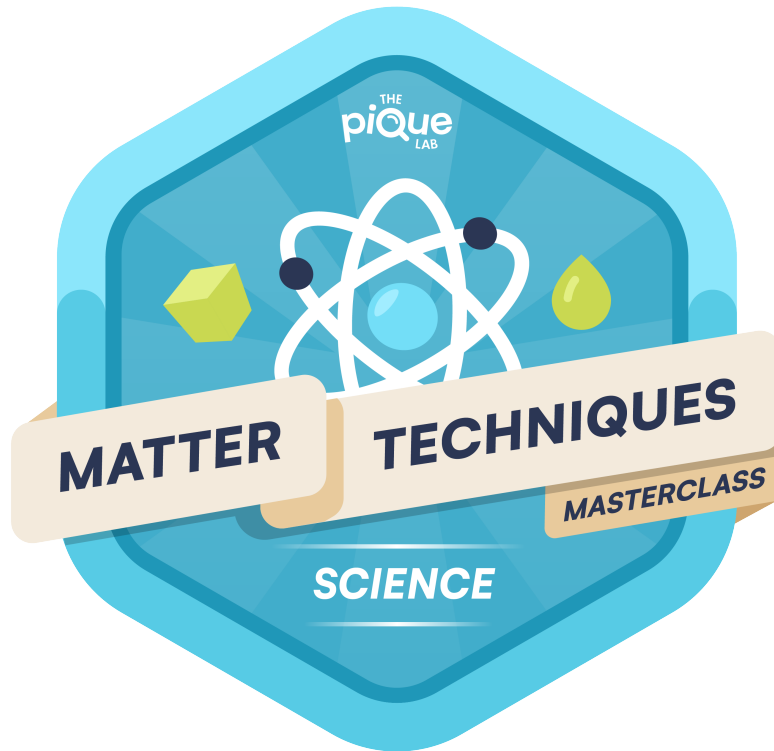




# THE PIQUE LAB LEARNING CENTRE

Primary School Science Programme



---

## MATTER TECHNIQUES MASTERCLASS

Answers to Question Booklet

---

Name: \_\_\_\_\_

Class: \_\_\_\_\_

# TOPICS COVERED

Topic	Title	Page
1	Fundamental Questions -----	1
2	Question Type 1 ----- (Air spaces between solids)	1
3	Question Type 2 ----- (Size of the solid)	2
4	Question Type 3 ----- (Syringe question)	2
5	Question Type 4 ----- (Tin can question)	2
6	Question Type 5 ----- (Inverted cup question)	3
7	Question Type 6 ----- (Funnel question)	3
8	Question Type 7 ----- (Inflating a balloon in a bottle question)	4
9	Question Type 8 ----- (Adding and removing matter)	4
10	Question Type 9 ----- (Determining the states of matter)	4
11	Question Type 10 ----- (Changes in mass and/or volume of substances)	5

---

# MATTER TECHNIQUES MASTERCLASS

---

## FUNDAMENTAL QUESTIONS

Qn	Answer
Q1	4
Q2	4
Q3	Tilt downwards at the side with 4 blocks / Tilt upwards at the side with the basketball. <b>Air in the basketball escaped</b> . Since <b>air has mass</b> , the deflated basketball would have a <b>smaller mass</b> than the 4 blocks.
Q4a	20 cm <sup>3</sup>
b	(Hint: Refer to Page 3 of Matter Fill-in-the-blanks notes)  Object Q is <b>not fully submerged</b> in water. Thus, the increase in water level <b>only represents</b> the <b>volume of</b> the part of object <b>Q</b> that is <b>submerged in water</b> .
Q5a	The pebbles <b>occupied space in the bottle</b> and <b>displaced</b> the water, causing the water level in the bottle to increase.
b	Add a bottle filled with stones into the water tank.
c	1) Waterproof 2) Sink in water
Q6	There were <b>air spaces</b> in the sponge. When more sponges were squeezed into the coin box, the <b>air in the sponges</b> were <b>compressed</b> .

## QUESTION TYPE 1: AIR SPACES BETWEEN SOLIDS

Qn	Answer
Q7	(Hint: Refer to Page 4, Experiment 1 of Matter colour notes)  There were <b>air spaces</b> between the glass beads. As <b>water does not have a definite shape</b> , water could <b>enter to displace the air</b> (causing the final water level in the beaker to be less than 110 ml).

