Let the mind manage the body
Que l'esprit gère le corps

MAURITIUS EXAMINATIONS SYNDICATE

EXAMINERS' REPORT

NCE 2025

BIOLOGY COMPONENT

Subject code: N530

April 2026

Table of Contents

1. Introduction

The 2025 National Certificate of Education (NCE) Biology assessment was designed to assess candidates' understanding and application of essential concepts from the Grade 9 Biology Teaching and Learning syllabus[1]. The paper carried 50 marks and consisted of six questions. It included multiple-choice items, short-structured questions, open-ended responses, interpretation of diagrams, practical-science procedures, and data handling.

The 2025 paper sampled a broad range of the syllabus content, including Blood Circulatory System, Reproduction, Biodiversity, Nutrition in plants and the use of basic scientific data. In line with the Teaching and Learning Syllabus and the MES Annual Programme[2], the paper did not only test factual recall. It also required candidates to interpret scientific diagrams, distinguish between related concepts, apply knowledge to new contexts, follow experimental procedures, and analyse simple numerical information.

A total of 13974 school candidates sat for Science (Biology). The overall pass rate in Science was 75.96%.

The mark distribution shows a paper with a wide spread of attainment rather than an excessive concentration in one narrow band. The mean mark on the Biology component was 25.4 out of 50 and the median mark was 25. About 19.5% of candidates scored between 40 and 50 marks, while about 25.7% scored below 15 marks. The distribution confirms that the paper was accessible to a majority of candidates, but it also revealed a substantially lower-performing group that struggled even with some short-answer and objective items.

This report focuses on academic performance. It identifies what candidates generally knew, what they found difficult, what these response patterns suggest about classroom learning, and which pedagogical approaches may better prepare future cohorts.

2. Key messages

Candidates generally showed a fair grasp of basic biological knowledge, especially where questions required recall of familiar facts, straightforward identification, or direct labelling.

Performance was weaker when candidates had to explain, justify, distinguish between closely related ideas, or apply knowledge in an unfamiliar or practical context.

Language and precision of expression continue to affect performance. In open-ended items, many responses were vague, incomplete, or not sufficiently linked to the demand of the question.

[1] Teaching and Learning Syllabus Grades 7, 8 and 9 (2017): Mauritius Institute of Education
[2] Annual Programme for the NCE 2025: Mauritius Examinations Syndicate

Several candidates showed weaknesses in scientific literacy skills such as interpreting trends, selecting relevant information, sequencing experimental steps, and drawing valid conclusions from practical work.

Data handling remains a major area for improvement. Question 6, which required graph plotting, description of trend and calculation of an average, was the least-scoring question in the paper. Candidates need more sustained classroom practice with diagrams, short constructed responses, practical investigations, command words, and quantitative reasoning in biological contexts.

3. General performance of candidates

The overall performance in Biology in 2025 may be described as fair but uneven. A majority of candidates demonstrated enough knowledge to access a substantial part of the paper. At the same time, the mark distribution shows a wide spread of attainment, indicating clear differences in depth of understanding.

The mean mark of 25.4 and the median of 25 suggest that the typical candidate obtained roughly half the available marks. The interquartile range, approximately from 14 to 37 marks, shows that the middle 50% of the candidature was distributed across a broad performance band. This pattern suggests that the paper discriminated reasonably well between lower-, middle- and higher-attaining candidates.

The performance bands also reveal useful trends. Approximately 19.5% of candidates scored between 40 and 50 marks. These candidates were generally able to combine sound recall with acceptable application and some degree of precision in scientific communication. At the lower end, roughly a quarter of candidates scored below 15 marks. For this group, the main difficulties included weak command of key biological vocabulary, poor interpretation of questions, limited familiarity with practical work, and weak numerical or graph-related skills.

Compared with the broad profile typically expected at this level, the 2025 paper confirms three features of the candidature:

1. Knowledge-based items were more accessible than reasoning-based items;
2. Short, direct questions were generally better answered than extended open-ended parts;
3. Candidates found it difficult to move from biological content knowledge to scientific use of knowledge, especially when they had to interpret evidence, explain a process, or present information in graphical form.

4. General comments on the paper

The paper covered a good spread of topics from the syllabus and contained a balance of objective and structured questions. The multiple-choice section sampled a wide range of knowledge, while later questions explored more focused areas such as photosynthesis, biodiversity, transport in humans, and sexually transmitted diseases.

