Pressure

Pressure tells us whether a _____ is _____ or _____ over an _____.

When you push **drawing pin** with your thumb, the _____ of the point has a very _____. This enables it to go into the wall. The flat bit you push has a _____. The _____ is more _____. There is _____ which is why it doesn't go into your thumb.

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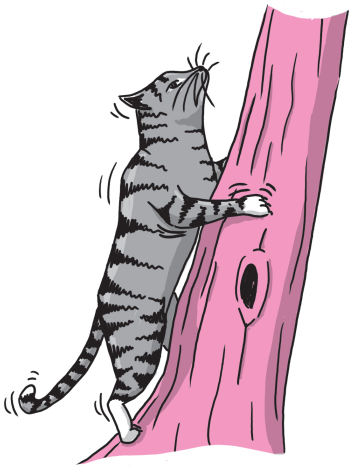
1 Do you want a high or low pressure? How did you decide?

(a) Cat's claws when it climbs a tree

(b) Standing on soft snow when you don't want to sink in

(c) A tractor's wheels in a muddy field

(d) Scissor blades cutting paper



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2 Fill in the gaps to complete the explanation:
A bar of chocolate has six chunks joined with thinner pieces of chocolate. When you try to bend the bar, the _____ is greatest where the bar is _____. This helps you break off one chunk of chocolate at a time.

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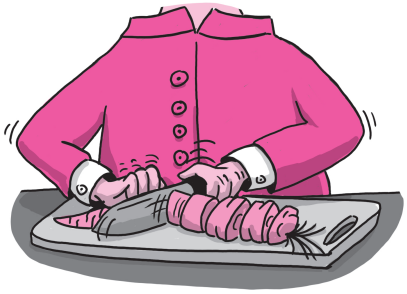
3 A chef is chopping carrots with a sharp knife. Complete the table to compare the force, pressure and area of the knife handle compared with its blade. Choose from the words **larger**, **smaller** and **equal**.

	On handle compared to blade edge,
Area	area is
Pressure	pressure is
Force	force is



A pressure of 30 N/cm^2 means that there is a force of _____ on each _____.

If this pressure is on a 4 cm^2 area, then the force will be _____.

4 Calculate the force on these areas if the pressure is 20 N/cm^2.

(a) 2 cm^2,

(b) 4 cm^2,

(c) 30 cm^2,

(d) 0.04 cm^2.

If there is a force of 60 N spread over an area of 4 cm^2, then the force on each square centimetre is _____. The pressure is _____.

5 Calculate the pressure for these forces and areas.

(a) 20 N over 2 cm^2,

(b) 20 N over 0.2 cm^2,

(c) 60 N over 12 cm^2,

(d) 60 N over 3 cm^2.

If there is a pressure of 60 N/cm^2 then the force on each square centimetre is ____. If the force is 240 N the area must be _____.

6 A force is 300 N. Calculate the area to make these pressures.

(a) 150 N/cm^2,

(b) 30 N/cm^2,

(c) 15 N/cm^2,

(d) 600 N/cm^2.

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7 Complete the word equations using **Force**, **Pressure** and **Area**.

(a) Force $=$

(b) Pressure $=$

(c) Area $=$

8 Rewrite your word equations using symbols.
F is the force, P is the pressure and A is the area.

(a) $F =$

(b) $P =$

(c) $A =$

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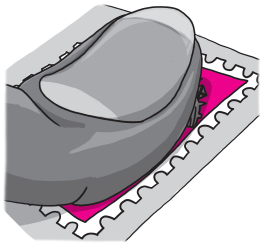
9 Use your understanding of pressure, or the formulae, to calculate

(a) the pressure when a 48 N force squeezes a 1.2 cm^2 stamp,

(b) the force when a 20 N/cm^2 pressure fluid pushes a 5 cm^2 piston,

(c) the area if a 900 N force makes a 90 N/cm^2 pressure.



Areas can also be measured in square metres. 1 m$^2 = 100$ cm $\times$ 100 cm $=$ _____ cm^2.

A pressure of $50\,000$ N/m^2 can also be written as $50\,000$ ___ (pascals) or 50 ___ (kilopascals).

10 A van with weight $25\,000$ N is supported by tyres with total area 0.25 m^2. Calculate the

(a) pressure in kPa,

(b) area in cm^2,

(c) pressure in N/cm^2.