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1. How to Start Your Answers Correctly

> ⭐ **Golden Rule:** Start your answer with the subject of the question. Give a complete, factual sentence that can stand alone without the question being read. Do not repeat the question or use vague pronouns like 'it,' 'this,' or 'these' without clear meaning.

❌ Words / Starters to Reject

Do NOT start your answer with these:

Rejected Starter	Why It Is Weak
"By not..."	Incomplete—does not state what is being done.
"Is..."	Begins with a verb fragment; often leaves the subject out.

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"This"	Too vague—does not specify what "this" ref...
"There"	Same as "This"—vague and unclear.
"It is"	Incomplete—does not state who or what.
"Not"	Negative starter—often leads to confusing or incomplete answers.
"It avoids"	Vague—does not specify what "it" is.
"It is because"	Redundant—repeats the question instead of answering.
"Because"	Gives a reason without a main statement—often an incomplete sentence.
"No"	Vague—does not state the correct answer, only a denial.

☑ Commonly Accepted Standard Starters

Instead, start your answers with these accepted starters:

☑ Accepted Starter	Example
"To..."	*"To get energy, people eat food."*
"By..."	*"By using crop rotation, farmers control pests."*
"Through..."	*"Through photosynthesis, plants make their own food."*
"Carrying out..."	*"Carrying out proper hygiene prevents diseases."*
"Practising..."	*"Practising crop rotation improves soil fertility."*
[Subject] + verb...	*"A cow breathes." / "Legumes help to fix nitrogen."*

✗ Common Mistake – Vague Pronouns

Do NOT replace the subject (core word) in the question with vague pronouns like *it, they, them, their* without naming the subject first.

Question: *Give a reason why a cow is called a living thing?*

✗ *It breathes.* (Vague – who or what is "it"?)

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✅ *A cow breathes.* (Clear – names the subject.)

Question: *Mention one way of caring for domestic animals.*

❌ *Feeding them well.* (Vague – who or what is "them"?)

✅ *Feeding domestic animals well.* (Clear – names the subject.)

Question: *Give one way in which leguminous plants help to improve soil fertility.*

❌ *They fix nitrogen.* (Vague – who or what is "they"?)

✅ *Legumes help to fix nitrogen in the soil.* (Clear – names the subject.)

Quick Check: Test Yourself!

Rewrite these weak answers correctly:

❌ It breathes. → ✅ **A cow breathes.**

❌ Feeding them well. → ✅ **Feeding domestic animals well.**

❌ They help to fix nitrogen. → ✅ **Legumes help to fix nitrogen in the soil.**

⭐ **Final Advice:** Pretend the examiner has NOT read the question. Your answer must make complete sense on its own. If your answer starts with 'Because' or 'It is,' it probably does NOT stand alone—rewrite it!

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2. Best Ways of Answering – Key Structures for Top Marks

⭐ **Golden Rule:** The way you structure your answer matters just as much as the content. Examiners look for specific patterns – follow them to avoid losing marks!

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1 Questions Comparing Two Things

When asked to compare two things, your answer MUST include a word like **'than'** to show the comparison.

Question: *Mention one reason why cattle farmers prefer keeping local breeds of cattle to exotic ones.*

❌ *Local breeds of cattle are resistant to tropical diseases.*

☑ *Local breeds of cattle are **more** resistant to tropical diseases **than** exotic ones.*

(Without 'more... than', it is just a fact about one breed – not a comparison.)

2 Questions with: *difference, different, distinguish, differentiate*

When asked about the **difference** between two things, your answer MUST include the word **'while'** to show the contrast.

Question: *State the difference between mass and weight.*

❌ *Mass is measured in kilograms. Weight is measured in newtons.*

☑ *Mass is measured in kilograms **while** weight is measured in newtons.*

Question: *What is the difference between vertebrates and invertebrates?*

❌ *Vertebrates have a backbone. Invertebrates do not have a backbone.*

☑ *Vertebrates have a backbone **while** invertebrates do not have a backbone.*

3 Questions with: *similar, similarity, related*

When asked about the **similarity** between two things, your answer MUST start with the word **'Both'**.

Question: *State the similarity between chemical changes and biological changes.*

❌ *Chemical changes are irreversible. Biological changes are irreversible.*

☑ ***Both** chemical changes and biological changes are irreversible.*

Question: *How is a fuse and a switch related in terms of use?*

❌ *A fuse breaks the circuit. A switch breaks the circuit.*

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☑ Both break the circuit.

4 Questions Starting With: *What piece of advice would you give...?*

When asked for advice, your answer MUST start with **'I would advise...'**.

Question: *Mr. Enzyme's son has a swollen moon face, swollen belly and little brownish hair on the head. What piece of advice would you give to Mr. Enzyme in order to get rid of the health condition his son is suffering from?*

✗ *Feed him on food rich in proteins.*

☑ ***I would advise** Mr. Enzyme to feed his son on food rich in proteins.*

5 Questions Starting With: *Why do you think...?*

When asked 'Why do you think...?', your answer MUST start with **'I think...'**.

Question: *Why do you think a whale is a mammal?*

✗ *Because it has mammary glands.*

☑ ***I think** it is because it has mammary glands and gives birth to live young.*

6 Adaptation Questions

For adaptation questions, you MUST state the **part** and its **use / function** in one sentence.

