THE PIQUE LAB LEARNING CENTRE

Primary School Science Programme

P4 CCI™ SCIENCE COURSE

Answer Booklet

Name: _____

Class: _____

TOPICS COVERED

2025 P4 CCI™ SCIENCE COURSE

TOPIC: PLANTS, FUNGI & BACTERIA

Qn	Answer
Q1	4
Q2	1
Q3	3
Q4	4
Q5a	Reproduces by spores
b	Bracket fungi feed on the dead matter that they grow on by breaking them down into simpler substances and absorbing them.
c	*Any 2 of the following:* 1) Flowering plants produce flowers <u>but</u> bracket fungi do not produce flowers. 2) Flowering plants produce fruits <u>while</u> bracket fungi do not produce fruits. 3) Flowering plants reproduce by seeds <u>but</u> bracket fungi reproduce by spores. 4) Flowering plants make their own food <u>while</u> fungi cannot make their own food.
Q6a	Mould/Bread mould
b	Reproduce by spores
c	Water, air (oxygen) and warmth.
Q7a	Living thing F makes its own food but living thing H does not make its own food.
b	No, I do not agree. Bacteria cannot make its own food and do not reproduce by spores, unlike E. OR No, I do not agree. E makes its own food and reproduces by spores, unlike bacteria.

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TOPIC: ANIMAL CLASSIFICATIONS

Qn	Answer
Q1	2
Q2	3
Q3	4
Q4	1
Q5a	P: Amphibians / Outer covering of moist skin Q: Mammals / Outer covering of hair R: Reptiles / Outer covering of dry skin covered with scales
b	Group R. A python has an outer covering of dry skin covered with scales, like the animals in group R.
c	1) They have hair as their outer covering. 2) The adults produce milk and suckle their young.
d	1) The animals in both groups are cold-blooded. 2) The animals in both groups reproduce by laying eggs.
Q6a	Animal X does not have scales and lays eggs.
b	Animal Y has scales but animal X does not have scales.
c	Mammals: W Birds: X Insects: X Fish: Z Reptiles: Y Amphibians: X
Q7a	Animal X: Insects Animal Y: Fish
b	*Accept any 1 of the following:* • Has hair as its outer covering. • Produce milk and suckle their young. • Warm-blooded • Gives birth to young alive • Breathes through lungs
c	Yes. Animal W has more than 6 legs/3 body parts, unlike an insect which has 6 legs/3 body parts.

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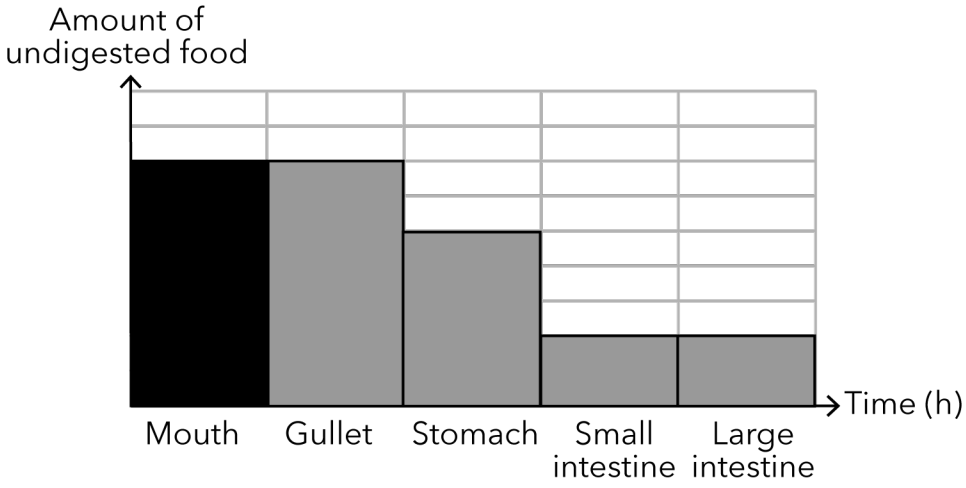
TOPIC: MATERIALS

