SIMPLE MACHINES

A Machine is a device where the application of a little effort (force) will overcome large amount of load. It is used for doing work easily. A machine also converts force

TERMS USED IN SIMPLE MACHINE

1. Mechanical Advantage: This is defined as the ratio of the load carried to the effort applied.

The Mechanical Advantage is affected by friction. It is dependent on friction

1. Velocity Ratio: This is defined as the ratio of the distance moved by the effort to the distance moved by the load

The velocity ratio is also defined as the ratio of the effort arm to the load arm.

Velocity ratio is independent on friction

1. Work Output: This is defined as the work done on the load
2. Work Input: This is the work done by the effort
3. Work done Against Friction: This is defined as the difference between work input ant work output.

EFFICIENCY OF A MACHINE

This is the percentage ratio of the work output to the work input.

VELOCITY RATIO OF SOME SIMPLE MACHINES

1. Inclined plane: This is a device used for raising or lowering object. For example, when trying to bring heavy objects from a truck, a piece of wood is put between the truck and the floor so that the object can be rolled down. The wood there is acting as an inclined plane. In this machine, the velocity ratio is defined as the reciprocal of the sine of the angle of inclination

The smaller the angle, the higher the velocity ratio and vice versa

If the angle of inclination is 30 then the velocity ratio will be 2

1. The screw jack: The velocity ratio of this machine is a function of its radius amp (r) and the pitch (P)
2. The pulley system (or the Block and Tackle system): The velocity ratio of this system is the number of pulleys.
3. The gear system: The velocity ratio of this machine is the ratio of the number of teeth in the larger gear to the number of teeth in the smaller gear.
4. Wheel And axle: The velocity ratio of this machine is defined as the ratio of the radius of the wheel to the radius of the axle

THE LEVER SYSTEM

A Lever can be defined as a simple machine which has an effort (a force applied), a fulcrum and a load.

This can be classified into three namely

1. First Class Lever: In this lever system, the fulcrum is between the effort and the load
2. Second Class Lever: In this lever system, the load is between the effort and the fulcrum
3. Third Class Lever: In this lever arrangement, the effort is between the fulcrum and the load.