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Council for Quality Assurance in
General and Further Education and Training

Predictability of the National Senior Certificate Examinations
Life Sciences Report
DBE & IEB

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Name & Surname	**Subject**
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ACRONYMS/ABBREVIATIONS

CAPS	Curriculum and Assessment Policy Statement
DBE	Department of Basic Education
IEB	Independent Examinations Board
MCQ	Multiple Choice Question
NSC	National Senior Certificate
SACAI	South African Comprehensive Assessment Institute
SAGs	Subject Assessment Guidelines

Section 1: Overview of the Subject

The Curriculum and Assessment Policy Statement (CAPS) defines Life Sciences as the scientific study of living organisms, encompassing all levels of biological organisation, from molecular structures to interactions within ecosystems. As a scientific discipline, Life Sciences relies on systematic methods, including hypothesis formulation, experimentation, observation, and replication, to generate reliable knowledge. Scientific findings are continuously tested, debated, and refined, reflecting the dynamic and evolving nature of scientific understanding.

Life Sciences encompasses a range of sub-disciplines, including biochemistry, genetics, microbiology, zoology, botany, and environmental studies. At the school level, these disciplines are integrated to provide learners with a comprehensive understanding of biological concepts, processes, and the interrelationships among living organisms and their environments.

According to CAPS, the study of Life Sciences serves three primary purposes. First, it develops learners' scientific knowledge and understanding of the natural world. Second, it equips learners with essential scientific process skills, including critical thinking, scientific investigation, problem-solving, data collection, and data analysis. Third, it fosters an appreciation of the role of science in society by promoting awareness of ethical issues, environmental sustainability, and the impact of scientific and technological advances on individuals and communities.

Through the study of Life Sciences, learners develop scientific literacy, an appreciation for biodiversity, and an understanding of the complex interactions between humans and the environment. The subject also encourages responsible citizenship, evidence-based decision-making, and environmental stewardship. Consequently, Life Sciences prepares learners for further education and careers in science-related fields while equipping them with the knowledge and skills required to address real-world biological and environmental challenges.

Life Sciences education is structured around three key aims. The first is the development of content knowledge, which focuses on understanding fundamental biological concepts, principles, and processes. The second is scientific inquiry, which

emphasises practical investigations and the development of essential process skills, such as observing, hypothesising, experimenting, interpreting data, and drawing evidence-based conclusions. The third is application and context, which enables learners to apply biological knowledge to everyday life, appreciate the historical development of scientific knowledge, and recognise the value of indigenous knowledge systems in understanding biological and environmental phenomena.

This report presents the findings of the evaluation of the predictability of the Department of Basic Education (DBE) and the Independent Examinations Board (IEB) National Senior Certificate (NSC) Life Sciences examination papers administered between 2022 and 2024. The findings are presented by examinable topic in accordance with the CAPS and the IEB Subject Assessment Guidelines (SAGs). The report also provides topic-specific recommendations for the DBE and the IEB, respectively.

Section 2: Research Design

The study employed a qualitative research design using document analysis to examine the predictability of DBE and IEB examination papers administered between 2022 and 2024. Document analysis was considered appropriate because the study relied on existing examination papers and marking memoranda, thereby enabling the subject expert to systematically interpret and evaluate these documents.

Purposive sampling was used to select ten high-enrolment subjects offered by the DBE and IEB. The South African Comprehensive Assessment Institute (SACAI) was excluded from the study because its examination guidelines closely align with those of the DBE. Life Sciences was selected as one of the high-enrolment subjects.

Data were collected by a single subject expert who analysed all relevant examination papers over the three-year period using evaluation instruments grounded in the principles of content and construct validity. The conceptual framework underpinning this study is discussed in detail in the *NSC Predictability Overview Report*. The subject expert examined each examination item, compared trends across the three years, and assessed the alignment of the examination with the CAPS and Abridged CAPS topics. A structured Microsoft Word-based instrument, comprising tables and thematic questions, guided the analysis of topic coverage, question types, cognitive skills assessed, and mark allocation. This approach enabled a comprehensive evaluation of the predictability of the examination papers. The thematic questions used in the evaluation are discussed in detail in the *NSC Predictability Overview Report*.

Section 3: Findings from the Evaluation of the DBE and IEB Question Papers

This chapter presents the findings of the evaluation of the DBE and IEB NSC Life Sciences Question Paper 1 and Paper 2. The findings are based on a systematic analysis of examination papers administered between 2022 and 2024 and provide an overview of patterns related to examination predictability.

The primary purpose of this study was to investigate whether the upward trend observed in learner performance in NSC examinations reflects genuine improvements in learner competence or whether it may, in part, be attributed to increasing levels of predictability in examination design. By analysing selected subjects over three consecutive examination cycles, the study sought to generate evidence-based insights to strengthen Umalusi's quality assurance and standardisation processes. In doing so, the study contributes to broader scholarly discourse on the validity, fairness, and integrity of high-stakes examination systems.

The findings are presented separately for the DBE and the IEB in Sections IIIA and IIIB, respectively, and for each question paper. The analysis is organised according to the thematic questions in the evaluation instrument, which are discussed in detail in the research design section of the *NSC Predictability Overview Report*.

For each examinable topic, the findings are summarised in tabular form and accompanied by a discussion based on six themes: topic coverage, content coverage by subtopic, topic weighting, item types by subtopic, subtopic–skill pairing, and scenario–subtopic–skill pairing. The analysis of these themes is presented in Sections a to f for each table. It evaluates the extent to which the components reflected in each table may have contributed to the predictability of the topics assessed in the Life Sciences Paper 1 and Paper 2 examinations between 2022 and 2024.

Before presenting the findings, the six analytical themes are defined in Sections a to f below. These definitions apply to the analysis of both Paper 1 and Paper 2 across the two assessment bodies.

a. Topic coverage

The topics prescribed for the final examinations of the NSC subjects are outlined in Section 4 of the CAPS or the Abridged CAPS. These guidelines help ensure alignment between the final examination and the intended curriculum. The analysis of topic coverage focused on the frequency with which each topic was examined over the three-year period, specifically identifying any emerging patterns that may have contributed to the predictability of topic selection.

b. Content coverage

This section examined the extent to which specific content areas or subtopics within the selected topic have been assessed over the three-year period. By analysing the frequency and repetition of subtopics in the final examination question papers, the aim was to determine whether any patterns of content selection have emerged that may contribute to the predictability of the question papers.

c. Weighting of the topic

This section examined the distribution of the mark allocation (or weighting) for the selected topic over the three-year period. By analysing whether the marks allocated to this topic have remained consistent, increased, or decreased across examination cycles, the aim was to determine the extent to which predictable emphasis may have emerged.

d. Variation in item types

To evaluate the extent to which question design contributed to the predictability of the final examination papers, it was essential to examine how specific item types have been used to assess a given topic over time. This included analysing the variety of item types employed (such as Multiple Choice Questions [MCQs], essays, calculations, and practical scenarios), the distribution of marks allocated to each type, and how difficulty levels and cognitive demands have varied across types. Additionally, the use of command words, terms that guide the expected cognitive response, can influence question predictability. This section examined these dimensions over the three-year period to identify patterns that may signal repetition or predictability.

e. Topic and skill pairing

To evaluate the predictability of the final examination question papers, it was crucial to examine how specific cognitive skills have been paired with particular topics over time. Consistent assessment of the same skill (such as interpretation, calculation, analysis, or explanation), when linked to a specific topic across multiple years, may signal a recurring pattern, potentially leading to predictability. Conversely, variation in skill pairing can help ensure a more comprehensive assessment of the intended learning outcomes. This section explored the extent to which skill demands associated with this topic have remained consistent or varied across the three-year period and determined whether such patterns suggest predictability in assessment design.

f. Scenario framing of items for a topic

Some examination questions use scenarios, visual stimuli, or real-life contexts to test skills within a given topic. The variety or repetition of such contexts over multiple years can influence the anticipation of the nature of scenario questions. Consistent use of similar scenarios may enhance predictability, whereas diverse and novel contexts encourage a deeper understanding and critical thinking. This section explored how the contextual framing of questions for each topic has evolved over the three-year period and sought to determine whether predictability patterns existed.

3.1: LIFE SCIENCES PAPER 1

This section presents an analysis of the final examination question papers from 2022 to 2024 for Life Sciences Paper 1 topics. The findings for each topic are summarised in Tables 3.1.1–3.1.10.

Table 3.1.1 below summarises the analysis conducted to assess the level of predictability of the Human Reproduction topic in DBE Life Sciences Paper 1 examinations from 2022 to 2024.

Table 3.1.1: Findings on the Predictability of the Human Reproduction Topic for the DBE Life Sciences Paper 1 Examinations from 2022–2024

Topic: Human Reproduction							
Year	**Topic examined (✓) or not examined (X)**	**Content area/subtopics covered, including mark allocation**	**Overall weighting of the topic in marks**	**Item type/types (e.g., MCQ, essays, short answers, table, etc.) and marks allocated per content area/subtopic**	**Level of difficulty per item type used to examine the subtopic**	**Cognitive level per item type used to examine the subtopic**	**Skill assessed per subtopic**
2022	✓	Male Reproductive System	41	Short Questions-9	Easy, Moderate, Difficult	L1, L2, L3	Identification of Structure and Functions.

							Application and Interpretation.
		Sperm Cell		Short Questions-8 (Diagram-based)	Easy, Moderate, Difficult	L1, L2, L3	Identification of Structure and Functions. Explanation. Application of Knowledge.
		Female Reproductive System (Menstrual Cycle)		MCQ-4 Terminology-3 Match Column-2 Data Response (Graph)-10	Easy, Moderate, Difficult and Very Difficult	L1, L2, L3, L4	Interpretation of Graph. Sequential Explanation.
		Ovarian Hormones		Short Question (description-5	Moderate	L2	Sequential Description
2023	✓	Male Reproductive System & Prostate Cancer	39	MCQ-8 Terminology-3 Match Column-2	Easy, Moderate Easy, Moderate Easy, Moderate	L1, L2 L1 L3	Remembering. Interpretative. Graph Drawing.

				Data Response (Diagram+ Table)-11	Difficult, Very Difficult	L21, L2, L3, L4	
		Stages of Development of Zygotes		Short Questions-8 (Diagram-based)	Easy	L1	Identification & Remembering
		Ovarian Cysts		Extract-7	Easy, Moderate	L1, L2	Source. Interpretation. Extraction.
2024	✓	Male Reproductive System	41	MCQ-2 Terminology-1 Short Questions-8 (Diagram-based)	Easy Easy Easy	L1 L1 L1	Identification & Remembering
		Female Reproductive System & Ectopic Pregnancy		MCQ-4 Terminology-1 Short Question-15 (Diagram-based)	Easy, Moderate Easy Easy, Moderate, Difficult, Very Difficult	L1, L2 L1 L1, L2, L3, L4	Identification & Remembering. Interpretation. Sequential Explanation.
		Menstrual Cycle		Data Response-10 (Table)	Difficult, Very Difficult	L3, L4	Interpretative. Analytic. Sequential Explanation.

