ASMOPSS THAILAND 2026

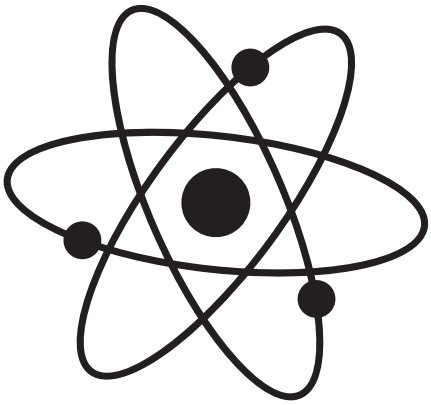
Asian Science & Mathematics Olympiad for Primary and Secondary Schools (Thailand)

Science Primary G.4

Sunday, August 9, 2026

10:30 a.m. – 12:00 p.m. (90 minutes)

B



Instructions

1. This exam includes 40 questions, with 4 choices given (100 marks).
2. Use a 2B black pencil or darker one to fill in the circle.
3. Fill out your name, grade, school, test center, room, seat number, and identification number either in pen or in pencil.
4. If you want to change an answer that you have already marked, use a clean eraser to erase the incorrect answer and mark the new one.
5. It should be noted that figures in the exam are not drawn to scale.
6. Dictionaries, calculators, and electronic devices are not permitted in the test room.
7. Note taking can be done on the test paper only, with no extra sheet provided.
8. Do not write anything or make any symbols in the black barcode area along the edge of the paper except the answers on the answer sheet. Make sure the answersheet is not crumpled.
9. Submit the answer sheet to the proctor when the time is up.
10. Cheating in the exam may cause serious consequences including disqualification from receiving any award or joining the second round of the test held by ASMOPSS THAILAND.

Should any disagreement arise, the judgment of the panel is deemed final.

Announcement of the results via https://asmopssthailand.com on September 16, 2026

: ASMOPSS Thailand / Miraah Education

Contact US

LINE @asmopss.thailand

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Instructions :

1. Each question carries a different score, as indicated at the end of the question.
2. Students must select only the one best answer for each question.

1. A student wants to investigate how the concentration of salt in water affects its boiling point. She prepares five beakers, each containing 500 mL of water, and adds different amounts of salt to each beaker.



In this experimental design, which of the following is the independent variable? (1.25 marks)

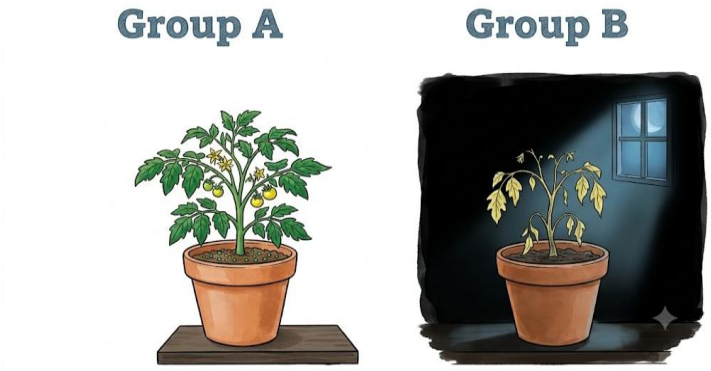
1. The volume of water used
2. The time taken for the water to boil
3. The boiling point of the water
4. The mass of salt added

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2. A scientist is investigating the effectiveness of a new fertilizer by comparing two groups of plants under different experimental conditions.

Group A receives the new fertilizer and normal sunlight.

Group B receives no fertilizer and is kept in a dark room.



Why is this experimental design considered flawed? (1.25 marks)

1. There is no control group.
2. More than one variable is changed at the same time.
3. The sample size is too large.
4. There is no dependent variable.

3. Four students are discussing ways to reduce electrical energy consumption at home. They make the following statements:

I. Leave the refrigerator door open to help cool the kitchen.

II. Turn off the lights when leaving a room that is not in use.

III. Use the air conditioner while keeping all the windows and doors open.

IV. Switch off the television at the main power socket when it is not in use.

Which of these statements describe effective ways to reduce electrical energy consumption? (1.25 marks)

1. I and III only
2. II and IV only
3. I, II, and IV only
4. II, III, and IV only

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4. Three organisms were analyzed based on their physiological and reproductive characteristics to determine the vertebrate class. The findings are summarized in the table below.

Feature	Organism X	Organism Y	Organism Z
Number of heart chambers	4	3	2
Body covering	Hair	Dry scales	Slimy scales
Fertilization	Internal	Internal	External
Egg structure	No shell (live young)	Leathery shell	No shell (jelly-like covering)

Which of the following correctly identifies the vertebrate classes of Organisms X, Y, and Z? (1.25 marks)

1. X : Mammal, Y : Amphibian, Z : Fish
2. X : Mammal, Y : Reptile, Z : Amphibian
3. X : Bird, Y : Reptile, Z : Amphibian
4. X : Mammal, Y : Reptile, Z : Fish

5. A student uses the dichotomous key below to identify five unknown organisms labeled P, Q, R, S, and T based on their distinguishing characteristics.

