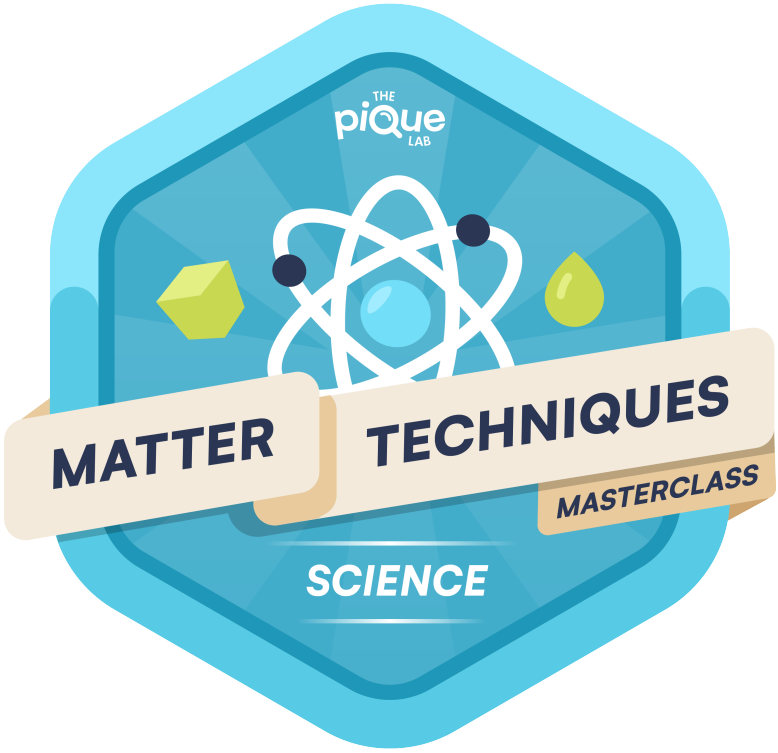
THE PIQUE LAB LEARNING CENTRE

Primary School Science Programme



MATTER TECHNIQUES MASTERCLASS

Answers to Question Booklet

Name: _____

Class: _____

TOPICS COVERED

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. **Air in the basketball escaped**. Since **air has mass**, the deflated basketball would have a **smaller mass** than the 4 blocks.
Q4a	20 cm^3
b	*(Hint: Refer to Page 3 of Matter Fill-in-the-blanks notes)* Object Q is **not fully submerged** in water. Thus, the increase in water level **only represents** the **volume of** the part of object **Q** that is **submerged in water**.
Q5a	The pebbles **occupied space in the bottle** and **displaced** 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 **air spaces** in the sponge. When more sponges were squeezed into the coin box, the **air in the sponges** were **compressed**.

QUESTION TYPE 1: AIR SPACES BETWEEN SOLIDS

Qn	Answer
Q7	*(Hint: Refer to Page 4, Experiment 1 of Matter colour notes)* There were **air spaces** between the glass beads. As **water does not have a definite shape**, water could **enter to displace the air** (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.

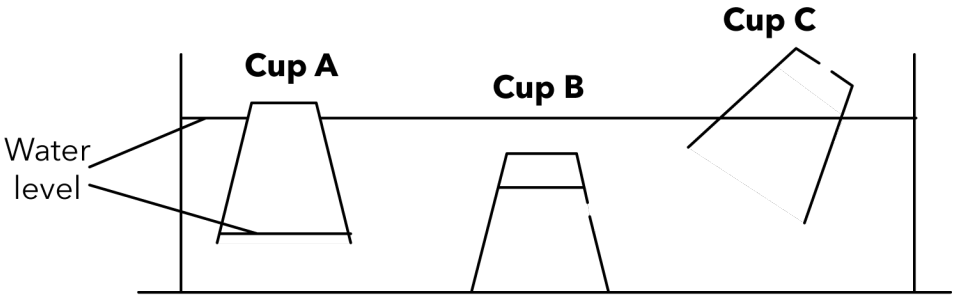
QUESTION TYPE 3: SYRINGE QUESTION

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

QUESTION TYPE 4: TIN CAN QUESTION

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

QUESTION TYPE 5: INVERTED CUP QUESTION

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

QUESTION TYPE 6: FUNNEL QUESTION

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

QUESTION TYPE 7: INFLATING A BALLOON IN A BOTTLE QUESTION

Qn	Answer
Q17a	*(Hint: Refer to Page 9, Experiment 7, Question 1 of Matter colour notes)* Air **occupied space** in the bottle **and could not escape**. While air in the bottle can be **compressed initially** to allow some air to enter the balloon, it **could not be compressed any further**.
b	*(Hint: Refer to Page 9, Experiment 7, Question 2 of Matter colour notes)* He can **poke a hole** at the base of the bottle. This allows the air in the bottle to **escape** through the hole, allowing the balloon to be inflated to a larger size to **occupy the space previously taken up by the air that has escaped/ displace the air**.

QUESTION TYPE 8: ADDING & REMOVING MATTER

Qn	Answer
Q18	1
Q19	2
Q20a	50
b	Air does not have a definite volume.
c	Decrease. There was less air in the container. Since air has mass, the mass of the contents in the container decreased.

QUESTION TYPE 9: DETERMINING THE STATES OF MATTER

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

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

Qn	Answer
Q23	3
Q24	2