Table 3.1.1 presents a comparative overview of the Human Reproduction topic across the three-year period. The analysis, presented in sections a to f, evaluates whether the components listed in Table 3.1.1 have contributed to the predictability of the DBE Life Sciences final examination Paper 1 from 2022 to 2024.

a. Topic coverage

The findings indicate that the topic of Human Reproduction was consistently assessed during the three-year period of the NSC final examination question paper. This topic is distributed across two sections of the Question Paper, namely Section A (Multiple Choice, Match Column, and Terminology) and Section B (Diagram-based and Data Response). This is in alignment with the CAPS requirements, in that the topic should be assessed at different cognitive levels, including knowledge, understanding of science, applying scientific knowledge, evaluating, analysing, and synthesising scientific knowledge. The fact that it is consistently included in the question paper indicates that it aligns with the CAPS requirements, and that the topic of Human Reproduction should assess the structure of male and female reproductive organs and the unique characteristics of certain elements of human reproduction.

The frequency of topics across the three-year period of NSC final examination question papers demonstrates a predictable pattern of coverage. Predictability is at an acceptable level, as it aligns with the CAPS requirements. The questions were not repeated, and the full scope of subtopics was adequately represented.

To maintain predictability at an acceptable level, the DBE should continue to rotate subtopics and vary cognitive demand (L1–L4). Predictability should be within CAPS expectations, as it supports a sound education that is fair and reliable.

b. Content coverage

The findings indicate that this topic was used in different items to explore the structure of male and female reproductive organs, and the unique characteristics of certain elements of human reproduction. The full scope of content was adequately assessed in the NSC final examination question paper of Life Sciences, over the three-year period. Different formats and phrasing were used in rotation to assess the topic. This aligns with the CAPS requirements, which state that Human Reproduction should be assessed every year. The subtopics have been rotated throughout the three-year period by using different item types to assess the topic.

The frequency of the topic indicates a predictable pattern in content coverage. However, the CAPS requires that the topic be assessed annually. The use of different item types to assess this topic suggests that the predictability of the content is within an acceptable range. The alignment of content coverage with CAPS requirements ensures that the question papers are continuous, fair, and valid, and that content depth is assessed across groups.

c. Weighting of the topic

The analysis reveals that the mark allocation for Human Reproduction has consistently remained the same over the three-year period. Paper 1 allocates 41 marks, with a slight decrease in 2023 to 39 marks, which is within the 5% deviation range. This allocation of marks is aligned with the CAPS Life Sciences, which prescribes that Human Reproduction be allocated 41 marks in Question Paper 1. The marks for Human Reproduction have been distributed across different item types, such as Short Questions, Multiple Choice, Terminology, Data Response, Graph-based, and Extract, over the three-year period. This implies that the weighting has consistently been kept at 27%, as required by CAPS Life Sciences.

This consistent weighting supports candidates in developing balanced competencies across different item types, to achieve the required skills outlined in the CAPS. Learners should be taught in an integrated way to understand the history, relevance, and

application of science. Although a repetition of mark allocation can lead to perceived predictability, in this case different item types have been alternated to assess the topic; therefore, this can be regarded as positive predictability, as it aligns with the CAPS requirements.

d. Variation in item types

The evaluation indicates that over the three-year period, this topic was assessed using different item types to explore the structure of male and female reproductive organs and the unique characteristics of specific elements of human reproduction. The following item types were used alternatively to assess Human Reproduction: Multiple Choice, Terminology, Short Questions, Match Column, Diagram-based, Extract, and a Data Response question.

MCQs were allocated 8 marks in 2022, 4 in 2023, and 6 in 2024. The Terminology item types have remained at 3 marks in 2022 and 2023, then decreased to 2 marks in 2024. The Match Column question was constant in 2022 and 2023 but was not included for this topic in 2024. The graph was only used in 2023, with an allocation of 10 marks. Short Questions (Diagram-based, Table, and Descriptions) were allocated 19 marks in 2022, which increased slightly to 22 marks in 2023 and 23 marks in 2024. Extract-based questions were assessed only in 2022 and allocated 7 marks. Data Response questions were assessed only in 2024 and allocated 10 marks.

- Across the three-year period, the distribution of levels of difficulty has varied slightly for similar item types assessing Human Reproduction. The level of difficulty for Multiple Choice was classified as easy and moderate over the three-year period. Short Questions (Diagram-based, Table, and Descriptions) were classified as easy, moderate, difficult, and very difficult over this period. Match Columns were classified as easy and moderate over the three-year period. Data Response questions were classified as difficult or very difficult only in 2024.

- Across the three-year period, the distribution of cognitive levels has been slightly varied for item types assessing Human Reproduction. For example, the cognitive levels for Multiple Choice have been allocated L1 and L2 over the three-year period, with varied subtopics each year.
- Short Questions (Diagram-based, Table, and Descriptions) were allocated L1, L2, L3, and L4 over this period, with varied subtopics. Match Columns were allocated L1, L2, and L3 over the three-year period. Data Response questions were allocated L3 and L4 only in 2024.

The evaluation and pattern observed indicate that different categories of questions (such as Multiple Choice, Match Columns, Terminology, Graph-based Diagram interpretations, and Data Response) were used over the three-year period to assess Human Reproduction. This indicates that a variety of question categories were used. Due to the variety of categories, it is difficult to recognise a pattern, thereby decreasing the predictability of the question paper over the three-year period. Although these formats were repeatedly employed for Human Reproduction, varied subtopics were used to assess it over the three-year period; therefore, this can be regarded as positive predictability, as it aligns with the CAPS requirements. The assessment body should continue to use different categories of questions and alternate the subtopics assigned to each category every year. The level of difficulty and cognitive levels should be varied to ensure that a pattern is not recognised.

e. Topic and skill pairing

The findings provide evidence that the Life Sciences final examination question papers demonstrate a structured and varied pairing of cognitive skills, used to assess Human Reproduction over the three-year period. In 2022, the key skills assessed were: identification of structure and provision of functions, application of knowledge and interpretation, interpretation of graphs, sequential explanation, and sequential descriptions. In 2023, the skills assessed were slightly varied to include recall of information, interpretation, graph

drawing, identification of structure, source interpretation, and extraction. In 2024, the skills assessed were: identifying, recalling information, interpreting, applying science, analysing information, and sequential explanation.

The evaluation indicates that a variety of cognitive skills have been assessed over the three-year period, with different subtopics each year. Even though there are skills such as identifying, interpreting, sequential explanation, and Description that are consistent each year, they indicate a shift depending on the subtopic being assessed. Although cognitive skills were repeatedly employed for Human Reproduction, varied subtopics were used to assess it over the three-year period; therefore, this can be regarded as positive predictability, as it aligns with the CAPS requirements. The assessment body should continue to use a variety of cognitive skills to assess Human Reproduction.

f. Scenario framing of items for a topic

The patterns observed indicate that the Life Sciences final examination question papers exhibit varied scenario framing across topics over the three-year period. These scenarios were contextual and grounded in real life, making them relatable. In 2022, the scenarios focused on identifying the Male Reproductive Structure and its functions, interpreting graphs based on the Female Reproductive System (the Menstrual Cycle), and sequentially explaining ovarian hormones. In 2023, the scenarios focused on recalling knowledge of the Male Reproductive Organs, interpreting the source on Prostate Cancer, drawing graphs based on given data regarding Prostate Cancer, identifying the stages of zygote development, and interpreting the source on Ovarian Cysts. In 2024, the scenarios focused on identifying the Male Reproductive System, interpreting the Female Reproductive System and Ectopic Pregnancy, sequentially explaining the Menstrual Cycle, and analysing the Menstrual Cycle.

The evaluation indicates a predictable pattern of contextual framing throughout the three-year period. However, these scenarios were used interchangeably across different Human Reproduction subtopics, preventing learners from anticipating specific scenario

types for a given subtopic. This reflects acceptable predictability. It is important for the assessment body to continue using different scenario framing across the Human Reproduction topic. Furthermore, the DBE can strengthen variation by alternating source interpretations, extract questions, and Graph-based questions across different subtopics each year to ensure further alignment with the CAPS.

Summary of findings and recommendations for the DBE Life Sciences Human Reproduction topic

Table 3.1.2 below summarises identified patterns of predictability across key components of question paper design, along with corresponding recommendations to reduce predictability and strategies to maintain effective assessment practices without compromising variability.

Table 3.1.2: Summary of Findings and Recommendations on the Predictability of the 2022–2024 DBE Life Sciences Human Reproduction Topic Paper 1

Identified unacceptable predictability on topic coverage
No unacceptable predictability on topic coverage. The questions were not repeated, and the full scope of subtopics was adequately represented.
Recommendations to avoid unacceptable predictability on topic coverage
To maintain predictability at an acceptable level, the DBE should continue to rotate subtopics and vary cognitive demand (L1–L4). Predictability should be within CAPS expectations, as this will continue to support a sound education that is fair and reliable.
Identified unacceptable predictability on content coverage
No identified unacceptable predictability. Different item types have been alternated to assess the topic.
Recommendations to avoid predictable content coverage

To maintain predictability at an acceptable level, the DBE should maintain a variety of subtopics.
Strategies to maintain content coverage that do not lead to a predictable question paper
Different subtopics should be used in rotation to assess this topic to maintain acceptable predictability. Maintain alignment of the content coverage with the requirements of the CAPS, to ensure that content depth is assessed across cohorts.
Identified unacceptable predictability on topic weighting
No unacceptable predictability was identified on topic weighting. The weighting has been consistently set at 27%, as required by CAPS Life Sciences, with the percentage alternating across item types.
Recommendations to avoid unacceptable predictability on topic weighting
Varied item types should be used each year, alternating across different subtopics.
Strategies to maintain topic weighting that do not lead to a predictable question paper
The assessment body should increase variation by alternating the weighting of different subtopics each year to further align with the CAPS.
Identified unacceptable predictability on item types
No identified unacceptable predictability on item types. The marks in Human Reproduction have been allocated using different item types, such as Short Questions, Multiple Choice, Terminology, Data Response, Graph-based, and Extract, over the three-year period.
Recommendations to avoid unacceptable predictability on item types
The assessment body should continue to use different categories of questions and alternate the subtopics assigned to each category every year.
Strategies to maintain the assessment of item types that do not lead to a predictable question paper
Rotate a variety of cognitive skills and vary subtopics each year.