1a. Has a backbone → Go to 2

1b. Does not have a backbone → Go to 3

2a. Maintains a constant body temperature → Organism P

2b. Body temperature varies with the environment → Go to 4

3a. Has jointed legs → Organism Q

3b. Does not have jointed legs → Organism R

4a. Skin covered with scales → Organism S

4b. Moist skin → Organism T

Based on the student's investigation, one organism breathes through gills during its larval stage and through lungs and its skin as an adult. Which letter in the dichotomous key represents this organism? (1.25 marks)

1. Organism T
2. Organism S
3. Organism R
4. Organism Q

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6. A group of students investigates the relationship between leaf veins and root systems in flowering plants. They form the following hypothesis:

"Flowering plants with parallel leaf veins tend to have fibrous roots, while flowering plants with netted leaf veins tend to have taproots."

The students grow four kinds of plants in identical containers. They use the same type of soil and give each plant equal amounts of water and light. Once the plants are fully grown, they examine the leaf veins and root systems.

Plant	Pattern of Leaf Veins	Root System
K	Parallel	Fibrous roots
L	Netted	Taproot
M	Parallel	Fibrous roots
N	Netted	Taproot

Which statement provides the best scientific interpretation of the investigation? (1.25 marks)

1. The amount of water is the independent variable, the soil type is the dependent variable, and the data prove that the root system dictates leaf vein patterns.

2. The pattern of leaf veins is a controlled variable, the amount of light is the dependent variable, and the hypothesis is rejected because all plants have roots.

3. The root system is the independent variable, the type of plant is the dependent variable, and the data prove that this pattern applies to all flowering plants.

4. The type of plant is the variable being compared, the leaf veins and root systems are the observed results, and the data support the hypothesis for the plants tested.

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7. Ben fills an empty plastic bottle with air and closes the cap tightly. He then places the bottle in a freezer overnight. The next morning, the shape of the bottle changed with its sides collapsing inwards. Which statement best explains this observation? (1.25 marks)

1. The air inside the bottle becomes denser and exerts a stronger outward force.
2. The air inside the bottle cools down and exerts less pressure, allowing the outside air to push the sides inwards.
3. The air inside the bottle escapes through the plastic, causing the bottle to lose its internal air pressure.
4. The plastic bottle softens in the cold temperature, causing it to collapse under its own weight.

8. A student compares the hardness of three unknown materials, X, Y, and Z, by attempting to scratch each material with another. The observations are shown below.

- ▶ Material X scratches Material Y.
- ▶ Material Z does not scratch Material X.
- ▶ Material Z scratches Material Y.

Based on these observations, which option correctly ranks the materials from hardest to softest?

1. Z > X > Y
2. X > Y > Z
3. Y > Z > X
4. X > Z > Y

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9. A primary school is running an "Electrical Safety at Home" campaign. Students are using a safety checklist to identify household habits that could cause short circuits or electric shocks. Which of the following statements on their checklist is incorrect? (1.25 marks)

1. Climbing a tree that is touching the overhead power lines is completely safe because wood is always a perfect electrical insulator.

2. Unplugging a toaster by pulling the power cord instead of the plug can damage the internal wires, increasing the risk of a short circuit.

3. Using an electrical appliance while standing barefoot on a wet bathroom floor greatly increases the risk of a severe shock because water conducts electricity.

4. Plugging several high-power electrical appliances into a single extension socket can overload the circuit, generating excess heat and potentially causing a fire.

10. A student aligns a flashlight, three cardboard screens with small holes, and a light sensor in a row. By changing the position of the screens, the student records whether the sensor detects light.

Test	Position of the Holes	Does the Sensor Detect Light?
1	All three holes are aligned in a straight line.	Yes
2	The middle hole is shifted upward.	No
3	The middle hole is moved back into the alignment.	Yes
4	The last hole is shifted sideways	No

Which conclusion is best supported by the results? (1.25 marks)

1. Light travels in straight lines, so it reaches the sensor only when the holes are aligned.

2. Light travels in curved paths, but the cardboard screens force it to straighten out.

3. Light stops moving whenever it hits cardboard, even when an open hole is in its path.

4. Light can pass through the screens at every position, but the sensor occasionally fails to detect it.

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11. Danny places a cold metal spoon into a bowl of hot soup and leaves it there for several minutes.



Initial condition Soup : hot , Spoon : cold

Which statement correctly describes what happens? (1.25 marks)

1. Heat transfers from the hot soup to the cooler spoon, causing the spoon to become warmer.
2. Coldness moves from the spoon into the soup, causing the spoon to become warmer.
3. Heat transfers from the spoon to the soup, causing the spoon become even colder.
4. No heat is exchanged between the soup and the spoon because they are made of different materials.

12. Nadia stands on a balcony holding a heavy metal ball in one hand and a light plastic ball of the same size in the other. She releases both balls simultaneously from the same height. Assuming that air resistance is negligible, what will happen? (1.25 marks)

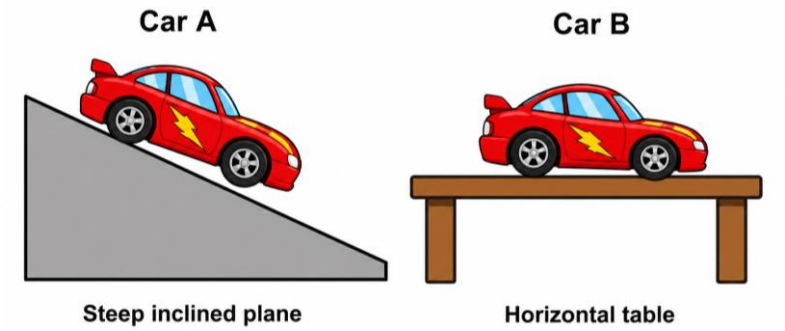
1. The heavy metal ball will hit the ground first because it has a greater mass.
2. The light plastic ball will reach the ground first because it has a smaller mass.
3. Both balls will hit the ground at the same time.
4. Both balls will float in the air and never hit the ground.

