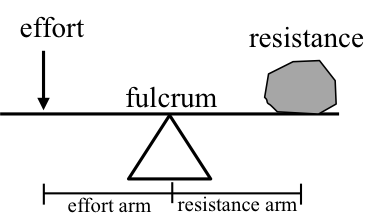
**Simple Machine Notes**

I. Types of **Simple Machines**

**A. Levers** – have a fulcrum, an effort arm, and a resistance arm.

1. Three types of levers are: FRE

a. **1st class** –

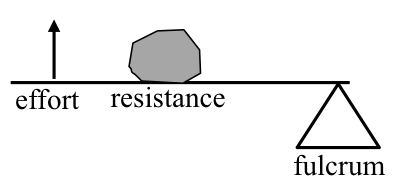


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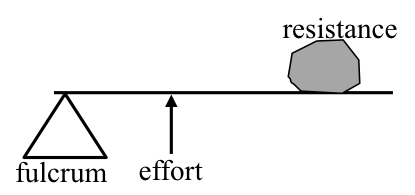
Ex. – hammer pulling nails, prying with a screwdriver, crowbar, seesaws

b. **2nd class** –



Ex. - doors, wheelbarrow

c. **3rd class** –



Ex. – brooms, hoe, baseball bat, fishing rod

2. Torque is force applied to the lever causing it to turn or rotate.

a. Effort torque = effort arm x effort force

b. Resistance torque = resistance arm x resistance force

B. **Pulleys** – Has a rope around a pulley(s) that is pulled to move an object.

Ex. - flag poles, cranes, window blinds

C. **Wheel-and-axles** - When one shaft is turned and it turns

another shaft/wheel/gear.

Ex. screwdriver, pencil sharpener, gears, winches

D. **Inclined plane** – Ramp that forms a right angle to the

ground

Ex. - wheelchair ramp, on-off ramps, overpasses

E. **Screw** - An inclined plane wrapped around a post.

Ex. - jar lids, wood screws, switchbacks

F. **Wedges** - A double inclined plane forming a point

Ex. – doorstop, any blade, scissors, etc.

II. All simple machines can be classified as either a lever or an inclined plane.

A. Pulleys and wheel-and-axles could be classified as circular levers with the axle being the fulcrum.

B. Screws and wedges are modified inclined planes.

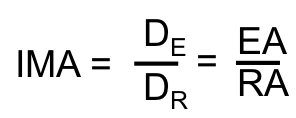
III. Compound machines are machines that combine 2 or more simple machines.

Ex. – bicycle, scissors

IV. Mechanical Advantage - how many times a machine

multiplies the effort force.

A) Ideal mechanical advantages - the mechanical advantage of a machine if there were no friction or loss of energy.



B) Actual mechanical advantage - the MA with friction