Question: *How are nectar suckers adapted to their mode of feeding?*

✗ *Nectar suckers have a long slender beak.*

☑ *Nectar suckers have a long slender beak **which enables them to suck nectar from flowers.***

Question: *State one adaptation of fish to live in water.*

✗ *Fish have gills.*

☑ *Fish have gills **which enable them to breathe in water.***

Question: *How are lungs adapted to their function?*

✗ *Lungs have air sacs.*

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✅ *Lungs have air sacs which carry out gaseous exchange.*

7️⃣ Questions With: *What should a person do...?*

When asked what someone should do, your answer MUST start with **'He/She should...'** or **'They should...'**.

Question: *What should a person do if they have a severe headache?*

❌ *Go to the hospital.*

✅ ***He should** rest and seek medical attention.*

Quick Check: Test Yourself!

Question: *Why do farmers prefer local breeds of cattle to exotic ones?*

❌ Local breeds are resistant to diseases. → ✅ **Local breeds are more resistant to diseases than exotic ones.**

Question: *State the difference between mass and weight.*

❌ Mass is in kg. Weight is in N. → ✅ **Mass is measured in kilograms while weight is measured in newtons.**

Question: *State the similarity between a fuse and a switch.*

❌ A fuse breaks the circuit. A switch breaks the circuit. → ✅ **Both break the circuit.**

🌟 **Final Advice:** Use 'while' for differences, 'Both' for similarities, 'I would advise' for advice – these small changes earn full marks!

3. Words That Must Be Written as One Word – Not Two!

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⭐ **Golden Rule:** These words are ONE word, not two! Practice writing them correctly so that you don't lose easy marks.

❌ Wrong (Split into Two)	☑ Correct (One Word)
Back bone	**Backbone**
Earth worm	**Earthworm**
Tape worm	**Tapeworm**
Pin worm	**Pinworm**
Thread worm	**Threadworm**
Ring worm	**Ringworm**
Top soil	**Topsoil**
Scare crow	**Scarecrow**
House fly	**Housefly**
Butter fly	**Butterfly**
Grass hopper	**Grasshopper**
Electro magnet	**Electromagnet**
Exo skeleton	**Exoskeleton**
Endo skeleton	**Endoskeleton**
Pin hole	**Pinhole**
Hydro electricity	**Hydroelectricity**

Quick Check: Test Yourself!

Write the correct spelling (one word) for each:

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✏️ *Earth worm* → **Earthworm**

✏️ *House fly* → **Housefly**

✏️ *Scare crow* → **Scarecrow**

✏️ *Top soil* → **Topsoil**

⭐ **Final Advice:** If in doubt, check if the word is a compound noun – it is likely written as one word. Practice writing these words correctly to avoid losing easy marks!

4. Words That Must Be Written as Two Words – Not One!

⭐ **Golden Rule:** Some science words must ALWAYS be written as two separate words. Practice writing them correctly so that you don't lose easy marks.

❌ Wrong (Joined as One)	☑ Correct (Two Words)
Carbondioxide	**Carbon dioxide**
Carbonmonoxide	**Carbon monoxide**
Tsetsefly	**Tsetse fly**
Sundry (wrong)	**Sun drying**
Blackfly	**Black fly**

🔴 **Quick Check: Test Yourself!**

Write the correct spelling (two words) for each:

✏️ *Carbondioxide* → **Carbon dioxide**

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✏️ *Tsetsefly* → **Tsetse fly**

✏️ *Blackfly* → **Black fly**

⭐ **Final Advice:** Carbon dioxide, carbon monoxide, tsetse fly – never join them! Remember: tsetse fly is two words, not one!

5. Commonly Misspelled Science Words

⭐ **Golden Rule:** Spelling matters in Science! Examiners are strict about correct spelling – practice writing these words correctly to avoid losing easy marks. In Uganda, use British spelling.

❌ Wrong Spelling	☑ Correct Spelling
Easly	**Easily**
Led (as a verb)	**Lead**
Drys	**Dries**
Contorl	**Control**
Irreversable	**Irreversible**
Practicing	**Practising**
Illeum	**Ileum**
Casuality	**Casualty**
Diptheria	**Diphtheria**
Probosis	**Proboscis**

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Nector	**Nectar**
Regulary	**Regularly**
Aviod	**Avoid**
Hairly	**Hairy**
Waterly	**Watery**
Diarrhea	**Diarrhoea**
Dysentry	**Dysentery**
Cocidiosis	**Coccidiosis**
Bilhazia	**Bilharzia**
Temprature	**Temperature**
Hygeine	**Hygiene**
Diaphram	**Diaphragm**
Esophagus	**Oesophagus**
Exosceleton	**Exoskeleton**
Endosceleton	**Endoskeleton**
Diary (when meaning milk)	**Dairy**
Typhiod	**Typhoid**

🧠 Quick Check: Test Yourself!

Write the correct spelling for each:

✏️ *Dysentry* → **Dysentery**

✏️ *Diarrhea* → **Diarrhoea**

✏️ *Diaphram* → **Diaphragm**

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✏️ *Typhiod* → **Typhoid**

⭐ **Final Advice:** Break the word into parts, say it aloud, and write it multiple times. In Uganda, always use British spelling – diarrhoea, not diarrhea; oesophagus, not esophagus.

6. Rejected Answers – Common Mistakes & Why They Are Wrong

Here are common answers that seem correct but are actually rejected, with detailed explanations as we developed them together.