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13. Two identical toy cars are placed on different surfaces.

▶ Car A is placed on a steep inclined plane.

▶ Car B is placed on a horizontal table.



When both cars are released without any additional force, Car A rolls down the slope, whereas Car B remains at rest. Why does Car A start moving on its own while Car B remains stationary? (1.25 marks)

1. The steep slope makes the car heavier.
2. Gravity has a component acting parallel to the slope and pulls the car down.
3. Gravity acts only on a slope and not on the table.
4. Because the car on the slope is made of a material that moves faster.

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14. A student performs a "**Jar Test**" to investigate the composition of garden soil. He places a sample of soil into a clear glass jar, fills it with water, shakes the mixture thoroughly, and allows it to settle undisturbed for 24 hours.



After settling, distinct layers are observed in the jar:

Pebbles at the bottom

Sand above the pebbles

Silt above the sand

Clay above the silt

A layer of floating material on the surface of the water

What is the floating material most likely composed of? (1.25 marks)

1. Small rock fragments or sand particles
2. Decayed organic matter
3. Dense mineral particles
4. Fine clay particles

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15. At a coastal science center, a volunteer groups a dolphin with a shark because both have streamlined bodies, fin-like structures, and live in the ocean. A scientist instead groups the dolphin with a seal because both breathe through lungs, give birth to live young, and nurse their young with milk. Which statement best explains the scientist's classification? (2.5 marks)

1. External body shape provides the strongest evidence for classification, so the dolphin and shark should belong in the same group.
2. Animals sharing in the same habitat should be placed in the same group, even when their breathing and reproductive methods are different.
3. Scientific classification relies on fundamental biological traits, whereas similar body shapes may result from adaptation to the same environment.
4. The method of locomotion is the primary criterion, meaning all swimming animals should be classified together regardless of other traits.

16. A student investigates the tensile strength of several materials by stretching each one until it snaps. The maximum pulling force (in newtons) that each material can withstand before snapping is recorded in the table below.

Material	Breaking Force (N)
Nylon Rope	80
Cotton Thread	20
Rubber Band	45
Paper Strip	10

If the student needs to make a harness to lift a 50 N bucket, which material(s) can safely support the load? (2.5 marks)

1. Nylon rope only
2. Cotton thread and rubber band only
3. Nylon rope and rubber band.
4. None of the materials

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17. A STEM team is programming an application to classify unknown organisms as plants, animals, or fungi. The sensors provide the following observations:

Organism P has chlorophyll and produces stored food when exposed to light.

Organism Q lacks chlorophyll, moves from place to place, and ingests food.

Organism R lacks chlorophyll, grows on dead wood, secrete digestive substances, and absorbs dissolved nutrients.

Which decision rule would classify all three organisms most accurately? (2.5 marks)

1. Classify all non-motile organisms as plants, all motile organisms as animals, and all organisms found on dead wood as fungi.

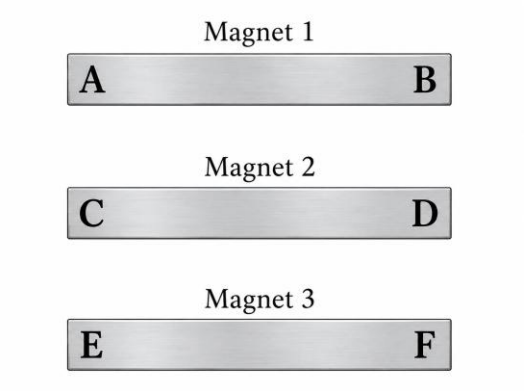
2. Classify organisms primarily by habitat, placing P in the light-dependent group, Q in the terrestrial group, and R in the decomposing wood group.

3. Classify P as a plant; among organisms without chlorophyll, classify Q as an animal based on ingestion and R as a fungus based on absorption.

4. Classify organisms primarily by size and shape, as metabolic traits like feeding methods and chlorophyll presence are less reliable than external appearance.

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18. A scientist has three identical bar magnets. Each magnet is completely coated with silver paint, so its north and south poles cannot be identified from its external appearance. The ends of the magnets are labelled A–F, as shown in the diagram.



When selected ends of the magnets are brought close together, the following observations are made:

- ▶ End B attracts end C.
- ▶ End D repels end E.

Consider the following statements:

I. When end A is brought close to end D, the two ends will repel each other.

II. When end C is brought close to end F, the two ends will attract each other.

III. If end B is a north pole, end F must be a south pole.

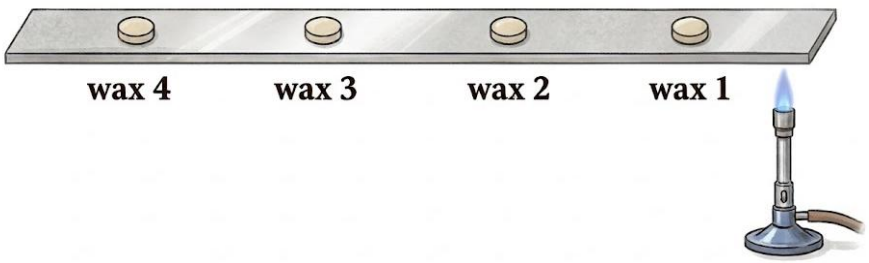
IV. If Magnet 2 is turned so that end D faces end B, the two ends will repel each other.

