

# Force

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Force can be classified as either

- a) Push
- b) Pull

## Types of Force

- a) Gravitational Force
- b) Normal Force
- c) Frictional Force
- d) Elastic Force
- e) Buoyant Force
- f) Weight

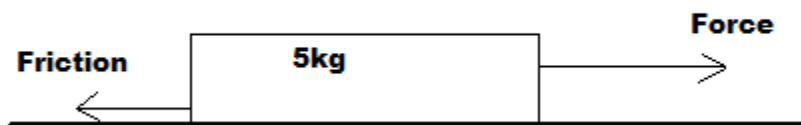


The effects of force will cause

- a) Stopping an object
- b) Moving an object
- c) Changing the speed of an object
- d) Change the direction of an object
- e) Changing the shape of an object

## Friction

Friction is a force which opposes the movement of an object. The effects of force be either advantages or disadvantages.



How friction is produced?

Friction is produce when two surfaces rub against each other.

Factors affecting friction

1. Type of surface
2. Mass of the object

When the surface is rough the friction is larger compared to smooth surface.

When the mass of the object is heavy, this will also increase the friction of an object.

Advantage of friction

1. Generate sparks (lighting matches)
2. Prevent from slipping
3. Tightening jars
4. Holding Objects



Disadvantage of friction

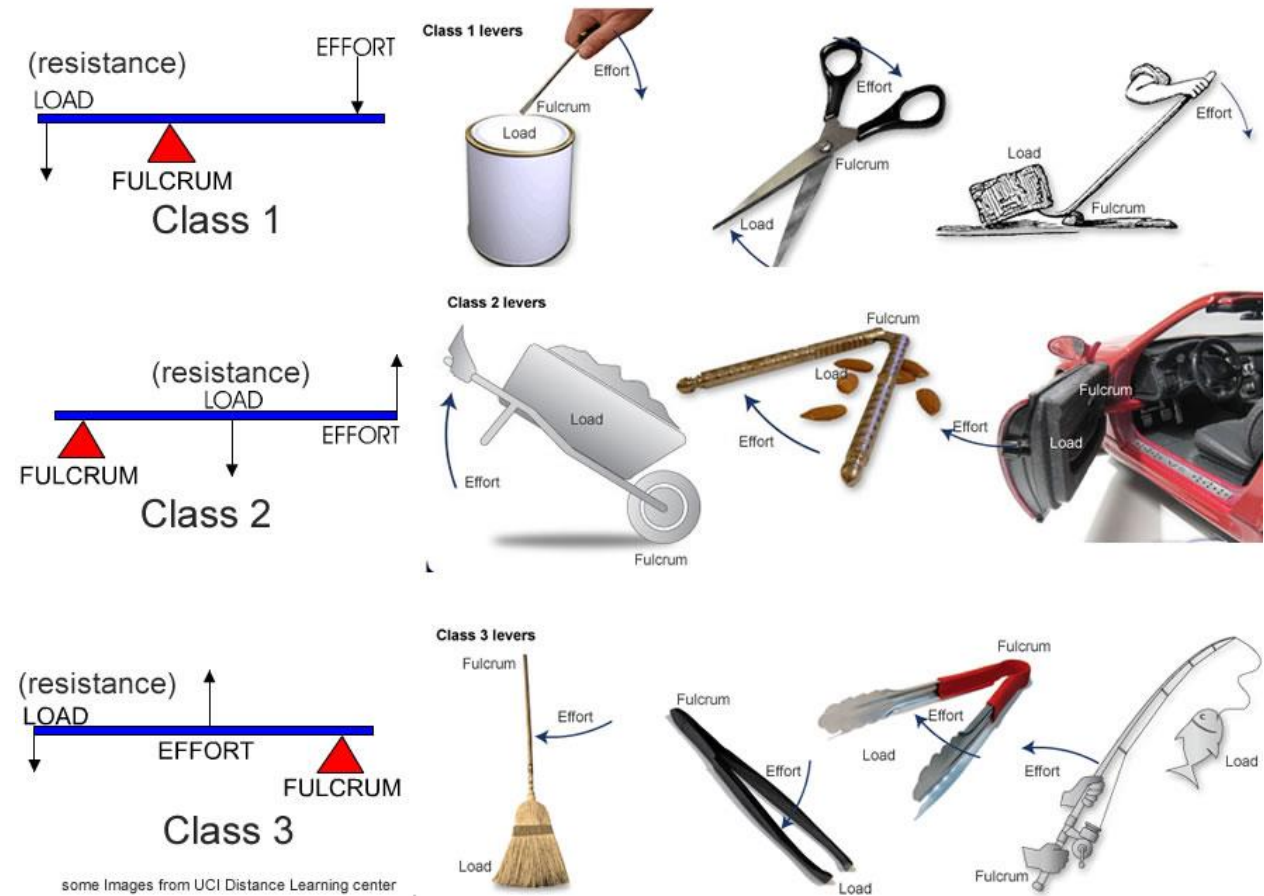
1. Wear off shoes
2. Produces noise
3. Produces heat

Ways to reduce Friction

1. Use wheels/ rollers
2. Use marbles to move an object
3. Use grease on tight hinges
4. Aerodynamic shape to reduce air friction

## Lever

Lever consists of fulcrum, load and force/effort



Question 1

State one advantages of using 3<sup>rd</sup> Class lever?

