INDIAN SCHOOL AL WADI AL KABIR		
CLASS: VIII	**DEPARTMENT: SCIENCE 2025-26**	**DATE: 03/09/2025**
WORKSHEET NO: 6	**TOPIC: FORCE AND PRESSURE**	**NOTE: A4 FILE FORMAT**
NAME OF THE STUDENT:	**CLASS & SEC:**	**ROLL NO.**

I. OBJECTIVE-TYPE QUESTIONS:

1. A person wants to skate using a skateboard. Which two objects must interact to move the skateboard?

a) The ground and the skateboard.

b) The ground and the person's foot.

c) The skateboard and its wheels.

d) The wheels of the skateboard and the person's foot.

2. During dry weather, while combing our hair, we sometimes experience our hair flying apart. The force responsible for this is-

a) Force of gravity

b) Electrostatic force

c) Force of friction

d) Magnetic force

3. When we press the bulb of a dropper with its nozzle submerged in water, the air inside escapes as bubbles. Once we release the pressure on the bulb, water fills the dropper. The rise of water in the dropper is due to

a) Pressure of water

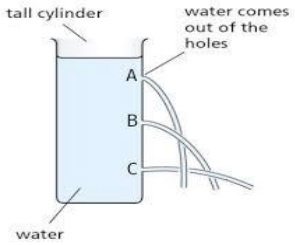
b) Gravity of the Earth

c) Shape of the rubber bulb

d) Atmospheric pressure

4. In the given figure, a beaker is filled with water. A, B, and C are three holes in the beaker. Which of the following statements is correct?

a) Water comes out with maximum pressure from hole A.
b) The pressure of water coming out from hole B is greater than that from hole C and hole A.
c) Waterfalls the farthest through hole C.
d) Water falls through the nearest hole B.



5. A person X pushes a cart with a force. Another person, Y, starts pushing the cart in the opposite direction with the same force. How does it affect the cart?
   a) It brings the cart to rest.
   b) It changes the direction of the cart.
   c) It increases the speed of the cart.
   d) It will change the shape of the cart.

6. When a wooden box is suspended from a spring balance, the spring stretches because:
   a) Earth's gravity pulls the box.
   b) Earth's magnetic field attracts the spring.
   c) The frictional force acts between the box and the spring.
   d) The electrostatic force acts between the box and the spring.

7. Like poles of a magnet:
   a) Attracts each other
   b) Neither attract nor repel
   c) Repels each other
   d) None of these

For question numbers 8-10, two statements are given- one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (i), (ii), (iii), and (iv) as given below -

i) Both A and R are true, and R is the correct explanation of the assertion.

ii) Both A and R are true, but R is not the correct explanation of the assertion.

iii) A is true, but R is false.

iv) A is false, but R is true

8**. Assertion (A):** It is difficult to carry a bag with narrow straps as compared to carrying the same bag with broader straps.

Reason (R): When the same force acts over a small area, its pressure is greater.

9**. Assertion (A):** The pressure at the bottom of the sea is less than that at the surface.

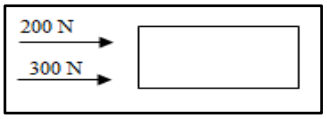
Reason (R): The pressure exerted by a liquid depends on the depth and the density of the liquid.

10. **Assertion (A):** A potter shapes kneaded clay into pots of different sizes and forms.

Reason (R): Force can cause a change in the size or shape of an object.

II. VERY SHORT ANSWER TYPE QUESTIONS (2M):

1. a) Two forces, 200N, and 300N, are acting on a body in the same direction. What is the resultant force?



[Hint: When two or more forces act in the same direction, the net force or the resultant force is the sum of the two forces, i.e., 200 N + 300 N = 500 N]

b) Identify the type of force in the situations below.

i) A coin or a pen falls to the ground when it slips out of your hand.
[Hint: (Force of gravity]

ii) A boat comes to rest if we stop rowing it.
[Hint: Frictional force]

iii) When a person hammers a nail.
[Hint: Muscular force]

2. a) What will be the net force on an object if two forces acting on it in opposite directions are equal? Why?

[Hint: If two forces acting in opposite directions are equal, then they cancel each other's effect, hence the net force will be zero.

b) What is the similarity between electrostatic and magnetic forces?

[Hint: (Both are non-contact forces; both are attractive as well as repulsive forces]

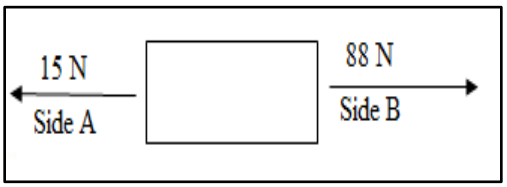
3. a) Why do you think that a ball rolling down the ground comes to rest?