Which option is scientifically correct? (2.5 marks)

1. Statements I and III only are correct.
2. Statements I, II, and IV only are correct.
3. Statements III and IV only are correct.
4. Statements I, II, III, and IV are all correct.

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19. In another laboratory investigation, a student places four identical wax beads at different positions along a long aluminum bar. One end of the bar is heated with a steady flame, and a stopwatch is used to record the time taken for each bead to melt completely and fall off.



The student makes the following claims based on the principles of heat transfer. Which statement is correct? (2.5 marks)

1. All four wax beads will melt at the same time because aluminum conducts heat instantly across the entire bar.

2. The wax beads will melt in the order from Wax 1 → Wax 2 → Wax 3 → Wax 4 because heat is transferred by convection from the hotter region to the cooler region.

3. The independent variable in this investigation is the distance of each wax bead from the heat source.

4. If the middle section of the aluminum bar is wrapped with a thick, wet cloth, heat will travel to Wax 4 even faster.

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20. A STEM team investigates how a container's color affects the temperature of the water inside when exposed to a light source. Two identical metal containers are filled with equal volumes of water. Container A is wrapped in black paper, while Container B is wrapped in white paper. Both containers are placed at the same distance from the lamp, and the students record the following data.

Time (min)	Temperature of Water in Container A (°C)	Temperature of Water in Container B (°C)
0	25	25
5	28	26
10	32	28
15	35	30
20	37	31

The team wants to display both how the temperature changed over time and how the two containers differed.

Which method would present the data most accurately? (2.5 marks)

1. A single bar graph showing only the temperatures at 20 minutes, with separate bars for each container and a clear title.

2. A single line graph with time on the horizontal axis, temperature on the vertical axis, and two clearly labelled lines on the same scale.

3. Two separate line graphs using different temperature scales to maximize the visual size of the changes in each container.

4. A pie chart showing the sum of all temperature readings, with one sector representing each container and a color key.

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21. A space research team transports a sealed mineral sample from Earth to a research station on the Moon. On Earth, the sample has a mass of 3.0 kg and a weight of 30 N. Which statement correctly predicts the properties of the sample on the Moon? (2.5 marks)

1. Its mass remains 3.0 kg, while its weight becomes less than 30 N because lunar gravity is weaker.
2. Its mass decreases, but its weight remains 30 N because the container is sealed.
3. Both its mass and weight remain unchanged because the matter inside is the same.
4. Both its mass and weight decrease because the weaker gravity causes part of the sample to disappear.

22. A school is building a rooftop garden for leafy vegetables. The ideal soil mixture must:

▶ Hold adequate moisture between watering periods;
▶ Allow excess water to drain so roots receive sufficient oxygen;
▶ Contain contain organic matter that supplies essential nutrients; and
▶ Remain loose enough for roots to grow.

The students are provided with sandy soil, clay-rich soil, and mature compost. Which mixture is most suitable for the garden? (2.5 marks)

1. A balanced blend of sandy soil and clay-rich soil, amended with a smaller portion of mature compost.
2. Primarily sandy soil, with a minimal layer of mature compost applied only to the surface.
3. Primarily clay-rich soil, compacted tightly to minimize internal air spaces.
4. Pure mature compost, because organic matter can completely substitute for mineral particles.

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23. A teacher brings a mystery box containing parts of an unknown plant collected from the school garden. Although the students are not allowed to examine the roots, they are provided with a single leaf and a flower to identify the plant. Using a magnifying glass, the students record the following characteristics:



Based on these observations, the students propose the following hypotheses regarding the unobserved parts of the plant.

A. The plant is a dicotyledon because its flowers have a number of petals that is a multiple of three.

B. If the students dig up the plant, they should expect to find a fibrous root system with many roots of similar size, rather than a single thick taproot.

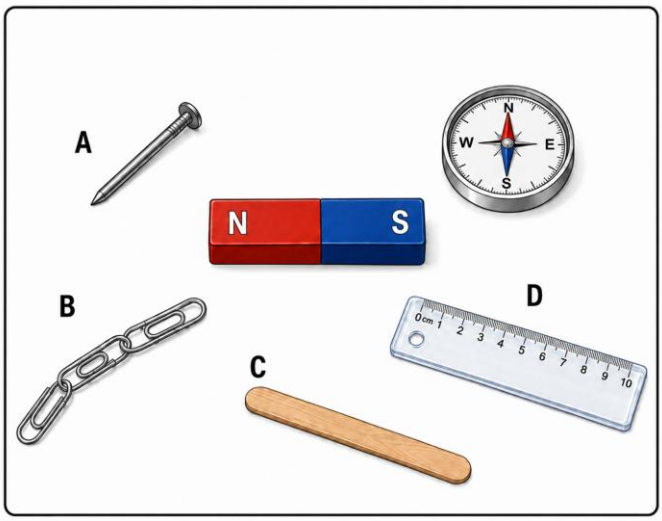
C. If the seed of this plant is cut open, it will not separate easily into two equal halves because it contains only one cotyledon.

Which of the students' hypotheses are scientifically correct and logically supported?
(2.5 marks)

1. Only A
2. Only A and B
3. Only B and C
4. All hypotheses are correct.

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24. Students use the set up in figure to investigate which objects are attracted by a bar magnet. They place each object 2 centimetres from the South (S) pole of the magnet and repeat the test three times.



The students also place the compass shown in figure near the magnet and observe that the compass needle deflects.

