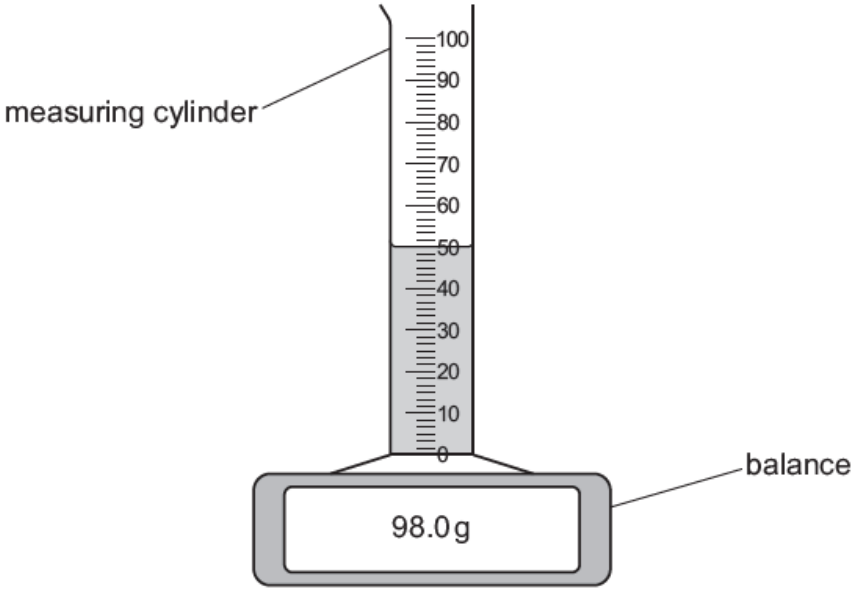
Pressure and density – Checkpoint Sec 1 Physics

1. No.13

Blessy calculates the density of a liquid.

She puts 50 cm^3 of the liquid in a measuring cylinder.

She puts the measuring cylinder on a balance.



(a) The unit of density is g / cm^3.

Write down the equation to calculate density.

density = ... [1]

(b) The mass of the empty measuring cylinder is 38.0 g.

The mass of the measuring cylinder and the liquid is 98.0 g.

(i) Calculate the **mass** of the liquid.

mass of liquid ..... g [1]

(ii) The volume of the liquid is 50 cm^3.

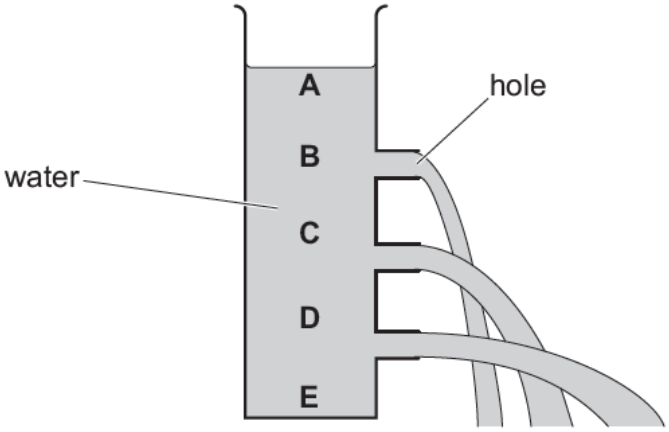
Calculate the **density** of the liquid.

density of the liquid ..... g/cm^3 [1]

2. No.14

Lily investigates water pressure.

(a) Water is inside a container with holes in one side.



