Work

Work is done when a force acts on an object to displace it. The SI unit of work is Joule (J). The relationship between work, force and displacement are:

Work = force x distance by which the body moves

That is, **W = F x D**

When a body moves under the influence of a force, work is said to be done. But if there is no motion produced in the body, the work done is zero. Thus, work is done only when the force applied to the body makes it move.

One joule is the amount of work done when a force of one newton acting on a body moves it through a distance of one meter in the direction of the force.

There are two types of work. They are:

1. Work done against the friction
2. Work done against the gravity

Work done against the friction

When force is applied to an object then the equal force exerted in the opposite direction. When an object is dragged then equal and the opposite direction is exerted which is called friction. So, when you pull or drag then friction is produced.

Activity 1

1. Take a strong spring balance and a heavy wooden block.
2. Tie the wooden block with the spring.
3. Apply the force on the spring balance to pull the wooden block.

Let the mass of the wooden block be 16 Kg. And you have applied the force to move it through a distance of 40 m. How much work is done on the wooden block?
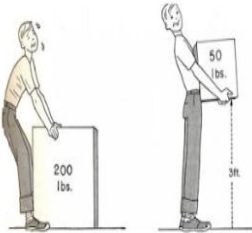Here, force is applied to move the body. The force of a body is the product of mass and acceleration due to gravity acting on it. Hence, the weight of the wood is:
$F = 16 \text{ Kg} \times 10 \text{ m/s}^2$
$= 160 \text{ N}$
Distance(D)= 40 m
$W = F \times D = 160 \times 40$
=6400 Joules

Work done against the Gravity

Activity 2

1. Take a wooden block and tie it with a string.
2. Attach a spring balance to the block and lift it slowly.
3. Note down the reading shown by the pointer of the spring balance.
4. Measure the height through which it is raised.

When the block is lifted, the force of gravity acts on the block constantly and pulls it downward. If the force applied is greater than the force of gravity, the block is raised upwards.