Object in figure	Description	Number of Trials in Which the Object Moved Toward the Magnet
A	Nail	3
B	Chain of paper clips	3
C	Wooden stick	0
D	Plastic ruler	0

Which analysis is best supported by the evidence? (2.5 marks)

1. The magnet attracts A and B because they are magnetic metal, and the compass demonstrates that magnetic force can act through non-contact interactions.

2. The magnet attracts A and B because they are longer, and the compass needle turns because the moving magnet creates air current.

3. The magnet attracts only objects with sharp or pointed edges, and the compass needle turns because light reflects off the shiny magnet surface.

4. The magnet attracts all four objects equally, but objects C and D did not move because the test was stopped before the movement became visible.

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25. An agricultural scientist investigates the roles of wind and insects in the pollination of a particular plant species, using the experimental setups shown in the diagram.



After two weeks, the scientist removes the plastic bag and checks whether each flower has developed into a fruit. He then evaluates the following claims.

A. If Flower X develops into a fruit while enclosed inside the sealed plastic bag, it indicates that the plant species is capable of self-pollination without relying on insects or wind as pollinating agents.

B. Covering Flower X with a plastic bag helps control the experimental conditions by preventing pollen from other plants from reaching the flower, thereby reducing the possibility of cross-pollination.

C. After successful fertilization, the ovules inside the ovary develop into fruits, while the ovary wall develops into seeds.

Which of the scientist's claims are scientifically accurate? (2.5 marks)

1. Only A
2. Only A and B
3. Only B and C
4. All claims are correct.

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26. A student tests four materials to determine which is most suitable for making a reusable table mat. The ideal material must:

- prevent water from passing through;
- bend without cracking; and
- remain strong when wet.

Identical samples of equal size are tested under the same conditions.

Material	Water Passed Through	Bent Without Cracking	Remained Strong When Wet
P	No	Yes	Yes
Q	No	No	Yes
R	Yes	Yes	Yes
S	No	Yes	No

The student concludes:

"Material P is the best material for every object that may come into contact with water."

Which evaluation of this conclusion is most scientifically justified? (2.5 marks)

1. The evidence proves that P is best for all water-related uses because it satisfied every criterion in this investigation.

2. The evidence supports Q as the best material because rigid materials are generally stronger and more useful when wet.

3. The evidence is unreliable because materials must be tested in different sizes and shapes before any comparison can be made.

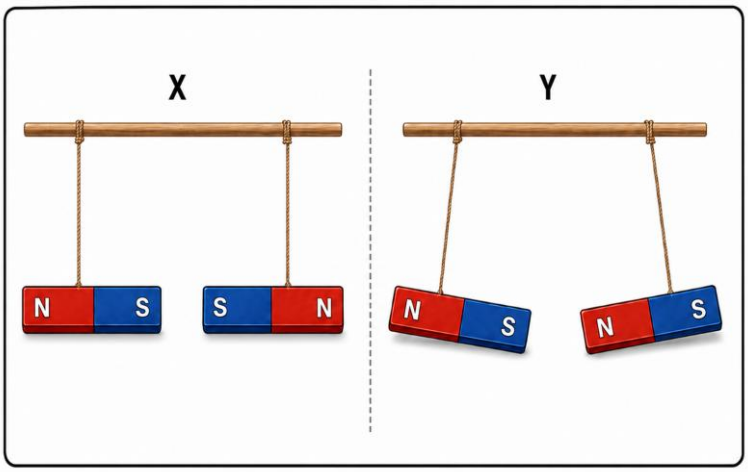
4. The evidence supports P for this table mat, but it does not show that P is best for every object used near water.

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27. Look at Figure 2, which shows two pairs of suspended bar magnets.

In Setup X, the facing poles are S and S.

In Setup Y, the facing poles are S and N.



A student concludes:

"Setup X will show attraction, while Setup Y will show repulsion, because every bar magnet has both a north pole and a south pole."

Which evaluation of the student's conclusion is scientifically justified? (5 marks)

1. The conclusion is correct because any two bar magnets will attract each other as long as both poles are present.
2. The conclusion is incorrect because like poles in Setup X repel, while opposite poles in Setup Y attract.
3. The conclusion is correct because south poles attract other south poles, while a south pole repels a north pole.
4. The conclusion cannot be evaluated because suspended magnets do not exert magnetic force until they are in direct contact.

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28. An experiment was conducted to compare the amount of light transmitted through four materials. The incident illuminance on each material was kept constant at 1,000 lux.
The results are shown below.

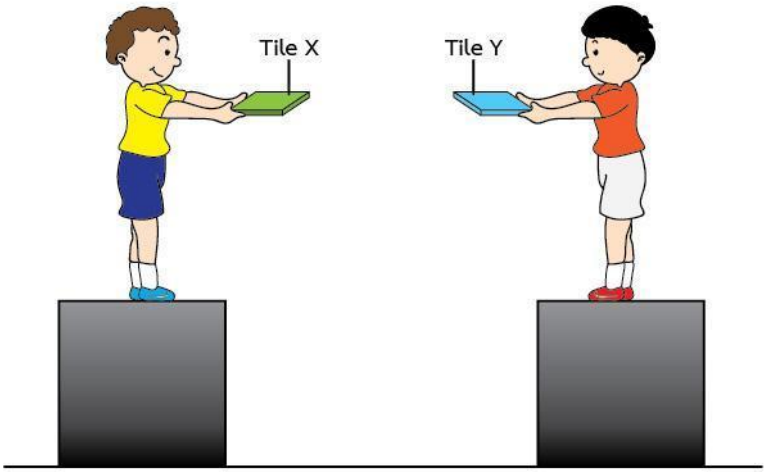
Material	Transmitted illuminance (lux)	Appearance of object behind material
A	985	Very clear
B	450	Blurry and indistinct
C	12	Not visible
D	520	Blurry and indistinct

Which statement correctly classifies the materials based on the results? (5 marks)

1. Materials B and D are translucent because they transmit some light but scatter it.
2. Material A is transparent because it transmits all light without any absorption or scattering.
3. Placing Material A behind Material C would produce approximately 973 lux of transmitted light.
4. Material D is transparent, whereas Material B is translucent, because D transmits 70 lux more.