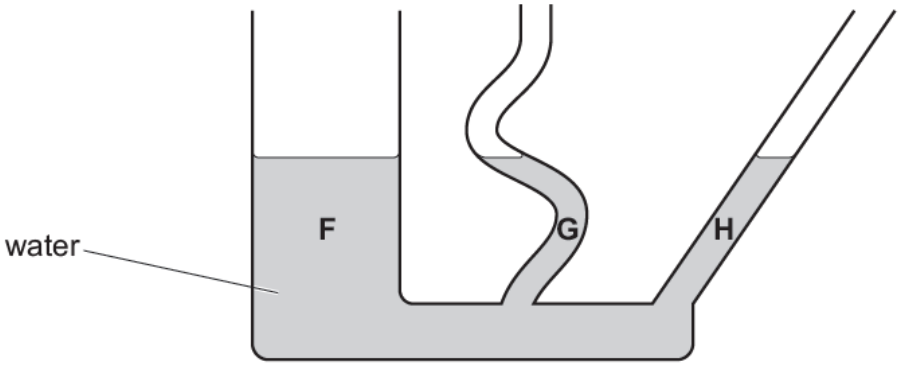
Where is the water pressure the **greatest**?

Circle the correct answer.

A **B** **C** **D** **E**

[1]

(b) Water is inside a different shaped container.



Compare the water pressure at **F**, **G** and **H**.

.....

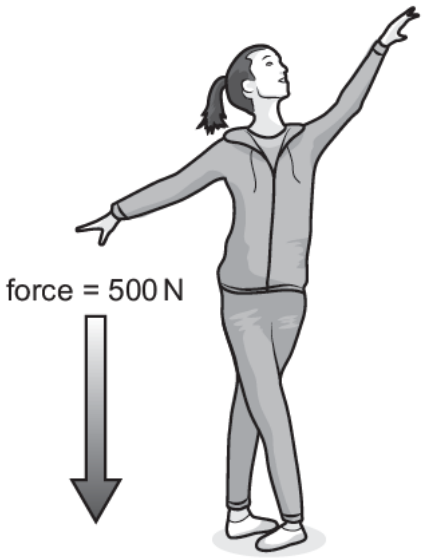
..... [1]

3. No.13

Mia is a dancer.

The force she exerts on the floor is 500 N.

(a) She stands with both feet flat on the floor.



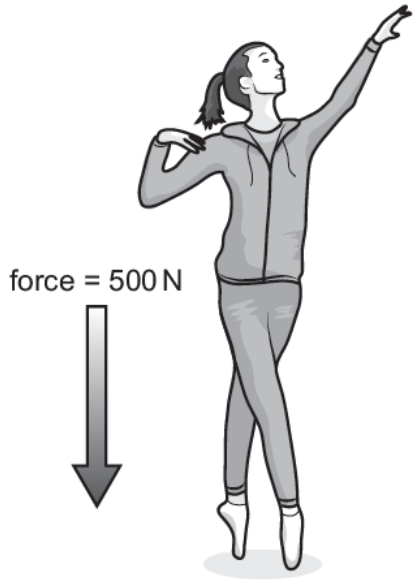
The area of her shoes in contact with the floor is 400 cm^2.

Calculate the pressure she exerts on the floor.

pressure ..... N/cm^2 [2]

(b) Mia stands on the points of her feet.

Her new area of contact with the floor is 10 cm^2 rather than 400 cm^2.



Describe what happens to the pressure she exerts on the floor.

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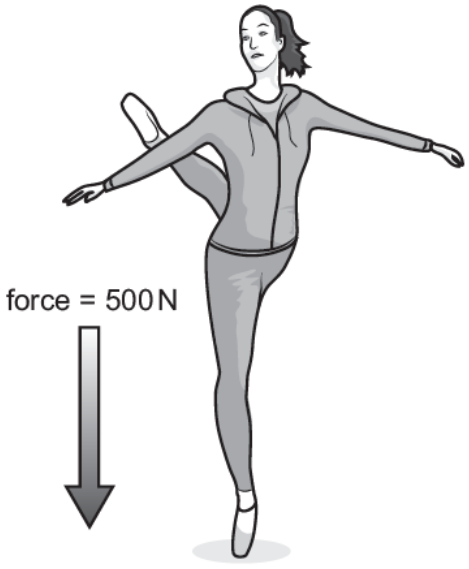
..... [1]

(c) Mia balances on one point.



