

Simple Machines



Lever



Inclined Plane



Wedge



Pulley



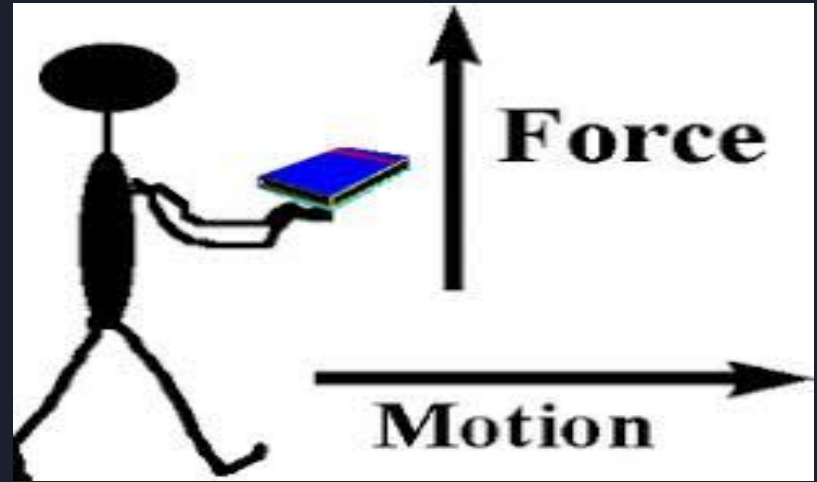
Wheel and Axle



Screw

What is a Force?

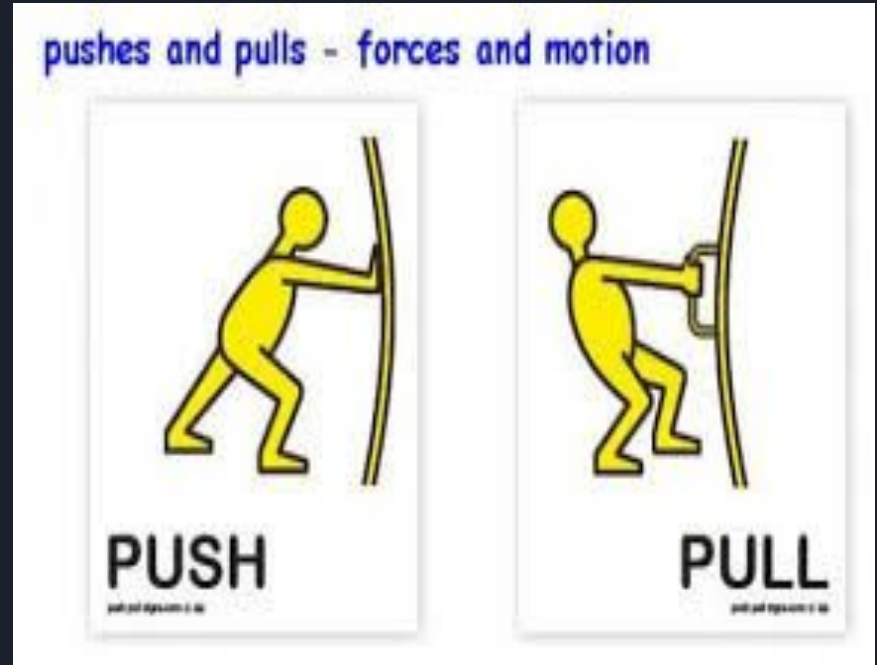
Motion: any change in the position or location of an object, even if it so slight or slow that it seems undetectable.



What is a Force?

Force: a push or a pull that makes an object move, slow down, or stop

- Just because there is no motion, does not mean that there is no force.



Forces Can Make Objects Do Five Things

1.
Speed
Up or
Start
Moving

Like kicking a football.

To start something moving, a push force must be larger than resisting forces like friction (see next page).



3.
Change
Direction

Like hitting a ball with a bat or gravity causing footballs to come back down to Earth.



4. Turn

Like turning
a spanner.



