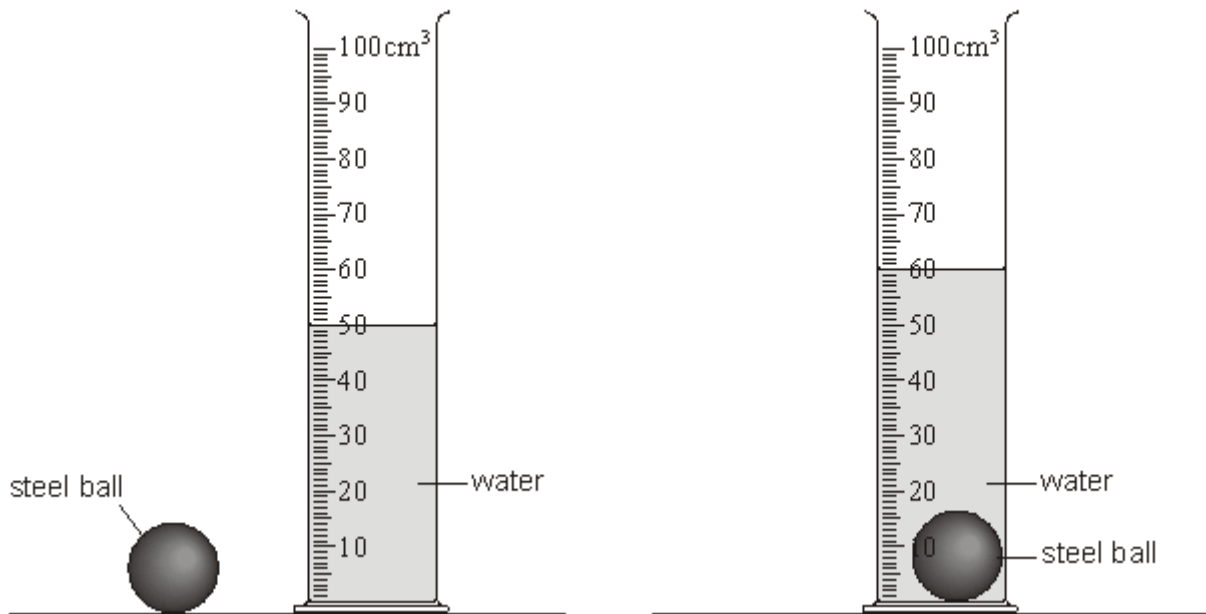# Hydesville Tower School

Year 7 Science

Scholarship sample questions

Name…………………

Q1.

(a)   Gary poured 50 cm^3 of water into a measuring cylinder.
He then put a steel ball into the measuring cylinder.

(i) What is the new reading on the measuring cylinder?

.... cm³

1 mark

(ii) What is the volume of the steel ball?

.... cm³

1 mark

(b) The table below shows the mass and volume of four objects.

object	mass (g)	volume (cm³)
aluminium figure	230	85
lead weight	800	70
steel block	200	25
wood puzzle	400	500

(i) Which object is the heaviest? ....

1 mark

(ii) Which object takes up the most space? ....

1 mark

(c) The frame of a bike is made of aluminium.

frame

(i) Give **one** reason why aluminium is a suitable material for the frame.

....

....

1 mark

(ii) A force between the tyres and the road stops the bike skidding.

What is the name of this force?

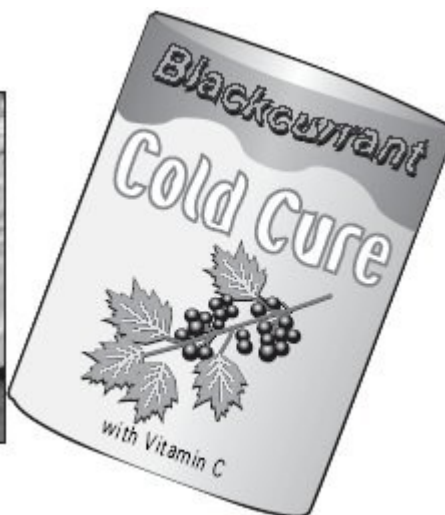...

1 mark

maximum 6 marks

Q2.

