.



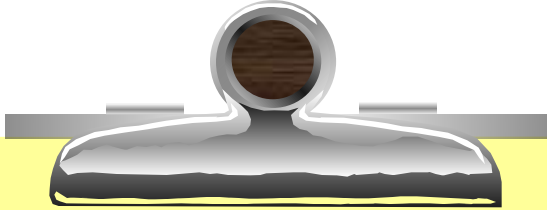
# Mass

- Inertia depends on the amount of mass.
- The greater the mass, the less the body accelerates under a force.
- The opposite is true also.
- Therefore, mass, which is a measure of the amount of matter in an object, is also a measure of the inertia of an object.



# Equilibrium

- Objects that are either at rest or moving with a constant velocity are in equilibrium.
- Newton's 1<sup>st</sup> law states one condition must be true for equilibrium: the net external force acting on a body in equilibrium must be equal to zero.



- An apple falls, the gravitational force on the apple is 2 N downward, and the force of the wind on the apple is 1 N to the right at an angle of 20 degrees. Find the magnitude and direction of the net force of the apple.