The paper also made legitimate demands in relation to the syllabus. Candidates were expected to:

- know key structures and functions in the human body and in plants;
- distinguish between related concepts such as artery and vein, xylem and phloem, socio-economic and ecological benefits, or result and conclusion;
- recall and sequence the steps of a common biology practical;
- extract information from a table, convert it into a graph, interpret the pattern and calculate an average.

Where candidates performed weakly, this was often less a matter of total lack of exposure to the topic and more a matter of shallow learning. Many responses showed that learners recognised words or themes, but could not use them accurately. In several questions, candidates gave answers that were loosely related to the topic but did not answer the specific question. This indicates the need for stronger classroom emphasis on meaning, precision, and transfer of learning.

It is also important to note that some questions exposed the effect of weak reading habits. Candidates frequently overlooked qualifiers such as one, two, other, possible, function, conclusion, and describe the trend. These words often carry the assessment demand. When learners do not attend carefully to such cues, they lose marks even when they possess some relevant knowledge.

5. Question-by-question analysis

Question 1 - Multiple-choice items (10 marks)

Question 1 consisted of ten multiple-choice items drawn from different parts of the syllabus. The question mainly assessed knowledge and understanding, but some items also required the interpretation of diagrams or the discrimination between related concepts. The section was generally accessible. However, several items exposed pedagogically significant misconceptions.

General strengths

Candidates generally did reasonably well on the more direct recall items. Many knew that plasma transports dissolved substances, that arteries carry blood under high pressure, that the testis produces sperms, that AIDS is caused by a virus, and that glucose is produced during photosynthesis. The section provided most candidates with an initial entry point into the paper.

General weaknesses

Several candidates had difficulty with careful reading of the stem and options. A few items also revealed weak conceptual distinctions: organism that can be counted with a quadrat versus those that move; and leaf margin versus midrib or vein network.

Item analysis

(a) Which of the following is a function of plasma in blood?

Key: D – It transports carbon dioxide

Objective: to identify the role of plasma as the liquid component of blood that transports dissolved substances.

Most successful candidates selected the transport function. Incorrect answers suggested confusion between blood components. Responses such as 'produces antibodies' point to confusion between plasma and white blood cells, or with the immune function more broadly.

Teaching should emphasise comparison across blood components.

(b) Which of the following statements about an artery is true?

Key: C – It carries blood under high pressure.

Objective: to relate vessel structure to blood pressure and direction of blood flow.

Many candidates correctly identified that arteries carry blood under high pressure. Wrong answers showed that some learners still memorise isolated statements without relating the function to the structure.

(c) In which component is haemoglobin found?

Key: A: Component 1 (shown on the photomicrograph)

Objective: to identify the component of blood in which haemoglobin is found and to distinguish between the blood components in a photomicrograph.

Candidates who recognised red blood cells performed well. Errors suggest poor familiarity with the microscopic appearance of blood. This reinforces the need for repeated exposure to visual representations.

(d) Which of the following statements about sexual reproduction is true?

Key: C – It involves the formation of gametes.

Objective: to identify a defining feature of sexual reproduction.

This item required conceptual understanding rather than recall of a single fact. The correct idea was that sexual reproduction involves the formation of gametes. Some candidates appeared attracted to statements about a single parent or division into two, showing confusion with asexual and sexual reproduction. Educators should explicitly compare the two modes of reproduction using parallel features: number of parents, gametes, fertilisation, and genetic outcome.

(e) Female reproductive system- What is part X?

Key: B - Oviduct

Objective: to identify a labelled part of the female reproductive system.

Success on this item depended on familiarity with the side-view diagram. Candidates who confused uterus, oviduct and ovary may know the words but not the spatial arrangement. More labelling practice from different diagram orientations (front and side views) is advised.

(f) Which organ of the male reproductive system produces sperms?

Key: C - Testis

Objective: to identify the function of the testis.

The majority of candidates from all the ability groups correctly identified the testis.

(g) Which of the following causes AIDS?

Key: A – A virus

Objective: to identify HIV as a viral disease.

The most common distractor chosen was bacterium.

(h) Which of the following is produced in plants during photosynthesis?

Objective: to identify glucose as a product of photosynthesis.

Chlorophyll was a common distractor opted by more than 33% of candidates. Chlorophyll is a familiar words that candidates have encountered at primary level as well. They may have associated this answer with photosynthesis without carefully reading the question.

