

Force and Pressure (Science)

Question 1:

Give two examples each of situations in which you push or pull to change the state of motion of objects.

Two examples of push force are as follows:

- (i) A heavy box at rest is pushed to move it from one room to another. This changes the state of motion of the box.
- (ii) A player pushes a football using his foot. This changes the state of motion of the ball.

Two examples of pull force are as follows:

- (i) Rope is pulled to draw water from a well. This changes the state of motion of the water bucket.
- (ii) A drawer is pulled to open it. This changes the state of motion of the drawer.

Question 2:

Give two examples of situations in which applied force causes a change in the shape of an object.

Two examples of forces that cause a change in the shape of an object are as follows:

- (i) Squeezing of a plastic bottle changes the shape of the bottle.
- (ii) Deformation of clay by pressing it between the hands.

Question 3:

Fill in the blanks in the following statements.

- (a) To draw water from a well we have to pull at the rope.
- (b) A charged body attracts an uncharged body towards it.
- (c) To move a loaded trolley we have to either push or pull it.
- (d) The north pole of a magnet repels the north pole of another magnet.

Question 4:

An archer stretches her bow while taking aim at the target. She then releases the arrow, which begins to move towards the target. Based on this information fill up the gaps in the following statements using the following terms.

muscular, contact, non-contact, gravity, friction, shape, attraction

- (a) To stretch the bow, the archer applies a force that causes a change in its shape.
- (b) The force applied by the archer to stretch the bow is an example of muscular force.
- (c) The type of force responsible for a change in the state of motion of the arrow is an example of a contact force.
- (d) While the arrow moves towards its target, the forces acting on it are due to gravity and that due to friction of air.

Question 5:

In the following situations identify the agent exerting the force and the object on which it acts. State the effect of the force in each case.

- (a) Squeezing a piece of lemon between the fingers to extract its juice.

Ans: In squeezing a piece of lemon, we make use of muscular force to extract its juice. This muscular force acts on the lemon. As a result, the shape of the lemon gets changed.

- (b) Taking out paste from a toothpaste tube.

Ans: We use our muscular force to take out paste from a toothpaste tube. The muscular force acts on the toothpaste tube. As a result, the shape of the tube gets changed.

- (c) A load suspended from a spring while its other end is on a hook fixed to a wall.

Ans: Here, the suspended load exerts a force on the spring and pushes the spring downwards. As a result, the spring gets stretched. Hence, its shape gets changed.


- (d) An athlete making a high jump to clear the bar at a certain height.

Ans: An athlete pushes the ground with his feet. His feet exert a muscular force on the ground. This allows him to jump over the bar. As a result, his state of motion gets changed.

Question 6:

A blacksmith hammers a hot piece of iron while making a tool. How does the force due to hammering affect the piece of iron?

When a blacksmith hammers a hot piece of iron, he uses his muscular force. This muscular force changes the shape of the iron so that it can be given a desired shape.

 Question 7:

An inflated balloon was pressed against a wall after it has been rubbed with a piece of synthetic cloth. It was found that the balloon sticks to the wall. What force might be responsible for the attraction between the balloon and the wall?

On rubbing an inflated balloon with a piece of synthetic cloth, it becomes charged. A charged body attracts an uncharged body. When this charged balloon is pressed against a wall, it sticks to the wall. The force acting between the charged balloon and the wall is the electrostatic force.

Question 8:

Name the forces acting on a plastic bucket containing water held above ground level in your hand. Discuss why the forces acting on the bucket do not bring a change in its state of motion.

We make use of muscular force to hold a bucket of water above the ground. This muscular force acts against the force of gravity that pulls the bucket towards the ground. The two forces are equal in magnitude but opposite in direction. Therefore, the net force on the bucket is zero. Hence, there is no change in its state of motion.

Question 9:

A rocket has been fired upwards to launch a satellite in its orbit. Name the two forces acting on the rocket immediately after leaving the launching pad.

The two forces acting on the rocket are the force of gravity, which pulls the rocket towards the ground, and the force of friction due to earth's atmosphere, which opposes its motion.

Question 10:

When we press the bulb of a dropper with its nozzle kept in water, air in the dropper is seen to escape in the form of bubbles. Once we release the pressure on the bulb, water gets filled in the dropper. The rise of water in the dropper is due to

(d) The rise of water in the dropper is due to atmospheric pressure.

The rise of water in a dropper is due to atmospheric pressure. When all the air escapes from the nozzle, the atmospheric pressure, which is acting on the water, forces the water to fill the nozzle of the dropper.