Identified unacceptable predictability on topic–skill pairing
No unacceptable predictability identified in topic-skill pairing. It is varied and aligned with the CAPS.
Recommendations to avoid unacceptable predictability through topic–skill pairing
Maintain diversity in the skill pairing of Human Reproduction subtopics with different cognitive demands
Strategies to maintain topic–skill pairing that do not lead to a predictable question paper
Maintain variety of cognitive skills to assess the topic with varying subtopics each year.
Identified unacceptable predictability in the scenario framing of items
The scenarios were used alternately across different Human Reproduction subtopics, preventing learners from anticipating specific scenario types for any given subtopic.
Recommendations to avoid unacceptable predictability in scenario framing of items
Maintain varied scenario framing of items alternatively across the Human Reproduction subtopic.
Strategies to maintain scenario framing of items that do not lead to a predictable question paper
The DBE can strengthen variation by alternating source-based Interpretation, Extract, and Graph-based questions across different subtopics each year to further align with the CAPS.

Table 3.1.3 below summarises the analysis conducted to assess the predictability of the Human Nervous System topic in the DBE Life Sciences Paper 1 examinations from 2022 to 2024.

Table 3.1.3: Findings on the Predictability of the Human Nervous System Topic for the DBE Life Sciences Paper 1 Examinations from 2022–2024

Topic: Human Nervous System							
Year	**Topic examined (✓) or not examined (X)**	**Content area/subtopics covered, including mark allocation**	**Overall weighting of the topic in marks**	**Item type/types (e.g., MCQ, essays, short answers, table, etc.) and marks allocated per content area/subtopic**	**Level of difficulty per item type used to examine the subtopic**	**Cognitive level per item type used to examine the subtopic**	**Skill assessed per subtopic**
2022	✓	The Brain and Neurons	53	MCQ-10 Terminology-5 Match Column-2 Diagram-based-6	Easy, Moderate Easy Moderate Easy, Moderate	L1, L2 L3 L2 L1, L2, L3	Identification of Structure and Functions. Explanation and Application of Knowledge.
		Brain Injuries (9)		Data Response-9 (table)	Easy, Moderate, Difficult, Very Difficult	L2, L3, L4	Interpretation of the Table. Drawing of Graph.

		Eye -Pupillary Mechanism (8)		Short Questions (Diagram-based)-8	Easy Moderate	L1, L2	Remembering and Identification.
		Human Ear (13)		Short Questions (Diagram-based)-13	Easy, Moderate, Difficult, Very Difficult	L1, L2, L3, L4	Identification of Structure and Functions. Explanation and Application of Knowledge. Sequential Explanation.
2023	✓	The Brain	53	MCQ-6 Terminology-3 Match Column-2 Short Questions-8 (Diagram-based)-11 Data Response	Easy, Moderate Easy Moderate Easy, Moderate, Difficult	L1, L2 L1, L2 L1, L2, L3	Identification of Structure and Functions. Explanation and Application of Knowledge. Sequential Explanation.
		Reflex Action (9)		Short Questions-9 (Diagram-based)	Easy, Moderate	L1, L2	Descriptive. Remembering. Sequential Explanation.
		Brain Disorder (Alzheimer)-14		Scientific Investigation-14	Moderate, Difficult, Very Difficult	L2, L3, L4	Remembering. Extraction.

				(Extract)			Scientific Investigative skills.
		Human Ear-8		Short Questions-8 (Diagram-based)	Easy	L1	Remembering.
2024	✓	Nervous System	54	MCQ-10 Terminology-4 Match Column-4	Easy, Moderate Easy Moderate	L1, L2 L1 L2	Remembering. Interpretation.
		Eye Disorder Cataracts-6		Short Questions-6 (Extract)	Moderate, Difficult	L2, L3	Extraction. Sequential Explanation. Application.
		Eye Disorder Long Sightedness-5		Short Questions-5	Moderate, Difficult	L3, L4	Sequential Explanation.
		Pupillary Mechanisms-11		Short questions-11 (Diagram-based)	Easy, Moderate Difficult, Very Difficult	L1, L2, L3, L4	Sequential Explanation.
		Types of Neurons		Short Questions-8 (Diagram-based)	Easy, Moderate	L1, L2	Remembering.

		(Myelinated and Unmyelinated) -8					Sequential Explanation.
		Neurons (Axon Diameter)-6		Data Response-6 (Graphs)	Difficult, Very Difficult	L3, L4	Interpretative. Analytic.

Table 3.1.3 presents a comparative overview of the Human Nervous System topic across the three-year period. The analysis, presented in Sections a to f, evaluates whether the components listed in Table 3.1.3 have contributed to the predictability of the DBE Life Sciences final examination Paper 1 from 2022 to 2024.

a. Topic coverage

The findings indicate that the Human Nervous System was consistently assessed in the three-year period of the NSC final examination question papers. The topic is crucial in the Life Science curriculum, as it counts for 54 marks in the final examination Paper 1, according to the CAPS. This topic has been distributed evenly across the two sections of the Question Paper: Section A (Multiple Choice, Match Column, and Terminology) and Section B (Diagram-based and Data Response).

This is in alignment with the CAPS requirements that the topic should be assessed at different cognitive levels, including knowledge, understanding of sciences, applying scientific knowledge, evaluating, analysing, and synthesising scientific knowledge. The fact that this topic is consistently included in the question papers indicates that it aligns with the CAPS requirements. The topic of the Human Nervous System should assess learners' knowledge of the nervous system and its functions, evaluate understanding of nervous system

processes (such as transmission of the nerve impulse, reflexes, and homeostasis), and assess the ability to analyse and solve problems related to nervous system disorders or injuries.

The frequency of topics across the three-year period of the NSC final examination question papers demonstrates a predictable pattern of coverage. Predictability is at an acceptable level, as it aligns with the CAPS requirements. The questions were not repeated, and the full scope of subtopics was adequately represented.

To maintain predictability at an acceptable level, the DBE should continue to rotate subtopics and vary cognitive demand (L1–L4). Predictability should be within CAPS expectations, as this will continue to support a sound education that is fair and reliable.

b. Content coverage

The findings indicate that this topic was used in different items to assess learners' knowledge of nervous systems and their functions, to evaluate an understanding of nervous system processes (such as transmission of nerve impulse, reflexes, and homeostasis), to assess ability to analyse, and solve problems related to nervous system disorders or injuries. In 2022, subtopics of the Human Nervous System assessed were: Brain and Neurons, Brain Injuries, Eyes, Pupillary Mechanism and Human Ear. In 2023, the subtopics were: The Brain, Reflex Action, Brain Disorder and Human Ear. In 2024, the subtopics were: Eye Disorder (Cataract), Eye Disorder (Long Sightedness), Pupillary Mechanism, Types of Neurons (Myelinated and Unmyelinated), and Neurons (Axon Diameter).

The full scope of content was adequately assessed throughout the three-year period of the NSC final examination question papers for Life Sciences. Different formats and phrasing were used in rotation to assess the Human Nervous System. This aligns with the CAPS requirements, which state that the Human Nervous System topic should be assessed annually across varied subtopics.

The frequency of the topic indicates a predictable pattern in content coverage. However, the CAPS requires that the topic be assessed annually. The use of different subtopics in rotation to assess this topic suggests that the predictability of the content is within

an acceptable range. The alignment of content coverage with CAPS requirements ensures that the question papers are continuous, fair, and valid, and that content depth is assessed across cohorts.

c. Weighting of the topic

The analysis reveals that the mark allocation for the Human Nervous System topic has consistently remained the same. In 2022 and 2023, the topic was allocated 53 marks. In 2024, there was a slight increase to 54 marks. This allocation of marks is aligned with the CAPS Life Sciences requirements, which prescribe that the Human Nervous System be allocated 54 marks in Paper 1. The marks for the Human Nervous System have been allocated across different item types, such as Short Questions, Multiple Choice, Terminology, Data Response, Graph-based, and Extract, over the three-year period. This implies that the topic weighting has consistently been set at 36%, as required by CAPS Life Sciences. This consistent weighting supports candidates in developing balanced competencies across different subtopics to achieve the required skills outlined in the CAPS. Learners should be taught in an integrated way to understand the history, relevance, and application of science. Although repeating the mark allocation can lead to perceived predictability, in this case, different subtopics have been alternated to assess the topic. Therefore, this can be regarded as positive predictability, as it aligns with the CAPS requirements.

d. Variation in item types

The evaluation indicates that, over the three-year period, this topic was assessed using different item types to explore human nervous system reactions to stimuli in surroundings. The following item types were used to assess the human nervous system: Multiple Choice, Terminology, Short Questions, Match Column, Diagram-based, Extract, Scientific Investigation (extract), and Data Response questions (graphs and tables).

MCQs were allocated 10 marks in 2022; in 2023, they were reduced to 6 marks; and in 2024, they were slightly increased to 10 marks. The Terminology item types have been constant at 5 marks in 2022 and 2024, and decreased slightly to 3 marks in 2023. The Match Column questions were allocated 2 marks in 2022, 3 marks in 2023, and 4 marks in 2024. The graph was used only in 2024 and was worth 6 marks. Short Questions (Diagram-based, Table, Descriptions) were allocated 36 marks in 2022; in 2023, they decreased to 25 marks, and in 2024, to 24 marks. Extract-Based (Scientific Investigation) questions were assessed in 2023 with 14 marks and were allocated 6 marks as short questions in 2024. The Data Response (Table) questions were used to assess the topic in 2022 and were worth 9 marks. In 2024, Data Response (Graphs) questions were used to assess the topic, totalling 6 marks.

- Across the three-year period, the distribution of item types has varied across different subtopics of the Human Nervous System. The level of difficulty for Multiple Choice was classified as easy and moderate. Short Questions (Diagram-based, Table, Descriptions) were classified as easy, moderate, difficult, and very difficult. Match Columns were classified as easy and moderate. Data Response questions were classified as difficult and very difficult only in 2023 and 2024.
- Across the three-year period, the distribution of cognitive levels has been slightly varied for item types assessing the Human Nervous System. For example, the cognitive levels for multiple choice have been allocated to L1 and L2 over the three-year period, with varied subtopics.
- Short Questions (Diagram-based, Table, Descriptions) were allocated L1, L2, and L3 over this period, with varied subtopics. Match Columns were allocated L1, L2, and L3 over the three-year period. Data Response questions were allocated L3 and L4 in 2023 and 2024.