Question 1: ***Mention the fungal sexually transmitted disease that can also be spread due to use of dirty toilets and bathrooms.***

❌ **Rejected Answer:** *Candida*

☑️ **Correct Answer: Candidiasis**

Why It Is Rejected: *Candida is the local/common name used by many people to refer to the disease, but in scientific terms, Candida is actually the* **name of the fungus** *(the organism). The disease it causes is called* ***Candidiasis****. The question specifically asks for the* **disease,** *so the correct scientific answer is* ***Candidiasis****. Examiners expect the scientific name of the disease, not the local or common name.*

Question 2: ***Identify the disease spread by fresh water snails.***

❌ **Rejected Answer:** *Bilharziasis*

☑️ **Correct Answer: Bilharzia**

Why It Is Rejected: *In the Uganda Primary Integrated Science curriculum, the disease caused by Schistosoma worms is officially referred to as* ***Bilharzia****. While Bilharziasis is used in some medical texts, it is not the term used in the Primary syllabus. Examiners expect the name as it appears in the curriculum –* ***Bilharzia****.*

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Question 3: What is soil erosion?

❌ Rejected Answer: *Soil erosion is the washing away of topsoil by its agents.*

❌ Rejected Answer: *Soil erosion is the removal of topsoil by its agents.*

☑ **Correct Answer: Soil erosion is the removal of topsoil.**

Why It Is Rejected: *The word "washing" limits erosion to water only. The phrase "by its agents" is a repetition of "removal" – once you say removal, it automatically implies there is something (an agent) doing the removing. The simplest and most accurate definition is* ***"Soil erosion is the removal of topsoil."***

Question 4: *Name any three agents of soil erosion.*

❌ Rejected Answer: *Fast flowing water*

☑ **Correct Answer: Water** (or *Flowing water*)

Why It Is Rejected: *The adjective "fast" makes the answer too specific. Water causes erosion even when it is not fast – gentle rain, slow-moving rivers, and runoff also erode soil. The agent is simply* **Water** *(or Flowing water), not Fast flowing water.*

Note: *Moving animals* and *Strong wind* are acceptable because the adjectives do not change the basic agent.

Question 5: *Mention the habitat of termites.*

❌ **Rejected Answer:** *Anthill*

☑ **Correct Answer: Termite mound**

Why It Is Rejected: *Anthill refers to the home of ants, not termites. While both are social insects, their habitats have different names. Termites build* **termite mounds** *– not anthills. Examiners expect the correct term for the organism given.*

Question 6: *Mention the habitat of fish.*

❌ **Rejected Answer:** *Lakes / Rivers / Ponds / Oceans*

☑ **Correct Answer: Water**

Why It Is Rejected: *These are too specific – not all fish live in lakes; some live in rivers, ponds, seas, or oceans. The correct answer is* **Water** *– the general habitat for fish. Examiners expect the general environment, not a specific location.*

Question 7: *Where does absorption of food take place in the digestive system?*

❌ **Rejected Answer:** *Small intestine*

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☑ **Correct Answer: Ileum**

Why It Is Rejected: *The small intestine is made up of three parts: duodenum, jejunum, and ileum. While most absorption occurs in the small intestine, the specific part where the final absorption of food (nutrients) takes place is the ileum. Examiners expect the specific part, not the general organ.*

Question 8: *Where does absorption of water take place in the digestive system?*

✗ **Rejected Answer:** *Large intestine*

☑ **Correct Answer: Colon**

Why It Is Rejected: *The large intestine is made up of several parts: caecum, colon, and rectum. While water absorption occurs in the large intestine, the specific part where most water absorption takes place is the colon. Examiners expect the specific part, not the general organ.*

Question 9: *Give two parts of the alimentary canal.*

✗ **Rejected Answer:** *Liver, Pancreas, Gall bladder*

☑ **Correct Answer: Mouth, Gullet (Oesophagus), Stomach, Small intestine, Large intestine, Rectum, Anus**

Why It Is Rejected: *The liver, pancreas, and gall bladder are accessory organs – they produce digestive juices but food does not pass through them. The alimentary canal is the tube through which food passes – from the mouth to the anus. Only list structures that food actually passes through.*

Question 10: *Where does digestion end in the alimentary canal?*

✗ **Rejected Answer:** *Anus*

☑ **Correct Answer: Ileum**

Why It Is Rejected: *The anus is the opening through which undigested food (faeces) leaves the body – no digestion occurs there. Digestion (the breakdown of food) ends in the ileum (the last part of the small intestine), where the final absorption of nutrients takes place.*

Question 11: *Outline three types of vaccines you know.*

✗ **Rejected Answer:** *Attenuated vaccine, Living vaccine*

☑ **Correct Answer: BCG vaccine, Measles vaccine, Polio vaccine, PCV, Hib B vaccine, Hepatitis B vaccine, Rotavirus vaccine, Yellow fever vaccine, COVID-19 vaccine**

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Why It Is Rejected: *"Attenuated vaccine" and "Living vaccine" are general descriptions – they are not specific vaccine names used in the Uganda Primary curriculum. Examiners expect the actual names of vaccines given to children.*

Question 12: *State any one method of storing sound.*

❌ **Rejected Answer:** *Recording method, Solfa Notation method*

☑ **Correct Answer: Mechanical / Physical method, Magnetic method, Electromagnetic method**

