

# 5. Pressure Exerted by Solid

## Factors affecting Pressure

### Activity 01 - Affect of force on pressure

**Items needed:** Several cakes of soap, thin metal wire, several bags of sand with the weight of 10N each (or standard weights of **10N, 20N, 30N**), a piece of plank which is longer than the length of cake of soap and similar in breadth of the same, a stop watch

#### **Method:**

- Place the cake of soap on the plank as given in the figure.
- Hang 10N weight (sand bag) to the wire which is sent around the cake of soap. Note down the time taken to pass the metal wire through the cake of soap.
- Repeat the procedure for all other weights and tabulate the results on the below table.

#### **Observations:**

Instance	Weight (N)/Force	Time taken to cut through the soap (s)
1	10N	
2	20N	
3	30N	

#### **Conclusions:**

### Activity 02 - Affect of force on pressure

#### **Items needed:**

A wooden structure made with two pieces of 2 planks (as in the diagram), Wooden block with the size 15cm x 10cm x 5cm, A sponge of equal size as the block, ruler or scale, hammer, a Newton spring balance, **Weight of 2kg and 5kg**

#### **Method :**

- Place the sponge on the horizontal plank and note down the reading relevant to the upper horizontal edge of the sponge using the scale.
- Measure the weight of the wooden block using the Newton spring balance and place it on the sponge.
- Note down the new reading (upper edge of the spring) on the scale.
- Then place the 2kg weight on the wooden block and take the reading.
- Then, remove 2kg weight and place the 5kg weight and take the reading.
- Tabulate the results on the table.

### Observations:

Instance	Force exerted on the piece of sponge (N)	Reading at the upper edge of the piece of sponge (cm)	Reduction of the height of sponge (cm)
Sponge only			
Wooden block on the sponge			
Wooden block and 2kg weight on sponge			
Wooden block and 5kg weight on sponge			

### Activity 03 - Affect of surface area on force

#### Items needed:

A cake of soap, a piece of thin wire with diameter **0.2mm**, a piece of thin wire with diameter **1.5mm**, 20N weight (a sand bag of weight of 20N) , a piece of plank which is similar in breadth to the cake of soap.

#### Method :

- Place the cake of soap on the plank as given in the figure.
- Hang 20N weight(or sand bag)to the thick wire (1.5mm diameter) and send it around the cake of soap.
- Take the observation.
- Repeat the procedure for the thin wire |(0.2mm diameter) and take the observation.

#### Observations:

#### Conclusion:

## Activity 04 - Affect of surface area on force

### Items needed:

Wooden structure made with two pieces of 2 planks (as in the diagram)

A wooden blocks with the size of,

A - 15cm x 10cm x 5cm

3 Sponges

B - 15cm x 10cm x 5cm

C - 15cm x 5cm x 5cm

D - 10cm x 5cm x 5cm

Newton spring balance

### Method :

- Weigh the wooden block using the spring balance.
- Place the **sponge B** on the horizontal plank and note down the reading relevant to the upper horizontal edge of the sponge using the scale.
- Then, place the **wooden block A** on the sponge and note down the reading relevant to upper horizontal edge of the sponge using the vertical scale.
- Now remove sponge B and repeat the procedure for **C** and **D** sponges separately and note down the reading.
- Tabulate the results in the following table.

### Observations:

Instance	Force exerted on the surface (N)	Contact surface area (cm <sup>2</sup> )	Height of the sponge (cm)	Reduction of the height of the sponge (cm)
Sponge <b>B</b> only				
When wooden block contacts its <b>15cmx10cm</b> area				
Sponge <b>C</b> only				
When wooden block contacts its <b>15cmx5cm</b> area				
Sponge <b>D</b> only				
When wooden block contacts its <b>10cmx5cm</b> area				

### Conclusions: