4.3 Working Scientifically: Measuring, Recording and Risk: Test Pack

Calculator allowed · about 15 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Name the best instrument to measure each quantity.

(a) The mass of a small rock sample.
(b) The temperature of warm water in a beaker.

(2)

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2 A pupil will hang masses of 100 g, 200 g, 300 g and 400 g from a spring and measure the length of the spring in mm. Each mass is tested three times and a mean length is needed. Write the column headings, in order, for a suitable results table and state what goes in the first column.

(4)

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3 A pupil expects a shoot to grow about 0.3 cm in one day. Two instruments are available.

Instrument P: a metre rule marked every 1 cm.
Instrument Q: a 30 cm ruler marked every 1 mm.

Choose the better instrument for measuring the daily growth. Use the smallest division of each instrument to explain your choice.

(4)

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4 A pupil times a toy car on a ramp. One stopwatch reading is 1 min 35 s. A second reading is 82 s. Calculate how many seconds longer the first time is than the second.

(3)

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Mark scheme · 4.3 Working Scientifically: Measuring, Recording and Risk: Test Pack

Question 1

(a) Balance, or scales or top-pan balance.	**B1**
(b) Thermometer, or temperature sensor.	**B1**

Answer: **(a) Balance; (b) Thermometer.**

Question 2

The first column is the independent variable, mass, with its unit in the heading, for example Mass (g).	**B1**
The first column holds the values 100, 200, 300 and 400, with no units in the cells.	**B1**
Three columns for the repeated lengths, each with its unit in the heading, for example Length 1 (mm).	**B1**
A final column for mean length with its unit, for example Mean length (mm).	**B1**

Answer: **Mass (g) | Length 1 (mm) | Length 2 (mm) | Length 3 (mm) | Mean length (mm). The first column holds 100, 200, 300 and 400.**

Question 3

Instrument Q is chosen.	**B1**
The smallest division of Q is 1 mm, which is 0.1 cm.	**B1**
A growth of 0.3 cm is three divisions of Q, so it can be measured.	**B1**
The smallest division of P is 1 cm, so a change of 0.3 cm is less than one division and cannot be seen.	**B1**

Answer: **Instrument Q. Its 0.1 cm divisions can show 0.3 cm of growth, but P has 1 cm divisions.**

Question 4

1 min 35 s = 95 s.	**B1**
95 - 82.	**M1**
13 s.	**A1**

Answer: **13 s.**

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