Why It Is Rejected: *"Recording" and "Solfa Notation" are general terms or teaching aids – they are not scientific methods of storing sound in the Primary curriculum. Examiners expect the scientific methods used in devices like vinyl records, tapes, and CDs.*

Question 13: *Identify the type of teeth missing in the milk set of teeth.*

❌ **Rejected Answer:** *Molar teeth*

☑ **Correct Answer: Pre-molar teeth**

Why It Is Rejected: *The milk set (deciduous teeth) already has molars – they are the large teeth at the back used for grinding food. The teeth that are missing from the milk set are the pre-molars (or bicuspids), which only appear in the permanent set of teeth.*

Question 14: *Give two reasons why people eat food.*

❌ **Rejected Answer:** *To be happy, For hospitality, It is a habit, To stop hunger*

☑ **Correct Answer: To get energy, To grow well, To be healthy, To repair body tissues, To prevent diseases**

Why It Is Rejected: *"To be happy," "For hospitality," "It is a habit," and "To stop hunger" are social, emotional, or cultural reasons – not scientific reasons. Examiners expect biological/nutritional reasons related to energy, growth, health, and repair.*

Question 15: *Mention the cause of marasmus in children.*

❌ **Rejected Answer:** *Lack of carbohydrates*

☑ **Correct Answer: Lack of all food values in the body (Starvation)**

Why It Is Rejected: *Marasmus is caused by a general lack of ALL food values (proteins, carbohydrates, fats, vitamins, and minerals) – not just one nutrient. Saying "lack of carbohydrates" is too specific and describes a different condition. The correct answer reflects total starvation.*

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Note: Kwashiorkor is caused by lack of proteins specifically. Do not confuse the two!

Question 16: *What is a balanced diet?*

❌ **Rejected Answer:** *A balanced diet is a meal that contains all food values in their right amount.*

☑ **Correct Answer: A balanced diet is a diet that contains all food values in their right amount.**

Why It Is Rejected: *The word "meal" is incorrect – a meal is a single serving of food eaten at one time (e.g., breakfast, lunch, supper). A diet is the overall pattern of eating over a period of time (e.g., a day, a week). A single meal does not have to contain all food values – but a balanced diet over the whole day should. Examiners are strict about this distinction!*

Question 17: *What is food?*

❌ **Rejected Answer:** *Food is anything good to eat or drink.*

☑ **Correct Answer: Food is anything taken into the body to nourish it.**

Why It Is Rejected: *The rejected definition is vague and unscientific – it does not explain the purpose of food (to nourish the body). Examiners expect a definition that includes the function of food – i.e., to provide nutrients for energy, growth, and health. Saying "good to eat or drink" is a social/cultural view of food, not a scientific one.*

Question 18: *Why are handles of iron boxes or frying pans made of wood?*

❌ **Rejected Answer:** *To prevent burns to the users.*

☑ **Correct Answer: Wood is an insulator of heat which prevents the user's hand from being burnt.**

Why It Is Rejected: *The rejected answer only states the effect (prevents burns) – it does not explain why wood prevents burns. Examiners expect the scientific reason – wood is a poor conductor (insulator) of heat, so it does not get hot easily, protecting the user's hand.*

Question 19: *Which type of life cycle do tsetse flies undergo? Give a reason to support your answer.*

❌ **Rejected Answer:** *The life cycle of tsetse flies has four stages.*

☑ **Correct Answer: The larva stage of tsetse flies is totally different from the adult stage in terms of function and structure.**

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Why It Is Rejected: *"Has four stages" is a general description – it does not explain why it is a complete life cycle. The key feature of a complete life cycle is that the larva looks completely different from the adult (in structure and function). Examiners want the specific reason, not just a count of stages.*

Question 20: Which type of life cycle do grasshoppers undergo? Give a reason to support your answer.

❌ **Rejected Answer:** *The life cycle of a grasshopper has three stages.*

✅ **Correct Answer:** **The nymph stage of the grasshopper resembles the adult stage in structure.**

Why It Is Rejected: *"Has three stages" is a general description – it does not explain why it is an incomplete life cycle. The key feature of an incomplete life cycle is that the nymph resembles the adult (in structure, though it may lack wings and reproductive organs). Examiners want the specific reason, not just a count of stages.*

⭐ **Final Advice:** Always read the question carefully – know what is being asked. If it asks for a disease, give the disease name, not the organism. If it asks for a specific part, give the specific part, not the general organ. If it asks for a reason, give the scientific reason – not a vague statement.

7. Food Chains – Using Spear-Headed Arrows Correctly

⭐ **Golden Rule:** A food chain shows the flow of energy from one organism to another. If a decomposer (like bacteria or fungi) is INCLUDED in the list of organisms given, you MUST include it at the END of the chain. The arrow points FROM the last living organism TO the decomposer.

❌ Rejected vs. ☑️ Accepted

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Question: *Use the organisms given in the list below and form a food chain: Groundnut, bacteria, lion, squirrel*

❌ **Rejected Answer:** *Groundnut → squirrel → lion* (if bacteria was in the list)

☑ **Correct Answer: Groundnut → squirrel → lion → bacteria**

Why: The list included bacteria – so it must be included in the food chain. Leaving it out means you have not used all the organisms given – which loses marks.