Emma and Philip wanted to see if changing the temperature of the water affected the

time taken for a cold cure powder to dissolve in water.

Philip recorded their results.

Water at 40°C took 74 seconds.
20°C took 144 seconds.
It took 34 seconds for water
at 57°C.

(a) (i)   Write the heading for the first column in the table below.

.... (ºC)	time to dissolve (s)

     (ii) Write their results correctly in the table above.

3 marks

(b) Give the names of **two** pieces of measuring equipment they would need.

1. ....

1 mark

2. ....

1 mark

(c)   Why did they put the same amount of water in each beaker?

....

....

1 mark

(d)   Emma wrote, 'My investigation was good', as her conclusion.

Philip said this was **not** a scientific conclusion.

Explain why Emma's conclusion is **not** scientific.

....

....

1 mark

(e)   Look at their results above.

Write a scientific conclusion for their investigation.

....

....

1 mark

maximum 8 marks

Q3.

Two pupils investigated the effect of temperature on how fast oil flows through a funnel. They used the equipment in the photograph below.

(a)   They measured the time taken for all the oil to flow through the funnel.

What equipment did they use to measure the time?

....

1 mark

(b)   Complete the table below to show what they should do with each factor in their investigation.
Tick **one** box for each factor.

factor	change it	keep it the same	measure it
temperature of the oil			
type of oil			
volume of oil			
time taken for all the oil to flow through the funnel			

2 marks

(c) (i) Look at their results in the table below.

temperature of oil (°C)	time taken for all the oil to flow through the funnel (s)
22	131
40	35
60	22
80	19

What happens to the time taken for the oil to flow through the funnel as its temperature increases?

....

....

1 mark

(ii) How long would it take for all the oil to flow through the funnel at 15°C?

Choose from the following times.
Tick the correct box.

15 seconds ☐

80 seconds ☐

131 seconds ☐

180 seconds ☐

Q4.

Jay collected pond snails from the school pond.
He measured the lengths of all their shells.
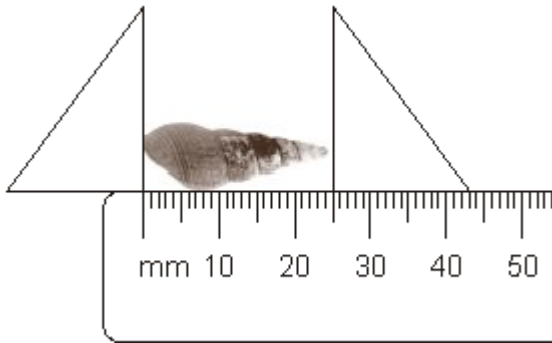
(a)   What is the length of the shell above?

.... mm

1 mark

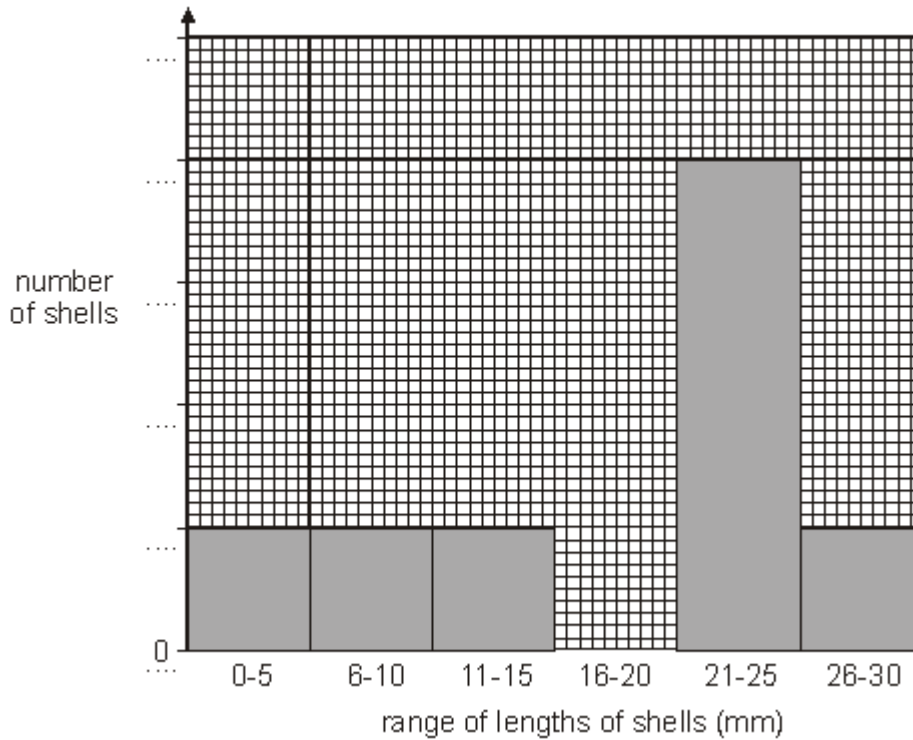(b)   Jay made a tally chart of the lengths of all the shells he found.

