



Flipping Physics Lecture Notes:

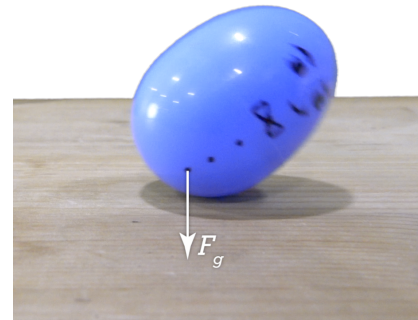
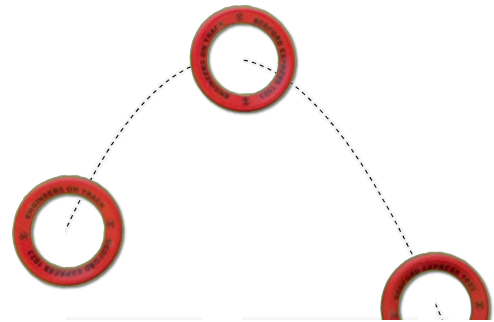
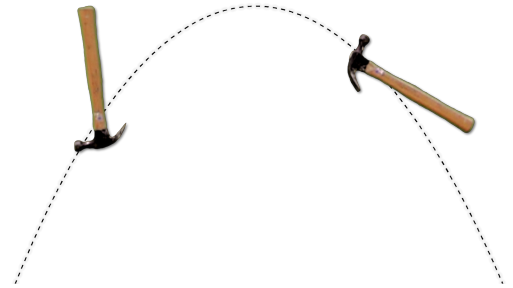
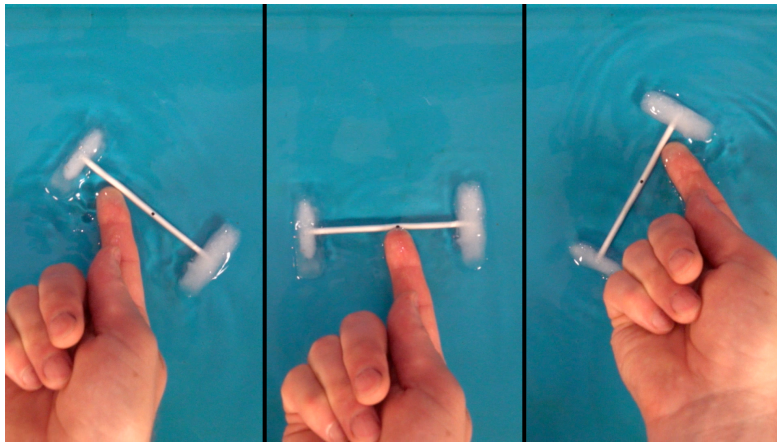
Introduction to Center of Mass

The center of mass of an object is the mass-weighted average position of all of the mass of the object. An object in projectile motion will rotate around its center of mass and its center of mass will follow the same parabolic path we are used to.

When the acceleration due to gravity is constant, as we consider it to be on the surface of planet Earth, the center of mass and center of gravity of an object are in the same location.

Notice that the center of mass of an object is not a physical location on the object and sometimes is not even located on the object at all. For example, this frisbee ring has its center of mass in the middle, not on the ring itself.

When you apply a force at or toward the center of mass of the object, the object will not rotate. If you apply a force to the left or right of the center of mass of the object, the object will rotate.



We consider the force of gravity to act on the center of mass of the object. The center of mass of a "Weeble" is very low on the object and when it is tipped over, the center of mass goes up. This is why a Weeble will always right itself.

When an object is hung by one point, the force of gravity will pull on the center of mass of the object in an attempt to bring the center of mass to its lowest point. This is why we can hang a flat object to find its center of mass, because the center of mass will always be below the hanging point.