☑ Correct Food Chain Structure

Step	Action
1.	Start with the **producer** (plant) – e.g., *Groundnut*
2.	Add a **spear-headed arrow (→)** pointing **from the food to the eater** – e.g., *Groundnut → Squirrel*
3.	Continue the chain to the **top predator** – e.g., *Squirrel → Lion*
4.	If a decomposer is in the list, add it at the **end** – e.g., *Lion → Bacteria*

Quick Check: Test Yourself!

Use the organisms given and form a food chain: Grass, grasshopper, frog, snake, fungi

❌ Grass → grasshopper → frog → snake → ☑ **Grass → grasshopper → frog → snake → fungi**

⭐ **Final Advice:** ALWAYS use ALL organisms given in the list. Use spear-headed arrows (→) pointing from the food to the eater – and from the last living organism to the decomposer!

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8. Guidance on Diagrams in Section B

Golden Rule: When a diagram part is labelled with a letter (e.g., Q for the liver), and the question asks about that part (e.g., "Which part produces bile juice?"), the learner MUST write the LETTER (Q), not the name (liver), because the question is referring to the diagram and its labels.

The Problem

In Section B, you are given a diagram with parts marked by letters (e.g., P, Q, R, S, T). Below the diagram, you may be asked:

Question: *Which part produces bile juice on the diagram above?*

✗ **Rejected Answer:** *Liver*

☑ **Correct Answer:** Q (the letter shown on the diagram)

Why It Is Rejected: The question specifically says "on the diagram above" – this means the answer must refer to the label on the diagram, not the scientific name. The examiner wants to know if you can read the diagram and match the letter to the correct part.

☑ How to Avoid This Mistake

Step	Action
1.	Read the question carefully – look for the phrase **"on the diagram"** or **"shown above"**.
2.	Look at the diagram – find the part being described (e.g., liver).
3.	Check the letter used – what letter is written next to that part? (e.g., **Q**)
4.	Write ONLY the letter – do NOT write the name unless asked.

Quick Check: Test Yourself!

Diagram of a flower (parts labelled): P = Petals, Q = Sepals, R = Stamen, S = Pistil

Question: *Which part produces pollen grains on the diagram above?*

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❌ Stamen → ☑ R

📌 Additional Guidance: Labeling Diagrams

When asked to use an arrow and a letter to indicate a part on a diagram:

> ⭐ **Golden Rule:** Always use a SHARP PENCIL. Draw a SIMPLE, CONTINUOUS, UNBROKEN LINE (not a sharp arrow and not a broken line) from the part to the letter. Place the letter CLEARLY at the end of the line.

❌ Wrong Way	☑ Correct Way
Use a pen to draw the line.	Use a **sharp pencil** (erasable and neat).
Draw a sharp, pointed arrow (➤).	Draw a **simple, continuous line** (———).
Draw a broken/dashed line (- - - -).	Draw a **continuous, unbroken line** (———).
Place the letter too far from the line.	Place the letter **clearly at the end** of the line.

> ⭐ **Final Advice:** When a question says "on the diagram," your answer must be the LETTER used on the diagram. The examiner is testing whether you can read and interpret the diagram – not whether you remember the scientific name. Always check the letter and write ONLY that letter!

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9. Guidance on Drawing Light Diagrams – Lenses

> ⭐ **Golden Rule:** When drawing light rays through a lens, all lines must enter the lens up to the APPARENT CENTRE because that is where the bending begins. The ray that passes through the exact middle does NOT bend. Other rays bend towards the thicker part.

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🔍 Step-by-Step Guide

Step	Action
1.	Draw a **dotted line** (principal axis) through the middle of the lens.
2.	Draw incoming rays hitting the lens **up to the apparent centre**.
3.	The ray through the middle **does not bend** – it goes straight.
4.	Other rays bend **towards the thicker part** of the lens.
5.	**Concave lens** (thin middle) → rays **spread apart**. **Convex lens** (thick middle) → rays **meet**.

📊 Quick Comparison Table

Type of Lens	Middle Thickness	Effect on Light Rays
Concave lens	Thinner in middle, thicker at edges	Rays **spread apart (diverge)**
Convex lens	Thicker in middle, thinner at edges	Rays **come together (converge)**

> ⭐ **Final Advice:** When drawing light diagrams for lenses, always: (1) draw a dotted line through the middle, (2) bring all rays to the apparent centre, (3) keep the middle ray straight, and (4) bend the other rays towards the thicker part. Use a pencil and ruler. Add arrows to show the direction of light.

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10. Guidance on Answering Step-by-Step Questions (4 Marks)

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⭐ **Golden Rule:** For questions that ask you to explain something 'in four steps,' you MUST: (1) Write each step as a complete, clear sentence. (2) Avoid personal pronouns like 'I,' 'we,' or 'my.' (3) Write in the present tense. (4) Ensure each step is a scientific statement, not a personal action.