(i) Which of the following can be counted using a quadrat?

Key: A – Snails

Objective: to apply knowledge of ecological sampling tools.

The answer is the organism that is suitably counted by a quadrat. While trees are fixed organisms, they are usually counted using transects. Candidates choosing moving organisms revealed a weak grasp of what quadrats are for. Fieldwork methods should always be taught through the logic of the tool: quadrats for stationary organisms, capture-mark-release or transects for other contexts.

(j) Labelled part of a leaf

Key: C - Midrib

Objective: to identify an external leaf structure from a diagram.

Some candidates chose the margin instead of the correct labelled structure. This suggests that line pointers in diagrams are not always interpreted carefully. Educators should use enlarged diagrams and short diagnostic quizzes on leaf parts.

Pedagogical implications for Question 1

Educators should use MCQs diagnostically, not only for revision. Each distractor can be linked to a common misconception. After a quiz, students should be asked to explain why the incorrect options are wrong. This develops discrimination, reduces careless errors, and strengthens conceptual understanding. Regular use of labelled diagrams, matching exercises, 'compare and contrast' charts, and oral justification of MCQ choices would be especially beneficial.

Question 2 - Leaf structure and photosynthesis (7 marks)

Question 2 assessed knowledge of leaf structure and the process of photosynthesis. It combined a matching exercise with the interpretation of a whole-plant diagram. The question was generally accessible and many candidates earned marks, but some persistent misconceptions were evident.

Relevant syllabus objectives assessed

- identify structures in the leaf and relate them to their biological functions;
- explain that photosynthesis requires light, carbon dioxide, water and chlorophyll;
- identify inputs and outputs involved in photosynthesis;
- use diagrams of plants to communicate understanding of processes.

Part (a): Matching leaf parts with functions

Objective: to match phloem, xylem, stomata and chlorophyll with their corresponding functions.

This part was fairly well attempted. Many candidates showed a basic understanding of the functions of stomata, xylem and phloem. However, confusion between xylem and phloem remained common. This is a recurrent weakness and suggests that some learners memorise the terms without anchoring them to the substances transported. A useful classroom strategy is to link xylem consistently with upward transport of water and minerals from roots, and phloem with transport of manufactured food from leaves to other parts.

A further point from the item analysis concerned chlorophyll and leaf adaptations. Chlorophyll absorbs light and the large leaf surface maximises light absorption. Candidates need precise teaching that distinguishes pigment function from organ adaptation.

Part (b): Process of photosynthesis

Objective: to identify the substances involved in photosynthesis and the products released.

This was a high-scoring part. Many candidates were able to identify carbon dioxide entering the leaf, water moving from the roots, and oxygen being released. Errors occurred where candidates confused oxygen release with carbon dioxide taken up during photosynthesis or mixed up transport of water and minerals up the plant with the transport of food. A few candidates wrote water vapour for A and were awarded marks as it was in the gas state although the expected answer was oxygen.

Strengths shown by candidates

- a sound basic recall of key terms linked to photosynthesis;
- ability to interpret a familiar diagram of the whole plant;

Weaknesses shown by candidates

- xylem and phloem are poorly distinguished by a notable group of learners;
- clarity in how the leaf is adapted for photosynthesis and the roles of the different parts (chlorophyll, stomata, xylem, phloem, leaf surface, etc…)

Pedagogical input for educators

This topic should be taught with an integrated approach rather than as a list of independent facts. Learners should repeatedly answer questions such as:

- What enters the leaf?
- What leaves the leaf?
- What travels through xylem?
- What travels through phloem?
- What happens inside the chloroplast?
- What is the role of stomata?

Using colour-coded arrows on diagrams can be effective here. Educators should also vary the diagrams used so that learners do not rely on a single textbook image.

Question 3 - Biodiversity (7 marks)

Question 3 centred on biodiversity and required candidates to show an understanding of both the value of biodiversity and the factors that threaten it. Although the content is familiar to learners, this question required candidates to create their own answer rather than selecting from the options provided. The performance in this question highlighted weaknesses in the effective use of language when expressing scientific ideas in writing.

Relevant syllabus objectives assessed

- define or explain the importance of biodiversity;
- identify socio-economic and ecological benefits of biodiversity;
- recognise natural and human factors that reduce biodiversity;
- relate biodiversity loss to environmental consequences.