[Hint: (It is the force of friction between the surface of the ball and the ground that brings the rolling ball to rest.]

b) Why does the porter place a round piece of cloth above his head before he places his luggage?

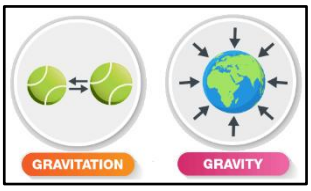
[Hint: This helps in increasing the area of contact between the luggage and his head. The increased area of contact reduces the pressure, enabling him to carry heavy loads.]

4. In a tug of war, Side A applies a 15N force and Side B applies an 88N force. Which side will the rope move? What will be the net force acting on the rope?



[Hint: If two forces are acting in opposite directions, then the net force will be the difference between the two forces. Therefore, net force is 88-15=73N. The rope will move towards B.]

5. Distinguish between the force of gravity and gravitational force.



[Hint: Force of gravity is the Earth's gravitational pull on a body. It is always attractive. Gravitational force is the force of attraction acting between any two bodies of the universe.]

6. a) What is the SI unit of pressure?

[Hint: N/m^2 or Pascal (Pa)]

b) Define pressure.

[Hint: The force acting on a unit area of a surface is called pressure. Pressure = force/area]

c) Give the two examples of the gases exerting pressure.

[Hint: When air is filled into a balloon, the balloon gets inflated (gets bigger). When air is filled into a bicycle tube with a pump, the tube is inflated and makes the tyre feel 'hard'.

III. SHORT ANSWER TYPE QUESTIONS (3M):

1. In a tug of war, three boys of team A pull the rope with forces of 100 N, 120 N, and 170N. In team B, the three members pull the rope with forces of 130 N, 150 N, and 155 N. Who will win the tug of war? What is the resultant force?

[Hint: Force applied by team A = F_A = 100 + 120 + 170= 390 N
Force applied by team B = F_B = 130 + 150 + 155= 435 N
As $F_B > F_A$, the resultant force is in the direction of F_B. So, Team B will win the tug of war. Resultant force = $F_B - F_A$
= 435 - 390
= 45 N]

2. Write one point of difference between contact and non-contact forces with an example.
[Hint: Contact force- The force between two objects that are in physical contact. E.g., lifting a bucket of water.
Non-contact: The force applied to a body by another body that is not in direct contact with it. E.g., A plastic comb gets charged when it is run through dry hair. This charged comb attracts small bits of paper.]
3. How would you distinguish between balanced and unbalanced forces?

BALANCED FORCE	UNBALANCED FORCE
Equal forces acting on one object in opposite directions are called balanced forces.	**Unequal forces acting on one object in opposite directions are called unbalanced forces.**
The state of motion of the object remains unchanged.	**There is a change in the state of motion of the object.**
Net force is zero	**Net force is not zero**

4. a) Describe the state of motion of an object.

[Hint: The state of motion of an object is described by its speed and the direction of motion. The state of rest is considered to be the state of zero speed. An object may be at rest or in motion; both are its states of motion.]

b) What are the effects of the application of force on an object?

[Hint: A force may make an object move from rest, may change the speed of an object if it is moving, or may change the direction of motion of an object, may bring about a change in the shape of an object, or may cause some or all of these effects.)

5. a)Why is it difficult to pull out a toy having a rubber sucker that is stuck to the wall?

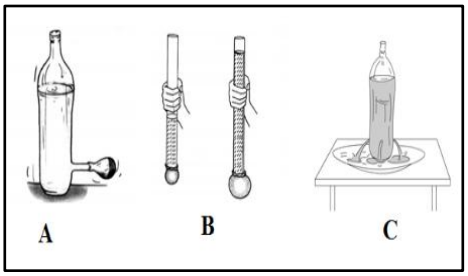
[Hint: It is difficult because of the difference in internal and external air pressure. There is less air pressure inside than outside, so outside air pressure pushes the surface of the rubber sucker towards the wall, making it difficult to pull.]

b) Why do some people suffer from nosebleeds at high altitudes?

[Hint: (The atmospheric pressure is at a maximum on the surface of the Earth. When we go to a higher altitude (say, a high mountain), the atmospheric pressure decreases. So, at high altitudes, the atmospheric pressure becomes much less than the pressure exerted by our fluids inside our body. Since our internal pressure by fluids is greater than the external air pressure, some of the thin blood vessels in our nose burst and bleeding can occur.)

