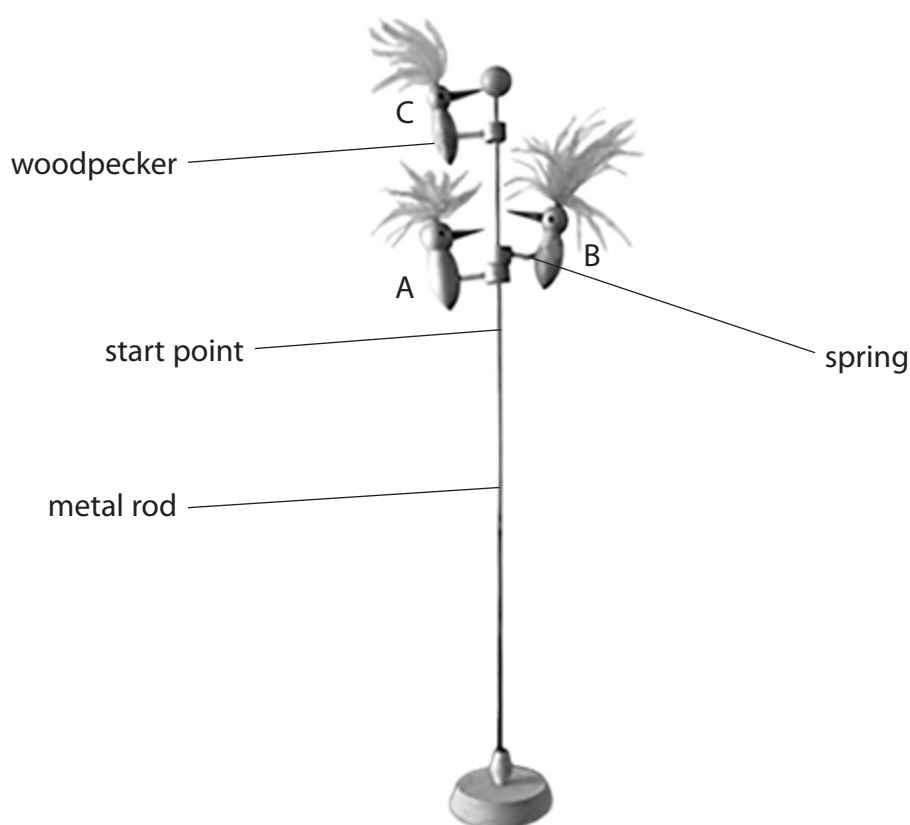


3 A student investigates a toy.

- the toy has three woodpeckers
- each woodpecker is attached to a wooden ring by a spring
- a metal rod passes through the wooden rings
- the woodpeckers have different masses
- the springs are identical

When a woodpecker is pulled back and released, it vibrates and moves down the rod.

**(a)** A student uses this method to investigate the toy.

- measure the mass of woodpecker A
- move woodpecker A to the start point and release it
- record the time it takes for woodpecker A to travel 20 cm
- repeat the test two more times

The student uses the same method for woodpeckers B and C.

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The table shows the student's results.

Woodpecker	Mass in g	Time in s		
		test 1	test 2	test 3
A	11.2	11.8	11.1	10.8
B	8.3	3.1	5.4	5.5
C	5.9	8.5	9.0	8.7

- (i) One of the time measurements in the table is anomalous.

Draw a circle around this anomalous measurement.

(1)

- (ii) State the relationship between average speed, distance moved and time taken.

(1)

- (iii) Calculate the average (mean) speed for woodpecker B.

(4)

average speed = cm/s

- (iv) Explain what type of graph the student should use to present his data.

(2)

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(b) Before carrying out his investigation, the student made this prediction.

'The smaller the mass of the woodpecker, the faster it moves down the rod.'

Discuss whether the student's results support his prediction.

(3)

(Total for Question 3 = 11 marks)

