

1 A student determines the volume of a block of modelling clay by two methods.

Method 1

He measures the block of modelling clay shown full size in Fig. 1.1.

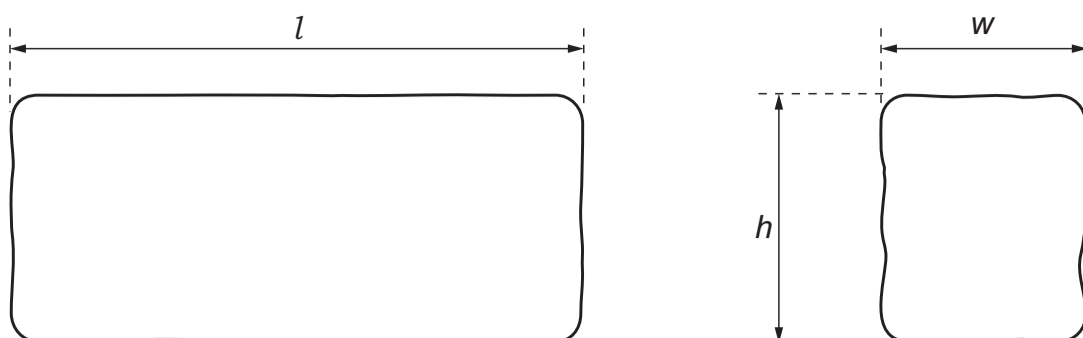


Fig. 1.1

- (a) (i) Measure the length l , width w and height h of the block of modelling clay on Fig. 1.1. Record your values in centimetres to the nearest millimetre.

length $l =$ cm

width $w =$ cm

height $h =$ cm [2]

- (ii) Calculate a value V_A for the volume of the block. Use your measurements from (a)(i) and the equation:

$$V_A = l \times w \times h.$$

$V_A =$ cm³ [1]

- (b) Suggest why V_A is only an approximate value for the volume of the block.

Describe how the accuracy of V_A can be improved.

suggestion

.....

improvement

..... [2]

- (c) Another student measures the dimensions of a block of clay which is much smaller than the block in (a). Suggest why these measurements may not be as accurate as yours, even if they are done carefully.

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..... [1]

Method 2

- (d) (i) The student pours water into a measuring cylinder.

Record the volume V_1 of the water in the measuring cylinder shown in Fig. 1.2.

$V_1 =$ cm³ [1]

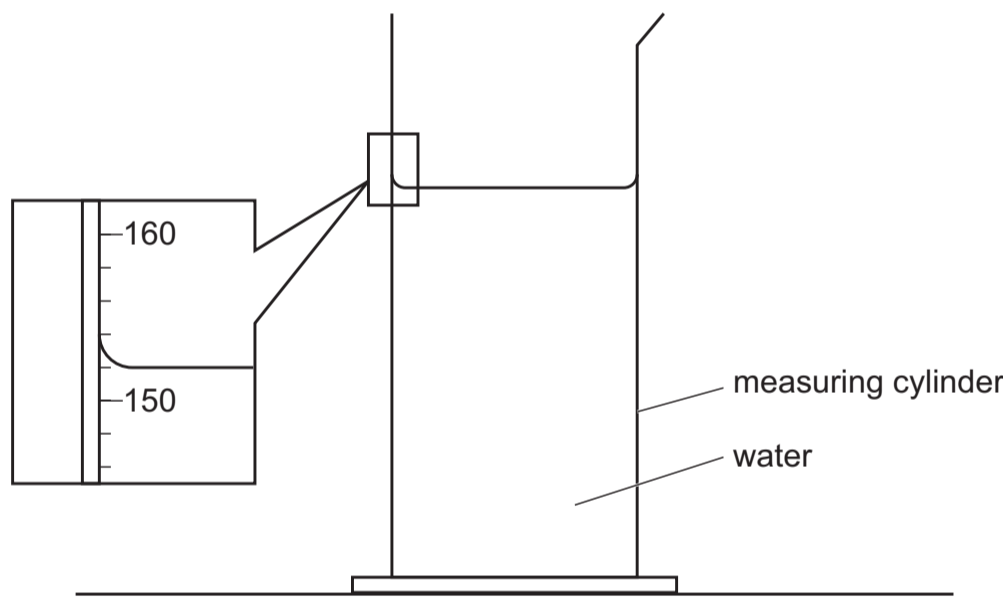


Fig. 1.2

- (ii) Describe briefly how a measuring cylinder is read to obtain an accurate value for the volume of water.

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..... [1]

- (e) The student lowers the modelling clay into the water using a loop of thread, as shown in Fig. 1.3.

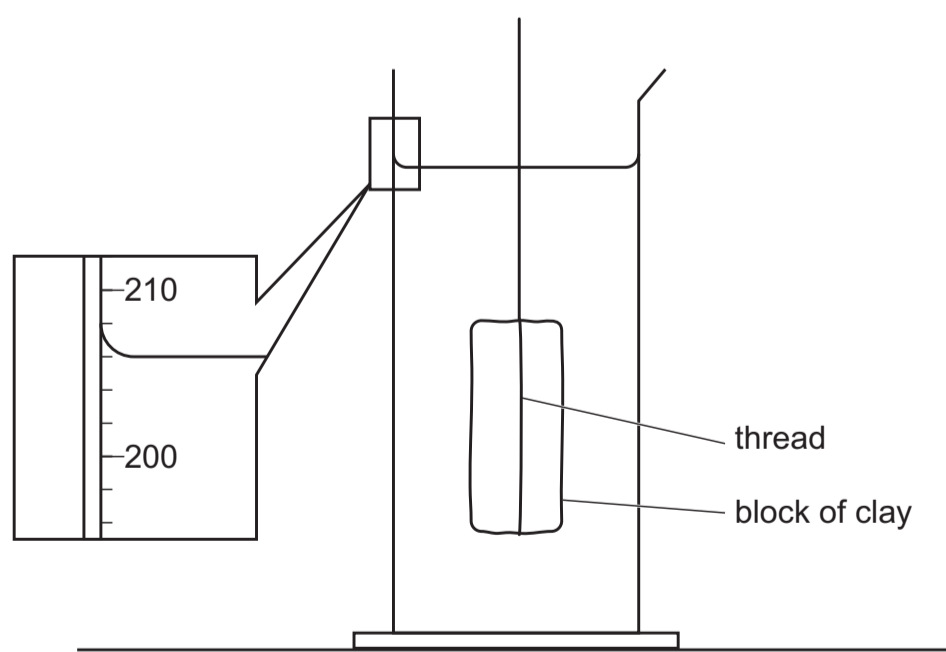


Fig. 1.3

Record the new reading V_2 shown on the measuring cylinder scale in Fig.1.3.

$V_2 =$ cm³

Calculate another value V_B for the volume of the block.

Use your measurements from (d)(i) and (e) and the equation: $V_B = (V_2 - V_1)$.

$V_B =$ cm³ [1]

- (f) Suggest **one** possible source of inaccuracy in Method 2 and suggest **one** improvement to reduce its effect.

source of inaccuracy

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improvement

..... [2]