



CLASS 8 SCIENCE · 2026-27

Force, pressure and friction

Physics

33

QUESTIONS

30

MINUTES

3

EXERCISES

This belongs to _____ Date _____

WHAT YOU'LL GET GOOD AT

- Distinguishes contact from non-contact forces and names each
- Calculates pressure from force and area, and rearranges for either
- Writes a numerical with formula, substitution, units and a stated answer
- Explains an everyday observation in terms of pressure or friction

Take your time, and have a go at every one. If you get stuck, look at the orange box — Ollie has already done one for you.

Force, pressure and friction

Physics · 33 questions · tick each box as you finish

Exercise 1 of 3 · 11 questions Contact or non-contact? Name the force.



WRITE THE ANSWER

HERE'S ONE DONE FOR YOU

A magnet attracting a pin is a non-contact force, and specifically a magnetic one. The test is simple and worth saying out loud: do the two objects have to touch for the force to act? Gravitational, magnetic and electrostatic forces do not. Everything else in Class 8 does.

1) A magnet attracting a pin from a short distance

2) Pushing a table across the room

3) A ball falling to the ground

4) A cycle slowing down when you stop pedalling

5) A comb rubbed on hair picking up small bits of paper

6) A charged balloon sticking to a wall

7) Kicking a football

8) A parachute slowing a falling person

9) An apple pulled towards the earth

10) Rubbing hands together to warm them

11) A paper clip jumping to a magnet

Exercise 2 of 3 · 11 questions Work these out. Write the formula, substitute, and give units on every line. ☐

WRITE THE ANSWER

HERE'S ONE DONE FOR YOU

$P = F/A = 150 \text{ N} \div 3 \text{ m}^2 = 50 \text{ Pa}$. Three lines, and each one earns something. The formula is written before any numbers appear, the units are carried through rather than added at the end, and the answer has its unit attached. A child who writes '50' has the physics right and half the marks, which is a frustrating way to lose them.

1) A force of 150 N acts on an area of 3 m². Find the pressure.

2) A force of 200 N acts on an area of 0.5 m². Find the pressure.

3) A box weighing 600 N rests on an area of 1.5 m². Find the pressure.

4) A pressure of 20 Pa acts over an area of 4 m². Find the force.

5) A force of 250 N produces a pressure of 500 Pa. Find the area.

6) A force of 90 N acts on an area of 3 m². Find the pressure.

7) A force of 500 N acts on an area of 0.25 m². Find the pressure.

8) A crate weighing 720 N rests on an area of 1.2 m². Find the pressure.

9) A pressure of 40 Pa acts over an area of 5 m². Find the force.

10) A force of 360 N produces a pressure of 90 Pa. Find the area.

11) A brick of weight 30 N rests on a face of area 0.05 m². Find the pressure.

Exercise 3 of 3 · 11 questions Explain in two or three sentences.

WRITE THE ANSWER

HERE'S ONE DONE FOR YOU

The knife: sharpening reduces the area of the edge, and since pressure is force divided by area, the same force now produces far greater pressure. Notice that the force has not changed at all - only the area. Almost every pressure question in Class 8 turns on that one point, and children who say 'because it is sharp' have restated the question rather than answered it.

1) Why is the edge of a knife sharpened?

2) Why do school bags have wide straps rather than thin cords?

3) Why is it harder to walk on soft sand in high heels than in flat shoes?

4) Why is a dam built thicker at the bottom than at the top?

5) Why is rolling friction less than sliding friction?

6) Why does a nail have a pointed tip?

7) Why do tractors have very wide tyres?

8) Why is it easier to swim in sea water than in a river?

9) Why do our ears sometimes pop in an aeroplane?

10) Why is oil put into machinery?

11) Why can a camel walk on sand where a horse would sink?

**All done? How did that feel?**

Colour in a star. Three stars means you could teach it to someone else.



