PHOTON THAILAND 2026

Photon Science Competition (Thailand)

Science Primary G.3–4

Sunday, August 9, 2026

3:00 – 4:30 p.m. (90 minutes)

B

Instructions

1. This exam includes 40 questions, with 4 and 5 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 PHOTON THAILAND.

Problems and Scoring

Part I : Number 1–30 are multiple-choice questions.
Each correct answer is worth 2 marks.

Part II : Number 31–40 are multiple-choice questions.
Each correct answer is worth 4 marks.

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

Announcement of the results via
https://prod.miraah-education.com/student on September 16, 2026

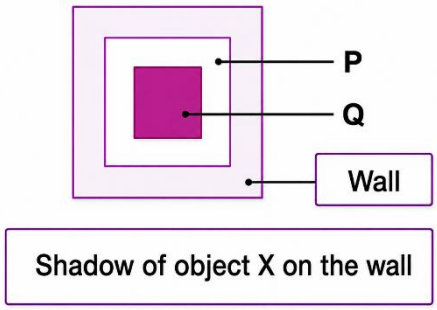
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Part I : This is a multiple-choice test with 4 options. Students must choose only one best answer.

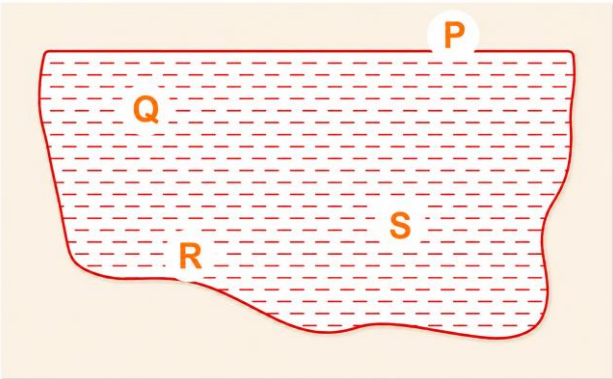
1. Warin placed object X between a flashlight and a wall. Object X was made of materials P and Q. When the flashlight was switched on, he observed that material P formed a faint shadow, whereas material Q formed a dark shadow, as shown in the diagram.

What are materials P and Q most likely to be?



1. P = wood and Q = steel
2. P = steel and Q = frosted glass
3. P = frosted glass and Q = wood
4. P = steel and Q = wood

2. The diagram below shows different locations in a pond, labelled P, Q, R, and S.



Which option correctly identifies an organism that could be found at the indicated location?

1. P = artificial grass
2. Q = a kingfisher
3. R = algae
4. S = mosquito eggs

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3. Mike cycles uphill to visit his grandmother. He finds that cycling uphill requires considerable effort, whereas travelling downhill is much easier.



Which statement best explains this observation?

1. The frictional force is greater when cycling uphill than when cycling downhill.
2. The frictional force is greater when cycling downhill than when cycling uphill.
3. When cycling uphill, the bicycle moves against the force of gravity.
4. When cycling downhill, the bicycle moves against the force of gravity.

4. Thara saw a bird walking on the ground and using its feet to scratch the soil in search of worms and insects.



Which type of feet would this bird most likely have?

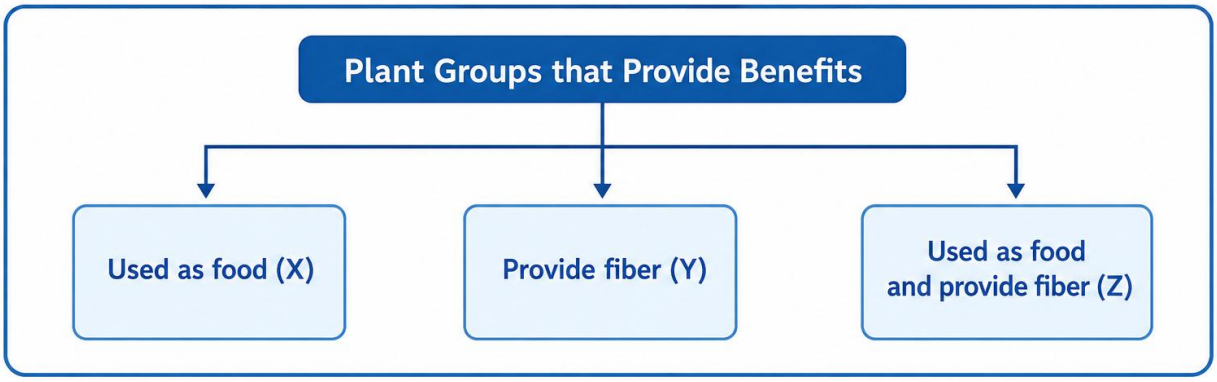
1. diagram A.
2. diagram B.
3. diagram C.
4. diagram D.

