

Primary Science Annual June 2022 - Report

1. General comments about the Primary Science Annual papers.

The 2022 Primary Science annual exam assessed scientific knowledge, skills and competences related to the Learning Outcomes within the Primary Science syllabus re everyday life experiences. Students in Year 4, Year 5 and Year 6 sat for a one hour written exam that carried 60% of the Primary Science global mark. The Primary Science annual exam paper content and layout were planned in a student-friendly manner and included diagrams and different types of questions assessing both lower and higher order cognitive skills. The Primary Science exam format is aligned towards the Trends in International Mathematics and Science Study (TIMSS) international assessment of the mathematics and science achievement.

2. Distribution of marks.

To ensure content validity and adequate emphasis on all components of the Primary Science syllabus, a specification grid is used for this purpose. The specification grid highlights the learning outcome/syllabus reference tested, the question number, marks allotted, and abilities tested. Abilities include content knowledge, skills and higher abilities including application, synthesis, analysis and evaluation. Furthermore, the specification grid provides the total percentage allotted for each ability component.

3. Comments about each paper and implications for teaching and learning.

This section aims to equip the educator with valuable feedback and information on students' understanding of concepts assessed during the Primary Science annual exam. Such feedback may be used to identify students' misconceptions and reflect on teaching and learning.

Year 4

Below is a sample of questions reviewed from the Year 4 Primary Science Annual Exam paper 2022.

In **Question 1** the most common mistake noted was that students did not refer to the senses but provided examples of body parts such as 'ears' instead of 'hearing', as in the example below.

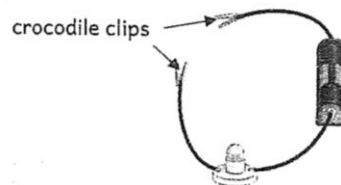
Incorrect response:

- b) Which of the five senses do Karl, Sarah and Bob use when the referee blows the whistle? X
mouth (1 mark)
- c) Which other sense is important while playing football? X
Legs and feet. (1 mark)

In **Question 3** most students answered correctly. However, some students provided a vague and non-scientific answer, as in the example below.

Incorrect response:

3. Maria makes a simple circuit as shown in the diagram below.



- a) What happens when Maria connects the two crocodile clips together? X
It doesn't work (1 mark)

In part 3d some students did not read the question well and listed natural and man-made materials that were not listed in part 3b.

Most students answered **Question 4** correctly, as seen in the example below.

Correct response:

- d) Galileo Galilei made great improvements to the equipment scientists use to see the Sun, Moon, stars and planets in more detail.

Name the equipment Galileo Galilei improved to look into space.

Galileo Galilei improved the telescope (1 mark)

In **Question 6** some students wrote 'soil' instead of explaining the function of the roots. Other responses included not differentiating between the term 'part' and 'function', as in the example below.

Incorrect response:

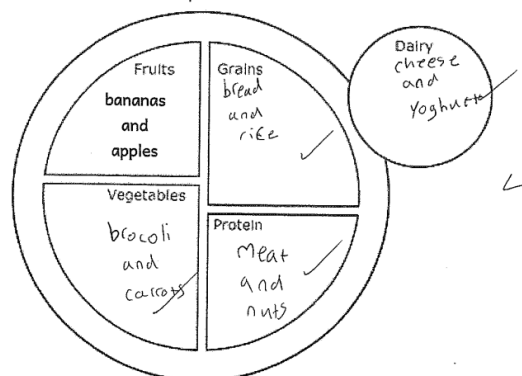
b) What is the function of the **part labelled C** in the flowering plant?

In part labelled C is roots x (1 mark)

Most students answered **Question 7** correctly, as seen in the example below. However, some students did not read the question well and listed other food items that were not included in the word bank. Some listed one food item only.

Correct response:

b) The diagram below shows a food plate.



i. Complete the food plate above. Choose a group of **two** words from the word bank below and write it in the correct space in the food plate, to complete a well-balanced food plate. The first one is done as an example.

bananas and apples	meat and nuts	cheese and yoghurt	broccoli and carrots	bread and rice
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(4 marks)

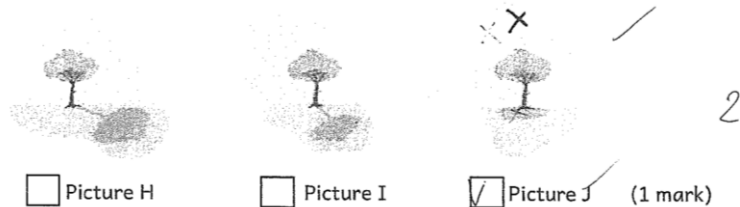
For part 7b(ii) some students confused good food hygiene practices with good personal hygiene practices or healthy food.

In **Question 8** students ticked the correct picture to part a, as seen in the diagram below. However, most students either omitted part b or marked the position of the sun incorrectly.