Tricky · Getting there · Easy now



Answer key

For grown-ups

Force, pressure and friction · keep this page back until your child has finished.

1. Contact or non-contact? Name the force.

- 1) Non-contact - magnetic force. The magnet and the pin never touch.
- 2) Contact - muscular force, applied directly by the body.
- 3) Non-contact - gravitational force, exerted by the Earth on the ball.
- 4) Contact - friction between the tyres and the road, and between moving parts.
- 5) Non-contact - electrostatic force, because rubbing gives the comb a charge.
- 6) Non-contact - electrostatic force.
- 7) Contact - muscular force.
- 8) Contact - air resistance, a kind of friction.
- 9) Non-contact - gravitational force.
- 10) Contact - friction.
- 11) Non-contact - magnetic force.

2. Work these out. Write the formula, substitute, and give units on every line.

- 1) $P = F/A = 150 \text{ N} \div 3 \text{ m}^2 = 50 \text{ Pa}$.
- 2) $P = F/A = 200 \text{ N} \div 0.5 \text{ m}^2 = 400 \text{ Pa}$. Dividing by a number less than one increases the answer.
- 3) $P = F/A = 600 \text{ N} \div 1.5 \text{ m}^2 = 400 \text{ Pa}$.
- 4) $F = P \times A = 20 \text{ Pa} \times 4 \text{ m}^2 = 80 \text{ N}$.
- 5) $A = F/P = 250 \text{ N} \div 500 \text{ Pa} = 0.5 \text{ m}^2$.
- 6) $P = F/A = 90/3 = 30 \text{ Pa}$.
- 7) $P = F/A = 500/0.25 = 2,000 \text{ Pa}$.
- 8) $P = F/A = 720/1.2 = 600 \text{ Pa}$.
- 9) $F = P \times A = 40 \times 5 = 200 \text{ N}$.
- 10) $A = F/P = 360/90 = 4 \text{ m}^2$.
- 11) $P = F/A = 30/0.05 = 600 \text{ Pa}$.

3. Explain in two or three sentences.

- 1) Sharpening reduces the area of the edge. For the same force, a smaller area means a much greater pressure, so the knife cuts more easily.
- 2) Wide straps spread the same weight over a larger area of the shoulder, which reduces the pressure and so the discomfort. The force is unchanged; only the pressure is.
- 3) A heel has a very small area, so the same body weight produces a much higher pressure and the heel sinks. Flat shoes spread the weight over a larger area.
- 4) Because the pressure of a liquid increases with depth. The water pushes hardest at the bottom, so the wall has to be thickest there to withstand it.
- 5) Because a rolling object touches the surface at fewer points at any one moment, so there is much less interlocking between the two surfaces than when one slides over the other.
- 6) Because a point concentrates the force onto a tiny area, and a small area with the same force gives a very large pressure, so the nail goes in.
- 7) Because a wide tyre spreads the tractor's weight over a large area. That lowers the pressure on soft ground, so the tractor does not sink into the field.
- 8) Because sea water is denser than river water, so it exerts a greater upward force on the swimmer. That upthrust makes it easier to float.
- 9) Because air pressure outside falls as the plane climbs, while the pressure inside the ear stays higher. The ear pops as the two are equalised.
- 10) To reduce friction between the moving parts. Less friction means less heat, less wear and less energy wasted.
- 11) Because its feet are broad and spread out. The same weight over a larger area means lower pressure, so it does not sink into loose sand.

WHILE YOUR CHILD WORKS

- Check the units on every line, not just the last one. Marks for layout are given independently of the answer.
- In pressure questions, ask 'what changed - the force or the area?' The answer is almost always the area.
- This sheet is the physics strand. If it goes noticeably worse than the other two, that is useful information a single Science mark could not give you.

**Spotted a gap while marking?**

A free assessment is one live class with a matched teacher - no card, nothing to cancel. Afterwards you get an honest note on what they noticed.

Book a free assessment - scholur.com/contact