She **cannot** remain on one point for a long time because it may damage her toes.

Suggest why this may damage her toes.

.....

..... [1]

4. No.10

Mike explains that different materials have different densities.

He says,

'Materials that are less dense than water will float.

Water has a density of 1 g / cm^3.'

He finds out the densities of different materials.

material	density in g / cm^3
gold	19.3
plastic	1.05
pumice stone	0.251
silver	10.5
wood	0.715

(a) Predict which **two** materials will float.

Choose from the table.

..... **and** ..... [1]

(b) Mike collects some water from the sea.

He tries to float the materials from the table in the seawater.

Now **three** of these materials float.

Use information from the table to explain why.

.....

.....

..... [2]

5. No.3

Carlos calculates the density of an object.

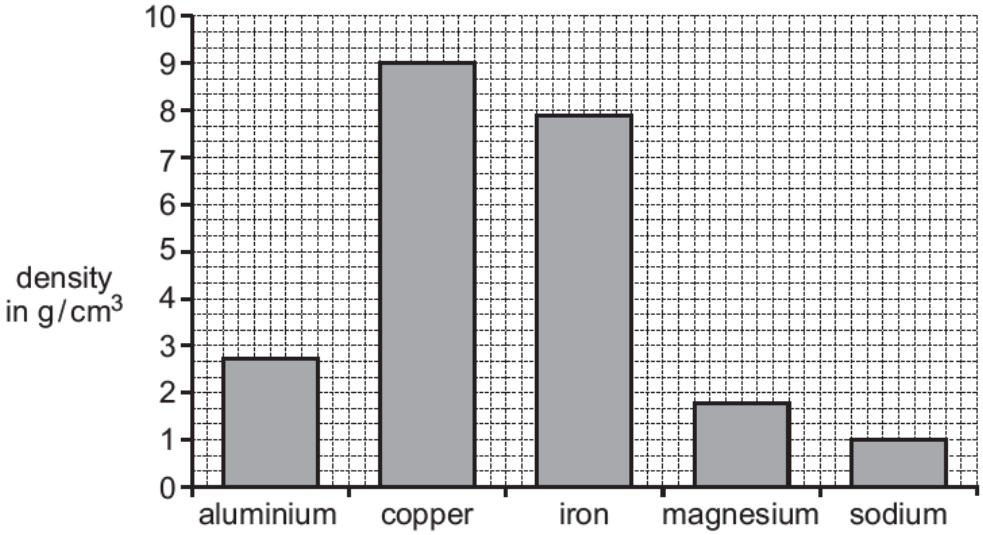
(a) The object has a mass of 450 g.

The object has a volume of 50 cm^3.

Calculate the density of the object.

density ..... g/cm^3 [3]

(b) Carlos knows the densities of different metals.



Carlos has a piece of each of the five metals.

Each piece of metal has the same volume.

Which piece of metal has the **greatest** mass?

Circle the correct answer.

