

Assessing Scientific Enquiry Skills – Working Scientifically

(Pre-2014 NC Levels 3-5)

4

Paper Towels

(a) Each of four children examined a different type of paper towel.

The image shows four children in circular frames, each examining a piece of paper towel. Sally is at the top, holding a piece of paper and saying, "Wipa towels have two layers". Ian is on the left, holding a piece of paper and saying, "Soaka towels feel thick". Alice is on the right, holding a piece of paper and saying, "Moppa towels feel soft". Stuart is at the bottom, holding a piece of paper and saying, "I can't see through Cleana towels".

Decide the kind of statement all the children have made.

Tick **ONE** box.



a prediction

a measurement

a plan

an observation

- (b) Robert and Lauren dropped water onto the four towels until they would hold no more water.



They recorded their results in a table.

Type of paper towel	Amount of water soaked up (cm ³)
Wipa	12
Soaka	18
Moppa	9
Cleana	15

They are trying to find out something about the towels.

What question were the children investigating?



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- (c) What is the **ONE** factor they **changed** as they carried out their investigation?



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6


Germinating Seeds

(a)



These children have recorded their observations about lettuce seeds germinating at three temperatures.

They planted the same number of seeds at each temperature.



Temperature (°C)	Total number of lettuce seeds germinated					
	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6
5	0	0	0	1	1
15	0	0	0	1	5	9
25	0	2	8	13	17	19

Complete the table to show how many seeds germinated at 5°C on Day 3.

(b) The children were trying to find out something about seeds.

What question were the children investigating?


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(c) The children discussed the results in the table.

Look at their results table to decide whether each conclusion is **true**, **false** or you **can't tell**.



Tick **ONE** correct box for each conclusion.

	True	False	Can't tell
The quickest germination was at 25°C.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
At 25°C all the seeds germinated by Day 6.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5°C is too cold for seeds to germinate.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The best temperature for germination was 15°C.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(d) Alan made a prediction:



The best temperature to germinate **any** kind of seed is 25°C.

Faiza said:



You have not collected enough information to support your prediction.

(i) Who do you agree with?

Tick **ONE** box.



agree with Alan	agree with Faiza	disagree with Alan and Faiza
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(ii) Explain your answer.

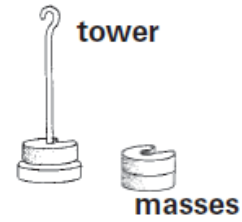


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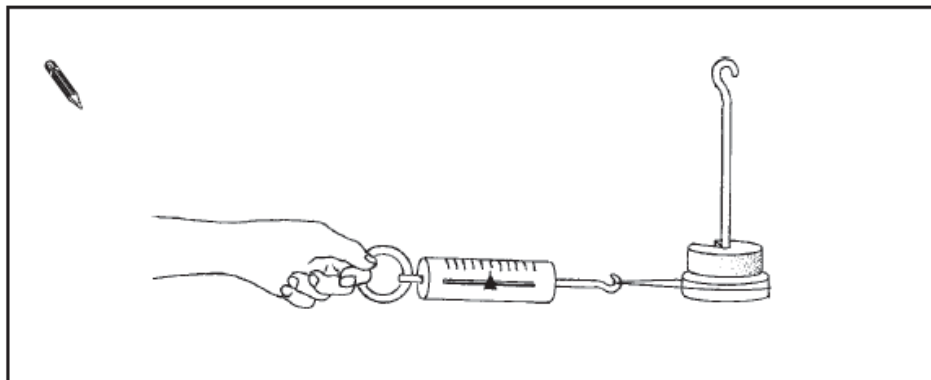
Stacking Masses

- (a) Abdul has some stacking masses.
He puts one mass on the stacking tower.
He uses a forcemeter to pull the tower.

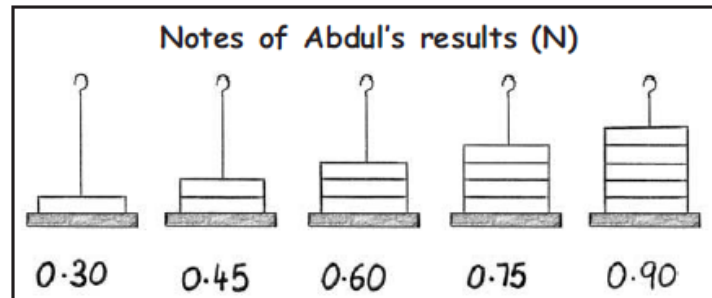


There is a force on the tower from the forcemeter.

Draw an arrow on the picture below to show the direction of this force.



- (b) Abdul measures the force needed to pull the tower. He notes the forcemeter reading each time he adds a mass to the tower.



Look at the notes of Abdul's results.

Describe what Abdul's notes tell him about the **number of masses** and the **size of the force** needed to pull them.



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(c) Abdul puts his results into this table, but he makes a mistake.

