

# FORCE AND PRESSURE

# Introduction

- To make the children aware about the practical applications of Force and Pressure in day-today life.
- To help in understanding the topic with the help of examples and practical applications.

# Previous Knowledge Testing

- The following questions can be asked from the students.
- 1. What is area?
- 2. Difference between Area and Volume.
- 3. What are the units of Area and Volume ?

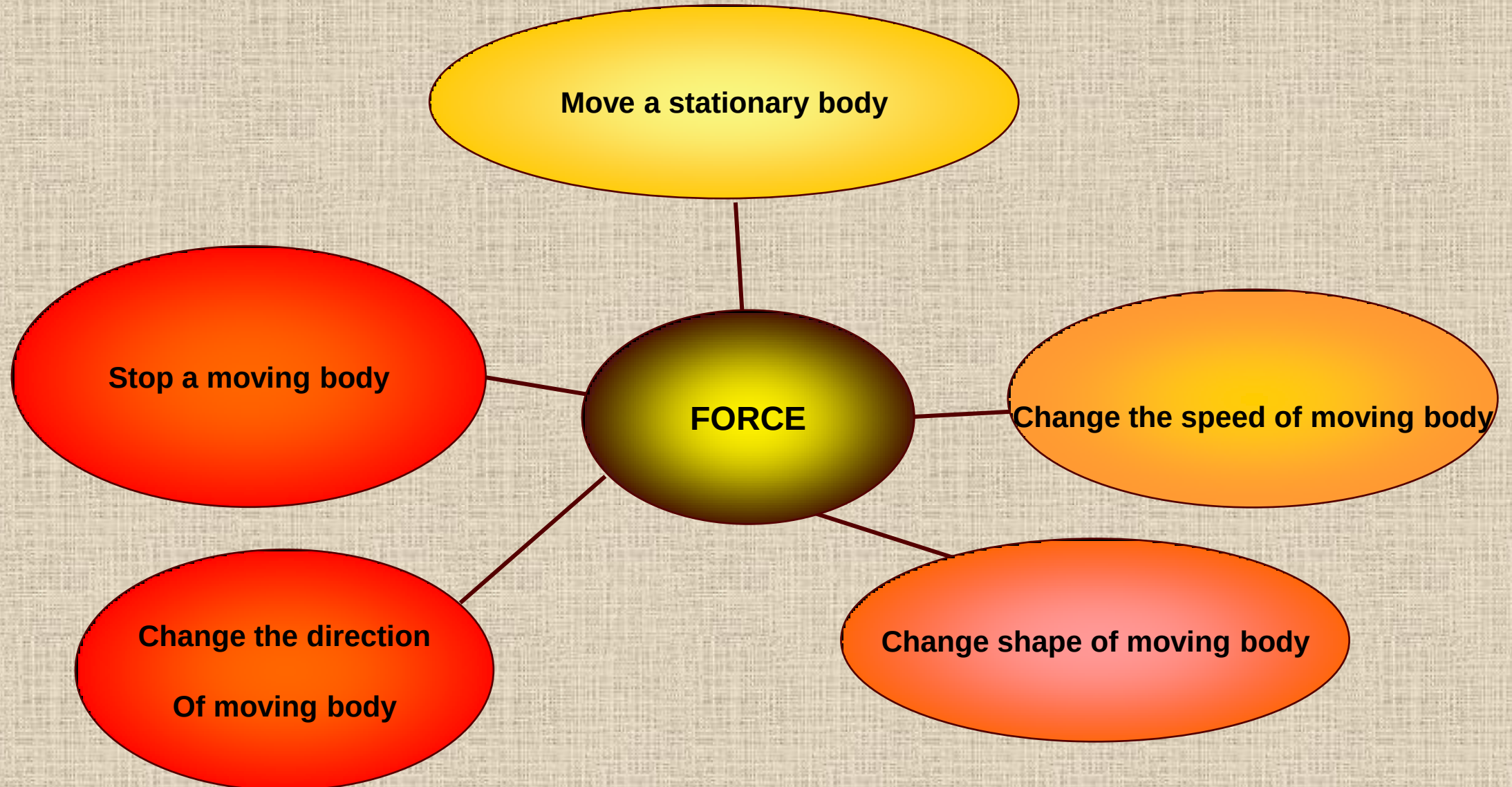
# FORCE

- A PUSH OR A PULL IS CALLED FORCE



- PUSH : A FORCE TO MOVE THE OBJECT AWAY FROM YOUR BODY
- PULL : A FORCE TO MOVE AN OBJECT TOWARDS YOUR BODY

# A FORCE CANNOT BE SEEN BUT WE CAN FEEL AND OBSERVE THE EFFECTS OF FORCE



# PRESSURE

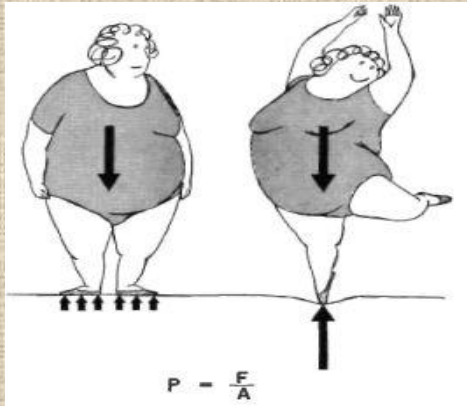
- Pressure is the force acting per unit area
- Formula for pressure :-

$$\text{Pressure} = \frac{\text{Force}}{\text{Area}}$$

- SI unit of pressure is :-  $\text{N/m}^2$  or Pascal
- Newton(N) for Force and  $\text{m}^2$  for Area

