Class 8 Force and Pressure Eureka Plus Science Exercise Questions with Answer

I. Tick (✓) the correct options.

1. Which of these is not related to force?

- friction
- colour
- weight
- texture

2. Which of these is a contact force?

- frictional force
- electrostatic force
- gravitational force
- magnetic force

3. What type of force is muscular force?

- a non-contact force
- a contact force
- friction force
- gravitational force

4. What type of force stops a ball rolling on the ground?

- magnetic force
- electrostatic force
- gravitational force
- Fictional force

5. What is gravity?

- a pressure
- weight of an object
- a force
- a push

6. What is the SI unit of pressure?

- Pascal

- joule
- newton
- metre

7. In which direction will a gas exert pressure?

- in every direction
- only in upward direction
- only in downward direction
- gases do not exert pressure

8. Where is the atmospheric pressure maximum?

- in ponds
- in deserts
- at sea level
- on mountains

II. Tick (✓) the true statements and cross (x) the false ones.

1. Force can change the speed of a moving object. T

2. Distance travelled by an object does not depend on the amount of force applied on it. F

3. Muscular force is a non-contact force. F

4. Pressure is the result of force exerted over an area. T

5. Blood pressure is a pressure exerted by the blood on the brain. F

6. Push is a contact force and pull is a non-contact force. F

III. Answer the following questions in one sentence.

I. What is the relationship between force and speed?

Ans: Speed is directly depend on magnitude of force .

2. When do the forces acting on an object add up?

Ans: When forces applied in same direction they add up

3. Name two non-contact forces.

Ans. Magnetic, Gravitational

4. What is magnetic force?

The force exerted by a magnet on certain metals is known as magnetic force.

5. Define gravitational force.

The invisible force by which every object in universe attract each other is called the gravitational force.

It is only experienced if objects are massive.

6. Define pressure.

Pressure is the result of force exerted over an area.

7. When is the blood pressure highest?

Blood pressure is at its highest when the heart pumps out blood, which is called systolic pressure.

8. What is atmospheric pressure?

Atmospheric pressure is defined as the force per unit area exerted on a surface by the weight of the air above it.

IV. Answer the following questions in two to three sentences.

1. Give an example to illustrate that force can change the speed of a moving object.

Example to illustrate that force can change the speed of a moving object:

If a girl applies force on the brakes of the bicycle she is riding, she can slow down the moving bicycle.

On the other hand, if the girl applies force in the forward direction, she can make the bicycle move faster. Thus force can change the speed of the bicycle.

2. What is the net force when two equal and opposite forces act on an object?

Ans: If two equal and opposite forces act on an object, the net force will be zero (the difference between the two forces). The object remains stationary and does not move in either direction.

3. What is the net force when two forces are applied on an object in the same direction?

Ans: when two forces are applied on an object in the same direction they add up

Net force = $F_1 + F_2$

4. What is electrostatic force?

Force by which charge objects attract or repel each other is called electrostatic force. Like charges repel each other while unlike charges attract each other

5. Why is gravity a non-contact force?

Ans: Gravity a non-contact force because Earth attract object from distance.

6. Explain weight.

The gravitational force experienced by an object is called its weight.

Weight = mass x Acceleration due to gravity.

Weight is measured by spring balance

7. Why does pressure increase with the depth of a water column?

Ans: Liquid Pressure increase with the depth of a water column because more water pilled up in depth of water.

Liquid Pressure = hdg

h = depth of a water column d = density of water g = acceleration due to gravity

8. How does a pin pierce a board?

Ans: Force applied on the broader end of the pin distributed over small area by pointed end, Thus large pressure created on the board and it pierce the board.

V. Answer the following questions in detail.

1.What are the different effects of force?

Ans: The different effects of force are:

- force moves an object at rest
- force can change the speed of a moving object
- force changes the direction of motion of a moving object
- force can change the shape of an object

2. Differentiate between contact and non-contact forces.

Ans: When force acting on an object is in contact with the object, it is known as contact force. Push and pull are contact forces.

Forces which act without coming in contact with an object are called non-contact forces. Magnetic and gravitational forces are non-contact forces.