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29. During a group project, Wenhao and David compared the impact resistance of two types of tiles, labelled X and Y. Wenhao dropped tile X, while David dropped tile Y. They release the tiles simultaneously from the same height and under identical conditions. Both tiles broke upon striking the ground.

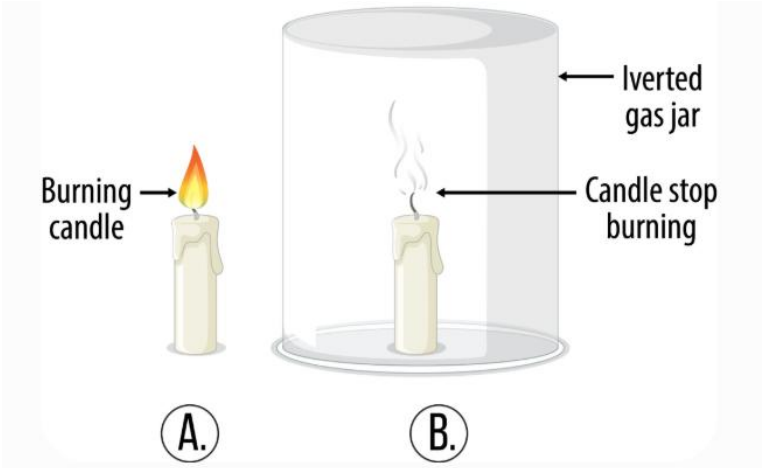


How should Wenhao and David continue the experiment? (5 marks)

1. Increase the drop height until only one type of tile breaks.
2. Increase the drop height until neither type of tile breaks.
3. Decrease the drop height until only one type of tile breaks.
4. Decrease the drop height until neither type of tile breaks.

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30. A group of students placed three identical candles on a flat surface, lit them simultaneously, and immediately covered each candle with a different-sized glass jar (labeled Jars X, Y, and Z).



The students recorded the volume of air enclosed within each jar and measured the time required for each candle flame to extinguish. The results are shown in the table below.

Glass Jar	Volume of Air (ml)	Time for Flame to Extinguish (s)
X	250	8
Y	500	16
Z	750	24

Which statement provides the most scientifically valid conclusion? (5 marks)

1. The candle in Jar Z burned the longest because nitrogen gas supports combustion more effectively when a larger volume of air is available.

2. The burning time is directly proportional to the amount of oxygen available inside the jar, as oxygen constitutes approximately 21% of atmospheric air.

3. The carbon dioxide inside the jars was completely consumed during combustion, causing the flame to extinguish when its concentration reached 0%.

4. If a 1,000 mL jar were used, the candle would continue burning indefinitely because the volume of air exceeds the required threshold.

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31. A teacher prepares four sets of young bean plants. All plants are healthy at the beginning of the investigation.

Set	Water	Light	Air	Mineral Nutrients
A	Provided	Provided	Provided	Provided
B	Not provided	Provided	Provided	Provided
C	Provided	Not provided	Provided	Provided
D	Provided	Provided	Not provided	Provided

Which statement correctly identifies the factors required for healthy plant growth?
(1.25 marks)

1. Plants require water, soil, darkness, and a sealed container throughout their growth cycle.
2. Plants require light, coloured flowers, insects, and strong wind to produce new leaves.
3. Plants require mineral nutrients, stones, warm water, and daily movement from location to another.
4. Plants need water, light, air, and mineral nutrients under suitable environmental conditions.

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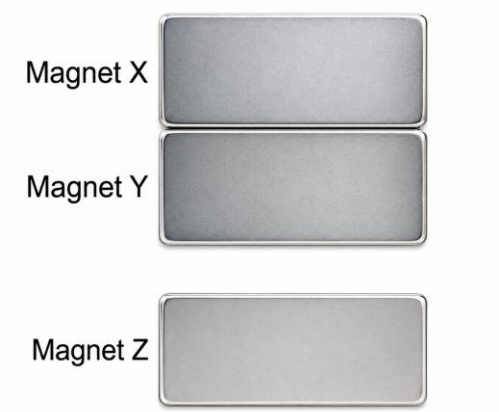
32. In a biology challenge, a group of students dissects an unknown flower and examines its structures under a magnifying glass. They observe that the flower has a long style with a sticky stigma, large, brightly colored petals, and a sweet, honey-like scent. However, they cannot locate any anthers or filaments inside the flower.

Which statement is incorrect? (1.25 marks)

1. This flower is recognized as both an incomplete flower and an imperfect, unisexual female flower.
2. This flower is capable of self-pollination because it does not require pollen from another flower to develop seeds.
3. If a bee transfers pollen from a male flower of the same species onto this flower's stigma, fertilization can still occur, allowing it to develop into a fruit.
4. In a typical flower, the primary function of the anther is to produce pollen grains, which contain the male gametes.