Part (a): Benefits of biodiversity

Objective: to distinguish between a socio-economic benefit and an ecological benefit.

This part was only partly successful. Many candidates gave one acceptable example, but a substantial number confused the two categories. Some inverted their responses, giving an ecological point as socio-economic or vice versa. Others offered statements about protecting the environment rather than the benefits of biodiversity itself.

Acceptable socio-economic answers included provision of food, timber, medicine, employment, tourism and foreign exchange earnings. Acceptable ecological answers included maintenance of food chains, decomposition, gas balance, pollination, and prevention of extinction. Vague answers such as 'good for the environment' or 'soil erosion' without explanation did not meet the demand of the question.

The main difficulty here was classification. Candidates often had relevant ideas but could not place them in the correct category.

Part (b): Natural calamities and their effects

Objective: to identify a natural event and explain one way in which it affects biodiversity.

Many candidates could name a natural calamity such as cyclone, flood, drought or forest fire. The follow-up part was more demanding because candidates had to explain the effect of the natural calamity on biodiversity. Better responses linked the event to habitat destruction, death or displacement of organisms, soil erosion or reduced population size. Weaker answers repeated the calamity, used vague phrases such as 'affects the environment', or failed to show how biodiversity was altered.

Part (c): Human activities affecting biodiversity

Objective: to identify a human activity leading to forest decline and two other activities affecting biodiversity.

Many candidates correctly gave deforestation for the first part. However, the second part required two other examples of how human activities affect biodiversity. Some repeated deforestation or gave two examples that were really the same idea, such as two forms of pollution. Some responses also focused on general wrongdoing rather than biologically relevant actions.

Strengths shown by candidates

- most candidates were aware that biodiversity can be affected by both natural and human factors;
- many could give at least one correct example, especially deforestation or cyclone;

Weaknesses shown by candidates

- confusion between category labels, especially socio-economic versus ecological;
- inadequate explanation of effects;
- failure to pay attention to qualifiers such as one way or two other examples;
- use of vague language.

Pedagogical input for educators

This topic should be taught with stronger emphasis on classification, reasoning and local application. A useful method is to present mixed statements and ask learners to sort them under headings such as ecological benefit, socio-economic benefit, natural threat, and human threat. Learners should then justify why each statement belongs to a particular category.

Educators should also encourage the use of Mauritius-based examples: mangroves, forests, lagoons, tourism, endemic species, cyclones, invasive species, and land clearing. Such contexts make the concepts concrete and support transfer in the examination.

Another important strategy is to teach students how to complete the move from example to effect. For instance:

Cyclone → uproots trees → destroys habitat → reduces populations;
Deforestation → removes habitat and food sources → causes species decline.

This chain-of-effect approach helps candidates write fuller and more biologically meaningful answers.

Question 4 - Transport in humans and cardiovascular disease (8 marks)

Question 4 focused on transport in humans, specifically the heart, blood vessels, and cardiovascular disease. This was a relatively accessible question, especially in the earlier parts, but it also revealed an important misconception: a notable number of candidates still confuse arteries and veins.

Relevant syllabus objectives assessed

- identify the heart and explain its function;
- locate the heart in the human body;
- distinguish between artery and vein using direction of blood flow;
- relate blocked coronary arteries to cardiovascular disease;

- identify risk factors or causes associated with cardiovascular diseases.

Part (a)(i) and (ii): Naming the heart and stating its function

Objective: to identify the heart and state that it pumps blood around the body.

Most candidates answered these parts satisfactorily. They recognised the organ and generally understood that its role is to pump blood. Weaker responses such as 'it makes blood flow' or 'it carries blood' showed partial understanding but lacked precision. The distinction matters: the heart pumps; blood vessels carry.

Part (a)(iii): Locating the heart

Objective: to place the heart correctly in the thoracic region, slightly to the left.

This part was also well handled by many candidates. Some placed the mark on the wrong side, though candidates who wrote an accurate verbal description demonstrated underlying knowledge. This suggests that diagram orientation and body symmetry remain problematic for some learners.

Part (a)(iv): Identifying Q and R as artery or vein

Objective: to use the arrows showing blood flow direction to distinguish an artery from a vein.

This was the most discriminating part of Question 4. Many candidates interchanged arteries and veins, indicating that they have not internalised the fundamental idea that arteries carry blood away from the heart and veins carry blood towards the heart. Some may still rely on incomplete rules, such as arteries carry oxygenated blood and veins carry deoxygenated blood, which break down when students meet exceptions such as pulmonary vessels.