❌ Common Mistake – Using Personal Pronouns

❌ *I wash my hands with clean water and soap.* (Personal – uses "I" and "my")
☑️ *Wash hands with clean water and soap.* (Scientific – impersonal)

📊 Example: 'In Four Steps, Explain How Rain Is Formed'

❌ Wrong (Personal):

1. *First, I see the sun heating water.*
2. *Then I see the water vapour rising.*
3. *Then I notice the vapour cooling down.*
4. *Finally, I see the droplets falling as rain.*

☑️ Correct (Impersonal):

1. *The sun heats water from lakes, rivers, and oceans.*
2. *The water evaporates and rises as water vapour.*
3. *The water vapour cools and condenses into tiny water droplets, forming clouds.*
4. *The droplets become heavy and fall as rain.*

📊 Example: 'In Four Steps, Explain How to Prepare ORS Locally'

❌ Wrong (Personal):

1. *First, I get a clean container.*
2. *Then I add the ORS powder to the water.*
3. *Then I stir it with a spoon.*
4. *Finally, I give it to the patient.*

☑️ Correct (Impersonal):

1. *Get a clean container.*
2. *Add the ORS powder to the recommended amount of cool boiled water.*

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3. *Stir the mixture thoroughly with a clean spoon.*
4. *Give the prepared ORS solution to the patient to drink in small sips.*

> ⭐ **Final Advice:** In step-by-step questions, always use IMPERSONAL language. Do NOT write 'I,' 'we,' or 'my.' Write scientific instructions that could be followed by anyone. Each step should be a complete sentence.

11. Guidance on Answering 'Explain How' Questions (2 Marks)

> ⭐ **Golden Rule:** For 2-mark 'Explain how...' questions, your answer should be: (1) Clear and direct – no unnecessary words. (2) Step-by-step – show the process. (3) Not more than 2½ lines – quality over quantity! (4) No personal pronouns – keep it scientific.

📊 Example 1: Uncontrolled Bush Burning

Question: *Explain how uncontrolled bush burning causes soil erosion.*

❌ Wrong (Too long – over 4 lines):
Bush burning removes the vegetation cover. It exposes the soil. Then water and wind carry away the soil.

☑️ Correct (2½ lines – clear and concise):
Bush burning removes vegetation cover, exposing the soil to agents of erosion like water and wind, which then carry away the topsoil.

📊 Example 2: Mulching Improves Soil Fertility

Question: *Briefly explain how mulching improves soil fertility.*

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❌ Wrong (Too long – 3+ lines):

Mulching is the process of covering the soil with dry grass or leaves. It helps to add nutrients to the soil when it rots.

✅ Correct (2 lines – clear and concise):

Mulch adds nutrients to the soil as it decomposes, and it helps to retain moisture which supports soil organisms that improve fertility.

📊 Example 3: Mulching Controls Weeds

Question: *Explain how mulching controls weeds in the garden.*

❌ Wrong (3+ lines):

When you put mulch on the soil, it covers the ground and stops weeds from growing because they cannot get sunlight. So the weeds die.

✅ Correct (1½ lines – clear and precise):

Mulch covers the soil, blocking sunlight from reaching weed seeds and preventing them from germinating.

🧠 **Quick Check: Test Yourself!**

Question: *Explain how uncontrolled bush burning causes soil erosion.*

❌ **Bush burning removes the grass. Then the soil is bare. Then water carries it away.**
→ ✅ **Bush burning removes vegetation cover, exposing the soil to water and wind which cause erosion.**

🌟 **Final Advice:** For 'Explain how' questions, do not write a definition – explain the PROCESS. Be clear, step-by-step, and keep it to 2½ lines. Examiners reward precise, scientific explanations – not long essays!

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12. Guidance on Calculation Questions

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Golden Rule: For calculation questions, you MUST: (1) Write the correct formula. (2) Show the substitution (working). (3) Write the correct units on your final answer. Even if your final answer is correct, you can lose marks if you miss any of these steps!

Mark Allocation – What Examiners Look For

What to Write	Marks
Correct formula	1 mark
Correct substitution and calculation	1 mark
Correct units on the final answer	1 mark (if question is 3 marks)

Common Formulae in Primary Science

Quantity	Formula	Unit
Density	*Density = Mass ÷ Volume*	g/cm³
Speed (sound)	*Speed = Distance ÷ Time*	m/s
Work / Energy	*Work = Force × Distance*	Joules (J)
Volume (regular objects)	*Volume = Length × Width × Height*	cm³ or m³
Moments	*Load × Load Arm = Effort × Effort Arm* (or *L × LA = E × EA*)	N·cm or N·m
Mechanical Advantage (general)	*M.A. = Load ÷ Effort*	ratio (no unit)
Mechanical Advantage (inclined plane)	*M.A. = Length of Slope ÷ Height of Slope*	ratio (no unit)
Efficiency	*Efficiency = (M.A. ÷ V.R.) × 100%*	%
Temperature conversion (°C to °F)	*°F = (°C × 9/5) + 32*	°F

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Temperature conversion (°F to °C)	$°C = (°F - 32) \times 5/9$	°C
Weight / Force	$Weight\ (N) = Mass\ (kg) \times 10$	Newtons (N)

Examples for Each Formula

1. Density

Question: *Calculate the density of a piece of soap that has mass of 60 g and volume of 30 cm³.*

Density = Mass ÷ Volume

= 60 g ÷ 30 cm³

= **2 g/cm³**

2. Speed of Sound

Question: *A boy claps his hands and hears an echo 2 seconds later. If the wall is 340 metres away, what is the speed of sound?*

Speed = Distance ÷ Time

= (2 × 340 m) ÷ 2 s

= 680 m ÷ 2 s

= **340 m/s**

(Sound travels to the wall and back – so total distance = 2 × 340 m = 680 m.)