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33. Three identical flat rectangular magnets, labelled Magnet X, Magnet Y, and Magnet Z, have no visible pole markings. Each magnet has a magnetic pole on its top face and the opposite pole on its bottom face. In the initial arrangement, the following observations are made:



- ▶ The bottom face of Magnet X attracts the top face of Magnet Y.
- ▶ The bottom face of Magnet Y repels the top face of Magnet Z.

Magnet X is then left unchanged, while Magnets Y and Z are each flipped over. Magnets Y and Z are separately placed beneath Magnet X so that their new top faces oppose the bottom face of Magnet X.

Consider the following statements:

A. The opposing faces of Magnets X and Y will repel each other.

B. The opposing faces of Magnets X and Z will attract each other.

C. If the original top face of Magnet X was a north pole, the bottom face of Magnet Z after it is flipped will also be a north pole.

Which statements are scientifically correct? (2.5 marks)

1. Statement A only
2. Statements A and B only
3. Statements B and C only
4. Statements A, B, and C

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34. An international research team is studying Earth's rotation. At the same moment, the researchers record the local solar conditions in four cities located at different longitudes.

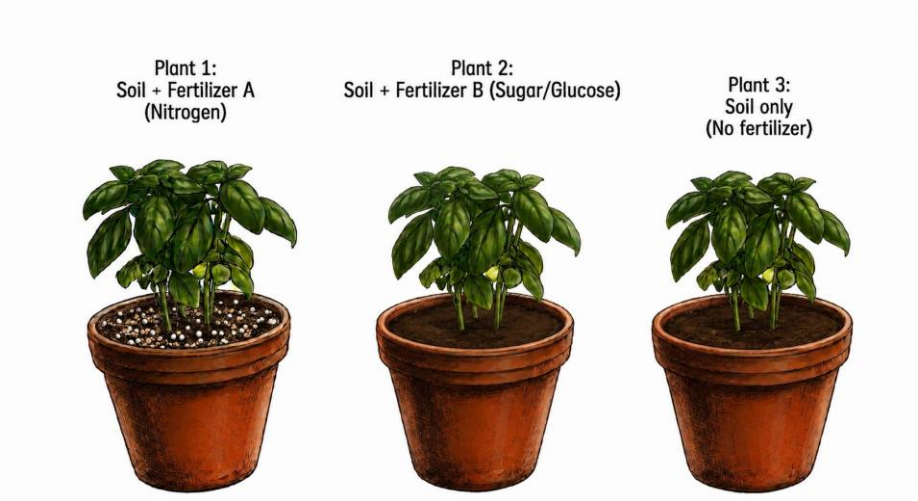
City	Longitude	Local solar condition
Bangkok	100° E	Solar noon
Tokyo	140° E	Afternoon
New Delhi	77° E	Morning
London	0°	Early morning

Assume that differences in latitude and seasonal daylight are ignored. Based on Earth's rotation from west to east, which statement is incorrect? (2.5 marks)

1. Tokyo reaches sunset earlier than Bangkok because Tokyo lies farther east.
2. London is still in early morning because it lies much farther west than Bangkok.
3. If Earth stopped rotating, London would remain dark while Tokyo remained illuminated.
4. The order of sunrise from earliest to latest is Tokyo, Bangkok, New Delhi, and London.

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35. Some students believe that plants obtain “food” directly from the soil to grow. To investigate this idea, they design an experiment to test how different fertilizers or nutrients affect plant growth while keeping all other variables constant, including light, water, and air.



After two weeks, Plant 1 exhibits the greatest, whereas Plant 2, which received a sugar solution, begins to wilt and die. What does this experiment demonstrate about the factors affecting plant growth? (2.5 marks)

1. Plants grow best when they absorb sugar directly from the soil as their primary food source.
2. Soil nutrients such as nitrogen support growth, but plants synthesize their own food through photosynthesis.
3. Fertilizer B was the most effective treatment, but the plants likely received excessive amounts of water.
4. Plants require only sugar to grow well and do not depend on soil nutrients.

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36. A group of young explorers is preparing for a camping trip. They need to select suitable materials for three items: a raincoat, a towel, and a reusable shopping bag.

They analyze the properties of four available materials:

Material	Properties
Material W	High water absorption and soft texture
Material X	Water-repellent, lightweight, and durable
Material Y	Strong, long-lasting, and reusable many times
Material Z	Low water absorption, thin, and disposable

Which combination of materials is the most appropriate and environmentally friendly choice for the raincoat, towel, and reusable shopping bag, respectively? (2.5 marks)

1. Raincoat: X Towel: W Reusable bag: Y
2. Raincoat: Z Towel: W Reusable bag: X
3. Raincoat: X Towel: Y Reusable bag: W
4. Raincoat: W Towel: X Reusable bag: Z

37. A student proposes the following hypothesis:

"Increasing the amount of organic matter in sandy soil increases the amount of water retained by the soil."

Which experimental design provides the fairest test of this hypothesis? (5 marks)

1. Place varying amounts of sandy soil in containers of different sizes, add compost to only one container, and compare the color of the mixtures.