Part (b)(i): Disease caused by blocked coronary arteries

Objective: to identify heart attack or coronary heart disease as a consequence of blocked coronary arteries.

Most candidates identified a heart attack.

Part (b)(ii): Other causes of cardiovascular diseases

Objective: to identify risk factors such as unhealthy diet, smoking, lack of exercise, obesity or stress.

Many candidates earned full marks here. Weaker responses repeated the same idea in different words or named outcomes rather than causes.

Strengths shown by candidates

- sound recognition of the heart and its broad role;
- reasonable awareness of common cardiovascular risk factors;
- familiarity with blocked coronary arteries as harmful.

Weaknesses shown by candidates

- lack of precision in describing function;
- confusion about left-right position and blood vessel type;
- tendency to rely on memorised associations instead of understanding directional flow.

Pedagogical input for educators

Transport in humans should be taught through models of circulation. Rather than memorising lists, students should trace the route of blood physically or with arrows on large diagrams. Effective classroom questions include:

Where is the blood coming from?

Where is it going?

Is it moving towards or away from the heart?

Which vessel does that make it?

Educators should deliberately address the artery/vein misconception by showing pulmonary circulation as an exception to oxygen-based rules. This helps learners adopt the more robust directional definition.

Considering cardiovascular diseases, it is useful to connect biological content with health education. Short case studies, food-label analysis, and interpretation of lifestyle scenarios can deepen understanding while supporting the wider goals of scientific literacy and healthy living.

Question 5 - Experimental work on photosynthesis (7 marks)

Question 5 assessed understanding through a familiar experiment on photosynthesis. Candidates were required to explain why a plant is first kept in darkness, identify the leaf regions that would test positive for starch, sequence the steps of the starch test, and state a valid conclusion. Although the context is standard, performance was weaker than expected. This suggests that many candidates know fragments of the experiment without understanding its logic.

Relevant syllabus objectives assessed

- understand that light is necessary for photosynthesis;
- know how a leaf is tested for starch;
- appreciate the role of controls in a practical investigation;
- draw conclusions from observations.

Part (a): Why is the plant kept in darkness at the start of the experiment?

Objective: to recognise that the plant is destarched before the investigation.

This was poorly answered. Only a minority gave the precise idea of removing starch or destarching the plant. Common weak answers included 'to stop photosynthesis', 'to prevent sunlight', 'to get better results' or 'to see the difference'. These responses show some awareness that the first step prepares for the leaf/plant for the experiment, but the scientific purpose was not understood. Only 33% of candidates in the final score range of 40 – 50 scored the mark in this part.

Part (b): Which parts of the leaf would turn blue-black

Objective: to identify the leaf regions exposed to light as those containing starch.

This was better answered by most candidates, showing that many understood the link between light and starch formation at a basic level.

Part (c): Steps for testing a leaf for starch

Objective: to recall and sequence the standard procedure accurately.

This part proved demanding. Some candidates knew isolated steps but not the correct order. Others omitted key details, especially the need to heat alcohol in a water bath, rinse the leaf, and then add iodine solution. The item analysis highlighted that even stronger candidates lost marks through imprecise wording or wrong step given. This is important: in science practicals, sequence and method matter. Stating 'put in alcohol' is not the same as specifying safe and correct heating in a water bath.

Part (d): Conclusion from this experiment

Objective: to conclude that light is necessary for photosynthesis.

Many candidates could not distinguish observation from conclusion. Statements such as 'starch is present' describe a result, not the conclusion. The expected scientific inference was that only the exposed parts of the leaf produced starch, showing that light is required for photosynthesis.

Strengths shown by candidates

- a fair number recognised the light-exposed areas of the leaf;

Weaknesses shown by candidates

- poor understanding of destarching;
- incomplete or incorrectly ordered method;
- inability to move from observation to conclusion;
- insufficient precision in practical-science language.

Pedagogical input for educators

This question strongly suggests the need for more practical and semi-practical teaching activities. Learners should not only read the starch test procedure; they should see it, discuss it, and preferably perform or observe it in sequence. Educators should insist on the why behind each step:

boiling water ⟶ kills the leaf and stops reactions;

hot alcohol in water bath ⟶ removes chlorophyll;

rinse in water ⟶ softens the leaf;

iodine solution ⟶ tests for starch.

