Access Tuition

GCSE Physics

Density

Question Paper

Time available: 30 minutes
Marks available: 22 marks

A student wanted to determine the density of a small piece of rock.

(a)   Describe how the student could measure the volume of the piece of rock.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

(4)

(b)   The volume of the piece of rock was 18.0 cm^3.

The student measured the mass of the piece of rock as 48.6 g.

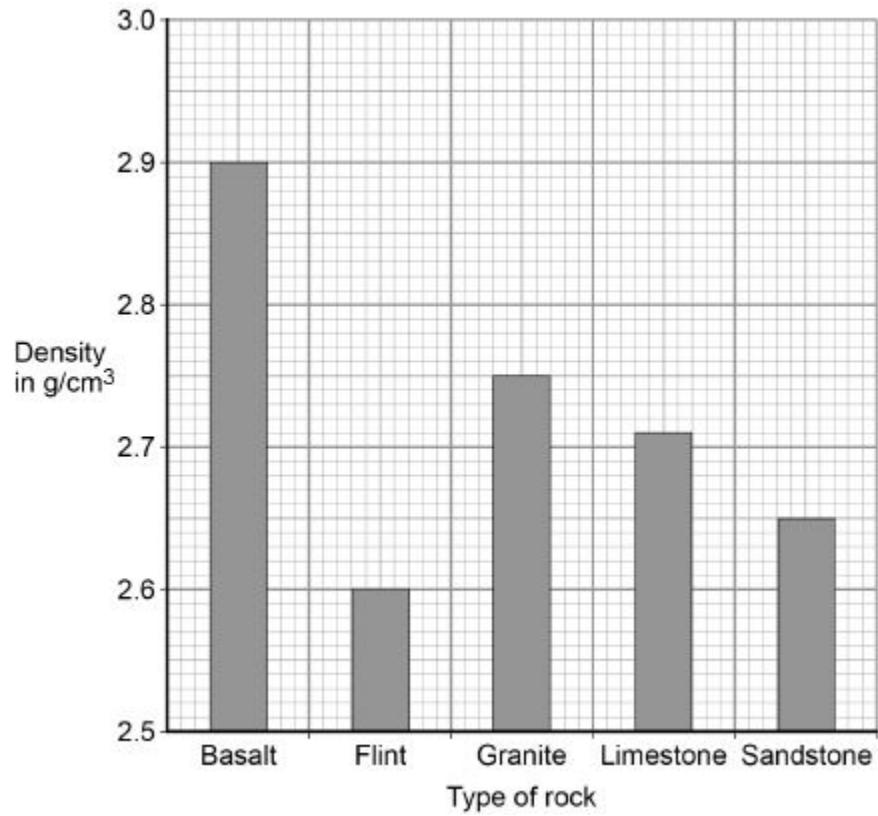Calculate the density of the rock in g/cm^3.

Use the equation:

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

_____

_____

_____

_____

Density = _____ g/cm^3

(2)

The graph below shows the densities of different types of rock.

(c)   What is the most likely type of rock that the student had?

Tick **one** box.

Basalt ☐

Flint ☐

Granite ☐

Limestone ☐

Sandstone ☐

(1)

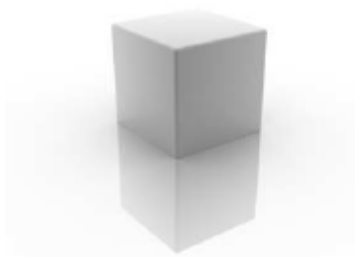(d)   Give **one** source of error that may have occurred when the student measured the volume of the rock.

_____

_____

(1)

(e)   How would the error you described in part **(d)** affect the measured volume of the rock?

_____

_____

(1)
(Total 9 marks)

2.   A student wants to calculate the density of the two objects shown in the figure below.

Metal cube   **Small statue**

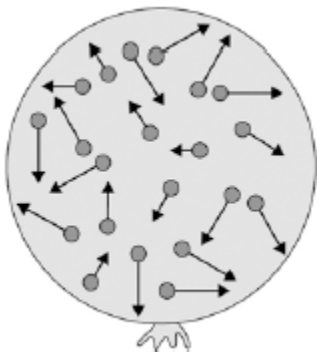© Whitehoune/iStock/Thinkstock,   © Marc Dietrich/Hemera/Thinkstock

Describe the methods that the student should use to calculate the densities of the two objects.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

(Total 6 marks)

The figure below shows a balloon filled with helium gas.

(a)   Describe the movement of the particles of helium gas inside the balloon.

_____

_____

_____

_____

(2)

(b)   What name is given to the total kinetic energy and potential energy of all the particles of helium gas in the balloon?

Tick **one** box.

External energy ☐

Internal energy ☐

Movement energy ☐

(1)

(c)   Write down the equation which links density, mass and volume.

_____

(1)

(d)   The helium in the balloon has a mass of 0.00254 kg.

The balloon has a volume of 0.0141 m^3.

Calculate the density of helium. Choose the correct unit from the box.

m^3 / kg	kg / m^3	kg m^3

_____

_____

_____

_____

Density = _____ Unit _____

(3)

(Total 7 marks)