Qn	Answer
Q1	3
Q2	1
Q3	3
Q4	1
Q5a	P, M, L, Q
b	**Choose**: Material P.
c	**Use Data:** All the water that was poured onto material P remained on the material. **Explain Data:** This shows that material P is waterproof (property). **(Link back to purpose):** Thus, a drinking straw made of material P would not absorb any of the drink, preventing any drink from leaking out of the straw.
Q6a	Flexibility
b	**Choose**: Material D. **Use Data**: Distance X for material D was the least. **Explain Data**: This shows that material D is the most flexible (property). **(Link back to purpose):** Thus, a strap made of material D will be able to bend the most around the user's wrist, allowing the user to wear the watch most comfortably.
Q7a	**Choose**: Material Y.
b	**Use Data**: No light was detected by the light sensor when material Y was tested. **Explain Data**: This shows that material Y is opaque (property). **(Link back to purpose):** Thus, the bathroom door made of material Y will not allow any light to pass through, preventing people outside the bathroom from seeing the person inside.

Qn	Answer
Q1	3
Q2	4
Q3	3
Q4	2
Q5a	Digestive juices. Substance X can be found in parts P, Q and R.
b	The absorption of water from undigested food into the bloodstream.
c	The teeth chew food and break food into smaller pieces. This increases the amount of surface area of the food in contact with the digestive juices for faster digestion of the food.
d	Both parts absorb substances into the bloodstream.
Q6a	The gullet does not produce digestive juices. Thus, no digestion occurs in the gullet.
b	All the digested food has been absorbed through the walls of the small intestine into the bloodstream.
Q7	

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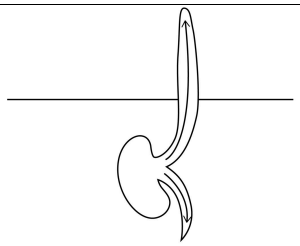
TOPIC: HUMAN SYSTEMS

Qn	Answer
Q1	3
Q2	4
Q3	2
Q4	1
Q5ai	System P: Respiratory System
aii	System Q: Circulatory System
b	Small intestine. The small intestine breaks down food into simpler substances and absorbs digested food through its walls into the bloodstream.
c	Lungs
Q6a	Ribcage
b	Heart and lungs
c	Skeletal system
Q7a	Respiratory system. It allows exchange of gases between the body and the surroundings / It takes in oxygen (air) into the body and removes carbon dioxide (air) from the body.
b	Lungs
c	Nose and windpipe
d	The digestive system breaks down food into simpler substances, which is absorbed through the walls of the small intestine into the bloodstream. The circulatory system then transports blood rich in digested food through the blood vessels to all parts of the body.

Qn	Answer
Q1	3
Q2	4
Q3	3
Q4	1
Q5a	P: Seed leaf Q: Roots
b	Part P, which is the seed leaf, provides food for the seedling to grow until the true leaves are fully developed.
c	The plant will die. If all of Part Q are removed, there will not be any roots to absorb water and mineral salts from the ground. Thus, the leaves will not be able to receive water to make food.
d	Flowers and/or fruits
Q6a	Factors required for germination: Oxygen, water and warmth Factor that does not affect germination: Light
b	The roots
c	
Q7a	Part X: Flower Part Y: Stem
b	The plant will die. When part Y is broken, the stem will be damaged. Thus, the water absorbed by the roots cannot be transported up to the leaves, causing them to be unable to make food.

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TOPIC: ANIMAL LIFE CYCLE

Qn	Answer
Q1	4
Q2	2
Q3	1
Q4	2
Q5a	Q
b	Animal P moults in the larva stage to shed its hard outer covering to grow bigger. *P4 CCI Notes, Volume 3, Page 8 Q4*
Q6a	Both have an egg stage/adult stage.
b	The mosquito has a 4-stage life cycle but the chicken has a 3-stage life cycle. OR The young of the mosquito does not resemble its adult but the young of the chicken resembles its adult. OR The mosquito spends part of life cycle in water while the chicken spends its entire life cycle on land. **Moulting is not accepted as the question asked for differences based only on the diagram.*
c	This increases the chances that some eggs will not be eaten by predators, can hatch to form young and develop into adults that can reproduce, ensuring the continuity of its own kind. *P4 CCI notes, Volume 3, page 8 Q3*
d	The adult stage. The adult mosquito can fly and spread diseases when they bite/sting humans. *P4 CCI notes, Volume 3, page 9 Q9*

e	This blocks the breathing tubes of the larvae and pupae and does not allow air to enter. This prevents them from taking in oxygen from the surrounding air, causing them to die. *P4 CCI notes, Volume 3, page 9 Q10*
Q7a	Stage M: Pupa Stage N: Larva
b	Stage N moults while the stage M does not moult. OR Stage N moves from place to place while the stage M does not move from place to place. OR Stage N feeds while the stage M does not feed. *P4 CCI notes, Volume 3, page 9 Q7*
c	Stage N. The larva/caterpillar feeds a lot on the leaves of the plants, damaging the leaves of the farmers' crops. *P4 CCI notes, Volume 3, page 9 Q8*