Another essential classroom move is to distinguish aim, observation, result and conclusion. Students should practise writing each separately. For example:

- Observation: exposed parts turn blue-black.
- Result: starch is present in the exposed parts.
- Conclusion: light is necessary for photosynthesis.

Such structured practice would improve performance considerably on inquiry-based questions.

Question 6 - HIV/AIDS, graph work and data handling (11 marks)

Question 6 carried the highest weighting on the paper and was the least-scoring question overall. It combined biological knowledge about HIV/AIDS and other sexually transmitted diseases with quantitative skills: graph plotting, trend description and calculation of an average.

Relevant syllabus objectives assessed

- know that HIV/AIDS is a sexually transmitted disease and identify ways of prevention;
- name other sexually transmitted diseases;
- present data on a graph using suitable axes and scales;
- describe trends in data;
- carry out a simple average calculation from a data set.

General performance

The item analysis indicates that many candidates scored only 2 to 5 marks out of 11, and some left parts unanswered, especially the graph. This suggests that for a significant number of learners, the barrier was not only biological knowledge but also confidence in handling numerical information.

Part (a): Plotting the graph

Objective: to convert table data into a line graph with correctly labelled axes, an appropriate scale, accurate plotting and a line joining the points.

This part exposed multiple weaknesses. A few candidates labelled both axes correctly and selected workable scales. Many, however, omitted labels, reversed the axes, chose poor scales, or tried to use the raw values as scale intervals without thinking about regular increments. Plotting itself was somewhat better, as some candidates could plot at least several points correctly once the correct scale was determined. A number then lost marks by drawing a bar chart instead of a line graph. Among the candidates who scored in the range of 40 – 50 marks in the paper, only about 50% scored the 4 marks available on this item.

This suggests that graphing is not sufficiently secure as a taught skill. Learners may be familiar with the appearance of graphs but not with the reasoning behind variable placement, scale choice and graph type.

Part (b): Describing the trend

Objective: to describe how the number of cases changed from 2017 to 2022 using trend language and relevant values.

Many candidates could identify some increase or decrease, but only a few described the pattern with adequate precision. The stronger response would note that the number of cases increased from 2017 to 2018, decreased through 2020, increased slightly in 2021, and rose again to the highest value in 2022. Appropriate figures from the data provided would be used. Weaker responses gave only one word, such as 'increase' or copied figures without relating them to the trend.

This reveals a broader literacy issue: students need structured language for describing data, for example steady increase, a sharp decrease, remained lower than, reached a peak, remained constant, fell to, then rose again.

Part (c): Calculating the average

Objective: to use appropriate mathematical knowledge in Biology

Only a minority calculated the average successfully. Some obtained partial credit by adding the values but not dividing correctly, or by making arithmetic mistakes. This is a significant signal of relatively poor mastery of mathematical concepts applicable in science, because the mathematics required in this item was basic. Weaknesses here may arise from limited number fluency or low confidence when mathematics appears in science. It should be noted that calculators are allowed in the Science assessment. Stronger candidates had no difficulty on this part.

Part (d): Suggesting a preventive measure

Objective: to state a valid measure for reducing new HIV/AIDS cases.

Many candidates gave acceptable answers such as using condoms, avoiding multiple sexual partners, abstinence, not sharing needles, or promoting awareness.

Part (e): Naming two other sexually transmitted diseases

Objective: to name two STDs other than HIV/AIDS.

Most candidates could name syphilis and gonorrhoea, though spelling was often weak.

Strengths shown by candidates

- basic awareness of HIV/AIDS as a public-health issue;
- generally acceptable knowledge of preventive measures and names of common STDs;
- some ability to plot points when the table is provided.

Weaknesses shown by candidates

- graph conventions not mastered;
- weak descriptive language for trends;
- poor accuracy in simple calculations;
- tendency to leave demanding sections unanswered.

Pedagogical input for educators

This question should not be seen only as a health-education item. It is also a scientific-literacy item. Biology teaching should regularly incorporate tables, graphs and short calculations. Candidates need repeated opportunities to:

- decide which variable goes on which axis;
- choose a regular scale;
- plot points carefully;
- decide when to use a line graph rather than a bar chart;
- describe change over time using evidence from data;
- calculate averages and other simple summary values.

