Step-by-Step Solutions & Marking Scheme

CBSE Class 8 Science (Curiosity) — Chapter 6: Pressure, Winds, Storms, and Cyclones

Quick answer key — Section A: 1-(c) 2-(c) 3-(c) 4-(b) 5-(b) 6-(a) 7-(A) 8-(C)

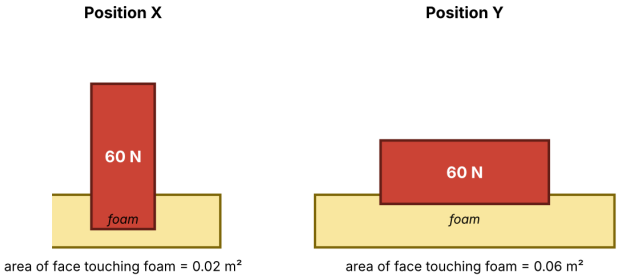
SECTION A — Multiple Choice Questions

1. (c) newton per square metre (N/m^2)

Pressure = force ÷ area, so its unit is N ÷ m^2 = N/m^2, also called the pascal (Pa).

Marking: 1 mark.

2. Fig. 1 → **(c) 3000 Pa**

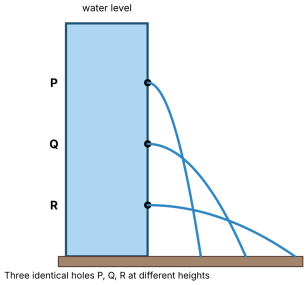


Step 1: Force = weight of brick = 60 N; area = 0.02 m^2.

Step 2: Pressure = Force ÷ Area = 60 ÷ 0.02 = **3000 Pa**.

Marking: 1 mark.

3. Fig. 2 → **(c) The stream from R**



Step 1: Hole R is the deepest, i.e. it has the tallest column of water above it.

Step 2: Pressure of a liquid increases with the height of its column, so the water leaves R with the greatest speed and travels the farthest.

Marking: 1 mark.

4. (b)

Fluids and gases in our body exert a pressure equal to the atmospheric pressure. It balances the pressure from outside, so we are not crushed.

Marking: 1 mark.

5. (b) Inside a closed car or bus

Tall trees, metal poles and water attract lightning or conduct charge, so they are dangerous. A closed vehicle is comparatively safe.

Marking: 1 mark.

6. (a)

The eye is the centre of the cyclone where the pressure is lowest; the wind there is calm, while the region around it has strong winds and heavy rain.

Marking: 1 mark.

7. Assertion–Reason → **(A)**

Step 1: A is true: a sharp knife cuts more easily.

Step 2: R is true: the sharp edge has a smaller area, so for the same force the pressure (force ÷ area) is greater.

Step 3: R explains A → (A).

Marking: 1 mark.

8. Assertion–Reason → **(C) A is true but R is false.**

Step 1: A is true: open doors and windows are safer during a storm.

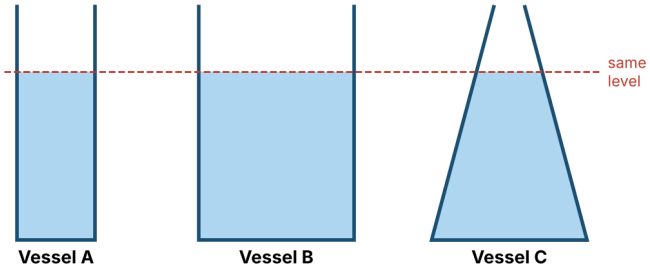
Step 2: R is false: opening them *reduces* (not increases) the pressure difference between inside the house and above the roof, which prevents the roof from being blown off.

Step 3: A true, R false → (C).

Marking: 1 mark.

SECTION B — Short Answer Questions

9. Vessels of different shapes (Fig. 3)

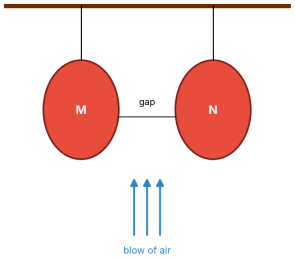


(a) The pressure at the bottom is the **same** in A, B and C.

(b) It is decided by the **height of the water column** (not by the shape or the amount of water). Overhead tanks are placed at a height so that the height of the water column, and so the pressure in the taps, is larger.

Marking: (a) 1; (b) ½ + ½.

10. Blowing between balloons (Fig. 4)



(a) The balloons move **towards each other**.

(b) Fast-moving air between them has a lower pressure. The higher air pressure on the outer sides pushes the balloons together.

Marking: 1 mark for each part.

11. Pressure calculation

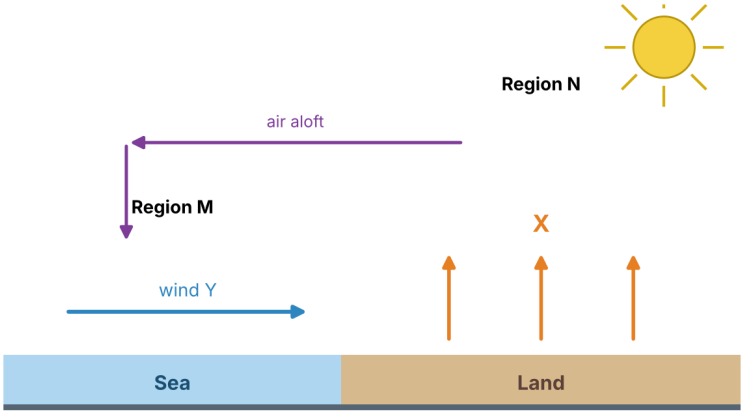
(a) Pressure = Force ÷ Area = 500 ÷ 0.25 = **2000 Pa** (2000 N/m^2).