aluminium

copper

iron

magnesium

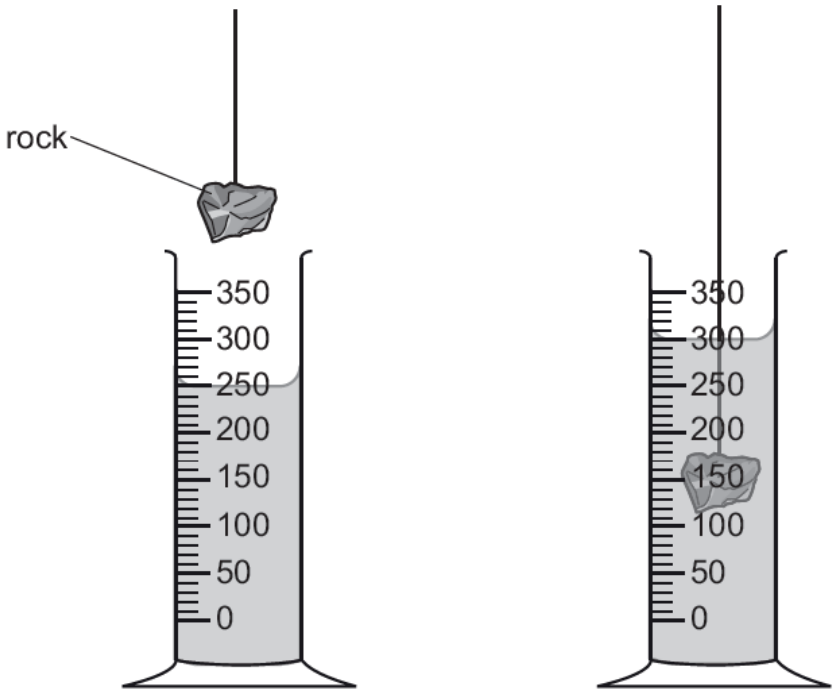
sodium

[1]

6. No.13

Measuring cylinders are used to measure volume.

Look at the diagram.



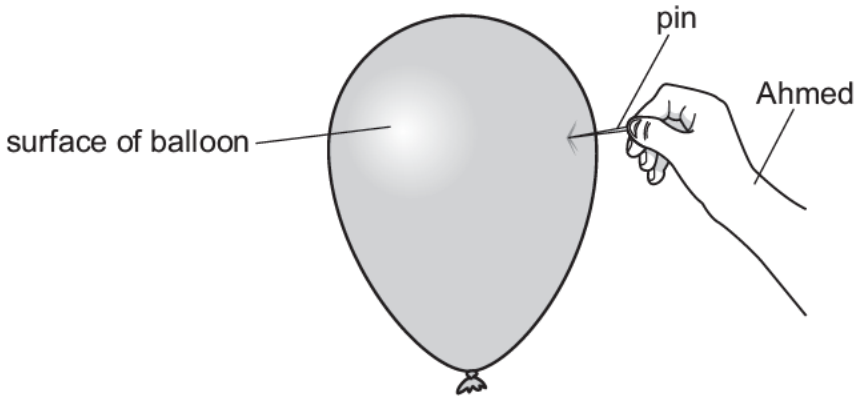
What is the volume of the piece of rock?

..... cm^3 [1]

7. No.14

Ahmed is learning about pressure.

He pushes a pin on the surface of a balloon.

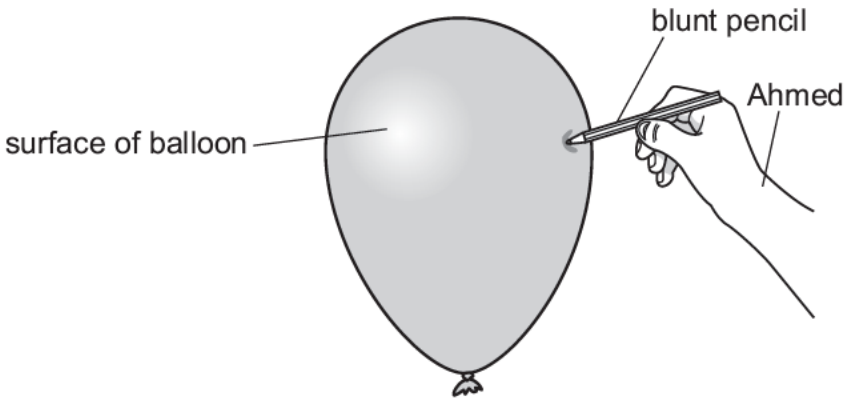


The balloon bursts (pops).

Ahmed repeats the investigation with an identical balloon.

He does **not** use a pin.

He pushes a blunt pencil with the same force.



The balloon does **not** burst.