The evaluation and observed patterns indicate that different categories of questions (such as Multiple Choice, Match Columns, Terminology, Graph-based Diagram Interpretations, and Data Response) were used over the three-year period to assess the Human Nervous System. This indicates that a variety of question categories were used, making it difficult to identify item types by subtopic and thus reducing the predictability of the question paper over the three-year period. Although these formats were repeatedly

employed for the Human Nervous System, varied subtopics were used to assess it over the three-year period. Therefore, this can be regarded as positive predictability, as it aligns with the CAPS requirements. Different categories of questions have been used, and subtopics have been used alternatively. The assessment body should continue to use different categories of questions and alternate the subtopics assigned to each category every year. The level of difficulty and cognitive levels should be varied to ensure that a pattern is not recognised.

e. Topic and skill pairing

The findings provide evidence that the Life Sciences final examination question papers demonstrate a structured and varied pairing of cognitive skills used to assess the Human Nervous System over the three-year period. In 2022, the key skills assessed were identification of structure and providing functions (Brain and Neurons), application of knowledge (Human Ear), interpretation (Brain Injuries), interpretation (Drawing of a Graph), and sequential explanation (Human Ear). In 2023, the skills assessed were slightly varied: recall information (Human Ear, Brain Disorder, and Reflex Action); identifying structure and providing functions (Brain), descriptive and sequential explanation (Reflex Action); and scientific investigation (Brain Disorder). In 2024, the skills assessed were: recall information (Nervous System and Types of Neurons [Myelinated and Unmyelinated]), interpretation, application of science, analysing information and sequential explanation (Eye Disorder [Long Sightedness], Pupillary Mechanism, Neurons [Axon Diameter] and Eye Disorder [Cataracts]), and interpretation (Neurons [Axon Diameter] and Nervous System).

The evaluation indicates that a variety of cognitive skills have been assessed over the three-year period, using different Human Nervous System subtopics each year. However, there are skills, such as recalling information, applying knowledge, and sequential explanation, that are consistently employed each year, but their use shifts depending on which subtopic is assessed. Although cognitive skills were repeatedly employed for the Human Nervous System, varied subtopics were used to assess it over the three-year period. Therefore, this can be regarded as positive predictability, as it aligns with the CAPS requirements. A variety of cognitive skills

and subtopics were employed to assess the topic. The assessment body should continue to use varied cognitive skills and varied subtopics to assess the Human Nervous System topic.

f. Scenario framing of items for a topic

The patterns observed indicate that the Life Sciences final examination question papers exhibit varied scenario framing across topics over the three-year period. These scenarios were contextual and grounded in real life, which made them relatable. In 2022, the scenarios focused on identifying Brain and Neuron structures and their functions, interpreting graphs based on Brain Injuries, providing a sequential explanation of the Human Ear, and applying knowledge to the Brain and Neurons and to the Human Ear. In 2023, the scenarios focused on recalling knowledge of Brain Disorders, the Human Ear, and Reflex Action; sequential explanations based on the Brain and Reflex Action; and scientific investigative skills based on the Human Ear. In 2024, the scenarios focused on interpreting the Nervous System and Neurons (Axon Diameter), sequential explanations of Eye Disorders (Cataracts) and (Long-Sightedness), and analytical skills in Neurons (Axon Diameter).

The evaluation indicates a predictable pattern of contextual framing throughout the three-year period. However, these scenarios were used interchangeably across different Human Nervous System subtopics, preventing learners from anticipating specific scenario types for a given subtopic. This reflects acceptable predictability. It is important for the assessment body to continue using different scenario framings of item types alternatively across the Human Nervous System subtopics. Furthermore, the DBE can strengthen variation by alternating source-based Interpretation, Extract, and Graph-based questions across different subtopics each year to ensure greater alignment with the CAPS.

Summary of findings and recommendations for the DBE Life Sciences Human Nervous System topic

Table 3.1.4 below summarises identified patterns of predictability across key components of question paper design, along with corresponding recommendations to reduce predictability, and strategies to maintain effective assessment practices without compromising variability.

Table 3.1.4: Summary of Findings and Recommendations on the Predictability of the 2022–2024 DBE Life Sciences Human Nervous System Topic Paper 1

Identified unacceptable predictability on topic coverage
The marks for Human Nervous System have been allocated across different item types, such as Short Questions, Multiple Choice, Terminology, Data Response, Graph-based, and Extract, over the three-year period.
Recommendations to avoid unacceptable predictability on topic coverage
To maintain predictability at an acceptable level, the DBE should continue to rotate subtopics and vary cognitive demand (L1–L4). Predictability should be within CAPS expectations, as this will continue to support a sound education that is fair and reliable.
Identified unacceptable predictability on content coverage
No identified unacceptable predictability. Different item types have been alternated to assess the topic.
Recommendations to avoid predictable content coverage
To maintain predictability at an acceptable level, the DBE should maintain varied subtopics.
Strategies to maintain content coverage that do not lead to a predictable question paper
Different subtopics should be used in rotation to assess this topic and maintain acceptable predictability. Maintain alignment of the content coverage with the requirements of CAPS, to ensure that content depth is assessed across cohorts.

Identified unacceptable predictability on topic weighting
No unacceptable predictability was identified on topic weighting. The weighting has been consistently maintained as required by CAPS Life Sciences, alternating among various item types.
Recommendations to avoid unacceptable predictability on topic weighting
Varied item types should be used each year, alternating across different subtopics.
Strategies to maintain topic weighting that do not lead to a predictable question paper
The assessment body should increase variation by alternating the weighting of different subtopics each year to further align with CAPS.
Identified unacceptable predictability on item types
No identified unacceptable predictability. A variety of question categories were used, making it difficult to identify item types by subtopic and thus reducing predictability.
Recommendations to avoid unacceptable predictability on item types
The assessment body should continue to use different categories of questions and alternate the subtopics assigned to each category every year.
Strategies to maintain the assessment of item types that do not lead to a predictable question paper
Rotate a variety of cognitive skills and vary subtopics each year.
Identified unacceptable predictability on topic–skill pairing
No identified unacceptable predictability on topic-skill pairing. It is varied and aligned with the CAPS.
Recommendations to avoid unacceptable predictability through topic–skill pairing
Maintain diversity in the skill pairing of Human Nervous System subtopics across varying cognitive demands.
Strategies to maintain topic–skill pairing that do not lead to a predictable question paper

Maintain variety of cognitive skills to assess the topic with varying subtopics each year.
Identified unacceptable predictability in the scenario framing of items
The scenarios were used alternately across different Human Nervous System subtopics, preventing learners from anticipating specific scenario types for any given subtopic.
Recommendations to avoid unacceptable predictability in scenario framing of items
Maintain varied scenario framing of items alternatively across the Human Nervous System subtopic.
Strategies to maintain scenario framing of items that do not lead to a predictable question paper
The DBE can strengthen variation by alternating source-based Interpretation, Extract, and Graph-based questions across different subtopics each year to further align with the CAPS.

Table 3.1.5 below summarises the analysis conducted to assess the predictability of the Human Endocrine System and Homeostasis topic in DBE Life Sciences Paper 1 examinations from 2022 to 2024.

Table 3.1.5: Findings on the Predictability of the Human Endocrine System & Homeostasis Topic for the DBE Life Sciences Paper 1 Examinations from 2022 to 2024

Topic: Human Endocrine System and Homeostasis							
Year	**Topic examined (✓) or not examined (X)**	**Content area/subtopics covered, including mark allocation**	**Overall weighting of the topic in marks**	**Item type/types (e.g., MCQ, essays, short answers, table, etc.) and marks allocated per**	**Level of difficulty per item type used to examine the subtopic**	**Cognitive level per item type used to examine the subtopic**	**Skill assessed per subtopic**

				content area/subtopic			
2022	✓	Endocrine Glands	34	MCQ-2 Terminology-2 Diagram-based-6	Easy Easy Easy, Moderate	L1 L1 L1, L2	Identification of Structure and Functions.
		Homeostatic Control of Carbon Dioxide		Scientific Investigation-15 (Practical scenario)	Easy, Moderate Difficult, Very Difficult	L1, L2, L3, L4	Interpretative and Analytical Skills. Application of Knowledge. Sequential Explanation.
		Homeostatic Control of Blood Glucose		Diagram-based-9 (Flow chart)	Easy, Moderate Difficult, Very Difficult	L1, L2, L3, L4	Interpretative and Analytical Skills. Application of Knowledge.

							Sequential Explanation.
2023	✓	Endocrine System	32	MCQ-4 Terminology-1	MCQ-4 Terminology-1	L1, L3 L1	Remembering. Application of Knowledge.
		Homeostatic Control of Salt Level in Blood & Homeostatic Control of Water in Blood		Short Question-14 (Diagram-based)	Easy, Moderate, Difficult	L1, L2, L3	Interpretative and Analytical Skills. Application of Knowledge. Sequential Explanation.
		Thermoregulation		Data Response (Diagram + graph)-11	Easy, Moderate, Difficult, Very Difficult	L1, L2, L3, L4	Interpretative and Analytical Skills. Application of Knowledge. Sequential Explanation. Calculation.
2024	✓	Endocrine System	32	MCQ-4	Easy	L1	Remembering

		Structures Involved in Homeostasis		Diagram-based-8	Easy	L1	Remembering
		The Effect of Insulin on Blood Glucose Levels		Data Response-11 (Scientific investigation)	Moderate, Difficult, Very Difficult	L3, L4	Interpretative. Explanation.
		Homeostatic Control of Thyroxin		Short Question-10 (Flow diagram)	Easy, Moderate, Difficult	L1, L2, L3	Interpretative. Explanation.

Table 3.1.5 presents a comparative overview of the Human Endocrine System and Homeostasis topic across the three-year period. The analysis, presented in Sections a to f, evaluates whether the components listed in Table 3.1.5 have contributed to the predictability of the DBE Life Sciences final examination Paper 1 from 2022 to 2024.

a. Topic coverage

The findings indicate that the Human Endocrine System and Homeostasis topic was consistently assessed in the three-year period of the NSC final examination question papers. This topic in the Life Science curriculum is allocated 44 marks in the final examination Paper 1, in accordance with the CAPS. This topic has been distributed evenly across the two sections of the question papers, Section A (Multiple Choice, Match Column, and Terminology), and Section B (Diagram-based and Data Response) over the three-year period. This is in alignment with the CAPS requirements, as it should be assessed at different cognitive levels, including knowledge,

understanding of science, applying scientific knowledge, evaluating, analysing, and synthesising scientific knowledge. The topic is consistently included in the question papers by alternating the subtopic, and therefore it is aligned with the CAPS requirements.

The frequency of topics across the three-year period of NSC final examination question papers demonstrates a predictable pattern of coverage. Predictability is at an acceptable level, as it aligns with the CAPS requirements. The questions were not repeated, and the full scope of subtopics was adequately represented.