Number of masses	Forcemeter reading (N)
1	0.90
2	0.75
3	0.60
4	0.45
5	0.30

What is the mistake in Abdul's table?



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(d) Abdul notices his mistake. He corrects his table.
Then he says: 'I wonder if I made any mistakes when I did my test?'

What should he do to check if he made any mistakes in his test?



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3

Bouncing Balls

- (a) Some children found out how high a tennis ball bounces on different surfaces.

They dropped a tennis ball from a height of 100cm.



What equipment did they use to measure how high the ball bounces?



- (b) They measured how high the ball bounced and recorded their results like this.

Surface	How high ball bounced (cm)
grass	40
tarmac	51
concrete	61
clay	47

How did the children present their results?

Tick **ONE** box.



in a graph

in a bar chart

in a pie chart

in a table

(c) Why did they drop the ball from the same height each time?



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(d) What is the **ONE** factor they **changed** as they carried out their investigation?



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(e) They carried out a second investigation.
They recorded the height the **same** ball bounced when dropped from **different** heights onto the **same** surface.

Height of drop (cm)	Height of bounce (cm)
50	32
100	62
150	88
200	115

Use the evidence from their two investigations to suggest which surface they used for their second investigation.

Tick **ONE** box.



grass

tarmac

concrete

clay

(f) Describe how the **height of the drop** affects the **height of the bounce**.



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- (a) Edward Jenner was a doctor who lived a long time ago.
 Jenner noticed that people who suffered from a disease called cowpox did not catch smallpox.
 Smallpox is a disease that can kill people.



What do we call it when someone **notices** something important like this?

Tick **ONE** box.



an observation

an effect

an investigation

a measurement

- (b) Jenner carried out a test. He used cowpox to see if it could stop people catching smallpox. He carried out his test on several people.

Why did Jenner carry out his test on several people instead of on just one person?



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- (c) A micro-organism causes smallpox.


Why do scientists wear masks and gloves when they work with micro-organisms?



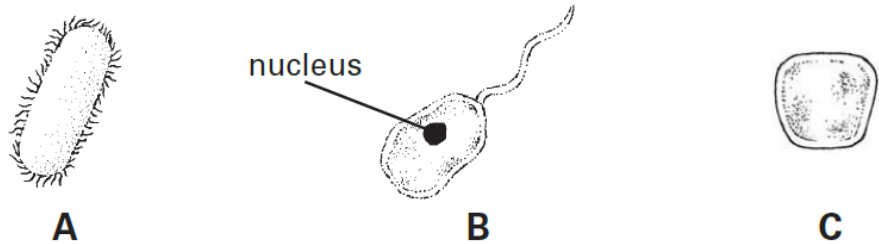
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- (d) There are many types of micro-organism. Some can help to prevent or cure disease.

Describe **ONE different** way in which micro-organisms can be helpful.

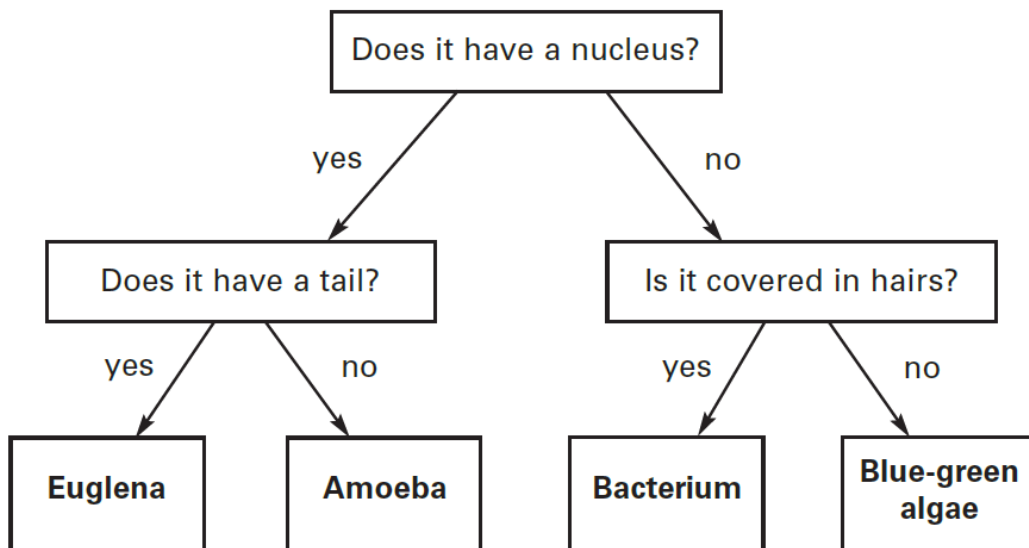



- (e) The diagrams below show how three different micro-organisms look under a microscope.



Use the key below to help you identify these micro-organisms.

Write your answers under the key.



 A is B is

C is