Explain why the balloon does **not** burst.

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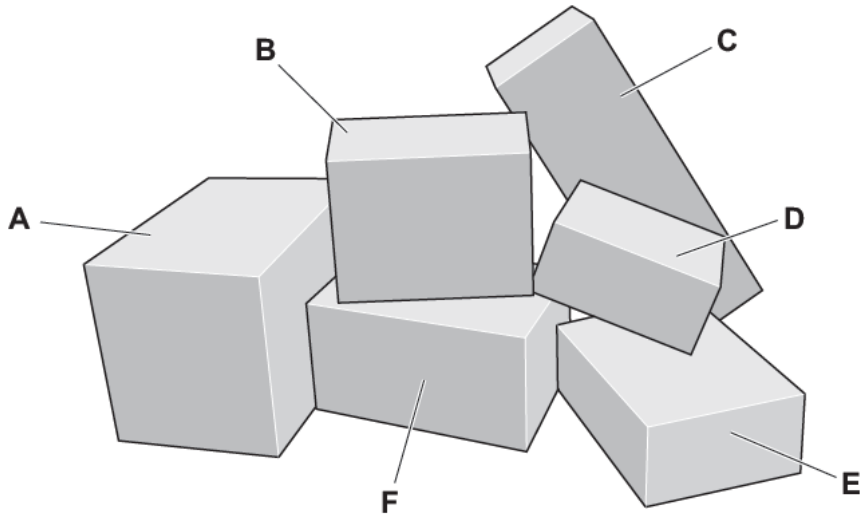
.....

..... [2]

8. No.9

Pierre and Carlos have six boxes.



They collect information about the six boxes.

box	colour	volume in cm^3	mass in g	density in g/cm^3
A	red	15	18.0	1.2
B	red	12	75.6	6.3
C	green	12	86.4	7.2
D	green	8	78.4	9.8
E	red	10	41.0	4.1
F	green	13	83.2	6.4

(a) Pierre says

'The green boxes are denser than the red boxes.'

Does the evidence in the table support his statement?

.....

(b) Carlos says

'The largest box is the most dense.'

Does the evidence in the table support his statement?

.....

Explain your answer.

.....

.....

[2]

Explain your answer.

.....

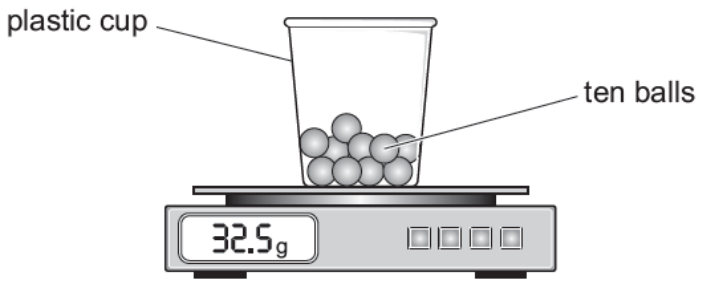
.....

[2]

9. No.9

Safia wants to find the density of a small ball.

(a) She measures the mass of a plastic cup containing **ten** identical balls.



(i) The plastic cup has a mass of 2.5 g.

What is the mass of **one** ball?