A practical classroom approach is to use small weekly data tasks linked to biology topics: plant growth over days or disease cases over time. Such tasks normalise data handling and reduce the perception that graph work belongs only to mathematics.

Educators should also teach writing frames for trend description. For example:
'The number increased from ... to ... between ... and ... . It then decreased to ... in ... before rising again to ... in ... .'
This helps learners connect data values with verbal description and greatly improves answer quality.

6. Cross-cutting strengths, weaknesses and pedagogical implications

The 2025 paper reveals several patterns that cut across topics.

Areas of relative strength

1. Basic recall of familiar biological facts.
2. Recognition of common diagrams when they are similar to those used in standard textbook representations.
3. Awareness of broad health issues such as HIV/AIDS and cardiovascular risk factors.
4. Access to straightforward questions with short answers.

Areas of persistent weakness

1. Precision of expression: Many candidates wrote responses that were relevant in a general way but not exact enough to secure marks.
2. Conceptual distinction: Learners frequently confuse closely related concepts and terminologies; for example, artery versus vein, xylem versus phloem, ecological versus socio-economic, and observation versus conclusion.
3. Practical-science understanding: Many candidates knew parts of an experiment but not the purpose or sequence of the procedure.
4. Data handling: Graph plotting, trend description and average calculation remain weak.
5. Reading the demand of the question: Command words such as name, state, suggest, describe as well as instructions about conclusion, one, two, and other were not always adhered to.

Implications for teaching

The overall message is that factual coverage alone is not enough. Classroom practice should balance content coverage with the active use of content. This means that students should regularly:

- explain and justify, not only recall;
- sort ideas into categories;
- compare related concepts explicitly;
- label and interpret diagrams in varied formats;
- observe or perform simple practical tasks;
- work with tables, graphs and short calculations;
- answer examination-style questions using the command words accurately.

Useful pedagogical approaches

- Retrieval plus explanation: after recalling a fact, ask students to explain why it is true or how it is used.
- Error analysis: present common wrong answers and let students identify why they are wrong.
- Visual comparison charts: especially for blood vessels, transport tissues, and reproductive structures.

- Practical talk-throughs: narrate each step of an experiment and ask the purpose of each step.
- Data routines: build a short graph or average calculation into regular biology lessons.
- Language scaffolds: provide sentence starters for description, explanation and conclusion.

Assessment recommendations for schools

Schools should consider using low-stakes formative assessments that reflect the objectives of the questions in the NCE paper. These should include short open-ended items, diagram-based questions and data tasks. Marking discussions among educators can also help establish a shared understanding of what counts as a precise biological answer. Where possible, scripts or sample answers should be reviewed with learners so that they can see the difference between a vague answer and a creditworthy one.

7. Conclusion

The NCE Biology 2025 assessment shows that a majority of candidates possess a workable foundation in the subject, as reflected in the overall pass rate. However, the paper also makes clear that many learners are not yet using biological knowledge with sufficient depth, accuracy and flexibility. The strongest candidates were those who combined sound recall with precise language, practical understanding and the ability to interpret information. The weakest candidates often showed fragmented learning, uncertainty with terminology and difficulty in handling evidence or procedure.

For educators, the key lesson is that improved performance will depend not only on revising syllabus content, but on teaching learners how to use that content in context. Greater emphasis on scientific language, command words, practical procedures, diagram interpretation and data handling is likely to bring substantial gains. With systematic exposure to these forms of thinking and communication, future candidates should be better equipped to succeed in Biology and to progress confidently to further science learning.

Appendix A - Suggested teaching and remediation priorities for Grade 9 Biology

1: Strengthen biological vocabulary in context

Vocabulary should not be taught as isolated lists. Learners need repeated use of terms in sentences, diagrams and short explanations. One effective method is the 'term-function-example' routine. For each new term, students should say what it is, what it does, and where it is seen. For example, 'xylem - a transport tissue - carries water and minerals from roots to leaves'. Repetition in context reduces vague responses in examinations.

2: Teach comparison explicitly

Several difficulties in the 2025 paper came from confusion between paired concepts. Schools should therefore, institutionalise comparison work. Examples include artery versus vein, xylem versus phloem, sexual versus asexual reproduction, socio-economic versus ecological benefit, and observation versus conclusion. Venn diagrams, two-column tables and card-sorting tasks are particularly useful.

