

St. Andrews Scots Sr. Sec. School

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Session: 2024-2025 – Answer Key

Class: VIII

Subject: Science

Topic: Force and Pressure

CHECK POINT 1

1. force
2. stop
3. increases
4. interaction

CHECK POINT 2

1. (T)
2. (F)
3. (T)
4. (F)
5. (F)

CHECK POINT 3

1. Pressure
2. depth
3. Pressure increases
4. Pressure gauge
5. newton per square metre

PRACTICE TIME

A. Tick (✓) the correct answer:

1. (b)
2. (c)
3. (b)
4. (a)
5. (c)

B. Match the columns:

1. (c)
2. (d)
3. (a)
4. (b)

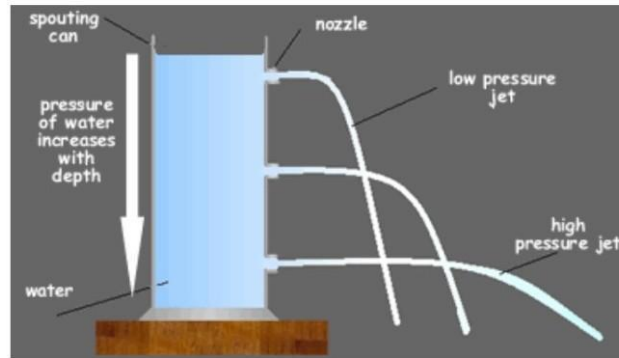
C. Very Short Answer Type Questions:

1. A force.
2. When two equal forces act in opposite direction, the object will move in the direction of bigger force.
3. Contact force.
4. Gravitational force.
5. Atmospheric pressure.

D. Short Answer Type Questions:

1. A force can pull or push the thing on which it is applied.
2. When the object is in direct or indirect contact with the source of the force, the force applied on the object is called contact force. Muscular force, mechanical force and friction are examples of contact force. The force acting on an object without touching it is known as noncontact force. Magnetic force, gravitational force and electrostatic force are examples of noncontact force.

3. When the area of contact increases, the pressure is decreased. Hence, the bases of the pillars of bridges are made broad to make the pressure bearable to the ground.
4. The pressure exerted by the liquid increases with increase in the depth of the liquid and vice versa.



5. People having high blood pressure feel uncomfortable because of an imbalance between the pressure of body fluids and the atmospheric pressure at higher altitudes.

E. Long Answer Type Questions:

1. Force is caused by the interaction of two objects. For example, a man pulling a hand cart, a man pushing a cart and a football player kicking a football.

2. We use the muscular force of animals in many ways as follows:

- (a) Elephants are made to drag heavy loads tied to them through strings or chains.
- (b) Horse, camel and bullocks are used to pull carts.
- (c) Mules and donkeys are made to carry loads and people from one place to another in hilly areas.

3. 'Liquids exert pressure on the wall of a container' can be shown by the following activity:

Procedure: Take a plastic bottle and fix a glass tube near the bottom of it by heating the tube and quickly inserting it into the bottle. Seal the joint with molten wax. Cover the mouth of the glass tube with a balloon. Fill the bottle up to half with water. Observe the volume of the balloon. Pour some more water into the bottle and again observe the volume of the balloon.

Observation: The volume of the balloon increases on pouring more water into the bottle.

Conclusion: Water (liquid) exerts pressure on the balloon and makes it grow in size.



Liquid exert pressure on the wall of the container

4. Some applications of atmospheric pressure are:

- (a) It helps us suck liquids through a straw.
- (b) It helps a person in paratropping or using a parachute while falling down from an aircraft against the gravitational force.
- (c) The changes in the atmospheric pressure on the surface of the earth help in weather prediction.

F. HOTS Questions:

1. A ball thrown upwards falls vertically downwards because the earth pulls things towards it with the help of gravitational force.
2. Tyres of heavy trucks are made broader because this increases the area of contact and the force due to heavy weight of the truck is distributed over a wide range of area and hence the pressure on the road is reduced.
3. A parachute helps a person land safely because it blocks the air acting in upward direction and slows the rate of falling of the person while landing.

Extra Questions:

Numericals:

- 1. In a horse-cart, each of the two horses pull with a force of 1000 N. Find the resultant force.**

$$\text{Resultant force} = (1000 + 1000) \text{ N} = 2000 \text{ N}$$

Both the horses pull the horse-cart in the same direction, the resultant force is calculated by adding the force, therefore, resultant force is the sum of both the forces.

- 2. In a game of tug-of-war, three girls of team A pull the rope with the forces of 80 N, 100 N and 120 N. In the team B, three girls pull the rope with the forces of 85 N, 105 N, and 125 N. What is the resultant force? Which team is the winner?**

$$\text{Force exerted by team A} = (80 + 100 + 120) \text{ N} = 300 \text{ N}$$

$$\text{Force exerted by team B} = (85 + 105 + 125) \text{ N} = 315 \text{ N}$$

$$\therefore \text{Resultant force} = \text{Force exerted by team B} - \text{Force exerted by team A} = (315 - 300) \text{ N} = 15 \text{ N}$$

\therefore Team B is the winner.

- 3. A solid object weighs 250 N. When placed on a wooden plank, the area of contact is found to be 10 m². Find the pressure exerted by the solid object on the wooden plank.**

$$\text{Area of contact} = 10 \text{ m}^2$$

$$\text{Force exerted by solid object on wooden plank} = 250 \text{ N}$$

$$\therefore \text{Pressure} = \text{Force} / \text{Area}$$

\therefore Pressure exerted by solid object on the wooden plank = Force exerted by solid object on wooden plank / Area of contact

$$\therefore = 250 / 10 = 25 \text{ Pa}$$

4. A force of 120 N is applied to an object of area 3 m². Calculate the pressure.

$$\text{Force} = 120 \text{ N}$$

$$\text{Area} = 3\text{m}^2$$

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

$$\therefore \text{Pressure} = 120 / 3 = 40 \text{ N/m}^2 \text{ or } 40 \text{ Pa}$$