LEVER

A lever is a simple machine. It consists of a solid board or rod (rigid beam) that can pivot about a point or fulcrum. A force or effort is applied, resulting in moving or applying force to a load. The distance from the applied force or effort force to the fulcrum is called the effort arm and the distance from the load to the fulcrum is called the load arm. A lever amplifies an input force to provide a greater output force. The ratio of force is called mechanical advantage lever. The mechanical advantage is that you can move a heavy object using less force than the weight of the object, you can propel an object faster by applying a force at a slower speed, or you can move an object further than the distance you apply to the lever. It is considered a "pure" simple machine because friction is not a factor to overcome, as in other simple machines. There are three common types or classes of levers, depending on where the fulcrum and applied force is located:

(a) First Class Lever (b) Second class lever and (c) Third class lever

First class lever: A first-class lever is a lever in which the fulcrum is located between the input effort and the output load. Example: Seasaws, scissors, crowbars, scissors, pliers, punching machine.

Pair of pliers  
Crowbars

(b) Second Class Lever:

In a second class lever the input effort is located at the end of the bar and the fulcrum is located at the other end of the bar, opposite to the input, with the output load at a point between these two forces. The load is between fulcrum and effort. Example: wheelbarrow, nut cracker, bottle opener, lemon squeezer

(c) Class three lever: Effort in the middle and the load is on one side of the effort and the fulcrum is located on the other side, for example, a pair of tweezers, hockey Stick, stapler, fishing rod etc. The mechanical advantage is always less than 1. Example: Tweezers (ref figure right side), Stapler, punching machine