To maintain predictability at an acceptable level, the DBE should continue to rotate subtopics and vary the allocation of marks across subtopics. The predictability within the CAPS expectations supports a sound education that is consistently fair and reliable.

b. Content coverage

The findings indicate that the Human Endocrine System and Homeostasis topic was consistently assessed throughout the three-year period by alternating subtopics. In 2022, the subtopics assessed were: Endocrine Glands, Homeostatic Control of Carbon Dioxide, and Homeostatic Control of Blood Glucose. In 2023, the subtopics assessed were: Endocrine System, Homeostatic Control of Salt Level in Blood, Homeostatic Control of Water in Blood, and Thermoregulation. In 2024, the subtopics were: Endocrine System, Structures Involved in Homeostasis, the Effect of Insulin on Blood Glucose Levels, and Homeostatic Control of Thyroxin.

This indicates that the full scope of content was adequately assessed throughout the three-year period of the NSC Life Sciences final examination question papers. Various formats and phrasing were used in rotation to assess the topic of the Human Endocrine System and Homeostasis. This aligns with the CAPS requirements, which state that the topic should be assessed every year with varied subtopics.

The frequency of the topic indicates a predictable pattern in content coverage. The CAPS requires that the topic be assessed on a year-to-year basis. The use of different subtopics in rotation to assess this topic suggests that the predictability of the content is within an acceptable range. The alignment of content coverage with CAPS requirements ensures that the question papers are continuous, fair, and valid, and that content depth is assessed across cohorts.

c. Weighting of the topic

The analysis reveals that the mark allocation for the Human Endocrine System and Homeostasis was 34 marks in 2022 and decreased slightly in both 2023 and 2024 to 32 marks. This allocation of marks aligns with the CAPS Life Sciences, which prescribes that the Human Endocrine System and Homeostasis should be allocated 34 marks in Paper 1. The marks for the topic have been allocated across different item types, such as Short Questions, Multiple Choice, Terminology, Data Response, Graph-based, and Extract, over the three-year period. This implies that the weighting has consistently been kept at 23%, as required by CAPS Life Sciences.

This consistent weighting supports candidates in developing balanced competencies across different subtopics to achieve the required skills outlined in the CAPS. Learners should be taught in an integrated way to understand the history, relevance, and applications of science. Although repeating the mark allocation can lead to perceived predictability, in this case, different subtopics have been alternated each year over the three-year period to assess this topic. Therefore, this can be regarded as positive predictability, as it aligns with the CAPS requirements. It is important for the assessment body to continue using different subtopics each year and to alternate between the Human Endocrine System and Homeostasis topics. Furthermore, the DBE can strengthen variation by alternating among Source Interpretation, Extract, and Graph-based questions across different subtopics each year to ensure greater alignment with the CAPS.

d. Variation in item types

The evaluation indicates that, over the three-year period, the Human Endocrine System and Homeostasis were assessed using different item types. The following item types were used to assess the topic: Multiple Choice, Terminology, Short Questions, Match Column, Diagram-based, Extract, Scientific Investigation (Extract), and Data Response questions (Graphs and Tables), with subtopics alternating per item type.

MCQs were worth 2 marks in 2022, then increased to 4 marks in 2023 and 2024. The Terminology item types were allocated 2 marks in 2022 and 1 mark in 2023, and terminology was not used in 2024 to assess this topic. The Match Column questions were not used throughout the three-year period to assess this topic. The Graph was only used in 2023, with an allocation of 11 marks. Short Questions (Diagram-based, Flow diagram, Table, Descriptions) were allocated 15 marks in 2022, decreased slightly to 14 marks in 2023, and increased slightly to 18 marks in 2024. The Data Response (Scientific Investigation) questions were used to assess the topic in 2022, with 15 marks allocated; in 2023 and 2024, Data Response (Graphs/Scientific Investigation) remained at 11 marks.

- Across the three-year period, the distribution of item types has varied across different subtopics of the Human Endocrine System and Homeostasis topic. The level of difficulty for multiple choice was rated as easy and moderate. Short questions (Diagram-based, Table, Descriptions) were classified as easy, moderate, difficult, and very difficult over this period. Data Response questions were classified as moderate, difficult, and very difficult.
- Across the three-year period, the distribution of cognitive levels has varied slightly for item types assessing the topic. The cognitive levels for Multiple Choice have been allocated L1 and L2 over the three-year period, with varied subtopics. Short Questions (Diagram-based, Table, Descriptions) were allocated to L1, L2, L3, and L4 over this period, with varied subtopics.

The evaluation and pattern observed indicate that different categories of questions, such as Multiple Choice, Terminology, Graph-based Diagram Interpretations, Scientific Investigation, and Data Response, were used over the three-year period to assess the

Human Endocrine System and Homeostasis. This indicates that a variety of question categories were used, making it difficult to identify item types by subtopic and thus reducing the predictability of the question paper over three years. Although these formats were repeatedly employed to assess the Human Endocrine System and Homeostasis, different subtopics were used over the three-year period. Therefore, this can be regarded as positive predictability, as it aligns with the CAPS requirements. Additionally, different categories of questions have been used, and subtopics have been alternatively employed. The assessment body should continue to use different categories of questions and alternate the subtopics assigned to each category every year. The level of difficulty and cognitive levels should be varied to ensure that a pattern is not recognised.

e. Topic and skill pairing

The findings provide evidence that the Life Sciences final examination question papers demonstrate a structured and varied pairing of cognitive skills used to assess the Human Endocrine System and Homeostasis over the three-year period. In 2022, the key skills assessed were: identification of structure and providing functions (Endocrine Glands), application of knowledge (Homeostatic Control of Carbon Dioxide and Homeostatic Control of Blood Glucose), interpretation and analytic skills (Endocrine Glands and Homeostatic Control of Blood Glucose), and sequential explanation skills (Homeostatic Control of Blood Glucose). In 2023, the skills assessed were slightly varied: recalling information (Endocrine System), sequential explanation (Homeostatic Control of Salt Level in Blood and Thermoregulation), and interpretation, analytic and application skills (Homeostatic Control of Salt Level in Blood and Control of Water in Blood). In 2024, the skills assessed were: recall of information (Endocrine System and Structures Involved in Homeostasis), interpretation, and explanation (Effect of Insulin on Blood Glucose Level and Homeostatic Control of Thyroxin).

The evaluation indicates that a variety of cognitive skills have been assessed over the three-year period, using different Human Endocrine Systems and Homeostasis subtopics each year. However, skills such as interpretation and explanation are consistently employed each year, but their application shifts depending on the subtopic assessed. Although cognitive skills were repeatedly

employed for the topic, varied subtopics were used to assess them over the three-year period. This can be regarded as positive predictability, as it aligns with the CAPS requirements and reflects the use of varied cognitive skills and subtopics to assess the topic. The assessment body should continue to use a variety of cognitive skills and subtopics to assess the Human Endocrine System and Homeostasis. To strengthen the acceptable predictability for this topic, the DBE should include more calculation skills, since they were used only in 2023.

f. Scenario framing of items for a topic

The patterns observed indicate that the Life Sciences final examination question papers exhibit varied scenario framing across topics over the three-year period. These scenarios were contextual and grounded in real life, which made them relatable. In 2022, the scenarios focused on identifying the structure of endocrine glands and their functions, and on interpreting and applying the concepts of Homeostatic Control of Carbon Dioxide, Endocrine Glands, and Homeostatic Control of Blood Glucose. In 2023, the scenarios focused on recalling knowledge of the Endocrine System; interpretation, analytical skills, and application were used to assess Homeostatic Control of Salt Level in Blood and Thermoregulation; and calculation skills were used to assess Thermoregulation. In 2024, the scenarios focused on interpretative and explanatory skills to assess the Effect of Insulin on Blood Glucose Level and the Homeostatic Control of Thyroxin.

The evaluation indicates a predictable pattern of contextual framing throughout the three-year period. However, these scenarios were used interchangeably across different Human Endocrine Systems and Homeostasis subtopics, preventing learners from anticipating specific scenario types for a given subtopic. This reflects acceptable predictability. It is important for the assessment body to continue using different item-framing scenarios across subtopics. Furthermore, the DBE can strengthen variation by alternating among source interpretation, calculation skills, and graph-based questions across different subtopics each year to ensure greater alignment with the CAPS.

Summary of findings and recommendations for the DBE Life Sciences Human Endocrine System and Homeostasis topic

Table 3.1.6 below summarises identified patterns of predictability across key components of the question paper design, along with corresponding recommendations to reduce predictability, and strategies to maintain effective assessment practices without compromising variability.

Table 3.1.6: Summary of Findings and Recommendations on the Predictability of the 2022–2024 DBE Life Sciences Human Endocrine System & Homeostasis Topic Paper 1

Identified unacceptable predictability on topic coverage
No identified unacceptable predictability. The questions were not repeated, and the full scope of subtopics was adequately represented.
Recommendations to avoid unacceptable predictability on topic coverage
Align it with the CAPS requirements to assess different cognitive levels, knowledge, and understanding of science, as well as the application, evaluation, analysis, and synthesis of scientific knowledge.
Identified unacceptable predictability on content coverage
No unacceptable predictability was identified. Different formats and phrasing were used in rotation to assess.
Recommendations to avoid predictable content coverage
The DBE should continue to rotate subtopics and vary mark allocations across subtopics.
Strategies to maintain content coverage that do not lead to a predictable question paper
Ensure that the varied subtopics are assessed annually to avoid content repetition.
Identified unacceptable predictability on topic weighting

No identified unacceptable predictability on topic weighting. Different subtopics were allocated varied marks each year.
Recommendations to avoid unacceptable predictability on topic weighting
Varied item types should be allocated different weighting and used each year in different subtopics.
Strategies to maintain topic weighting that do not lead to a predictable question paper
The assessment body should increase variation by alternating the weighting of different subtopics each year to further align with the CAPS.
Identified unacceptable predictability on item types
No identified unacceptable predictability on item types. The marks have been allocated using different item types aligned with the CAPS requirements.
Recommendations to avoid unacceptable predictability on item types
The assessment body should continue to use different categories of questions and alternate the subtopics assigned to each category of questions every year.
Strategies to maintain the assessment of item types that do not lead to a predictable question paper
Rotate a variety of cognitive skills and vary subtopics each year.
Identified unacceptable predictability on topic–skill pairing
No identified unacceptable predictability on topic-skill pairing. It is varied and aligned with the CAPS.
Recommendations to avoid unacceptable predictability through topic–skill pairing
Maintain diversity in skill pairings between the Human Endocrine System and Homeostasis subtopics to accommodate varying cognitive demands.
Strategies to maintain topic–skill pairing that do not lead to a predictable question paper
Maintain variety of cognitive skills to assess the topic with varying subtopics each year.

Identified unacceptable predictability in the scenario framing of items
The scenarios were used alternately across different Human Endocrine System and Homeostasis subtopics, preventing learners from anticipating specific scenario types for any given subtopic.
Recommendations to avoid unacceptable predictability in scenario framing of items
Maintain varied framing of items across scenarios, alternating between the Human Endocrine System and Homeostasis subtopics.
Strategies to maintain scenario framing of items that do not lead to a predictable question paper
The DBE can strengthen variation by alternating source-interpretation, extract, and graph-based questions across different subtopics each year to further align with the CAPS.