range of lengths of shells (mm)	0-5	6-10	11-15	16-20	21-25	26-30
number of shells	I	I	I	III	IIII	I

 What was the most common **range** of lengths of shells Jay collected?

.... mm

1 mark

(c)   Jay recorded his results in a bar chart.

number of shells

range of lengths of shells (mm)

0-5 6-10 11-15 16-20 21-25 26-30

(i)   Add the missing numbers to the side of the bar chart labelled
       'number of shells'.

1 mark

(ii)   **On the chart above,** draw the bar for the number of shells measuring
       16-20 mm.

1 mark

(d)   Look at Jay's results and decide if each conclusion below is **true** or **false** or if you
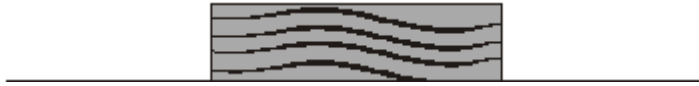   **cannot tell.**
       Tick the correct box for each conclusion.

conclusions	true	false	cannot tell
The oldest snails have the darkest shells.	☐	☐	☐
He did **not** find any shells longer than 30 mm.	☐	☐	☐
He found a total of eight snails.	☐	☐	☐
All the snails he found are the same type.	☐	☐	☐

2 marks

maximum 6 marks

Q5.

(a)   Tasha puts a small block of wood on a smooth surface.

She puts different forces on the block.
The diagrams below show the size and direction of these forces.

Will each block move to the **left**, to the **right** or **stay still**?
Tick the correct box in each row.

forces on block	moves to the left ←	moves to the right →	stays still
(i) ▶5 N	☐	☐	☐
(ii) 10 N◀ ▶10 N	☐	☐	☐
(iii) 6 N◀ ▶4 N	☐	☐	☐
(iv) 6 N◀ 2 N◀ ▶8 N	☐	☐	☐

1 mark

1 mark

1 mark

1 mark

(b)   (i)   Which piece of equipment should Tasha use to measure the forces on the block?

Tick the correct box.
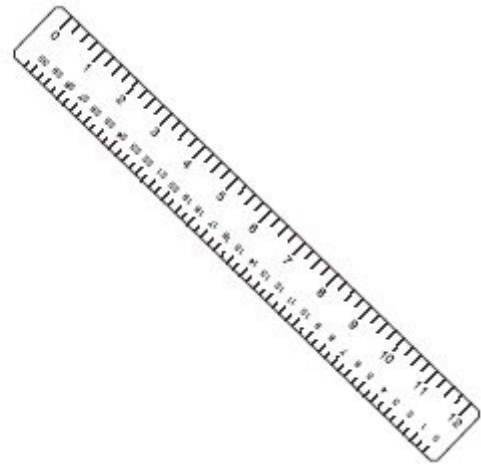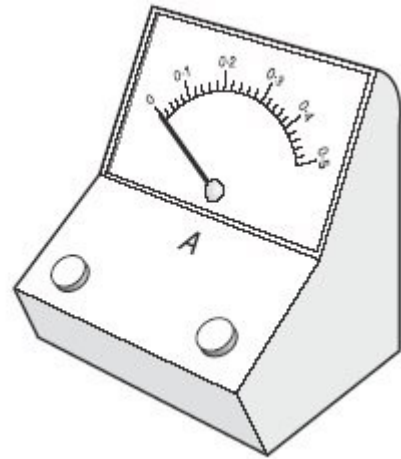
1 mark

(ii) Give the name of the equipment used to measure force.