### QUESTION TYPE 2: SIZE OF THE SOLID

Qn	Answer
Q8	1
Q9	2
Q10a	Bubbles in the water
b	Soil J has the most amount / largest volume of air spaces, followed by soil K and soil L.

### QUESTION TYPE 3: SYRINGE QUESTION

Qn	Answer
Q11	3
Q12	The air in the syringe <b>can be compressed</b> to push in the plunger till the 5 cm mark. However, <b>air would still occupy space inside the syringe</b> . Thus, Abigail could not push in the plunger till the 0 cm mark.

### QUESTION TYPE 4: TIN CAN QUESTION

Qn	Answer
Q13	<p>(Hint: Refer to Page 6, Experiment 4, Question 3 of Matter colour notes)</p> <p>With two holes in the lid of can X, <b>air from the surroundings will enter</b> the can <b>through one hole</b> to occupy the space of the condensed milk that is escaping/ <b>displace the condensed milk through the other hole</b>.</p>

### QUESTION TYPE 5: INVERTED CUP QUESTION

Qn	Answer
<b>Q14</b>	<p>(Hint: Refer to Page 7, Experiment 5, Question 1 of Matter colour notes)</p> <p><b>Air occupies space</b> in the cup and <b>cannot escape</b>. While air in the cup can be <b>compressed initially</b> to allow some water to enter, it <b>could not be compressed any further</b>. As such, <b>water would not be able to fill up the cup completely</b> to reach the paper (keeping the paper dry).</p>
<b>Q15a</b>	
<b>b</b>	<p>i) Air occupied space in the cup.</p> <p>ii) Air does not have a definite volume / can be compressed.</p>

### QUESTION TYPE 6: FUNNEL QUESTION

Qn	Answer
<b>Q16a</b>	<p>(Hint: Refer to Page 8, Experiment 6, Question 1 of Matter colour notes)</p> <p>There is no straw placed in the funnel of set-up Q. Thus, the <b>air, which occupies space</b> in beaker Q, <b>could not escape</b>. While the air in beaker Q could be <b>compressed initially</b> to allow some water to enter, it <b>could not be compressed any further</b>.</p>
<b>b</b>	<p>(Hint: Refer to Page 8, Experiment 6, Question 2 of Matter colour notes)</p> <p>There is a straw placed in the funnel of set-up P. Thus, the <b>air in beaker P can escape</b> through the straw. This allows <b>all the water to enter</b> beaker P to <b>occupy the space previously taken up by the air/ displace the air</b>.</p>

## QUESTION TYPE 7: INFLATING A BALLOON IN A BOTTLE QUESTION

Qn	Answer
<b>Q17a</b>	<p>(Hint: Refer to Page 9, Experiment Z, Question 1 of Matter colour notes)</p> <p>Air <b>occupied space</b> in the bottle <b>and could not escape</b>. While air in the bottle can be <b>compressed initially</b> to allow some air to enter the balloon, it <b>could not be compressed any further</b>.</p>
<b>b</b>	<p>(Hint: Refer to Page 9, Experiment Z, Question 2 of Matter colour notes)</p> <p>He can <b>poke a hole</b> at the base of the bottle. This allows the air in the bottle to <b>escape</b> through the hole, allowing the balloon to be inflated to a larger size to <b>occupy the space previously taken up by the air that has escaped/ displace the air</b>.</p>

## QUESTION TYPE 8: ADDING & REMOVING MATTER

Qn	Answer
<b>Q18</b>	1
<b>Q19</b>	2
<b>Q20a</b>	50
<b>b</b>	Air does not have a definite volume.
<b>c</b>	Decrease. Since air has mass and there was less air in the container.

## QUESTION TYPE 9: DETERMINING THE STATES OF MATTER

Qn	Answer
<b>Q21</b>	4
<b>Q22</b>	<p><b>Choose:</b> T.</p> <p><b>Use data:</b> 25 °C is higher than T's boiling point / T's boiling point is lower than 25 °C.</p> <p><b>Explain:</b> Thus, T was a gas at 25 °C, which can be compressed into a container of a capacity smaller than its volume.</p>

**QUESTION TYPE 10: CHANGES IN MASS AND/OR VOLUME OF  
SUBSTANCES**

<b>Qn</b>	<b>Answer</b>
<b>Q23</b>	3
<b>Q24</b>	2