Table 3.1.7 below summarises the analysis conducted to determine the level of predictability for the Responding to the Environment (Plants) topic in DBE Life Sciences Paper 1 examinations from 2022 to 2024.

Table 3.1.7: Findings on the Predictability of the Responding to the Environment (Plants) Topic for the DBE Life Sciences Paper 1 Examinations from 2022 to 2024

Topic: Responding to the Environment (Plants)							
Year	**Topic examined (✓) or not examined (X)**	**Content area/subtopics covered, including mark allocation**	**Overall weighting of the topic in marks**	**Item type/types (e.g., MCQ, essays, short answers, table, etc.) and marks allocated per**	**Level of difficulty per item type used to examine the subtopic**	**Cognitive level per item type used to examine the subtopic**	**Skill assessed per subtopic**

				content area/subtopic			
2022	✓	Plant Hormones, Functions and Location	13	MCQ-4 Terminology-2	Moderate Easy	L2 L1	Remembering
		Effect of Auxin in Tropism		Extract-7	Easy, Moderate	L1, L2	Source Interpretation. Extraction.
2023	✓	Plant Hormones, Functions and Location	13	MCQ-2 Terminology-2	Easy Easy	L1 L1	Remembering
		Effect of Auxins on Growth		Data Response-9 (Scientific Investigation)	Difficult, Very Difficult	L4	Interpretative. Analyse Data in the Table.
2024	✓	Plant Hormones, Functions and Location	13	Terminology-2	Easy	L1	Remembering
		Effect of Auxins in Tropism		Data Response-11 (Scientific Investigation)	Difficult, Very Difficult	L2, L3, L4	Interpretative. Analyse Data.

Table 3.1.7 presents a comparative overview of the Responding to the Environment (Plants) topic across the three-year period. The analysis, presented in Sections a to f, evaluates whether the components listed in Table 3.1.7 have contributed to the predictability of the DBE Life Sciences final examination Paper 1 from 2022 to 2024.

a. Topic coverage

The findings indicate that the topic Responding to the Environment (Plants) was consistently assessed over the three-year period of the NSC final examination question papers. The fact that it is consistently included in the question papers indicates that it is aligned with the CAPS requirements to assess learners' knowledge of the topic and to evaluate an understanding of the concept, as well as their ability to analyse and solve problems related to:

- The frequency of the topic over the three-year period of the NSC final examination question papers demonstrates a predictable pattern in topic coverage. Predictability is at an acceptable level, as it aligns with the CAPS requirements. The questions were not repeated, and the full scope of subtopics was adequately represented.
- To maintain predictability at an acceptable level, the DBE should continue rotating the subtopics and varying cognitive demand. Predictability should be within CAPS expectations, as this will continue to support a sound education that is continuous, fair, and reliable.

b. Content coverage

The findings indicate that Plant Hormones, Function and Location, and the Effect of Auxins were consistently assessed over the three-year period. The full scope of content was adequately assessed throughout the three-year period of the NSC Life Sciences final examination question papers.

The frequency of the topic indicates a predictable pattern in content coverage. However, the CAPS requires that this topic be assessed on a year-to-year basis. Subtopics were used in different scenarios, and their phrasing was not repeated to assess them, suggesting that the predictability of the content is within an acceptable range. To maintain acceptable predictability, the DBE should continue to use varied subtopic scenarios on a rotational basis each year.

c. Weighting of the topic

The analysis reveals that the mark allocation for Responding to the Environment (Plants) has consistently remained the same, at 13 marks over the three-year period. This allocation of marks aligns with the CAPS Life Sciences, which prescribes that the topic be allocated 13 marks in Life Science Paper 1.

This consistent weighting supports candidates in developing balanced competencies across subtopics to achieve the skills outlined in the CAPS. Learners should be taught in an integrated way to understand the history, relevance, and application of science. Although repeating the mark allocation can lead to perceived predictability, in this case, different subtopics have been alternated to assess the topic. Therefore, this can be regarded as positive predictability, as it aligns with the CAPS requirements. To maintain acceptable predictability, the DBE should continue to use varied subtopic scenarios on a rotational basis each year.

d. Variation in item types

The evaluation indicates that over the three-year period, this topic was assessed using different question types. MCQs were worth 4 marks in 2022, 2 marks in 2023, and were not used to assess this topic in 2024. The Terminology item types have remained at 2 marks over the three-year period. Extract-based questions were used to assess this topic only in 2022, and were worth 7 marks. The Data Response (Scientific Investigation) questions were used to assess the topic in 2022, with an allocation of 9 marks, and in 2024, Data Response (Scientific Investigation) questions were used to assess the topic with an allocation of 11 marks.

- Across the three-year period, the distribution of item types has varied across subtopics. The level of difficulty for Multiple Choice was classified as easy and moderate over the three-year period. Data Response questions (Scientific Investigation) were classified as difficult and very difficult in 2023 and 2024. Extract-based questions were classified as moderate and easy in 2022.
- Across the three-year period, the distribution of cognitive levels has varied slightly for item types. Cognitive levels for MCQs have been allocated L1 and L2 over the three-year period.
- Data Response questions (Scientific Investigation) were allocated L2, L3, and L4 in 2023 and 2024.

The evaluation and pattern observed indicate that different categories of questions, such as Multiple Choice, Terminology, Data Response (Scientific Investigation), and Extract-based questions, were used over the three-year period to assess Responding to the Environment (Plants). Although the evaluation indicates that few categories of questions were used, it is difficult to identify a specific category for a given topic, as these categories were used interchangeably across subtopics over the three-year period. Therefore, this can be regarded as positive predictability, as it aligns with the CAPS requirements and uses a range of question categories. The assessment body should continue to use different categories of questions and alternate the subtopics assigned to each category every year. The level of difficulty and cognitive levels should be varied to ensure that a pattern is not recognised.

e. Topic and skill pairing

The findings provide evidence that the Life Sciences final examination question papers demonstrate a structured and varied pairing of cognitive skills used to assess the Responding to the Environment (Plants) topic over the three-year period. In 2022, the key skills assessed were recalling information (Plant Hormones) and interpreting and extracting sources (Effect of Auxins in Tropism). In 2023, the skills assessed were: recalling information and analysing data in the table (Effect of Auxins on Growth). In 2024, the skills assessed were: recall of information, interpretation, and analytical skills (Plant Hormones and the Effect of Auxins in Tropism).

The evaluation indicates that a variety of cognitive skills have been assessed over the three-year period, with alternating subtopics each year. However, skills such as recalling information and interpretation are consistently employed each year, though their application shifts depending on the subtopic assessed. Although cognitive skills were repeatedly employed in Responding to the Environment (Plants), varied subtopics were used to assess it over the three-year period. Therefore, this can be regarded as positive predictability, as it aligns with the CAPS requirements and a range of cognitive skills. The assessment body should continue to use varied cognitive skills and varied subtopics to assess this topic.

f. Scenario framing of items for a topic

The patterns observed indicate that the Life Sciences final examination question papers exhibit scenario framing that varied across topics over the three-year period. These scenarios were contextual and grounded in real life, which made them relatable. In 2022, the scenarios focused on recalling information on Plant Hormones, Functions and Location, and source interpretation, based on a real-life extract, to assess the Effect of Auxins in Tropism. In 2023, the scenarios focused on recalling knowledge, interpreting, and analysing data in the table on the Effect of Auxins on Growth. In 2024, the scenarios focused on recalling knowledge, interpretation, and analysis, based on the Effect of Auxins in Tropism.

The evaluation indicates a predictable pattern of contextual framing throughout the three-year period. However, these scenarios were used interchangeably across different subtopics, preventing learners from anticipating specific scenario types for a given subtopic. This reflects an acceptable predictability. It is important for the assessment body to continue using different scenario framings for items across the topic. Furthermore, the DBE can strengthen variation by alternating source-interpretation, extract, and graph-based questions across subtopics each year to better align with the CAPS.

Summary of findings and recommendations for the DBE Life Sciences Responding to the Environment (Plants) topic

Table 3.1.8 below summarises identified patterns of predictability across key components of question paper design, along with corresponding recommendations to reduce predictability and strategies to maintain effective assessment practices without compromising variability.

Table 3.1.8: Summary of Findings and Recommendations on the Predictability of the 2022–2024 DBE Life Sciences Responding to the Environment (Plants) Topic Paper 1

Identified unacceptable predictability on topic coverage
Predictability is at an acceptable level, as it aligns with the CAPS requirements. The questions were not repeated, and the full scope of subtopics was adequately represented.
Recommendations to avoid unacceptable predictability on topic coverage
The DBE should continue to rotate the subtopics and vary cognitive demand. Predictability should be within CAPS expectations, as this will continue to support a sound education that is continuous, fair, and reliable.
Identified unacceptable predictability on content coverage
No identified unacceptable predictability. The subtopics were used in different scenarios, and phrasing was not repeated to assess the topic. The predictability of the content is within the acceptable range.
Recommendations to avoid predictable content coverage
The DBE should continue to use varied subtopic scenarios on a rotational basis each year.
Strategies to maintain content coverage that do not lead to a predictable question paper
Ensure that the varied subtopics are assessed annually to avoid content repetition.

Identified unacceptable predictability on topic weighting
Different subtopics have been alternated to assess the topic. Therefore, this can be regarded as positive predictability, as it aligns with the CAPS requirements.
Recommendations to avoid unacceptable predictability on topic weighting
The DBE should continue to use varied subtopic scenarios on a rotational basis each year.
Strategies to maintain topic weighting that do not lead to a predictable question paper
The assessment body should increase variation by alternating the weighting of different subtopics each year to further align with the CAPS.
Identified unacceptable predictability on item types
It is difficult to perceive a specific category for a topic, as they were used alternatively for subtopics.
Recommendations to avoid unacceptable predictability on item types
The assessment body should continue to use different categories of questions and alternate the subtopics assigned to each category every year.
Strategies to maintain the assessment of item types that do not lead to a predictable question paper
The level of difficulty and cognitive levels should be varied for different item types, to ensure that a pattern is not recognised.
Identified unacceptable predictability on topic–skill pairing
It aligns with the CAPS requirements and employs a range of cognitive skills.
Recommendations to avoid unacceptable predictability through topic–skill pairing
Use varied cognitive skills and varied subtopics to assess this topic.
Strategies to maintain topic–skill pairing that do not lead to a predictable question paper
Maintain variety of cognitive skills to assess the topic, with varying subtopics each year.