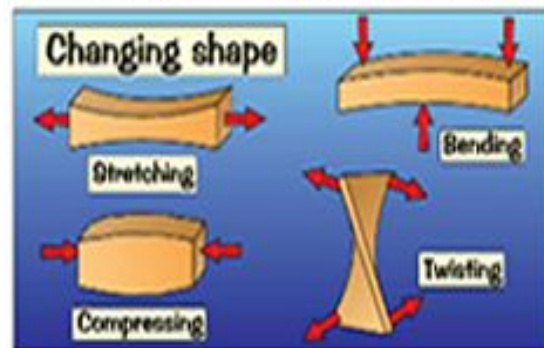
2.
Slow
Down or
Stop
Moving

Like drag or air resistance (see next page).

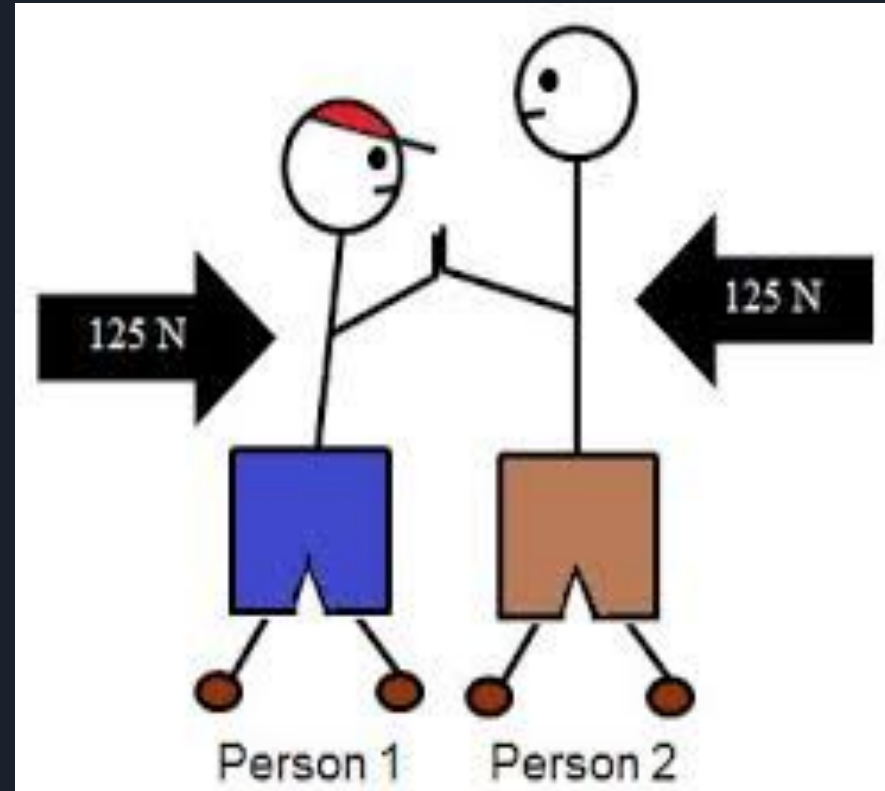


5.
Change
Shape

Like stretching and compressing (see p.83), bending and twisting.



- Force is measured in Newtons (N)
- The greater the force, the greater the number of newtons





THE *inertia*
DANCE PROJECT



Let's Talk About Force!

- There are three different kinds of forces acting on objects:
 - Gravity
 - Magnetic
 - Mechanical

Let's Talk About Force!

Gravity

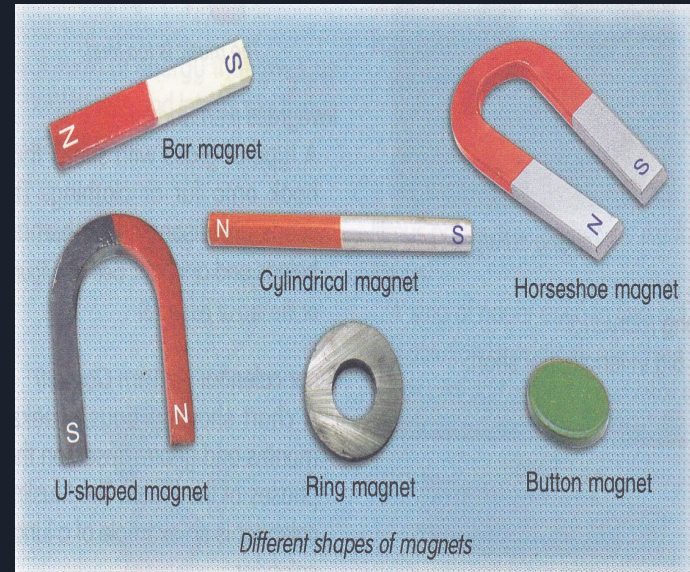
- Drop objects
- Measure time of impact



Let's Talk About Force!