3. Explain with an experiment that air around us exerts pressure.

Ans: Experiment to show that air around us exerts pressure:

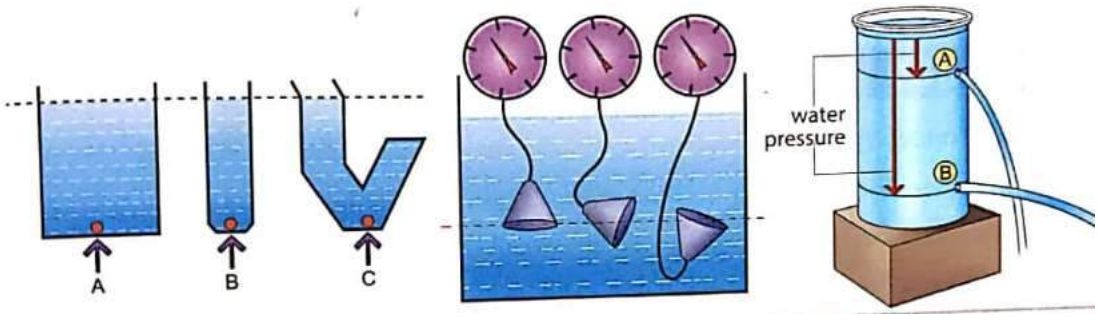
- Fill a tumbler completely with water.
- Keep a card firmly pressed on the tumbler.
- Now, carefully turn the tumbler upside down.
- The paper will remain pressed on the tumbler holding the water.

The air that presses upwards on the paper as shown in the illustration keeps the card paper fixed to the tumbler. This shows that air around us exerts pressure.

4. Why do we not feel air pressure although there is a tall column of air above us?

Ans: We do not feel the air pressure although there is a tall column of air above us because the human body too exerts an equal amount of pressure outwards. It cancels the effect of atmospheric pressure.

5. Use the illustrations given below to write a note on the pressure exerted by a liquid.



Ans: Figure 1: The pressure of water or any other liquid at a given depth does not depend upon the shape of the vessel containing the liquid or the amount of liquid in the vessel. It depends on the height of the column of liquid.

Figure 2: The pressure in a liquid is independent of direction. At a given depth, a liquid will exert the same amount of pressure in all directions.

Figure 3: Pressure exerted by a liquid increases with depth

Hots

I. Answer the following questions.

1. Two metal bearings of the same size and weight are pushed with the same force on two different surfaces. One travels further than the other. When can this happen?

Ans: Since the two metal bearings are rolled on two different surfaces, the frictional force experienced by each of these bearings will be different. This is because friction force depends on nature of surface of object. Therefore one bearing travels further than the other.

2. Two table tennis balls of equal mass are placed on a table tennis table and pushed turn by turn. When will one ball travel further than the other?

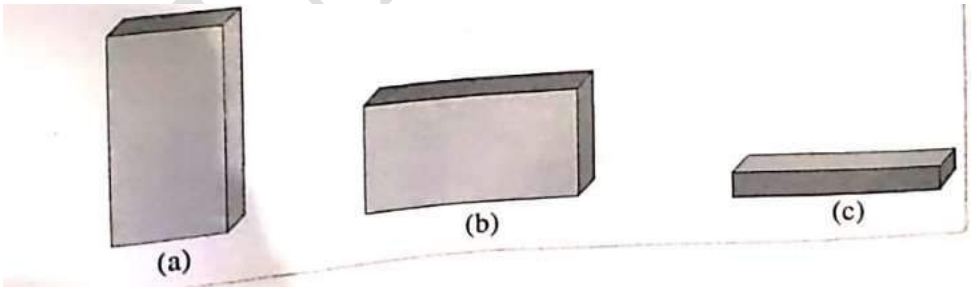
Ans: One ball will travel further than the other if it is pushed with more force.

3. Why are dams constructed with a very broad base?

Ans: Water pressure increases with the depth of the water. In deep water, there is more water piled up which causes the pressure to be very high at the bottom.

A dam contains a huge amount of water. To withstand the greater water pressure at the bottom, the lower portion of the dam is made very broad.

4. A rectangular box is placed on the same surface in three different ways as shown below. In which case will the box exert the highest pressure on the area below?



Ans: The box exerts the highest pressure in case (a) due to less area of contact

II. Solve the following:

1. A few books placed on a desk exert a force of 8 N. If the books occupy an area of 0.04 m^2, what will be the pressure exerted?

1. Pressure = Force/Area = 8N /0.04 m2 = 200 N/m2 = 200 Pa

Thus, the pressure exerted by the books on the desk is 200 Pa.

2. A square tile having a 50 cm side is designed to withstand a pressure of 200 N/m2. Find out pressure if a force of 45 N can be applied on the tile.

Ans: Force = 45 N ; Area = 0.5 m x 0.5 m = 0.25 m2

Pressure = f/A = 45 N /0.25 m2 = 180 N/m2 = 180 Pa

Thus, when a force of 45 N is applied on the tile, it experiences a pressure of 180 N/m2, which is less than 200 N/m2. This means that the tile will be able to bear the pressure of 45 N.

3. A square metal slab exerts a pressure of 100 N/rn2. If the slab exerts a force of 100 N. which of the following are the dimensions of the slab?

Ans: Area = Force/Pressure = 100/100 = 1m

- 1 m x 1 m
- 0.1 m x 0.1 m
- 2 m x 2 m

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