Identified unacceptable predictability in the scenario framing of items
The scenarios were used alternately across subtopics, preventing learners from anticipating specific scenario types for any given subtopic.
Recommendations to avoid unacceptable predictability in scenario framing of items
Continue using different scenario framings of items alternatively across the topic.
Strategies to maintain scenario framing of items that do not lead to a predictable question paper
The DBE should strengthen variation by alternating source-interpretation, extract, and graph-based questions across different subtopics each year to further align with the CAPS.

Table 3.1.9 below summarises the analysis conducted to determine the level of predictability for the Reproduction in Vertebrates topic in DBE Life Sciences Paper 1 examinations from 2022 to 2024.

Table 3.1.9: Findings on the Predictability of the Reproduction in Vertebrates Topic for the DBE Life Sciences Paper 1 Examinations from 2022–2024

Topic: Reproduction in Vertebrates							
Year	**Topic examined (✓) or not examined (X)**	**Content area/subtopics covered, including mark allocation**	**Overall weighting of the topic in marks**	**Item type/types (e.g., MCQ, essays, short answers, table, etc.) and marks allocated per content area/subtopic**	**Level of difficulty per item type used to examine the subtopic**	**Cognitive level per item type used to examine the subtopic**	**Skill assessed per subtopic**
2022	✓	Reproductive Strategies in Fish Species	9	Data Response & Graph Interpretation-9	Easy, Moderate	L1, L2, L3	Interpretative Skills. Sequential Explanation.
2023	✓	Reproductive Strategies in Frogs	8	Terminology-1 Data Response-7	Easy Moderate	L1 L1, L2, L3	Remembering. Explanation.

2024	✓	Reproductive Strategies in Vultures	8	Terminology-1 Source-based (passage)-8	Easy Easy, Moderate	L1 L1, L2	Remembering. Extraction. Explanation.

Table 3.1.9 presents a comparative overview of the Reproduction in Vertebrates topic across the three-year period. The analysis, presented in Sections a to f, evaluates whether the components listed in Table 3.1.9 have contributed to the predictability of the DBE Life Sciences final examination Paper 1 from 2022 to 2024.

a. Topic coverage

The findings indicate that the Reproduction in Vertebrates topic was consistently assessed across the three-year period of the NSC Life Sciences final examination question papers. This is in alignment with the CAPS requirements that it should be assessed at different cognitive levels, including knowledge, understanding of science, applying scientific knowledge, evaluating, analysing, and synthesising scientific knowledge. The fact that it is consistently included in examination question papers indicates it aligns with the CAPS requirements.

The frequency of topics across the three-year period of the NSC final examination question papers demonstrates a predictable pattern of coverage. Predictability is at an acceptable level; various vertebrate species were used to assess this topic. The questions were not repeated, and the full scope of subtopics was adequately represented.

To maintain predictability at an acceptable level, the DBE should continue to rotate the various vertebrate species annually. Predictability should be within CAPS expectations, as this will continue to support a sound education that is continuous, fair, and reliable.

b. Content coverage

The findings indicate that the content was consistently assessed over the three-year period, using various vertebrate reproductive strategies. The full scope of content was adequately assessed throughout the three-year period of the NSC Life Sciences final examination question papers.

The frequency of the topic indicates a predictable pattern in content coverage. However, the CAPS requires that the topic be assessed on a year-to-year basis. The use of reproductive strategies from different vertebrate species in rotation to assess this topic suggests that the predictability of the content is within an acceptable range. The alignment of content coverage with CAPS requirements ensures that the question papers are continuous, fair, and valid, and that content depth is assessed across cohorts. To maintain this, the DBE should continue to use varying vertebrate reproduction strategies on a yearly rotation.

c. Weighting of the topic

The analysis reveals that the allocation of marks for Reproduction in Vertebrates has remained the same in 2023 and 2024, at 8 marks, a slight decrease from 2022, when it was 9 marks. This allocation of marks aligns with the CAPS Life Sciences, which prescribes that Reproduction in Vertebrates be allocated 8 marks in Paper 1.

This implies that the weighting has consistently been kept at 5%, as required by CAPS Life Sciences. This consistent weighting supports candidates in developing balanced competencies across subtopics and in achieving the skills outlined in the CAPS. Learners should be taught in an integrated way to understand the history, relevance, and application of science.

Although a repetition of mark allocation can lead to perceived predictability, in this case, different vertebrate species have been assigned varying reproduction strategies to assess this topic. Therefore, this can be regarded as positive predictability, as it aligns with the CAPS requirements.

d. Variation in item types

The evaluation indicates that over the three-year period, this topic was assessed using various item types to explore reproductive strategies across vertebrate species. The following item types were used alternatively to assess Reproduction in Vertebrates: Terminology, Data Response, Interpretation (graph), and Source-based (passages).

The Terminology item type has been constant between 2023 and 2024, with an allocation of one mark. The Data Response (graph) question was used in 2022 with an allocation of 9 marks, and in 2023 it decreased slightly to 7 marks. The Source-based question was used in 2024 and allocated 8 marks.

- Across the three-year period, the distribution of item types has varied across different vertebrate reproduction strategies. The level of difficulty for Terminology was classified as easy and moderate in 2023 and 2024. Data Response was classified as easy and moderate only in 2023. Interpretation and Data Response (graph) were classified as easy, moderate, and difficult in 2022. Source-based (passages) was classified as easy and moderate in 2024.
- Across the three-year period, the distribution of cognitive levels has varied slightly for item types to assess this topic. Terminology was allocated L1 and L2 in 2023 and 2024. Data Response was allocated L1, L2, and L3 in 2022 and 2023. Interpretation (graph) was allocated L2 and L3 in 2022. Source-based (passages) was allocated L1 and L2 in 2024.

The evaluation and observed patterns indicate different categories of questions, such as Terminology, Data Response, Interpretation (graph), and Source-based (passages), that were used over the three-year period to assess this topic. This indicates that a variety of question categories were used, making it difficult to identify item types by reproduction strategy across species and thus reducing the predictability of the question paper over the three-year period. Therefore, this can be regarded as positive predictability, as it aligns with the CAPS requirements. Different categories of questions have been used, and varied vertebrate species have been

alternatively assessed. The assessment body should continue to use different categories of questions and alternate the species assigned to each category every year. The level of difficulty and cognitive levels should be varied to ensure that a pattern is not recognised.

e. Topic and skill pairing

The findings provide evidence that the Life Sciences final examination question papers demonstrate a structured and varied pairing of cognitive skills used to assess Reproduction in Vertebrates over the three-year period. In 2022, the key skills assessed were: interpretation and sequential explanation (Reproduction Strategies in Fish Species). In 2023, the skills assessed were: recalling information and sequential explanations (Reproduction Strategies in Frogs). In 2024, the skills assessed were: recalling information, extraction skills, and sequential explanations (Reproduction Strategies in Vultures).

The evaluation indicates that a variety of cognitive skills have been assessed over the three-year period, using different vertebrate species each year. Therefore, this can be regarded as positive predictability, as it aligns with the CAPS requirements. A range of cognitive skills and vertebrate species were employed to assess the topic. The assessment body should continue to use a variety of cognitive skills and vertebrate species to assess Reproduction in Vertebrates.

f. Scenario framing of items for a topic

The observed patterns indicate scenario framing that varied across topics over the three-year period. These scenarios were contextual and grounded in real life, which made them relatable. In 2022, the scenarios focused on interpretative scenarios based on Reproductive Strategies in Fish Species and sequential explanations of how the process takes place. In 2023, the scenarios focused on recalling knowledge and sequential explanations, based on how reproductive strategies operate in frogs. In 2024, the scenarios focused on recalling knowledge, extraction, and sequential explanations of how reproductive strategies take place in vultures.

The evaluation indicates a pattern of contextual framing that is not predictable throughout the three-year period. These scenarios were used alternately for various vertebrate species, preventing learners from anticipating specific scenario types for any one species. This reflects acceptable predictability. It is important for the assessment body to continue using different scenario framings for items across the Reproduction in Vertebrates topic. Furthermore, the DBE can strengthen variation by alternating source interpretations, extracts, and graph-based questions across vertebrate species each year to better align with the CAPS.

Summary of findings and recommendations for the DBE Life Sciences Reproduction in Vertebrates topic

Table 3.1.10 below summarises identified patterns of predictability across key components of question paper design, along with corresponding recommendations to reduce predictability and strategies to maintain effective assessment practices without compromising variability.

Table 3.1.10: Summary of Findings and Recommendations on the Predictability of the 2022–2024 DBE Life Sciences Reproduction in Vertebrates Topic Paper 1

Identified unacceptable predictability on topic coverage
Varying vertebrate species were used to assess this topic. The questions were not repeated, and the full scope of subtopics was adequately represented.
Recommendations to avoid unacceptable predictability on topic coverage
The DBE should continue to rotate the various vertebrate species annually. Predictability should be within CAPS expectations, as this will continue to support a sound education that is continuous, fair, and reliable.
Identified unacceptable predictability on content coverage

Various reproductive strategies of vertebrate species were used in rotation to address this topic, suggesting that the predictability of the content is within an acceptable range.
Recommendations to avoid predictable content coverage
The DBE should continue to use varying vertebrate reproduction strategies on a yearly rotation.
Strategies to maintain content coverage that do not lead to a predictable question paper
Ensure that the varied subtopics are assessed annually to avoid content repetition.
Identified unacceptable predictability on topic weighting
Varying reproductive strategies among vertebrate species have been examined to assess this topic. Therefore, this can be regarded as positive predictability, as it aligns with the CAPS requirements.
Recommendations to avoid unacceptable predictability on topic weighting
The DBE should continue to use varying vertebrate reproduction strategies on a yearly rotation.
Strategies to maintain topic weighting that do not lead to a predictable question paper
The assessment body should increase variation by alternating the weighting of subtopics each year to better align with the CAPS.
Identified unacceptable predictability on item types
A variety of question categories were used, making it difficult to identify item types by reproduction strategy across species and thus reducing the predictability of question papers.
Recommendations to avoid unacceptable predictability on item types
The assessment body should continue to use different categories of questions and alternate the species assigned to each category every year.
Strategies to maintain the assessment of item types that do not lead to a predictable question paper

The level of difficulty and cognitive levels should be varied for different categories of questions, to ensure that a pattern is not recognised.
Identified unacceptable predictability on topic–skill pairing
A variety of cognitive skills has been assessed using varied vertebrate species each year. Therefore, this can be regarded as positive predictability.
Recommendations to avoid unacceptable predictability through topic–skill pairing
The assessment body should continue to use a variety of cognitive skills and vertebrate species to assess Reproduction in Vertebrates.
Strategies to maintain topic–skill pairing that do not lead to a predictable question paper
Topic-skills pairing aligns with the CAPS requirements. Varied cognitive skills and varied vertebrate species should be employed rotationally, annually.
Identified unacceptable predictability in the scenario framing of items
The scenarios were used alternately across vertebrate species, preventing learners from anticipating specific scenario types for any one species.
Recommendations to avoid unacceptable predictability in scenario framing of items
The assessment body should continue to use different scenario framings of items in an alternating manner across the Reproduction in Vertebrates topic.
Strategies to maintain scenario framing of items that do not lead to a predictable question paper
The DBE should strengthen variation by alternating source-interpretation, extract, and graph-based questions across different vertebrate species each year to further align with the CAPS.