# Pressure depends on two factors

- **1.force** -more force more pressure (directly proportional)
- **2.area** -more area less pressure ( Inversely proportional)



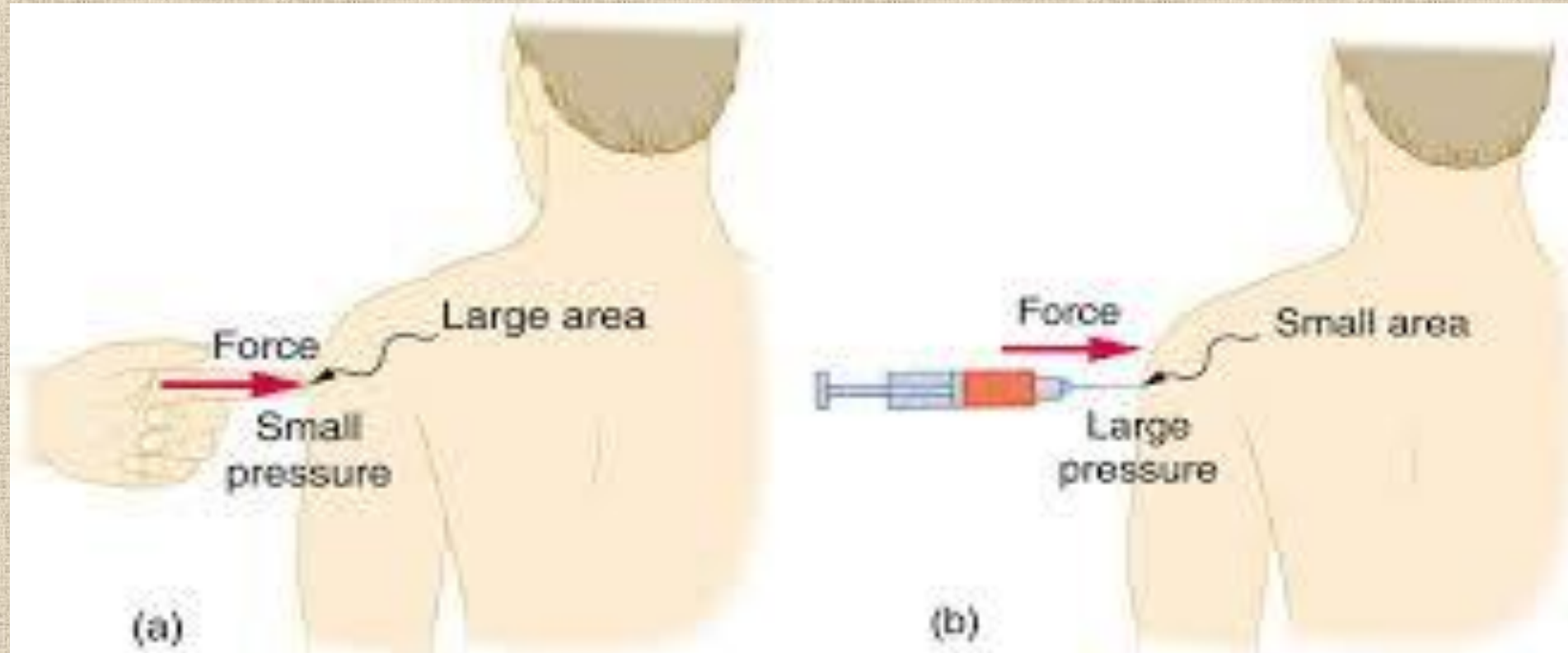
- *The same force produces less pressure if it acts on a large area but can produce more pressure if acts on a small area.”*

# Activity –2

- Force exerted by weight of a person = 600 N .Find Pressure

| Position   | Area in contact    | Force | Pressure=<br>Force/Area |
|------------|--------------------|-------|-------------------------|
| Standing   | 0.05m <sup>2</sup> | 600 N |                         |
| Sitting    | 0.1m <sup>2</sup>  | 600 N |                         |
| Lying Down | 0.4m <sup>2</sup>  | 600 N |                         |

- Person poked with finger ( case a) Pressure in form of pain due to force will be less
- Person poked with a sharp end of needle (case b) Pressure in form of pain will be more



# DIFFERENCE BETWEEN FORCE AND PRESSURE

| Force                             | Pressure                                      |
|-----------------------------------|-----------------------------------------------|
| It is a pull or push on an object | Ratio between force and area on which it acts |
| It has a direction                | It does not have any direction                |

# Every day observation

*School bags have wide straps so the weight of bag may fall over a large area of the shoulder of the student producing less pressure on shoulder.*



***Sharp knife cuts better than a blunt knife so the force of our hand falls over a very small area of object produces large pressure.***



*The tractor have broad tyres so there is less pressure on ground and do not sinking to comparatively soft field.*



*It is easier to walk on soft sand if we have flat shoes rather than shoes with sharp heels.*



*The foundations of buildings and dams are laid on a larger area to produce less pressure*



*The wooden or concrete sleepers are kept below the railway line.*



*A wide belt is provided over the wheels of an army tank.*



# Recapitulation

- Force is a push or pull applied on any object which can change its size, shape and direction of motion.
- The effects of Force can be seen while playing, walking and other day-to-day activities.
- Pressure is Force applied per unit Area.
- The unit of Pressure is  $\text{N/m}^2$  or Pascal
- The effects of pressure can be observed in the activities around us. The examples can be reviewed.

• **THANK YOU.**