Correct response:

8. Nina observed that the shadow around a tree changes its position during the day, as outlined in pictures H, I and J below.

a) Tick (✓) the picture that shows the shadow at **noon**.



In **Question 9**, some students could not provide a scientific reason to support their choice of the best day to fly a kite. Most students did not know the names of the weather instruments and some confused the instrument used to measure wind direction with wind speed, as in the example below.

Incorrect response:

- d) i. Name the weather instrument used to measure **rainfall**.
Rain gauge (1 mark)
- ii. Name the weather instrument used to measure the **air temperature**.
Thermometer (1 mark)
- iii. Name the weather instrument used to measure **wind speed**.
wind vane (1 mark)
- 2

Year 5

Below is a sample of questions reviewed from the Year 5 Primary Science Annual Exam paper 2022.

Most incorrect responses in **Question 1** indicate that students did not read the question well and included numbers instead of ticking, as in the example below.

Partially incorrect response:

b) Tick (✓) the correct box to indicate **your present stage** in the human life cycle.

adult child baby old person teenager

4 2 1 5 3 (1 mark)

c) Plants also have a life cycle.
















Tick (✓) the **first stage** of a plant's life cycle.

seed with leaf seed small tree tree with fruit

1 2 3 4 (1 mark)

In **Question 2** it is evident that students hold misconceptions about amphibians and reptiles. Incorrect responses also included names of fish instead of characteristics of fish.

Incorrect response:

Animal pictures			Group name
 monkey	 lion	 cat	mammals ✓
 crocodile	 snake	 tortoise	amphibians ✗
 robin	 eagle	 penguin	birds
 newt	 frog	 toad	reptiles ✗
 sea bream	 shark	 swordfish	Fish ✓ (1 mark)

(4 marks)

Incorrect response:

Write **two** characteristics of a fish.

Characteristic 1: seabream

Characteristic 2: clownfish

(2 marks)

Correct response:

Write **two** characteristics of a fish.

Characteristic 1: have a backbone

Characteristic 2: live in the sea

(2 marks)

In **Question 3**, students found difficulty distinguishing between the term ‘property’ and ‘usefulness’. For example, some students provided examples of uses of cotton instead of its property.

Correct response:

a) Complete the table below.

Shoe	Material	Property	Usefulness
running shoes	rubber sole	Grips to the ground.	Prevents the athlete from slipping while running.
wellington boots	plastic	i. <u>Water Proof.</u>	ii. <u>Prevents getting mud on your socks.</u>

i. Write one property of plastic. (1 mark)

ii. Give a reason to explain why plastic is useful for wellington boots. (1 mark)

In **Question 5**, most incorrect answers included interpreting the term ‘object’ as a material or medium, as in the example below.

Incorrect response:

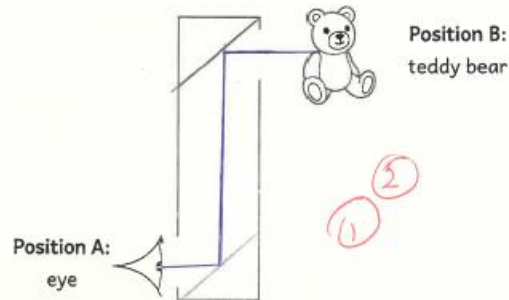
Name **two** objects in the house that sound travels through such that Emma can still hear Neil's guitar playing.

i. air ii. water (2 marks)

In **Question 8**, students did not draw the ray diagram correctly. Many students did not use a ruler to draw the light rays and/or did not draw arrows to indicate the direction of the ray of light, as in the examples below.

Partially correct response:

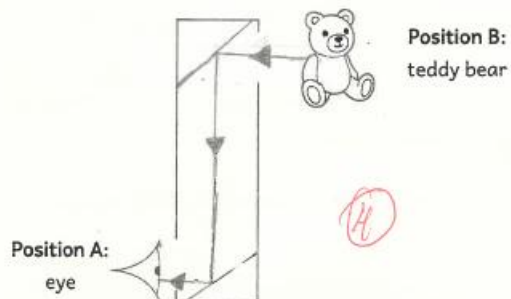
8. Diane is investigating light travelling in a periscope. She makes a periscope from cardboard as shown in the diagram below.



- a) On the diagram above, mark with a straight line the **positions** of the **two mirrors** in the periscope. (2 marks)
- b) Diane looks through the hole in the periscope marked Position A. She sees the image of a teddy bear on one of the mirrors. Draw the **ray of light** on the diagram above to indicate how light travels through the periscope. (2 marks)

Correct response:

8. Diane is investigating light travelling in a **periscope**. She makes a periscope from cardboard as shown in the diagram below.



