

Simple Machines :)

What is it?

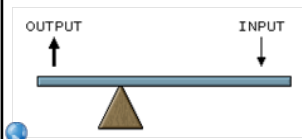
- a device that reduces the amount of effort force needed to do work by increasing the distance that the force is applied.
- can also change the direction of the effort force

Effort force

- force used to potentially move the object
- also known as an input force

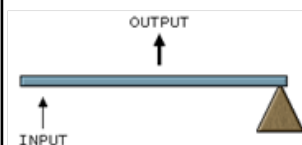
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Lever



- A bar that is free to move around a fixed point
- Fulcrum- fixed point
- Load- what is being moved
- Can be used to reduce the amount of force required to move a load in two ways:
 - increasing the distance from the fulcrum to the point where the effort force is applied
 - decreasing the distance the load is from the fulcrum

Rule to levers

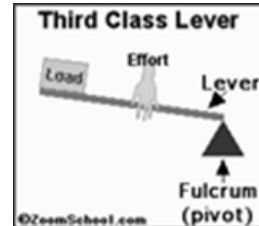
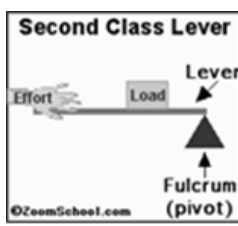
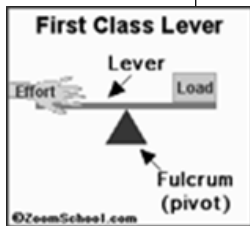


- The greater the distance between fulcrum and effort force, the less force is needed.

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Types of levers

- First class lever
 - fulcrum in the middle, effort force on one end and load on the other end
- Second class lever
 - fulcrum on the end, effort force on one end and load in the middle
- Third class lever
 - fulcrum on the end, effort force in the middle and load on the end



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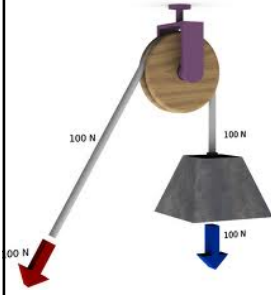
Examples

- First class
 - pliers
 - scissors
- Second class
 - wheelbarrow
 - nutcracker
- Third class
 - hammer
 - catapult



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What is a pulley?



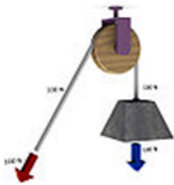
- Grooved wheel with a rope running along the groove
- Can change the amount and/or the direction of the force applied (effort force).

Rule to pulleys

- The longer the rope, the less force is needed to move the object.

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Fixed pulley



- Changes the direction of the movement of the object.
- Pulley stays in one spot

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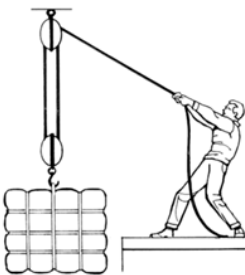
Moveable pulley



- Makes the rope longer which uses less force to move the object
- pulley moves with the load

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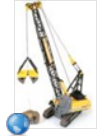
Block and tackle



- consists of 2 or more pulleys that are used to move an object
- has at least 1 fixed pulley and 1 moveable pulley

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Examples



Fixed pulley

- flagpole
- rock climbing rig



Moveable pulley

- sailboats
- cranes



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