6. What do the following activities prove?

[Hint: A liquid exerts pressure on the walls of the container.
B- Pressure exerted by the water at the bottom of the container depends upon the height of the water column.
C- Liquid exerts equal pressure at the same depth.]



IV. LONG ANSWER TYPE QUESTIONS (5M):

1. Explain the various types of contact and non-contact forces.

[Hint: Muscular force is the force that is caused by the action of muscles inside the body. It is also a contact force. E.g., Athletes use muscular force for running.
Frictional force is the force that opposes the motion of one body over the surface of another body. It is a contact force. E.g., A bicycle eventually comes to rest when you stop pedaling it.
Magnetic force is the force exerted by magnets on magnetic materials like iron. It can be either attractive or repulsive. E.g., A magnet attracts magnetic materials.

Electrostatic force is the force of attraction or repulsion exerted between charged particles. E.g., A straw rubbed with paper attracts another straw but repels it if it has also been rubbed with a sheet of paper.
Gravitational force is the force exerted by Earth's gravity on all objects. It is always attractive. The falling of an apple from a tree or the falling of any object when we throw anything up.)

2. Give a reason for the following.

a) If you walk in the snow, your feet will sink. But if you put on skies, you can move over the snow easily.
[Hint: Skies increase the area of contact with the snow, thereby reducing the pressure on it. The reduced pressure enables the skies to slide over the snow without sinking much.]

b) Iron rails of railway tracks are fixed over wide wooden or concrete sleepers.
[Hint: Iron rails are fixed over wide wooden or concrete sleepers to reduce pressure received from the train by increasing the area of contact, because if surface area increases, pressure decreases and vice versa.]

c) It is easier to sew with a pointed needle than a blunt needle.
[Hint: It is easier to sew with a pointed needle because the pointed end reduces the area of contact, thereby increasing pressure and enabling us to stitch easily.]

d) It is easy to peel vegetables with a sharp knife.
[Hint: It is easy to peel vegetables with a sharp knife instead of using a blunt knife because less area of contact means more pressure is exerted.]

3. a) Calculate the pressure produced by a force of 1000 N acting on an area of 2 m^2.
[Hint: P= F/A, 1000/2= 500N/m^2)

b) Over what area should a force of 200 N act to produce a pressure of 1000 Pa?
[Hint: A=F/P=200/1000=1/5=0.2m^2]

c) The pressure of a gas contained in a cylinder with a movable piston is 300 Pa. The area of the piston is 50 m^2. Calculate the force exerted on the piston.
[Hint: (F=P x A = 300 x 50 = 15000N)

d) If a force of 5N is applied over an area of 2.5 m^2. Calculate the pressure produced.
[Hint:(Pressure = F/A, 5/2.5 = 2 Pa)

V. CASE STUDY- BASED QUESTIONS/PASSAGE-BASED QUESTIONS:

Read the following passage and answer the questions:

Force is a push or pull that affects objects and occurs when two objects interact. We use force in daily activities like opening doors, lifting weights, squeezing bottles, cutting vegetables, and shaping clay. Sports also involve force - hitting carrom strikers, kicking footballs, and catching

balls. Force has both magnitude and direction. It can: Make stationary objects move, change an object's shape, Increase or decrease speed, change direction, and bring moving objects to rest. All physical interactions around us involve forces, making it a fundamental concept that explains how we manipulate and interact with our environment through pushes and pulls.

a) What is force?
[Hint: A push or a pull on an object is called a force.]

b) How does an applied force change the speed of an object?
[Hint: If the applied force is in the direction of motion, the speed of the object increases. But if the force is applied in the direction opposite to the motion, then it decreases the speed of the object.]

c) In the following situations. State the effect of the force in each case.

i) Kicking a Football
[Hint: The force makes the stationary object move and also changes its direction]

ii) Squeezing a Stress Ball
[Hint: The force changes the shape of the ball, compressing it from its original round form to a flattened shape]

iii) Applying Brakes on a Bicycle
[Hint: The force decreases the speed of the bicycle and eventually brings the moving object to rest]

OBJECTIVE-TYPE QUESTIONS: ANSWERS

1. b) The ground and the person's foot
2. b) Electrostatic force
3. d) Atmospheric pressure
4. c) Waterfalls the farthest through hole C
5. a) It brings the cart to rest
6. a) Earth's gravity pulls the box
7. c) Repel each other
8. i) Both A and R are true, and R is the correct explanation of the assertion
9. iv) A is false, but R is true
10. i) Both A and R are true, and R is the correct explanation of the assertion

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