Magnetic

- Compare strengths



Let's Talk About Force!

Mechanical

- Move objects by pushing and pulling
- Easier to push if taller, otherwise easier to pull



Force!

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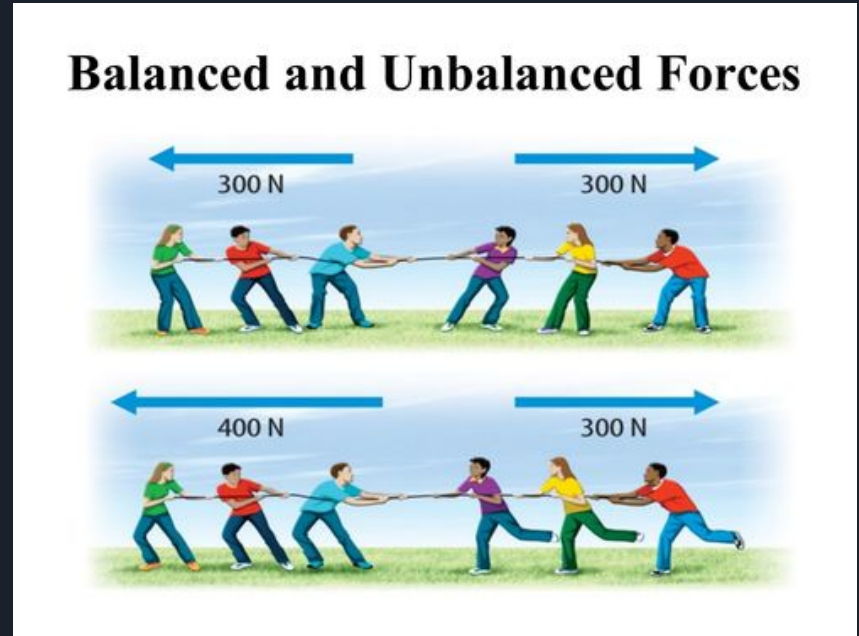
MECHANICAL FORCE

SCIENCE



Unbalanced vs balanced forces

- A force that keeps an object still, the forces are known as balanced
- When the object is **moved** it becomes unbalanced