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5. Which group of letters can be rearranged to form a word meaning a person who makes or repairs wooden furniture and other wooden objects?

1. REOBCBL
2. AITEPNR
3. ARENCPTRE
4. ACITERHTC

6. Based on the diagram classifying useful plants, which option correctly matches each plant with its use?



1. X = cotton, Y = mango, Z = banana
2. X = mango, Y = cotton, Z = coconut
3. X = mango, Y = cotton, Z = teak
4. X = teak, Y = mango, Z = cotton

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7. The masses of four objects, P, Q, R, and S, and the maximum loads supported by four types of rope, W, X, Y, and Z, are shown in the table.

Object	Mass of object (g)	Rope	Maximum mass supported (g)
P	290	W	230
Q	50	X	150
R	150	Y	110
S	300	Z	290

Assume that a rope can support an object when the object's mass is less than or equal to the maximum mass supported by the rope. Which statement is incorrect?

1. Object S cannot be supported by any of the ropes.
2. Object Q can be supported by any of the ropes.
3. Object P can be supported only by rope Z.
4. Object R can be supported only by rope X.

8. Which of the following correctly matches each animal group with its examples?

Animal group	Examples
a. Rodents	1. Cows and buffaloes
b. Carnivorous animals	2. Lions and tigers
c. Ruminants	3. Snakes
d. Animals that swallow their prey whole	4. Rats and squirrels

1. a–4, b–3, c–1, d–2
2. a–4, b–2, c–1, d–3
3. a–2, b–3, c–4, d–1
4. a–1, b–4, c–2, d–3

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9. The table below shows some properties of materials X, Y, and Z.

Property	X	Y	Z
Can be stretched and return to its original shape	Yes	No	No
Has good tensile strength	Yes	No	Yes
Conducts electricity	No	No	Yes

Which statement is most consistent with the information in the table?

1. X is rubber.
2. Y is steel.
3. Z is wood.
4. Y is aluminium.

10. Sound waves travel at different speeds through different media. A student collected the data shown below.

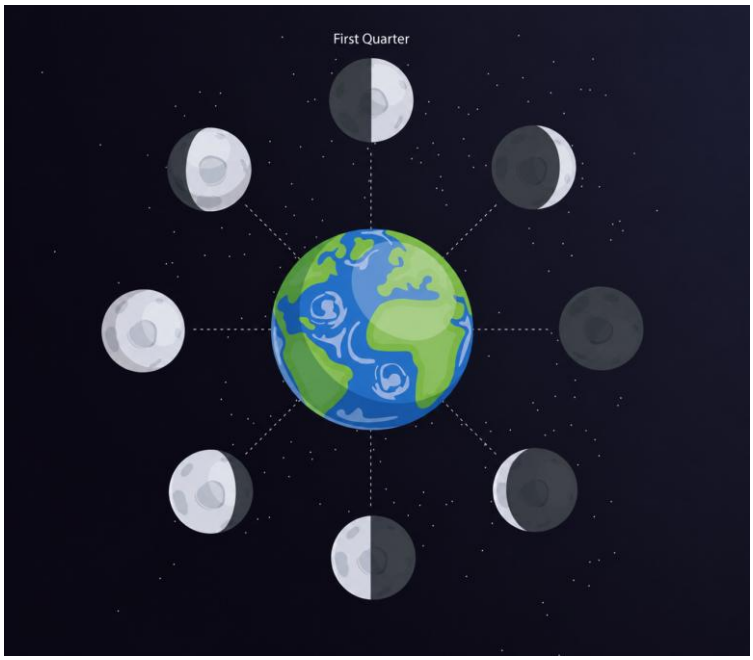
Medium	Air	Water	Iron
Speed of sound (m/s)	343	1,482	5,960

Which conclusion is best supported by the data?