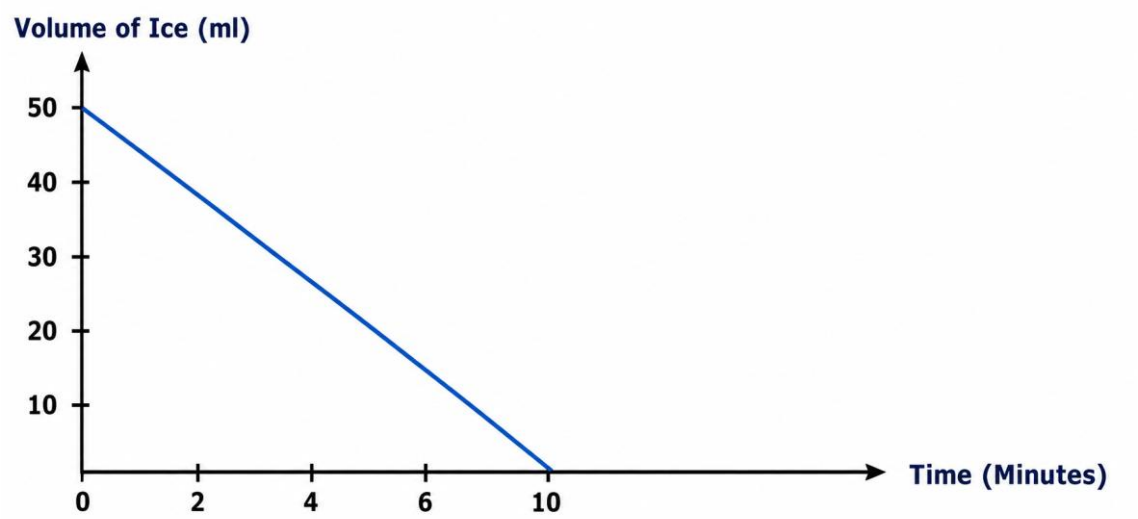
2. Mix equal amounts of compost into clay, sand, and gravel, applying varying volumes of water, and measure the height of each mixture after one hour.

3. Prepare equal-mass mixtures with varying amounts of compost in identical containers, add equal volumes of water, and measure the water that drains out over a fixed time period.

4. Prepare identical sandy-soil mixtures, pour the same volume of water into each container, and place the containers in locations with different temperatures.

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38. A student places an ice cube in a room at 25°C and measures its volume at one-minute intervals until it has completely melted into water. The graph below illustrates the melting process:

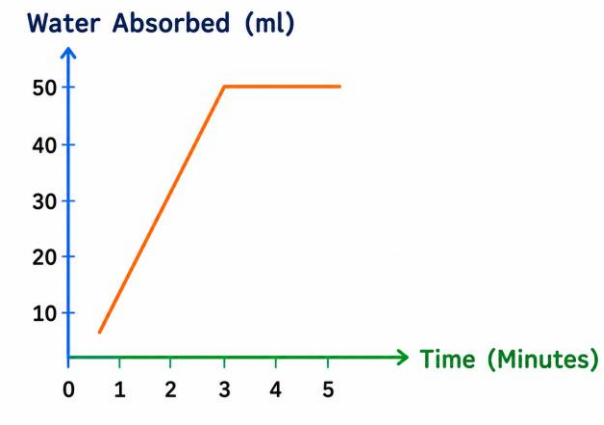


Based on the graph, which of the following statements provide a scientifically valid conclusion? (5 marks)

1. The rate of melting is faster between the 8th and 10th minute than between the 0 and 2nd minute.
2. The ice cube has completely melted at the 15th minute, when the volume of solid ice reaches 0 ml.
3. The student should use ice cubes of identical mass if they wanted to compare the melting rates of different geometric shapes.
4. The independent variable in this experiment is the volume of the ice cube.

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39. A student measures the volume of water (in ml) absorbed by a mystery sponge over a 5-minute period. The results are plotted on the graph below:



After analyzing the graph, the student draws the following four conclusions:

I. The rate of water absorption is constant during the first 3 minutes.

II. Between the 3rd and 5th minute, the sponge continues to absorb water, but at a significantly slower rate than during the initial period.

III. The "saturation point" – the maximum volume of water the sponge can hold) is 50 ml.

IV. If the student extends the experiment to the 10th minute, the total volume of water absorbed will likely increase to approximately 70 ml.

Which of the statements above are scientifically correct and logically supported by the graph? (5 marks)

1. Only I and III
2. Only I, II, and III
3. Only II and IV
4. All statements are correct.

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40. A student is analyzing a "Smart House" prototype and identifies four energy transformations taking place within the house.

Appliance 1: Electric Heater (converts Electrical Energy → Thermal Energy)

Appliance 2: Electric Fan (converts Electrical Energy → Mechanical Energy)

Appliance 3: Rechargeable Battery (converts Electrical Energy → Chemical Energy)

Appliance 4: LED Light Bulb (converts Electrical Energy → Light Energy + Thermal Energy)

Which of the following statements regarding these energy transformations is incorrect? (5 marks)

1. Appliance 1 and 2 are examples of useful energy transformation.
2. Appliance 3 is the only example where energy is "stored" in a different form.
3. Appliance 4 demonstrates that all electrical energy is converted into the "intended" form of energy (light).
4. If Appliance 2 is unplugged, the energy conversion process stops immediately because electrical energy is the source for this transformation.

---------- End of Questions ----------

Please check your answers before submitting the answer sheet.

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Answers Keys : Science Primary - Grade 4

No.	Answers	No.	Answers
1.	4	21.	1
2.	2	22.	1
3.	2	23.	3
4.	4	24.	1
5.	1	25.	2
6.	4	26.	4
7.	2	27.	2
8.	4	28.	1
9.	1	29.	3
10.	1	30.	2
11.	1	31.	4
12.	3	32.	2
13.	2	33.	2
14.	2	34.	3
15.	3	35.	2
16.	1	36.	1
17.	3	37.	3
18.	3	38.	3
19.	3	39.	1
20.	2	40.	3

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