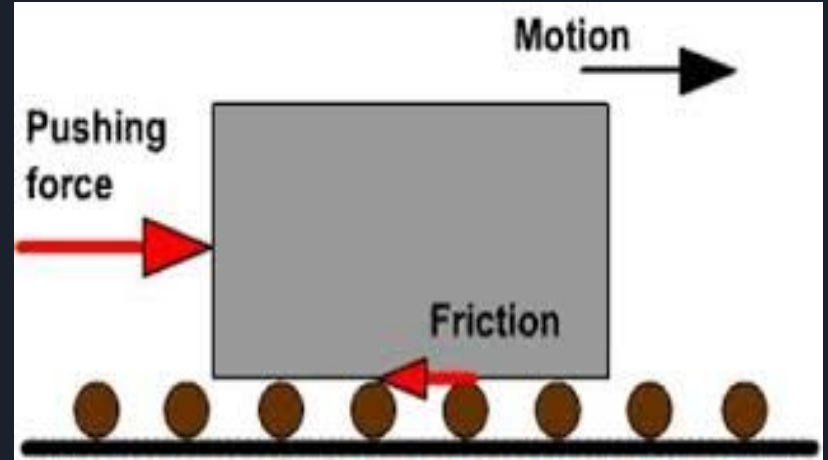
Unbalanced vs balanced forces

Balanced and Unbalanced Forces

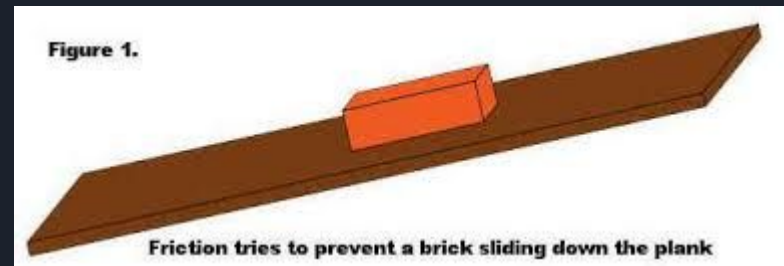
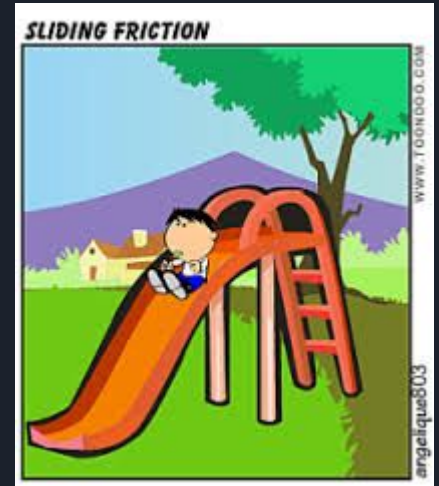


Friction

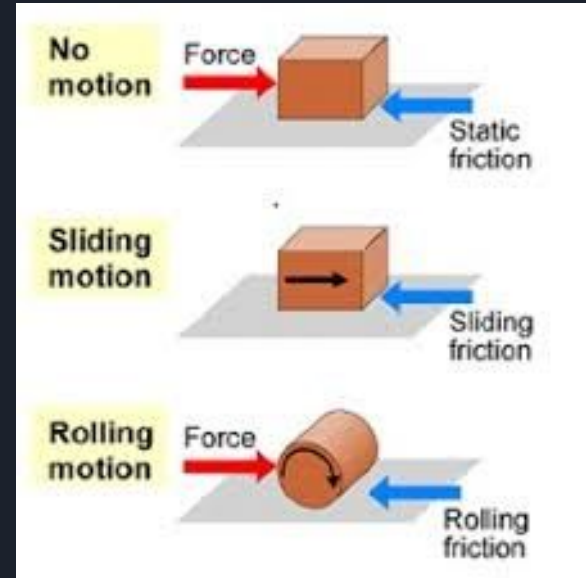
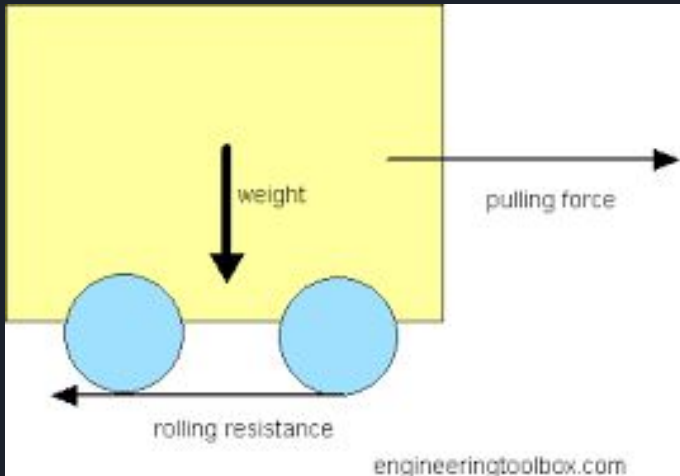
- Friction - the force that resists movement
 - Smooth surfaces have less friction
 - The amount of force needed to start an object moving is greater than the force needed to keep it moving