(b) New area = 2 × 0.25 = 0.5 m^2; pressure = 500 ÷ 0.5 = **1000 Pa** (half the earlier value).

Marking: (a) 1; (b) 1.

SECTION C — Long Answer Questions

12. Sea breeze (Fig. 5)



A coastal area at midday

(i) Region N (over the land) has the lower pressure.

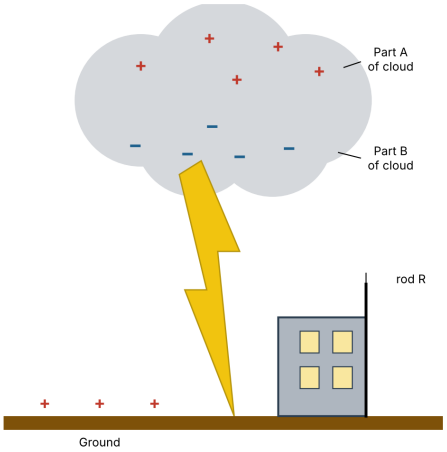
(ii) Y is the **sea breeze**; it blows from the sea to the land.

(iii) The land heats up faster than the sea, so the air above it becomes warm and light and rises, creating a low-pressure area.

(iv) At night the land cools faster and the sea is warmer, so low pressure forms over the sea; the wind blows from the land to the sea (land breeze).

Marking: 1 mark for each part.

13. Thundercloud (Fig. 6)



(i) Part A (top) has **positive** charge; part B (bottom) has **negative** charge.

(ii) The negatively charged base of the cloud induces a positive charge on the ground and on objects such as buildings and trees.

(iii) Air is normally an insulator; when the charges grow very large, it breaks down and the charges flow suddenly, giving a bright flash (½). The lightning heats the air around it so quickly that the air expands and produces the loud sound of thunder (½).

(iv) R is a **lightning conductor**; its upper end is pointed and higher than the building, and its lower end is buried in the ground, giving the charges an easy path into the earth.

Marking: 1 mark for each part.

14. Pressure of a standing student

(i) Total area = 2 × 0.02 = 0.04 m^2; pressure = 400 ÷ 0.04 = **10 000 Pa**.

(ii) Area = 0.02 m^2; pressure = 400 ÷ 0.02 = **20 000 Pa**.

(iii) The pressure is greater on one foot, **2 times** (20 000 ÷ 10 000).

(iv) Broad shoes spread the weight over a larger area, so the pressure is less and the feet sink less; high heels have a tiny area and a large pressure.

Marking: 1 mark for each part.

15. Reasons

(i) Water pressure increases with depth, so the horizontal pressure near the bottom is very large; a broad base withstands it.

(ii) Pressing the sucker pushes out the air, so the pressure inside becomes lower than the outside air pressure, which presses it onto the wall.

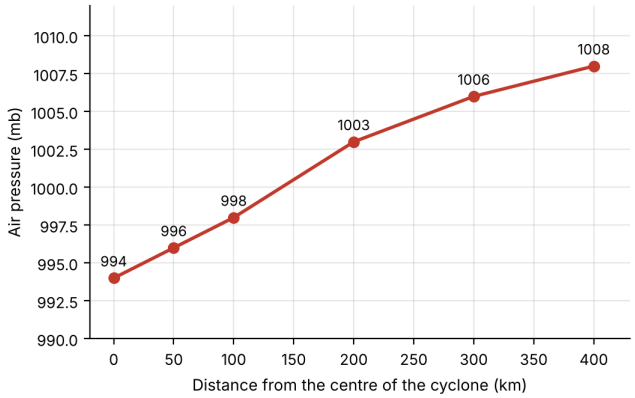
(iii) Water exerts pressure on the sides of a container as well, so it is pushed out through the hole.

(iv) Broad straps spread the weight over a larger area, so the pressure on the shoulder is less.

Marking: 1 mark for each part.

SECTION D — Case-Based / Practical Questions

16. Cyclone pressure (Fig. 7)



(i) 994 mb.

(ii) 1003 mb.

(iii) 994 mb = 994 × 100 Pa = **99 400 Pa**.

(iv) The **eye** of the cyclone; the wind there is **calm**.

(v) On reaching land, the supply of warm moist air from the ocean is cut off, so the cyclone gradually loses its strength.

Marking: 1 mark for each part (½ + ½ in (iv)).

17. Roofs in a storm

(i) The pressure above the roof is **lower** than the pressure below it.

(ii) High-speed winds are accompanied by **low air pressure** (the faster the wind, the lower the pressure).

(iii) With the doors and windows shut, the higher pressure inside pushes the roof up against the low pressure above it; the large difference blew off the roof.

(iv) With the doors and windows open, the wind flows through the house, so the pressure difference between inside and above the roof is small.

(v) Stay away from tall objects, crouch down in a low open area (any one correct precaution).

Marking: 1 mark for each part.

Section	A	B	C	D	Total

Marks	8	6	16	10	40

Note: any other correct and relevant answer should be accepted and awarded full marks.