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TOPIC: MAGNETS

Qn	Answer
Q1	3
Q2	4
Q3	3
Q4	2
Q5	Flip the object around so that end Q of the object is facing the same pole of the bar magnet. If the object and the bar magnet moved away from each other / repelled each other, he can confirm that the object is a magnet since only like poles of two magnets facing each other repel.
Q6a	Wood / Glass / Copper / Aluminium *(any non-magnetic material)*
b	The magnet's magnetism acted at a distance and passed through the toy bridge, which is made of a non-magnetic material, to attract the toy block, which is made of a magnetic material. This caused the toy block to move to other end of the bridge.
c	The toy block is made of a non-magnetic material and cannot be attracted to the bar magnet.
Q7a	Iron / Steel / Nickel / Cobalt *(any magnetic material)*
b	Nail Y is made of a non-magnetic material and cannot be magnetised to become an electromagnet.
c	1) Increase the number of batteries in the circuit. 2) Increase the number of turns/coils of wire around nail X / the electromagnet.
d	Magnet A. Magnet A can attract the most iron pins from the furthest distance.

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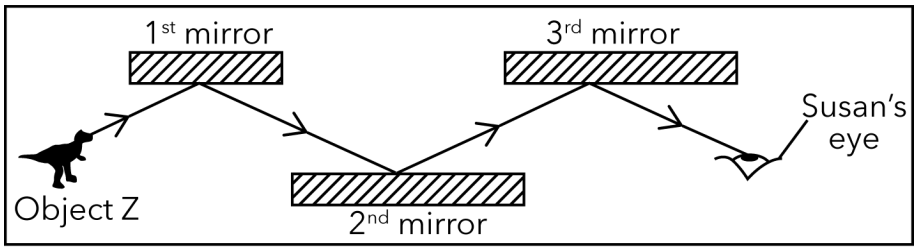
TOPIC: MATTER

Qn	Answer
Q1	4
Q2	3
Q3	2
Q4	3
Q5a	70 cm^3
b	130 cm^3. Water has a definite volume and cannot be compressed.
c	Less than 600 cm^3. There are air spaces between the marbles. As water does not have a definite shape, water can enter to **occupy the space previously taken up by / displace** the air, causing the total volume of the contents in container A to be less than 600 cm^3. *P4 CCI notes, Volume 3, page 27, Q6*
Q6a	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. *P4 CCI notes, Volume 3, page 24, Q1A*
b	Poke a hole at the base of the cup. The air in the cup escapes through the hole, allowing water to enter the cup to **occupy the space previously taken up by / displace** the air. *P4 CCI notes, Volume 3, page 24, Q1B & 1C*
c	With two holes in the lid of the can, air from the surroundings will enter the can through one hole to **occupy the space previously taken up by / displace** the milk that is flowing out through the other hole. This allows the condensed milk to flow out faster. *P4 CCI notes, Volume 3, page 27, Q5*
Q7a	While the coloured water cannot be compressed, air can be compressed.
b	15 ml *Any reasonable answer between 15 ml to 20 ml (not inclusive). Air can actually only be slightly compressed.