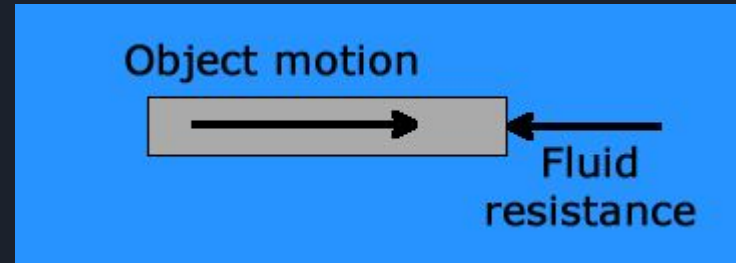
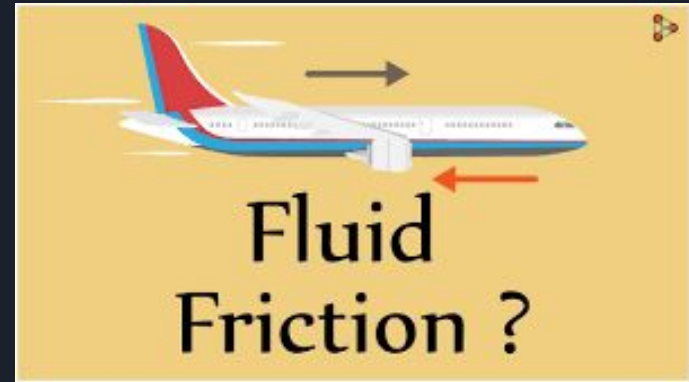
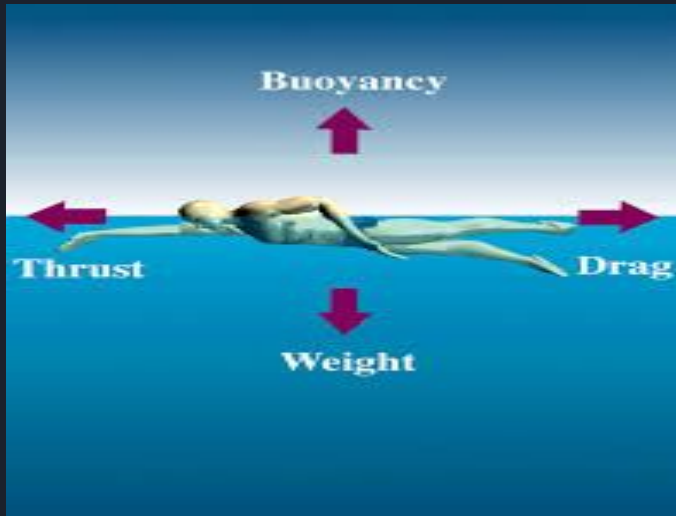
- What are three common types of friction?
 - **Sliding friction** is when two surfaces slide one over the other



Rolling friction is
when an object rolls
over a surface



Fluid friction occurs in fluids (gases and liquids)





Friction

Group the following according to whether they increase or decrease friction:

- brake pads
- hockey stick tape
- oiling door hinges
- ball bearings

- gymnasts applying powder to their hands
- curling brooms
- soccer cleats

- adding snow to the pan of a truck in winter
- sanding handrails
- Waxing snowboards



Friction

Increase Friction	Decrease
<ul style="list-style-type: none">• Brake pads• Hockey stick tape• Soccer cleats• Gymnasts applying powder to their hands• Adding snow to the pan of a truck	<ul style="list-style-type: none">• Oiling door hinges• Ball bearings• Curling brooms• Waxing snowboards• Sanding handrails

Simple Machines



Simple Machines

Simple Machine - device that makes life easier?



Simple Machines

Simple Machine - device that makes life easier?