3. Work / Energy

Question: *A force of 50 N is used to push a box 4 metres. How much work is done?*

Work = Force × Distance

= 50 N × 4 m

= **200 J**

4. Moments

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Question: A see-saw has a load of 40 N placed 2 m from the pivot. If the effort is 80 N, what is the effort arm?

Load × Load Arm = Effort × Effort Arm

40 N × 2 m = 80 N × EA

80 N·m = 80 N × EA

EA = 80 N·m ÷ 80 N

EA = **1 m**

5. Mechanical Advantage (General)

Question: *A machine uses an effort of 20 N to lift a load of 100 N. Calculate the mechanical advantage.*

M.A. = Load ÷ Effort

= 100 N ÷ 20 N

= 5 (no unit – it is a ratio)

6. Mechanical Advantage (Inclined Plane)

Question: *A ramp is 10 m long and 2 m high. Calculate the mechanical advantage of the inclined plane.*

M.A. = Length of Slope ÷ Height of Slope

= 10 m ÷ 2 m

= 5 (no unit – it is a ratio)

7. Efficiency

Question: *A machine has a mechanical advantage of 4 and a velocity ratio of 5. Calculate its efficiency.*

Efficiency = (M.A. ÷ V.R.) × 100%

= (4 ÷ 5) × 100%

= 0.8 × 100%

= **80%**

8. Temperature Conversion (°C to °F)

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Question: Convert 100 °C to Fahrenheit.

°F = (°C × 9/5) + 32

= (100 × 9/5) + 32

= (900/5) + 32

= 180 + 32

= 212 °F

9. Temperature Conversion (°F to °C)

Question: *Convert 212 °F to Celsius.*

°C = (°F − 32) × 5/9

= (212 − 32) × 5/9

= 180 × 5/9

= 900/9

= **100 °C**

10. Converting Kilograms to Newtons

Question: *Convert 5 kg to Newtons.*

Weight (N) = Mass (kg) × 10

= 5 kg × 10 N/kg

= **50 N**

📌 Quick Reference Card

M.A. for inclined plane = Length of Slope ÷ Height of Slope – this is a ratio, so no units!

Speed of sound = Distance ÷ Time (m/s)

Density = Mass ÷ Volume (g/cm³)

Work = Force × Distance (Joules)

°F = (°C × 9/5) + 32

°C = (°F − 32) × 5/9

Weight (N) = Mass (kg) × 10

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Quick Check: Test Yourself!

Calculate the density of a block of wood with mass 50 g and volume 25 cm³.

❌ 2 → ☑ **Density = Mass ÷ Volume = 50 g ÷ 25 cm³ = 2 g/cm³**

Convert 50 °C to Fahrenheit.

❌ 100 °F → ☑ **°F = (50 × 9/5) + 32 = 90 + 32 = 122 °F**

⭐ **Final Advice:** For calculation questions, always show your formula, your working, and your units. Even if you make a small mistake in the calculation, you can still score marks for the formula and working. Never just write the final number!

13. Commonly Tested Definitions – Accepted Standard Responses

⭐ **Golden Rule:** In the current curriculum, examiners accept SHORT, PRECISE definitions – not long, wordy ones. The key is to include the ESSENTIAL idea without extra details.

Concept	☑ Accepted Definition
Food chain	*The flow of energy from one organism to another.*
Photosynthesis	*The process by which plants make their own food.*
Electric circuit	*A complete path through which electricity flows.*
Germination	*The development of a seed into a seedling.*
Soil erosion	*The removal of topsoil.*

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Magnet	*A material that attracts magnetic materials.*
Matter	*Anything that has mass and occupies space.*
Habitat	*A place where an organism lives.*
Fertilisation	*Fusion of male and female gametes.*
Pollination	*Transfer of pollen from anther to stigma.*
Balanced diet	*A diet that contains all food values in their right amount.*
Food	*Anything taken into the body to nourish it.*

🔴 **Quick Check: Test Yourself!**

What is germination?

❌ Growth of a seed. → ☑ **The development of a seed into a seedling.**

What is a balanced diet?

❌ A meal with all food values. → ☑ **A diet that contains all food values in their right amount.**

🌟 **Final Advice:** In the current curriculum, SHORT and PRECISE definitions are accepted. Do not write long, wordy definitions – you may lose marks for including unnecessary details. Stick to the standard responses your teacher has given you!

14. Diseases and their Germs – What to Write in Exams!

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⭐ **Golden Rule:** Under the new curriculum, you are required to write the TYPE of germ (e.g., bacteria, virus, protozoa, fungus, worm) – NOT the specific scientific name (e.g., *Vibrio cholerae*, *Plasmodium*). Examiners will REJECT the scientific name!