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Question 2:

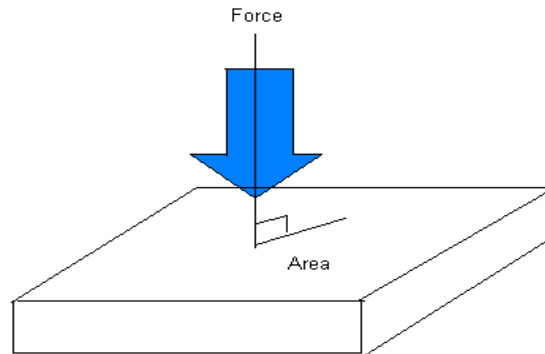
Name 3 appliances using 1<sup>st</sup> class lever ?

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# Pressure

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This chapter will discuss about the relationship of Pressure and Forces. The pressure unit is pascal(Pa) which is equivalent to  $1Pa = 1Nm^{-2}$ . The definition of pressure can be describe as the amount of Force exerted onto a unit area. Look at example below to for the illustration

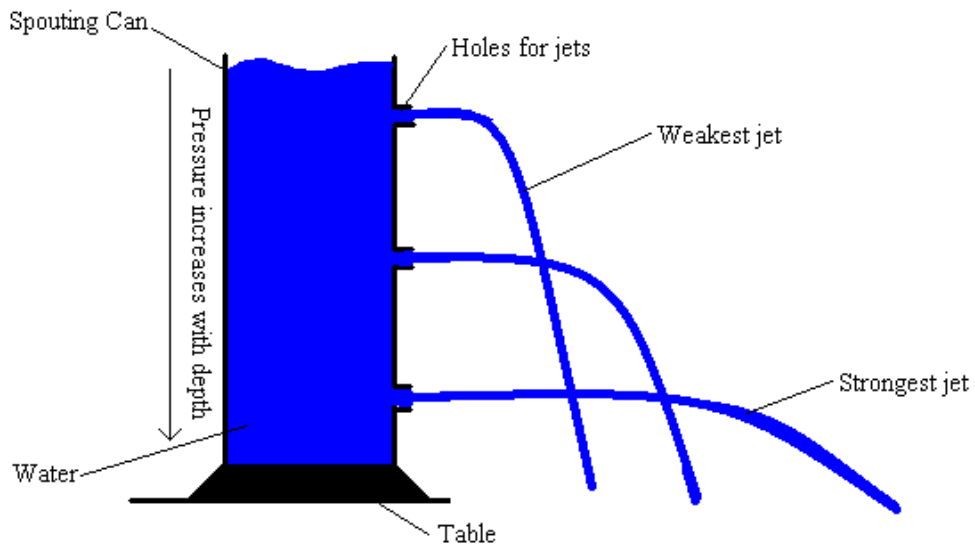


Normal Force acting on the surface Area

In order to obtain maximum pressure, it is either Force or the Area which play the role. The equation below can summarize the relationship of the Pressure, Force and Area.

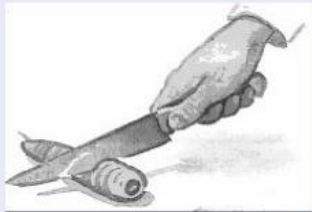
$$P = \frac{\textit{Force}}{\textit{Area}}$$

## Pressure in Liquid

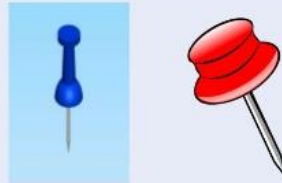


As the depth is larger, the water pressure will get stronger.

### APPLICATION INVOLVING HIGH PRESSURE



A sharp knife has a *very small surface area* on its cutting edge so that *high pressure can be exerted* to cut the meat.



Nails, needles and pins have very sharp ends with *very small surface areas*. When a force is applied to the head of a nail, the pressure will drive its sharp end into a piece of wood easily.



The studs on a football boot have only a *small area of contact with the ground*. The *pressure under the studs is high enough for them to sink into the ground*, which gives extra grip.