1. Sound travels slowest through solids because solids are too rigid.
2. In general, sound travels faster through solids than through liquids and gases.
3. The speed of sound decreases when sound travels from air into water.
4. Sound cannot travel through air.

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11. Astronomers monitor the cyclical phases of the Moon as it orbits Earth.
The pattern repeats in a predictable sequence every month. Look at the orbital pattern below:



If a scientist observes a "First Quarter" moon tonight, which phase will they systematically see exactly two steps later in this repeating pattern?

1. New Moon
2. Full Moon
3. Waning Gibbous
4. Waxing Gibbous

12. When geologists look at a crystal of table salt under a high-powered magnifying lens, they observe that the atoms arrange themselves into a neat 3D shape. This shape has exactly 6 flat faces, 8 vertices, and 12 edges, where every single face is an identical square. What is this 3D shape called?

1. Rectangular prism
2. Cube
3. Triangular prism
4. Square-based pyramid

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13. A marine biologist is studying a common starfish. If you look at the starfish directly from above and draw a straight line connecting the tip of each arm to the next, which 2D polygon will you create?

1. Triangle
2. Square
3. Regular pentagon
4. Regular hexagon

14. A group of students are comparing the sizes of celestial bodies in our solar system. They discover the following information regarding the diameters of four objects:

Object W : 3,474 km
Object X : 12,742 km
Object Y : 6,779 km
Object Z : 139,820 km

If these objects represent Earth, Mars, Jupiter, and the Moon, which object is Mars?

1. Object W
2. Object X
3. Object Y
4. Object Z

15. A student performs a scratch test to compare the hardness of four unknown mineral samples: P, Q, R, and S.

- ▶ Mineral P can scratch Mineral Q, but cannot scratch Mineral R.
- ▶ Mineral S can scratch Mineral R.

Which of the following correctly ranks the minerals from softest to hardest?

1. Q ⟶ P ⟶ R ⟶ S
2. S ⟶ R ⟶ P ⟶ Q
3. P ⟶ Q ⟶ R ⟶ S
4. Q ⟶ R ⟶ P ⟶ S

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16. A medical scientist compares the average resting heart rate (beats per minute, or bpm) across different age groups of humans. Look at the chart below:

Newborn Babies : 120 – 160 bpm

Toddlers (1-3 years) : 90 – 150 bpm

Children (6-12 years) : 70 – 110 bpm

Adults (18+ years) : 60 – 100 bpm

What scientific conclusion can be drawn when comparing age to resting heart rate?

1. As humans grow older, their resting heart rate generally increases.
2. As humans grow older, their resting heart rate generally decreases.
3. Adults have the fastest heart rate among all groups.
4. Children have a lower heart rate than adults.

17. The table below shows the maximum running speeds of four different land animals:

Animal	**Maximum Speed** (km/h)
Cheetah	120
Pronghorn	88
Greyhound	74
Ostrich	70

Based on the data, which of the following statements is correct?

1. The ostrich is faster than the greyhound.
2. The greyhound is the slowest animal listed.
3. The pronghorn is slower than the ostrich but faster than the greyhound.
4. The cheetah is nearly twice as fast as the ostrich.

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18. A flock of migratory birds flies 10 km north to escape a cold weather front. After reaching a lake, they change their path and fly 10 km west for food. Finally, they fly 10 km south to look for a nesting site. Compared to their original starting point, in which direction are the birds located now?

1. North of their starting point
2. South of their starting point
3. West of their starting point
4. East of their starting point

19. A Mars rover is facing directly north to take photos of a crater. The command center sends a signal telling the rover to turn 90° clockwise, drive forward 5 meters, and then turn 180° counterclockwise. Which direction is the rover's camera currently facing?

1. North
2. South
3. East
4. West

20. A chef is designing a high-efficiency frying pan. She wants the bottom of the pan to heat up as quickly as possible to cook food quickly, but she wants the handle to stay cool so she can hold it safely without burning her hand. Which combination of materials should she choose?