Complete Table: Disease → Type of Germ

Disease	☑ Type of Germ (Write This!)	✗ Scientific Name (DO NOT Write This!)
Cholera	**Bacteria**	*Vibrio cholerae*
Typhoid	**Bacteria**	*Salmonella typhi*
Tuberculosis (TB)	**Bacteria**	*Mycobacterium tuberculosis*
Pneumonia	**Bacteria**	*Streptococcus pneumoniae*
Diphtheria	**Bacteria**	*Corynebacterium diphtheriae*
Tetanus	**Bacteria**	*Clostridium tetani*
Gonorrhoea	**Bacteria**	*Neisseria gonorrhoeae* (Gonococci)
Trachoma	**Bacteria**	*Chlamydia trachomatis*
Bacillary dysentery	**Bacteria**	*Shigella*
Malaria	**Protozoa**	*Plasmodium*
Sleeping sickness	**Protozoa**	*Trypanosoma*
Coccidiosis (in animals)	**Protozoa**	*Eimeria*
Amoebic dysentery	**Protozoa**	*Entamoeba histolytica*
Candidiasis (fungal STD)	**Fungus**	*Candida*
Ringworm	**Fungus**	*Tinea*

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Athlete's foot	Fungus	*Tinea pedis*
Bilharzia	Worm	*Schistosoma*
River blindness	Worm	*Onchocerca volvulus*
Elephantiasis	Worm	*Wuchereria bancrofti*
Influenza (Flu)	Virus	*Influenza virus*
HIV / AIDS	Virus	*Human Immunodeficiency Virus*
Ebola	Virus	*Ebola virus*
COVID-19	Virus	*Coronavirus (SARS-CoV-2)*
Measles	Virus	*Measles virus*
Polio	Virus	*Poliovirus*
Rabies	Virus	*Rabies virus*
Yellow fever	Virus	*Yellow fever virus*

Quick Check: Test Yourself!

Write the correct type of germ for each disease:

- Cholera → **Bacteria**
- Malaria → **Protozoa**
- Bilharzia → **Worm**
- River blindness → **Worm**
- Sleeping sickness → **Protozoa**
- Ringworm → **Fungus**
- Ebola → **Virus**
- Gonorrhoea → **Bacteria**
- Trachoma → **Bacteria**

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Final Advice: Memorise the TYPE of germ – not the scientific name. Examiners will REJECT scientific names like *Vibrio cholerae*, *Plasmodium*, or *Schistosoma*. Stick to: BACTERIA, VIRUS, PROTOZOA, FUNGUS, or WORM!

15. Final Advice for Candidates

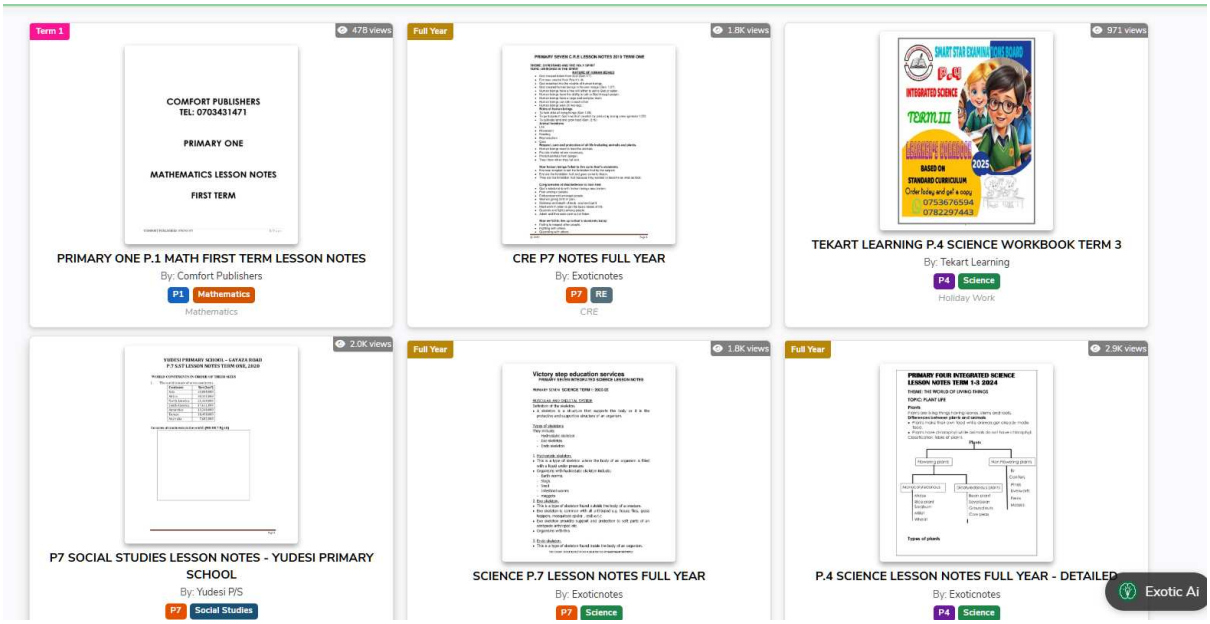
Summary of Key Rules

Rule	Example
Start with the subject	*A cow breathes.* (Not *It breathes.*)
Use 'while' for differences	*Mass is in kg **while** weight is in N.*
Use 'Both' for similarities	***Both** are irreversible.*
Use 'I would advise' for advice	***I would advise** him to eat food rich in proteins.*
Use 'I think' for 'Why do you think?'	***I think** it is because...*
For adaptations, state part + use	*...which enables it to...*
Never start with 'Because' alone	*The heart pumps blood...* (Not *Because it pumps blood.*)
Never write 'For study purpose'	Always give a specific, scientific reason.
In step-by-step, avoid 'I', 'we'	*Wash hands...* (Not *I wash my hands...*)
In calculations, show formula, working, units	*Density = Mass ÷ Volume = 60g ÷ 30cm³ = 2 g/cm³*

Quick Reference Card

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