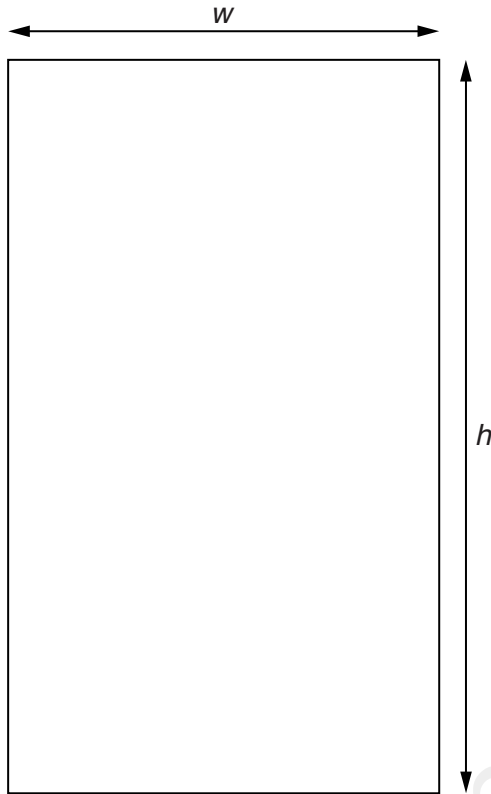


# STABILITY OF BLOCK

**1** The IGCSE class is investigating the stability of a block of wood.  
Figs. 1.1 and 1.2 show the dimensions of the block.



**Fig. 1.1**



**Fig. 1.2**

(a) (i) On Figs. 1.1 and 1.2, measure the height  $h$ , width  $w$  and depth  $d$  of the block.

$h =$  .....

$w =$  .....

$d =$  .....

[2]

(ii) On Fig. 1.2, draw the line **AC**.

[1]

(iii) Measure and record the angle  $\alpha$  between lines **AD** and **AC**.

$\alpha =$  ..... [1]

(b) A student places the block on the edge of the bench, as shown in Fig. 1.3.

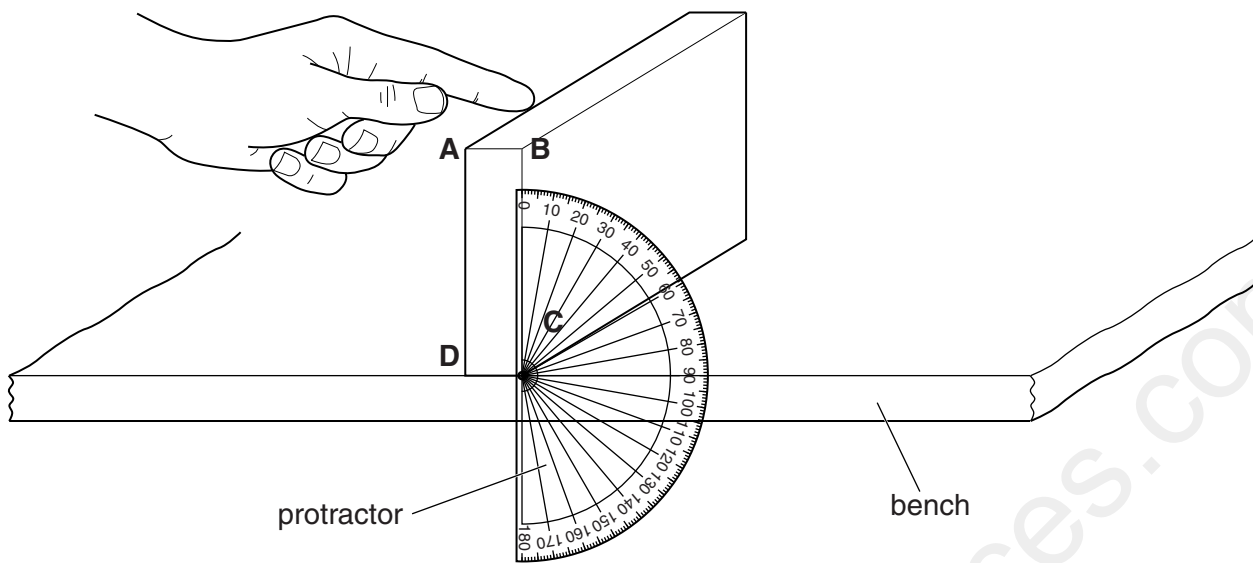


Fig. 1.3

He holds the protractor next to face **ABCD** of the block, as shown in Fig. 1.3. He gently pushes the top of the block (as indicated in Fig. 1.3) so that the block tips over.

He records the angle  $\theta$  between side **BC** of the block and the vertical line on the protractor. The angle  $\theta$  is when the block just tips over. He repeats this procedure a suitable number of times.

Suggest the number of measurements of  $\theta$  that you think would be suitable for this experiment.

number = .....[1]

(c) The student calculates the average value  $\theta_{av}$  of all his values for  $\theta$ .

$\theta_{av} = \dots\dots\dots 20^\circ \dots\dots\dots$

He suggests that  $\theta_{av}$  should be equal to  $\alpha$ . State whether the results support this suggestion. Justify your statement by reference to the results.

statement .....

justification .....

.....

.....

[2]

[Total: 7]

## -----Marking Scheme-----

- (a) 9.7, 5.7, 2.0 (accept 2) or 97, 57, 20 [1]  
all given to correct unit [1]  
line AC drawn correctly, corner to corner [1]  
 $\alpha = 18 - 20^\circ$  [1]
- (b) number from 3 to 20 with no unit [1]
- (c) correct statement for results (expect Yes) [1]  
idea of within (or beyond) experimental accuracy [1]

**[Total: 7]**