1. Pan bottom: Aluminum / Handle: Iron
2. Pan bottom: Plastic / Handle: Copper
3. Pan bottom: Copper / Handle: Plastic
4. Pan bottom: Wood / Handle: Aluminum

21. A toy factory needs a material to manufacture a new type of launcher. The material must be able to stretch significantly when force is applied and completely snap back to its original shape and length when released. Which property of matter is the factory looking for?

1. Transparency
2. Elasticity
3. Magnetism
4. Stickiness

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22. A team of meteorologists is building a weather balloon to collect data from active storm clouds. They need a material for the outer layer that is completely waterproof and extremely lightweight. Which material is the best choice for the balloon's skin?

1. Cotton fabric
2. Paper
3. Nylon plastic
4. Clay

23. An engineer wants to test the hardness of four different material samples by scratching them against one another. She records the following observations:

- ▶ Copper can scratch the unknown material Sample X.
- ▶ Glass can scratch copper.
- ▶ Topaz can scratch glass.

Which of the following lists the materials in order from the softest to the hardest?

1. Topaz ⟶ Glass ⟶ Copper ⟶ Sample X
2. Sample X ⟶Copper ⟶Glass ⟶Topaz
3. Copper ⟶ Sample X ⟶Glass ⟶Topaz
4. Sample X ⟶ Glass ⟶ Copper ⟶ Topaz

24. A teacher sets up an experiment in which she deflates a football completely and measures its mass on an electronic scale. Then, she pumps air into the football until it is full and measures its mass again. What will the scale show, and what property of matter does this prove?

1. The mass will decrease, proving air has no weight.
2. The mass will stay exactly the same, proving air is energy.
3. The mass will increase, proving air has mass.
4. The mass will decrease, proving air is lighter than a vacuum.

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25. A laboratory technician has an unknown clear liquid sample. To safely identify what substance it is without tasting it, she heats it up until it boils and records the constant temperature during boiling as exactly 100°C

Based on this specific physical property, what is the clear liquid?

1. Rubbing alcohol
2. Liquid nitrogen
3. Saltwater solution
4. Pure water

26. To reduce environmental damage and combat climate change, scientists urge cities to shift from non-renewable energy resources to renewable energy resources.

Which of the following groups contains only clean, renewable environmental resources?

1. Coal, natural gas, and petroleum
2. Solar power, wind energy, and hydroelectric power
3. Uranium, gasoline, and charcoal
4. Crude oil, wind energy, and firewood

27. Consider the relationship between each object and a characteristic property of its material.

Rubber band: Flexibility :: Glass window: _____

1. Elasticity
2. Water absorbency
3. Transparency
4. Hardness

28. The ostrich and the penguin are flightless birds. Which characteristic best explains why they are classified in the same group as flying birds?

1. They are cold-blooded and have scales covering their wings.
2. They have feathers, wings, beaks, and reproduce by laying eggs.
3. They give birth to live young and feed them with milk.
4. They use gills to breathe while swimming underwater.

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29. Look at the classification table below, which groups four animals based on their specific characteristics:

Group X	Group Y
 	 

What are the best titles for Group X and Group Y?

1. Group X: Animals with fur Group Y: Animals with feathers
2. Group X: Birds Group Y: Mammals
3. Group X: Insects Group Y: Reptiles
4. Group X: Animals that eat meat Group Y: Animals that eat plants

30. A scientist observes that opened pasteurised fresh milk spoils within 24 hours when left at room temperature. However, when stored in a refrigerator, the milk remains usable for a longer period. Why does a low temperature help preserve food?

1. A low temperature kills all bacteria that may be present in the food.
2. A low temperature slows the growth and reproduction of microorganisms in the food.
3. A low temperature rapidly removes all the water contained within the food.
4. A low temperature changes every substance in the food into a solid state.

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Part II : This is a multiple-choice test with 5 options. Students must choose only one best answer.

31. Many vegetables contain large amounts of dietary fibre. Although the human body cannot completely digest and absorb fibre in the same way as other nutrients, why should vegetables be eaten every day?

