

FORCE AND PRESSURE

Activity 1

Table 1 gives some examples of familiar situations involving motion of objects. You can add more such situations or replace those given here. Try to identify action involved in each case as a push and/or a pull and record your observations. One example has been given to help you.

Table 1 : Identifying Actions as Push or Pull





S.NO.	Description of the situation	Action can be grouped as a			
		Push		Pull	
1	Moving a book placed on a table	<input type="radio"/> Yes	<input type="radio"/> No	<input type="radio"/> Yes	<input type="radio"/> No
2	Opening or shutting a door	<input type="radio"/> Yes	<input type="radio"/> No	<input type="radio"/> Yes	<input type="radio"/> No
3	Drawing a bucket of water from a well	<input type="radio"/> Yes	<input type="radio"/> No	<input type="radio"/> Yes	<input type="radio"/> No
4	A football player taking a penalty kick	<input type="radio"/> Yes	<input type="radio"/> No	<input type="radio"/> Yes	<input type="radio"/> No
5	A cricket ball hit by a batsman	<input type="radio"/> Yes	<input type="radio"/> No	<input type="radio"/> Yes	<input type="radio"/> No
6	Moving a loaded cart	<input type="radio"/> Yes	<input type="radio"/> No	<input type="radio"/> Yes	<input type="radio"/> No
7	Opening a drawer	<input type="radio"/> Yes	<input type="radio"/> No	<input type="radio"/> Yes	<input type="radio"/> No

Show Result

Do you notice that each of the actions can be grouped as a pull or a push or both? Can we infer from this, that to move an object, it has to be pushed or pulled?

Activity : 2

Table 2: Studying the Effect of Force on Object

Description of situation	How to apply force	Diagram	Action of force	
			Change in state of motion	Change in shape
			Yes/No	Yes/No
A lump of dough on a plate	Pressing it down with your hands		<input type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Yes <input type="radio"/> No
Spring fixed to the seat of a bicycle	By sitting on the seat		<input type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Yes <input type="radio"/> No
A rubber band suspended from a hook/nail fixed on a wall	By hanging a weight or by pulling its free end		<input type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Yes <input type="radio"/> No
A plastic or metal scale placed between two bricks	By putting a weight at the centre of the scale		<input type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Yes <input type="radio"/> No

Show Result

While a force may cause one or more of these effects, it is important to remember that none of these actions can take place without the action of a force. Thus, an object cannot move by itself, it cannot change speed by itself, it cannot change direction by itself and its shape cannot change by itself.

Activity 3 to show liquid exerts pressure at same depth?

1. For this activity initially we need to take empty plastic bottle.
2. Drill four holes near the bottom at same height.
3. Now fill the bottle with water.
4. Observe the streams of water coming out.
5. Then we will see water flows with same pressure.
6. This indicates that liquid exert equal pressure at same depth.

Activity 4 to show liquid exerts pressure on walls of container also on the side of container.

For this activity

1. We need to take a plastic bottle.
2. Then fix cylindrical glass tube near to the bottom.
3. Stretch rubber balloon on the mouth of tube.
4. Now fill half of the bottle with water.
5. Then, balloon starts bulging.
6. It shows pressure is exerted on the walls of the container.

Activity 5 to show liquid exerts pressure at the bottom of container?

1. Firstly, we need to take a tube of approximately length of 15cm.
2. Take a piece of good quality rubber balloon.
3. Stretch the rubber balloon over the end of tube.
4. Then we need to hold the pipe in middle at vertical position.
5. Now pour the water into it.
6. You will notice balloon starts bulging.
7. As more and more water is poured balloon bulges more.

Activity 6 to show that pressure increases with depth

1. Firstly, we need to take a plastic container.
2. Then we need to make 3 holes at different heights.
3. Put the container under a tap.
4. Then we need to observe the force with which water flows out through all holes
5. It is observed that water flows with great pressure from last hole as compare to the other holes.
6. This shows that pressure increases with depth.

Activity – To show the existence of atmospheric pressure (other than textbook)

- **Materials Required:** tumbler, water, square cardboard piece
- **Method:** Fill up the tumbler with water up to the brim. Cover it with cardboard piece and turn the glass upside down. Slowly remove your hand.
- **Observation:** Cardboard does not fall and water stays in the glass.
- **Inference:** air pushes the cardboard up and prevents it from falling.