3: Develop short constructed responses

Many learners can select answers in multiple-choice items but struggle to create their own responses, particularly when at least one accurate sentence is required. Biology lessons should therefore include quick written tasks requiring definitions, explanations and conclusions. Educators should model what makes a sentence complete, scientifically accurate and relevant to the command word.

4: Rebuild confidence in science practicals

The performance in Question 5 suggests that practical procedures are not secure for many learners. Even where laboratories are limited, educators can improve this by using demonstrations and videos. Students should be asked not only 'what is the next step?' but also 'why is this step done?' This moves learning from memory to understanding.

5: Integrate mathematics into biology

Question 6 confirms that some candidates disengage when numbers appear in a biology paper. To address this, biology departments should embed very small but regular quantitative tasks into teaching. These may include reading values from a table, calculating simple averages, comparing percentages, or plotting small line graphs. Such tasks should be routine and low-stakes so that students do not see them as foreign to Biology.

6: Improve use of command words

Educators should repeatedly unpack the demands of terms such as name, state, describe, explain, suggest, calculate, label, identify and conclude. A very practical method is to display one command word at the start of a lesson and ask learners what kind of response it requires. Over time, this builds examination awareness and reduces off-target answers.

7: Use misconceptions as teaching resources

The misconceptions seen in this paper can be productively recycled. For example, educators can present statements such as 'veins carry deoxygenated blood', 'starch is the conclusion', or 'a quadrat is used to count frogs', and ask students to challenge them. This creates memorable learning because students actively correct the error rather than passively receiving the right answer.

8: Connect Biology to Mauritian contexts

Wherever possible, examples should connect to the Mauritian environment and public-health context. Biodiversity can be linked to endemic species, mangroves, lagoons, forests, tourism and cyclones. Health topics can be linked to lifestyle, diet, exercise and public awareness. Local relevance improves retention and helps learners apply knowledge more confidently in unfamiliar questions.

9: Improve marking literacy among learners

Students benefit when they understand why one answer gains credit and another does not. Educators can therefore share simplified marking criteria: relevance, precision, completeness and use of scientific language. Peer marking of short answers can be powerful when supported by a clear expected answer.

10: Plan revision around recurring weak areas

Schools should not revise all topics in the same way. Some areas deserve additional time because they repeatedly generate difficulty: nutrition in plants, blood vessels, practical investigations, graph work, and classification of biodiversity concepts. Targeted revision based on evidence will be more efficient than broad but superficial revision.

Appendix B - Suggested classroom question types for future preparation

To prepare candidates more effectively for future NCE Biology papers, educators may wish to incorporate a wider variety of question types into regular classwork, homework and tests.

1. One-mark precision items

These are short tasks that require exactly one correct idea, for example:

- Name the blood component that contains haemoglobin.
- State the function of phloem.
- Name one cardiovascular disease linked to blocked coronary arteries.

Such items build precision and help eliminate vague wording.

2. Diagram interpretation items

Students should work with labelled and unlabelled diagrams of leaves, blood vessels, reproductive systems, the heart and ecological sampling methods. A good routine is to ask students to label, explain, and then justify their labels. This prevents diagram work from becoming mere memorisation.

3. Classification tasks

Give mixed statements and ask learners to sort them under two or more headings, for example:

- socio-economic benefit or ecological benefit;
- natural cause or human cause;
- artery or vein;
- observation or conclusion.

These tasks directly address major weaknesses seen in the 2025 paper.

4. Practical-method sequencing

Provide cards showing the steps of a procedure, such as testing a leaf for starch and ask learners to arrange them in order and explain the purpose of each step. This can also be done orally or as a quick starter activity.

5. Data response items

Provide a simple table and ask learners to do one or more of the following: draw a graph, identify the highest and lowest values, describe the trend, or calculate an average. These can be completed in five to ten minutes and should become normal practice in Biology lessons.

6. Error-correction items

Present a flawed answer and ask learners to improve it. For example:

- 'The conclusion is that starch is present.'
- 'A vein carries blood with carbon dioxide.'
- 'A quadrat is used to count birds.'

This develops analytical thinking and examination awareness.

7. Short explanation items

Questions such as 'Why is the plant left in darkness first?' or 'Why are arteries adapted to high pressure?' encourage candidates to move beyond recall. These should be used regularly, with feedback focused on completeness and scientific language.

A classroom programme that combines these question types is likely to produce stronger, more adaptable candidates.