....

1 mark

maximum 6 marks

Q6.

Amy and Tom investigated how sugar affects the growth of pollen grains.
They looked at pollen grains under a microscope.

Amy's Plan

- Add some pollen grains to one drop of very concentrated sugar solution.

- Add some pollen grains to one drop of dilute sugar solution.

- Count how many pollen grains have started to grow.

Tom's Plan

- Add one drop of different concentrations (0%, 5%, 10%, 15%, 20% and 25%) of sugar solution to each slide.

- Add the same amount of pollen to each drop.

- One hour later count how many pollen grains have started to grow.
  Work out the percentage.

sugar solution

growing pollen grain

(a)   Give **two** ways in which Tom's plan is better than Amy's plan.

1 ....

2 ....

2 marks

(b)   In Tom's investigation, what factor did he change (the independent variable)?

....
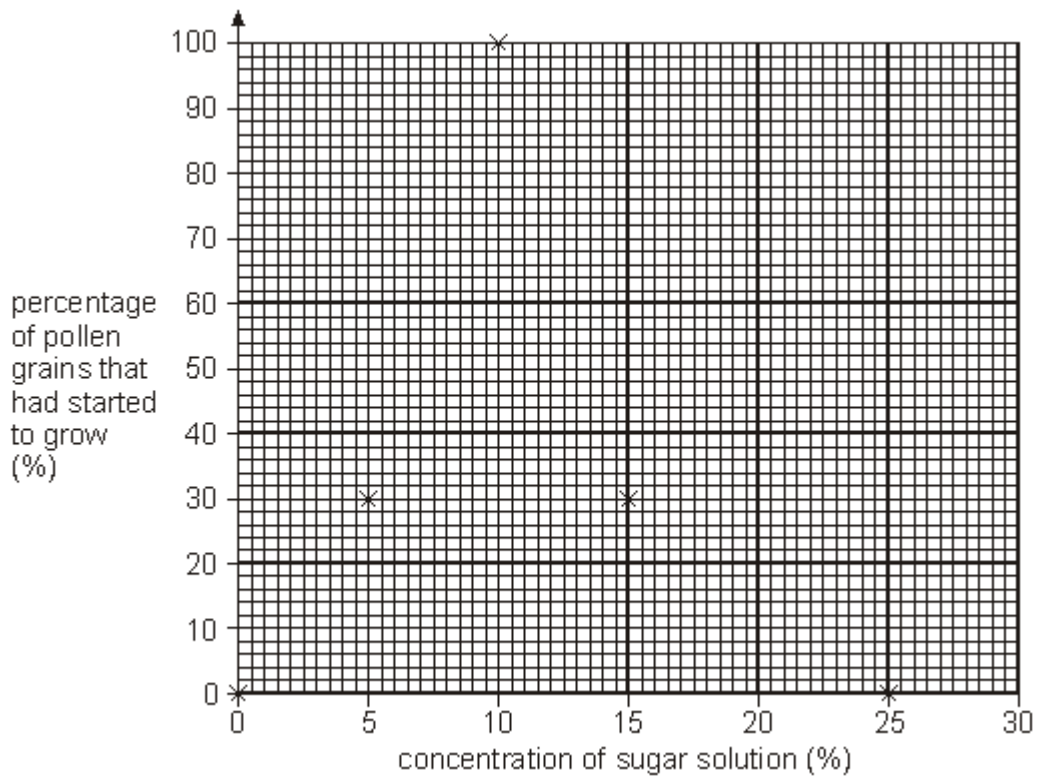
1 mark

(c)   Look at Tom's results in the table below.

concentration of sugar solution (%)	percentage of pollen grains that had started to grow (%)
0	0
5	30
10	100
15	30
20	10
25	0

He plotted five of his results on graph paper.

Plot the result for 20% sugar solution.

(d)   Tom's conclusion was, 'The greater the concentration of sugar solution, the greater the percentage of pollen grains that had grown.'

Do his results support his conclusion?
Tick one box.

yes ☐   no ☐

Use the results in the graph to explain your answer.

....

....