- a) On the diagram above, mark with a straight line the **positions** of the **two mirrors** in the periscope. (2 marks)
- b) Diane looks through the hole in the periscope marked Position A. She sees the image of a teddy bear on one of the mirrors. Draw the **ray of light** on the diagram above to indicate how light travels through the periscope. (2 marks)

Year 6

Below is a sample of questions reviewed from the Year 6 Primary Science Annual Exam paper 2022.

In **Question 2** students are not familiar with the seven life processes and/or the correct use of terminology related to life processes. Common answers include misusing the term 'breathing' to mean respiration, as in the examples below.

Incorrect response:

2. All living things do seven life processes. Some of these life processes include movement, sensitivity, reproduction, excretion and nutrition.
- a) List the other **two** life processes.
1. Breathing
 2. hearing (2 marks)

Correct response:

2. All living things do seven life processes. Some of these life processes include movement, sensitivity, reproduction, excretion and nutrition.
- a) List the other **two** life processes.
1. One of them is respiration.
 2. The other one is growth. (2 marks)

Some students found difficulty in expressing themselves and give a reason why animals die due to deforestation.

Correct response:

- c) Trees are living things. Every year thousands of trees are cut down in forests. This is known as **deforestation**. Animals die as a result.
- Give **two** reasons to explain why animals die because of deforestation.
- Reason 1: They die because they lose their home.
- Reason 2: The predator won't have food to eat. (2 marks)

In **Question 3**, most students answered the question correctly. Some students provided a vague or misconceived answer to part b such as 'adding hot water' or 'evaporation' to change water from the liquid state to a gas.

Correct response:

b) How can water in the liquid state be changed into a gas?
You can boil it and steam will come out. (1)

(1 mark)

In **Question 4** most students were not aware of the term 'echo'. In part 4b a few students were able to use the term 'reflect' or 'bounce off the wall' and several students listed temporary ways of reducing the echo effect, as in the example below.

Correct response:

4. Jake moved into a new house. He noticed that every time he shouted in an empty room, soon after he heard another similar sound.

a) Name the sound effect Jake heard. (1)

Echo

(1 mark)

b) Explain using scientific terms, how the sound effect Jake heard is formed. (1)

If you would shout your sound would bounce off the wall and come back.

(1 mark)

Partially correct response:

c) Describe **two** ways how this sound effect can be reduced. (1)

1. by filling the the room with solid objects

2. not shouting
by

(2 marks)

The concept of light rays and direction of light rays is poor among students as is evident in **Question 9**. A few students drew light rays originating from the light bulb and reflected towards the person correctly. The majority drew several light rays emerging from the light bulb and spreading out to all parts of the picture, as seen in the diagram below.

Correct response:

9. The picture below shows Kate reading the newspaper.



2

a) On the picture above, draw the ray of light to indicate how Kate can see the page she is reading. (2 marks)

Incorrect response:

9. The picture below shows Kate reading the newspaper.



+

a) On the picture above, draw the ray of light to indicate how Kate can see the page she is reading. (2 marks)

Common incorrect answers for part 9d included 'telescope' and 'binoculars' instead of 'microscope' or 'magnifying glass'.

4. Tips for students – Science exam skills

The Primary Science exam requires students to exhibit a range of skills and competences that have been nurtured/developed throughout the scholastic year/s. Below are a few tips that students may find useful when preparing for the Primary Science exam.

Students are encouraged to:

- Answer in written in ink (preferably blue ink).
- Write legibly. Illegible writing cannot be awarded any marks.
- Answer in English or Maltese.
- Use a ruler for underlining and/or drawing specific diagrams or graphs.

- e) Read the exam question carefully to fully understand what is required.
- f) Identify the topic/s tested by looking for keywords or clues from diagrams, tables, pictures to identify the concepts being tested.
- g) Eliminate the incorrect statements to derive the correct statement/s when tackling multiple choice questions.
- h) Respond with a sentence/phrase that is short, simple and to the point, for open-ended questions.
- i) Support answer with data or information elicited from the exam question.
- j) Be familiar and recall scientific technical words/terms/key knowledge e.g. conductor/insulator, waterproof, sight/smell/touch/hear/taste etc. particularly when answering open-ended questions.
- k) Check you work once finished the entire paper.

5. Links for further resources

- Recorded Lessons on Teleskola – [Year 4](#) – [Year 5](#) – [Year 6](#)
- Teacher’s and Student’s Resource Packs – [Year 4](#) - [Year 5](#) – [Year 6](#)
- Xjentifikwizz – [Link to quizzes](#)

- Link to document outlining [Primary Science FAQs](#).
- Link to Primary Science annual past papers and sample papers - <https://curriculum.gov.mt>
- Further information on the [TIMSS 2019 Malta Report](#).
- Link to Primary Science TIMSS released items – [Primary Science Resource Pack](#).
- Further information on Primary Science may be accessed through the following website <https://primaryscience.skola.edu.mt/>