Inclined
plane



lever



screw



Wheel and
axle



pulley



wedge

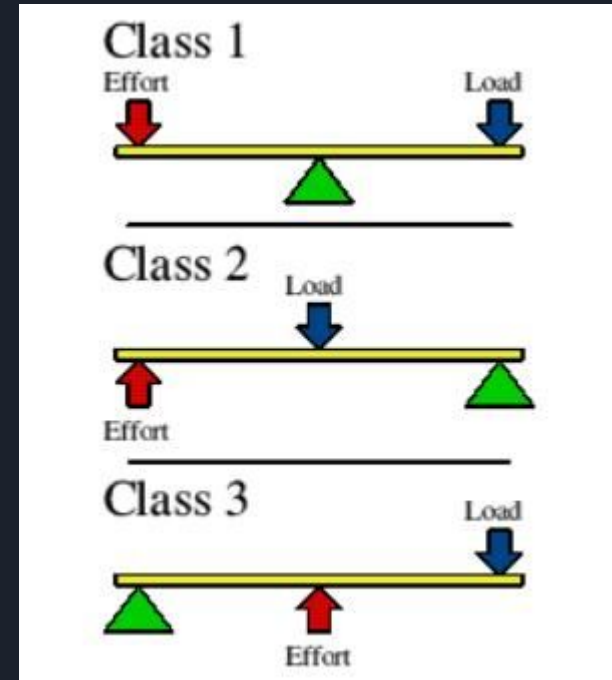
Inclined Planes

- A sloped surface , or incline
- A ramp is an inclined plane



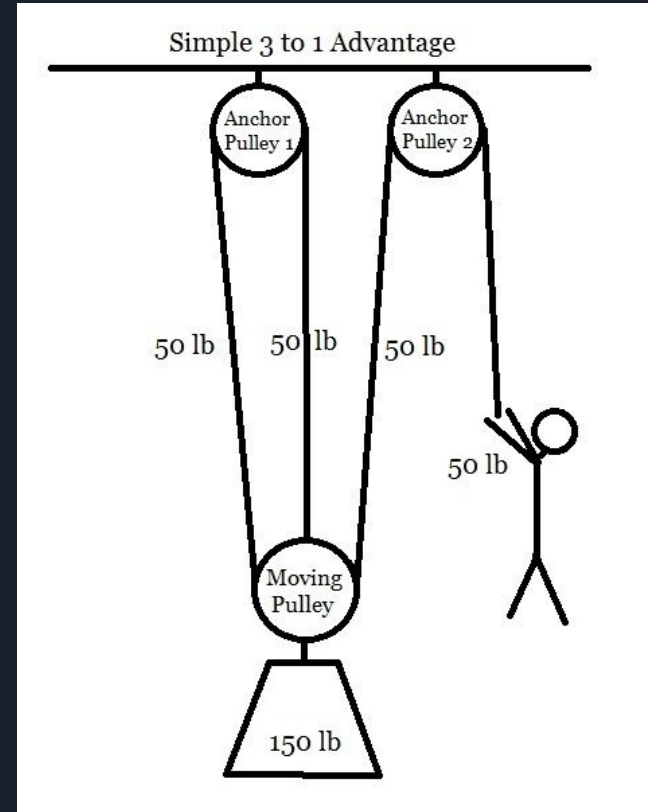
Lever

- A solid or stiff bar that rests on a fulcrum
- Fulcrum the point that a lever rests on



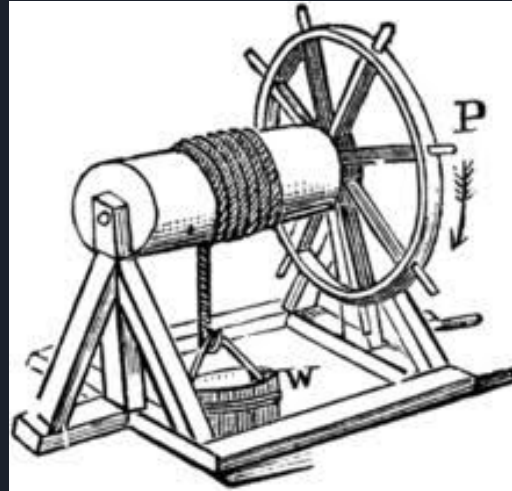
Pulley

- A grooved wheel and a rope or cable



Wheel and Axle

- A wheel that is attached to a smaller axle
- If you turn the wheel, the axle moves and vice versa



Screw

- An inclined plane that spirals around a central shaft



Wedge

- A machine with a thin end and a thicker end
- Can be used to split objects





Simple Machines

Foldable Activity

- Students will create a foldable based on the six simple machines
- Students will:
 - write the name of the simple machine on the front of the page
 - Draw a picture on the inside flap
 - Write a definition on the other side of the flap