THE PIQUE LAB LEARNING CENTRE

Primary School Science Programme

EXPERIMENTAL TECHNIQUES MASTERCLASS

Answer Booklet

Name: _____

Class: _____

TOPICS COVERED

Topic	Title	Page
1	#1: AIM OF THE EXPERIMENT ----------	1
2	#2: RELATIONSHIP TYPE QUESTION ----------	1
3	#3: HOW DO WE ENSURE A FAIR TEST? ----------	2
4	#4: HOW DO WE ENSURE THAT THE RESULTS ARE RELIABLE? ----------	2
5	#5: STATING A HYPOTHESIS OF THE EXPERIMENT ----------	3
6	#6: MAKING A CONCLUSION FROM THE RESULTS OF THE EXPERIMENT ----------	3
7	#7: WHAT IS THE PURPOSE OF CONTROL SET-UP? ----------	4

EXPERIMENTAL TECHNIQUES MASTERCLASS

#1: AIM OF THE EXPERIMENT

Qn	Answer
Example 1	To find out how the brand of insecticide affects the number of fruit flies still alive after 20 minutes.
Q1	To find out if the presence of light affects the germination of seeds.

#2: RELATIONSHIP TYPE QUESTION

Qn	Answer
Example 2	As the temperature of the water increases until 25 ˚C, the rate of photosynthesis of plant A increases. As the temperature of the water increases beyond 25 ˚C, the rate of photosynthesis of plant A decreases.
Q2	As the temperature of the water increases, the amount of dissolved oxygen decreases.

#3: HOW DO WE ENSURE A FAIR TEST?

Qn	Answer
Example 3	Applying fair test type 2 template structure: 1. More than one variable has been changed in the experiment. 2. The age of the girls was not kept the same, 3. and this would affect the size of their lungs, which would affect the amount of air each girl breathes out into the balloon, affecting the size of the balloon.
Q3	Yes. There is only one changed variable, which is the size of flowers that affects the number of bees that lands on them.
Q4	More than one variable would have been changed in the experiment. The location of each beaker would not have been kept the same and this would have affected the temperature/ wind speed in the location, which would have affected the time taken for the liquid to evaporate completely.
Q5	As the thickness of each material increases, the rate of heat conduction through the material decreases. Thus, keeping the thickness of the materials the same ensures that there would be only one changed variable, which is the type of material that affects the results, ensuring a fair test.

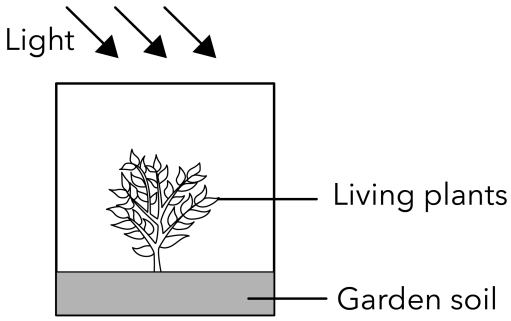
#4: HOW DO WE ENSURE THAT THE RESULTS ARE RELIABLE?

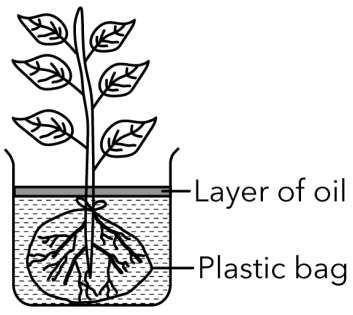
Qn	Answer
Example 4	James conducted the same experiment for three attempts to ensure that the results are consistent before taking the average change in James' heart rate for a more reliable result.
Q6	For each type of paper, he should carry out the experiment at least 3 times to ensure that the results are consistent, before taking the average number of wooden blocks the paper can withstand for a more reliable result.

#5: STATING A HYPOTHESIS OF THE EXPERIMENT
&
#6: MAKING A CONCLUSION FROM THE RESULTS OF THE EXPERIMENT

Qn	Answer
Example 5A	As the number of bulbs arranged in series increases/decreases, the brightness of each bulb increases/decreases. OR The number of bulbs arranged in series does not affect the brightness of each bulb.
Example 5B	As the number of bulbs arranged in series increases, the brightness of each bulb decreases.
Example 6A	Both pure water and tap water are conductors/insulators of electricity. OR Pure/Tap water is a conductor of electricity while tap/pure water is an insulator of electricity.
Example 6B	Pure water is an insulator of electricity while tap water is a conductor of electricity.
Q7	As the distance of the torch from the wall increases/decreases, the height of the shadow formed increases/decreases. OR The distance of the torch from the wall does not affect the height of the shadow formed.
Q8	Liquid N expands the fastest, followed by Liquid L, Liquid M and then Liquid K.

#7: WHAT IS THE PURPOSE OF THE CONTROL SET-UP?

<table>
<tr><th>Qn</th><th>Answer</th></tr>
<tr><td>Example 7A</td><td>
<table>
<tr><th>Items for Set-up C</th><th>Tick</th></tr>
<tr><td>Clear glass tank</td><td>✓</td></tr>
<tr><td>Tracing paper</td><td></td></tr>
<tr><td>Black paper</td><td></td></tr>
<tr><td>Living plants</td><td>✓</td></tr>
<tr><td>Garden soil</td><td>✓</td></tr>
<tr><td>Light</td><td>✓</td></tr>
</table>
</td></tr>
<tr><td>Example 7B</td><td> 

Set-up C</td></tr>
<tr><td>Example 7C</td><td>Set-up C acts as a control set-up to compare and confirm that any change in the rate of photosynthesis of plants is caused only by the amount of light received by the plants.</td></tr>
<tr><td>Q9a</td><td> 
</td></tr>
<tr><td>Q9b</td><td>The purpose of the control set-up is to compare and confirm that any change in the water level is caused only by the roots of the plant absorbing water.</td></tr>
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