

## Force and Pressure Class 8 Living Science Solution

P. 140 Oral Questions For Formative Assessment

1. No. It does not move always.
2. No. One also needs to know the directions of these forces.
3. Gravitational force.
4. Frictional force.
5. Yes. Magnetic force and gravitational force.

P. 145 Oral Questions For Formative Assessment

1. Pressure
2. Pressure is the force exerted per unit area.
3. Pascal (Pa)
4. (a) Pressure is exerted both downwards and sideways but downwards pressure is greater than sideways pressure. (b) Liquid pressure increases with depth. Liquid pressure at the same depth is the same in all the directions.
5. We might face the problem of nose bleeding.

P. 146 For Formative and Summative Assessment

- A. 1. a 2.a 3.d 4.c 5. b 6. d 7. a 8. d
- B. 1. True 2. False 3. A + B 4. A - B 5. No 6. False 7. It's weight
8. magnetic force 9. Electrostatic force 10. frictional force 11. smaller 12. increase 13. True
14. False

- C. 1. A force can be described by stating its magnitude and the direction in which it acts.
2. If several forces act in different directions on a body, the effect on the object is due to the magnitude and direction of the net force acting on it.
3. If an object is thrown up, it finally comes down. This happens due to the fact that gravitational force pulls every object towards the earth.
4. Weight is a measure of the earth's gravitational pull on an object whereas mass is the measure of the object without earth's gravitational pull.
5. A magnet can act from a distance because it is surrounded by an invisible field of magnetic force.
6. Pressure is defined as the force exerted per unit area. Pressure depends on two factors:
- (i) The amount of force applied.
  - (ii) The area over which the force is applied, i.e. the area of contact between the two objects.

7. The pressure exerted by air is called atmospheric pressure. It is caused by the air above us which presses down on us with a force equal to that exerted by a mass of 1 kilogram, on every square centimetre.

8. When the knife is blunt the area of contact becomes larger which results into lesser effect of the force. Thus, it is difficult to cut vegetables with a blunt knife.

D. 1. Force is either a push or a pull. Four main effects of force are:

(i) It can make a stationary object move, or can change its position of rest.

(ii) It can change the speed of a moving object.

(iii) Force can change the direction of motion of a moving object.

(iv) It can change the shape or size of an object.

2. Some forces act on bodies only when they are in contact with the body. These are known as contact forces. Examples: muscular force, frictional force. Whereas some other forces can also act on bodies which are not in contact. They are known as non-contact forces. Examples: electrostatic force, gravitational force, etc.

3. Friction is a force that slows things down or prevents things from moving. Example, a ball rolling down on the ground slows down and then comes to rest after moving a certain distance. The opposing force exerted by the ground on the rolling ball is the friction.

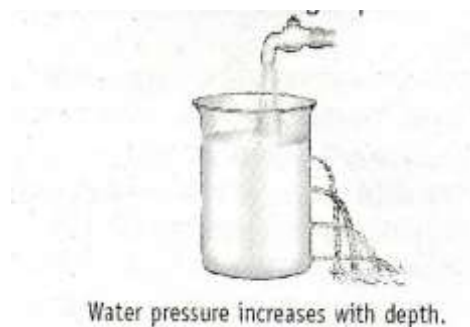
4. Heavy tanks have broad chains called caterpillar tracks which considerably increase the area of contact. The tracks help the tank to distribute its weight more evenly over a larger surface area than wheels can. This prevents it from sinking in areas where wheeled vehicles of the same weight would sink.

5. Take a plastic container and make four holes in it at different heights.

Fill the container with water, and let water keep flowing into it from a tap. Notice the force with which water comes out of the holes. You will find that water comes out with greater force from the holes at greater depth.

Water from the bottom-most hole will be spurted out the farthest from the container.

This shows that the pressure in a liquid increases with increasing depth.



6. When I press a rubber sucker on a smooth surface, it sticks to the surface. This happens because there is very little air between the sucker and the smooth surface to push from inside. Therefore, the greater atmospheric pressure from outside pushes the sucker firmly to the surface.

E. 1. When two or more forces act on an object in different directions, the effect on the object is due to the magnitude and direction of the net force acting on it.

(a) When forces are applied on an object in the same direction, they add up. The net force on the object is a single force whose magnitude is the sum of the two forces. The net force acts in the same direction as the two forces.

(b) When forces are applied on an object in opposite directions, they oppose each other. The net force on the object is the difference between the two forces. This net force will act in the direction of the larger force. If the two opposing forces are equal, the net force is zero.

2. A force applied on an object can have various effects on it. Some of them are listed below:

- (a) Force can make a stationary object move, or can change its position of rest.
- (b) Force can change the speed of a moving object.
- (c) Force can change the direction of motion of a moving object. (d) Force can change the shape or size of an object.

3. The following experiment will prove that air exerts pressure in all directions:

Take a plastic bottle. Put some boiling water in it.

The steam coming out of the water will expel most of the air from inside the bottle.

After about two minutes, screw the cap tightly on the bottle.

Put the bottle in a trough and pour some cold water mixed with ice on it.

As the bottle cools down and the steam condenses, it has very little air inside it.

The atmospheric pressure acting on the bottle from outside is, therefore, much larger than the pressure exerted by the air inside it. This causes the bottle to get crushed from all sides. This experiment shows that air exerts pressure in all directions.

#### HOTS Questions

1. Assuming that air resistance is also not present, this statement is true. In the absence of any opposing force the body will continue moving with uniform speed in a straight line.
2. False, because muscular force is applied on the object through the stick which in turn is in contact with the body. Thus, it is a contact force.
3. The gravitational force is so small that it cannot be felt unless one of the bodies is huge like the earth. The gravitational force between an object and a building is too small to be felt.
4. To have a clear picture about the capability of a given force to produce a certain effect, we must not only know the force but also the area over which it acts. Thus, a new physical quantity known as pressure is introduced to find the effect of a force.
5. If the window of a jet plane flying at a high altitude breaks, it will have three effects.
  - (a) We will not be able to get enough oxygen from air for breathing, because of the low density of air at that height.
  - (b) We will experience problems like nose bleeding as the air pressure will be much lower than our blood pressure.
  - (c) The temperature at that height will be much below freezing which the body will not be able to tolerate.
6. When a rubber sucker is pressed against a rough surface there will be many gaps between the rubber sucker and the surface, through which air can get in. Since a vacuum will not develop inside the sucker, it will not stick to the rough surface.