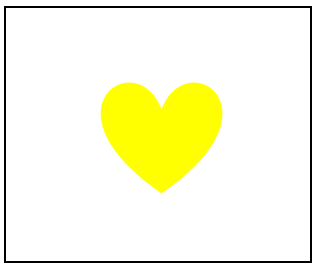
2025 P4 CCI™ SCIENCE COURSE

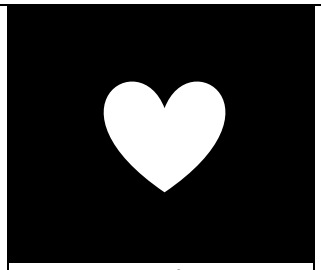
TOPIC: LIGHT ENERGY

PROPERTIES OF LIGHT/LIGHT RAYS

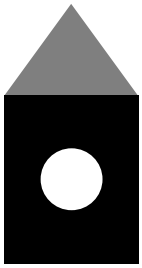
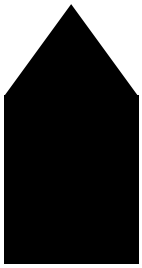
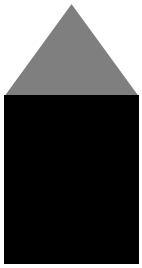
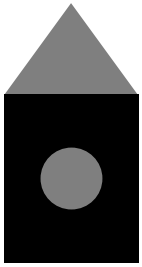
Qn	Answer
Q1	1
Q2	4
Q3	3
Q4	2
Q5a	 **Top view**
b	Light from Object Z is reflected off the 1st mirror, which is then reflected off the 2nd mirror and is reflected off the 3rd mirror into Susan's eye, enabling her to see Object Z.
c	1) Light travels in a straight line. 2) Light can be reflected.
Q6	Light from the Sun is reflected off the lady, which is then reflected off the side mirror of the motorcycle into the rider's eyes, enabling the rider to see the lady standing behind the motorcycle.
Q7a	5 objects G
b	1) Place more objects G closer to each other on the moving belt. 2) Increase the speed of the moving belt.
c	An object that is 5 cm in height cannot block light from the barcode scanner from reaching the light sensor. Thus, the light sensor still receives all the light from the barcode scanner.

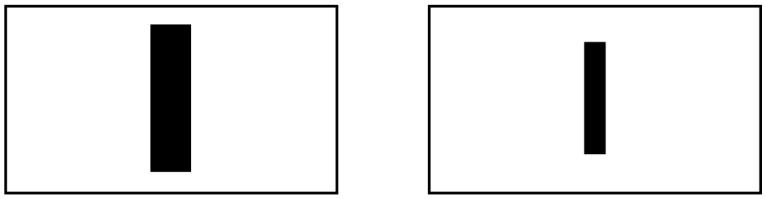
PROPERTIES OF MATERIALS

Qn	Answer
Q8	2
Q9	3
Q10	1
Q11	4
Q12a	**Choose:** Material Z. **Use Data:** The amount of light detected by light sensor A is the most. **Explain Data:** This shows that material Z is the most reflective (Property). Thus, most light from the streetlamps would be reflected off the safety vest made of material Z, allowing the cyclist wearing the safety vest to be seen most easily (Purpose).
b	**Choose:** Material X. **Use Data:** The amount of light detected by light sensor B is the most. **Explain Data:** This shows that material X allows the most amount of light to pass through (Property). Thus, most light from the Sun would be able to pass through the windows made of material X into Stefanie's room, allowing her room to be lit most brightly (Purpose).
Q13a	Cup Q blocks more light than cup P.
b	Cup P: Frosted glass Cup Q: Metal/Wood/Ceramic Cup R: Clear glass/Clear plastic
c	10.30 am * *Any reasonable time in the mid-morning.*
Q14a	She will observe a bright heart-shaped patch of light on card R only.
b	 Card R (Use a highlighter to draw a heart and colour it with the highlighter.) **OR**

	 Card R (Draw a heart, then shade the outside of the heart.)

SHADOWS

Qn	Answer
Q15	4
Q16	2
Q17	3
Q18	3
Q19a	   **Position C** **Position A** **Position _____**    **Position _____** **Position B** **Position _____**
b	The shadow of the object was formed when light from the torch, which travels in a straight line, was blocked by the metal block, which is opaque, and the triangular block made of frosted glass, which is translucent.
Q20a	X; Z; Y
b	Move object Y nearer to the light source such that object Y is closer to the light source than object Z is.
c	The shadows will become bigger/fainter/blurrier [Choose any 2]

d	Light travels in a straight line.
Q21a	 **Screen P** **Screen Q**
b	The shadows will become smaller, darker, and sharper/clearer.
c	As the distance of the torch from an object increases, the size of the shadow formed on the screen decreases.
d	The shadow formed on Screen P would be lighter/fainter than the shadow formed on Screen Q. Since frosted glass is translucent while wood is opaque, the frosted glass cup will block less light from the torch, casting a lighter/fainter shadow on Screen P.