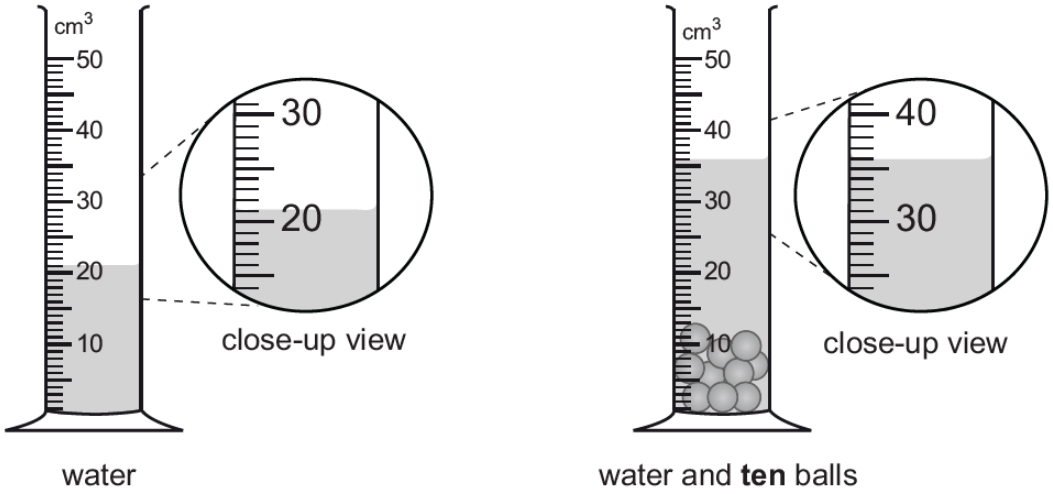
..... g [1]

(ii) Why does Safia use **ten** identical balls?

.....

..... [1]

(b) Safia measures the volume of the **ten** identical balls.



Complete the measurements to find the volume of **one** ball.

The volume of water in the measuring cylinder is ..... cm^3.

The volume of the water and **ten** balls in the measuring cylinder is ..... cm^3.

The difference in volume between these two readings is ..... cm^3.

The volume of **one** ball is ..... cm^3.

[2]

(c) Calculate the density of a ball.

Use your answers for mass in part **(a)** and volume in part **(b)** to calculate the density.

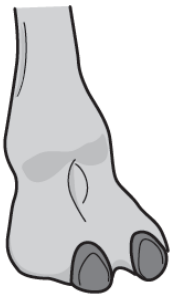
$$\textbf{density} = \frac{\textbf{mass}}{\textbf{volume}}$$

The density of the ball is ..... g/cm^3 [1]

10. No.9

Jamila and Ahmed collect information about a camel and a horse.

camel



weight = 5000 N
total area of feet = 2000 cm^2

horse

weight = 4000 N
total area of feet = 400 cm^2

Pressure is calculated by the equation

$$\text{pressure} = \frac{\text{force}}{\text{area}}$$

The total pressure exerted by the camel's feet is 2.5 N/cm^2.

Calculate the total pressure exerted by the horse's feet.

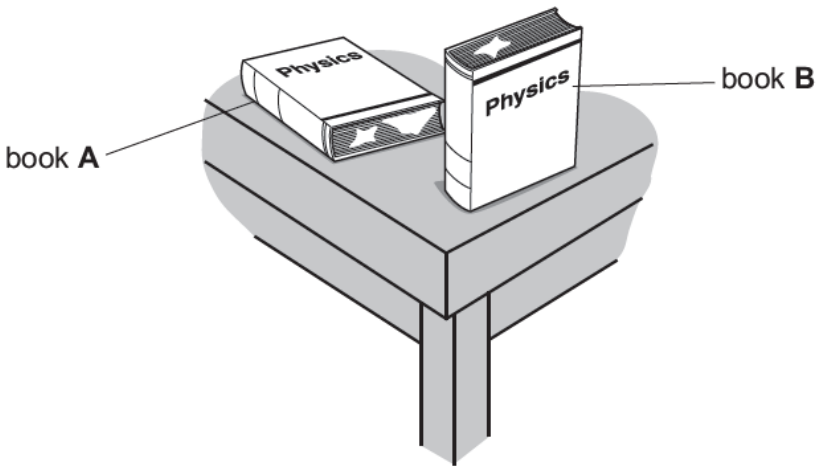
.....

.....

pressure ..... N/cm^2 [2]

11. No.12

Blessy puts two books on a table.



The books are the same size and the same mass.

Which book exerts the greater pressure on the table?

.....

Explain your answer.

.....

..... [1]