1. Fibre adds bulk to waste and helps food move efficiently through the intestines.
2. Fibre supplies the body with as much usable energy as dietary carbohydrates.
3. Fibre increases the ability to hold one's breath underwater for longer periods.
4. Fibre can completely replace the water that the body requires each day.
5. Fibre reduces bone mass by dissolving the minerals stored within the bones.

32. On a hot sunny day, a student plays football and sweats a lot. He needs a t-shirt made of a material that can easily absorb water (sweat) and allow air to pass through easily to keep him cool. Which material is the best scientific choice for his t-shirt?

1. Plastic : it is completely waterproof.
2. Cotton : it is a natural plant fiber.
3. Rubber : it can stretch easily when he runs.
4. Glass fibers : they are very smooth.
5. Paper : it is thin and air can pass through easily.

33. During the heavy monsoon season in Thailand, students must walk to school in the pouring rain. What properties must the raincoat material have?

1. It must be water-absorbent and very heavy.
2. It must be transparent and able to melt easily in water.
3. It must have many tiny holes.
4. It must be waterproof and flexible.
5. It needs to be windproof and brightly colored.

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34. Look at the direction of energy flow from a diagram below:

 :   : _____

1. Earthworms
2. The Sun
3. Dark Soil
4. Rainwater
5. Oxygen Gas

35. In a science experiment, students pull up plants with two different root systems.

Plant 1 : Has a cluster of many small and thin roots that branch off.

Plant 2 : Has one main, thick root vertical with smaller roots that branch off.

Which classification correctly matches these observations?

1. Plant 1 has taproots (monocot) Plant 2 has fibrous roots (dicot).
2. Plant 1 has fibrous roots (dicot) Plant 2 has taproots (monocot).
3. Plant 1 has fibrous roots (monocot) Plant 2 has taproots (dicot).
4. Both plants have taproots and are classified as monocots.
5. Both plants are non-vascular plants because they have roots.

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36. Look at the simple identification key below which is used to classify an unknown organism:

(1) : *Does it have a backbone?*

Yes⟶ Go to 2 No⟶ Organism W

(2) : *Is it warm-blooded (endothermic)?*

Yes⟶ Go to 3 No⟶ Organism X

(3) : *Does it have feathers covering its body?*

Yes ⟶ Organism Y No ⟶ Organism Z

If a scientist is using this key to identify a Pigeon, which letter is the correct representation?

1. Organism W
2. Organism X
3. Organism Y
4. Organism Z
5. None of these organisms

37. Many flowering plants rely closely on animals to reproduce. What do the plants provide to the insects, and what do the insects do for the plants in return, respectively?

1. Oxygen / Carbon dioxide
2. Shelter / Protection from rain
3. Water / Soil nutrients
4. Seeds / Warmth
5. Sweet nectar / Pollination

38. A student places a sealed glass jar containing 10 grams of ice on a digital scale. The combined mass of the jar and the ice is 150 grams. She leaves the sealed jar in a warm room until all the ice has melted into liquid water.
What will the total mass of the sealed jar and its contents be after the ice has melted?

1. Less than 150 grams because liquid water has less mass than solid ice
2. Exactly 150 grams because the total amount of matter remains unchanged
3. More than 150 grams because liquid water occupies a different amount of space
4. Exactly 140 grams because the ice loses its mass during the melting process
5. Zero grams because the melting process completely destroys the original matter

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39. A young athlete trains intensely every day, causing micro-tears in her muscle tissues. To help her body repair these tissues, new muscle fibers must be built. Which group of foods in daily meals should the young athlete eat?

1. White bread, white rice, and honey
2. Butter, olive oil, and coconut milk
3. Fish, eggs, and soybeans
4. Apples, watermelons, and cucumbers
5. Potato chips, candy bars, and sodas

40. Scientists classify mammals into three distinct subgroups based on how their babies develop. Look at the characteristics of Group X below:

▶ They are warm-blooded vertebrates with fur.

▶ They give birth to tiny, undeveloped embryos.

▶ They crawl into a special abdominal pouch on the mother's body to drink milk and finish growing.

Which of the following animals belongs to Group X?

1. Whale
2. Platypus
3. Bat
4. Dolphin
5. Kangaroo

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

Please check your answers before submitting the answer sheet.

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Answers Keys : Science Primary - Grade 3 - 4

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

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