Conclusions

The evidence presented indicates that the evaluation of Life Sciences DBE Paper 1 for the period between the 2022 and 2024 question papers does not demonstrate unacceptable predictability.

The CAPS mandated the Life Sciences topic as fixed, requiring annual appearance in Paper 1. Topics such as Human Reproduction, Reproduction in Vertebrates, Responding to the Environment (Plants), and Human Nervous System were repeated. The annual repetition of these topics does not constitute unacceptable predictability, as they align with policy requirements. The content is based on varied subtopics, item types, and skill pairings, and its focus shifts annually to ensure learners do not perceive it as predictable.

The structure of the Life Sciences question papers remained consistent over the three-year period to support continuity, fairness and alignment with the CAPS standards. The content, cognitive skills, and item types were varied annually to prevent unacceptable predictability. This implies that Life Sciences Paper 1 from 2022 to 2024 does not exhibit unacceptable predictability and maintains a balanced, valid assessment structure that is policy-compliant and fair.

3.2: LIFE SCIENCES PAPER 2

This section presents an analysis of the DBE final examination question papers from 2022 to 2024 for Life Sciences Paper 2 topics. The findings for each topic are summarised in Tables 3.2.1–3.2.8.

Table 3.2.1 below summarises the analysis conducted to assess the predictability of the DNA Code of Life topic in DBE Life Sciences Paper 2 examinations from 2022 to 2024.

Table 3.2.1: Findings on the Predictability of the DNA Code of Life Topic for the DBE Life Sciences Paper 2 Examinations from 2022–2024

Topic: DNA Code of Life							
Year	**Topic examined (✓) or not examined (X)**	**Content area/subtopics covered, including mark allocation**	**Overall weighting of the topic in marks**	**Item type/types (e.g., MCQ, essays, short answers, table, etc.) and marks allocated per content area/subtopic**	**Level of difficulty per item type used to examine the subtopic**	**Cognitive level per item type used to examine the subtopic**	**Skill assessed per subtopic**
2022	✓	Protein Synthesis (Transcription)-12	27	MCQ-2 Terminology-2 Short Question-8 (Diagram-based)	Easy Easy Easy, Moderate	L1 L1 L1, L2	Remembering. Draw a Table.
		Gene Mutation-8		Data response-8 (Table)	Easy, Moderate, Difficult	L1, L2, L3	Remembering. Interpretation. Sequential Explanation.
		DNA Profiling-7		Short question-7 (Diagram-based)	Easy	L1, L2	Remembering.

							Sequential Explanation.
2023	✓	Protein Synthesis Concepts (9) Protein Synthesis Diagram (8)	37	MCQ-4 Terminology-3 Match Column-2 Short Question-8 (Diagram-based)	Easy Easy Moderate Easy, Moderate	L1, L2 L1 L2 L1, L2	Remembering. Identification.
		Gene Mutation-14		Data Response-14 (Extract & Table)	Easy, Moderate, Difficult	L1, L2, L3	Extraction. Interpretation. Sequential Explanation.
		DNA Replication-6		Short Question (Descriptive)-6	Moderate	L2	Sequential Explanation.
2024	✓	DNA & RNA-9 DNA Replication-6	27	MCQ-4 Terminology-3 Match Column-2 Short Question-6 (Diagram-based)	Easy Easy Moderate Easy	L1 L1 L1 L1	Remembering. Identification.

		Protein Synthesis (Transcription) -12		Data Response-12 (Extract & Table)	Easy, Moderate	L1, L2, L3	Identification. Interpretation. Sequential Explanation.

Table 3.2.1 presents a comparative overview of the DNA Code of Life topic across the three-year period. The analysis, presented in Sections a to f, evaluates whether the components listed in Table 3.2.1 have contributed to the predictability of the DBE Life Sciences final examination Paper 2 from 2022 to 2024.

a. Topic coverage

The findings indicate that the DNA Code of Life topic was consistently assessed across the three-year period of the NSC final examination question papers. This aligns with the CAPS requirements, as it should be assessed annually to evaluate learners' knowledge, understanding, and ability to analyse and solve problems related to the DNA Code of Life.

The frequency of topics across the three-year period of NSC final examination question papers demonstrates a predictable pattern of coverage. Predictability is at an acceptable level, as it aligns with the CAPS requirements. The questions were not repeated, and the full scope of subtopics was adequately represented.

To maintain predictability at an acceptable level, the DBE should continue rotating the subtopics and vary question types every year. Predictability should be within CAPS expectations, as this will continue to support a sound education that is fair and reliable.

b. Content coverage

The findings indicate that the DNA Code of Life topic was consistently assessed across the three-year period of the NSC final examination question papers. This aligns with the CAPS requirements, as it should be assessed annually to evaluate learners' knowledge, understanding, and ability to analyse and solve problems related to the topic. The full scope of content was adequately assessed throughout the three-year period of the NSC Life Sciences final examination question papers.

Different formats and phrasing were used in rotation to assess Protein Synthesis, Gene Mutation, and DNA Replication, which appeared more frequently than others over the three-year period.

The frequency of the topic indicates a predictable pattern in content coverage. However, the CAPS requires that the topic be assessed on a year-to-year basis. The use of different question formats and phrasing in rotation to assess this topic suggests that the predictability of the content is within an acceptable range.

The alignment of content coverage with CAPS requirements ensures that the question papers are continuous, fair, and valid, and that content depth is assessed across cohorts. Therefore, the assessment body should continue to align the content with the CAPS requirements, and use varied question formats and phrasing, to ensure that a pattern is not developed.

c. Weighting of the topic

The analysis reveals that the mark allocation for DNA Code of Life has remained at 27 marks in 2022 and 2024, with a significant increase to 37 marks in 2023. The CAPS Life Sciences prescribes that DNA Code of Life be allocated 27 marks in Paper 2.

This consistent weighting supports candidates in developing balanced competencies across the topic to achieve the required skills outlined in the CAPS. Learners should be taught in an integrated way to understand the history, relevance, and application of

science. Although repeating the mark allocation can lead to perceived predictability, in this case different formats and phrasing have been alternated to assess the topic. Therefore, this is an acceptable predictability, as it aligns with the CAPS requirements.

The alignment of topic weighting with the requirements of the CAPS ensures that the question papers are continuous, fair, and valid. Therefore, the assessment body should continue to align the topic's weighting with the CAPS requirements and use varied question formats and phrasing to prevent a pattern from developing.

d. Variation in item types

The evaluation indicates that, over the three-year period, this topic was assessed using a variety of item types. The following item types were used alternatively to assess DNA Code of Life: Multiple Choice, Terminology, Short Questions (Diagram-based, Descriptions), Match Column, and Data Response questions (Extract and Table).

MCQs were allocated 2 marks in 2022; they increased slightly to 4 marks in 2023 and remained at 4 marks in 2024. The Terminology item types were allocated 2 marks in 2022, increased to 3 marks in 2023, and remained at 3 marks in 2024. The Match Column questions were allocated 2 marks in 2023 and 2024. Short Questions (Diagram-based, Table, Descriptions, and Extract) were allocated 16 marks in 2022, decreased slightly to 14 marks in 2023, and decreased significantly to 6 marks in 2024. The Data Response (Table and Extract) questions were used to assess the topic in 2022 with an allocation of 8 marks; in 2023, there was a significant increase to 14 marks; and in 2024, there was a slight decrease to 12 marks.

- The level of difficulty for Multiple Choice was classified as easy and moderate over the three-year period. Short Questions (Diagram-based and Descriptions) were classified as easy and moderate over this period. Match Columns were classified as easy and moderate across the three-year period. Data Response questions (Table, Extract) were classified as easy, moderate, or difficult across the three-year period.

- Across the three-year period, the distribution of cognitive levels has varied slightly for the same item types. The cognitive levels for Multiple Choice have been allocated L1 and L2 over the three-year period, with varied format and phrasing.
- Short Questions (Diagram-based and Descriptions) were allocated L1 and L2 over this period. Match Columns were allocated L1, L2, and L3 in 2023 and 2024. Data Response questions (Table and Extract) were allocated L2, L3, and L4 over the three-year period.

The evaluation and observed patterns indicate that different categories of questions, such as Multiple Choice, Match Columns, Terminology, Diagram-based, and Data Response, were used over the three-year period to assess DNA Code of Life. This indicates that a variety of question categories were used, making it difficult to identify item types by subtopic and decreasing the predictability of question papers over the three-year period. Although these formats were repeatedly employed, varied formats and phrasing were used to assess them.

Therefore, this is an acceptable predictability, as it aligns with the CAPS requirements. Different categories of questions have been used, and varied formats and phrasing have been alternatively employed. The assessment body should continue to use different categories of questions and alternate the formats and phrasing assigned to each category every year. The level of difficulty and cognitive levels should be varied to ensure that a pattern is not recognised.

e. Topic and skill pairing

The findings provide evidence that the Life Sciences final examination question papers demonstrate a structured and varied pairing of cognitive skills used to assess the DNA Code of Life topic over the three-year period.

In 2022, the key skills assessed were: recalling information (Protein Synthesis [Transcription], DNA Profiling), drawing a graph (Protein Synthesis [Transcription]), interpretation (Gene Mutation), and sequential explanations (Gene Mutation and DNA Profiling).

In 2023, the skills assessed varied slightly: recalling information (Protein Synthesis), identifying (Protein Synthesis Concepts), extraction and interpretation (Gene Mutation), and sequential explanation (Gene Mutation and DNA replication). In 2024, the skills assessed were: recalling information (DNA and RNA, DNA Replication), identifying (DNA and RNA, Protein Synthesis [Transcription]), and interpreting and sequentially explaining (Protein Synthesis).

The evaluation indicates that a variety of cognitive skills have been assessed over the three-year period, using different formats and phrasing. However, skills such as recalling information, interpreting knowledge, and sequential explanation were consistently employed each year, though their application shifted depending on the phrasing and format of the question.

Although the same cognitive skills were repeatedly employed for this topic, varied formats and phrasing were used to assess it over the three-year period. Therefore, this can be regarded as an acceptable predictability, as it aligns with the CAPS. The assessment body should continue to use varied cognitive skills and varied question phrasing and format to assess DNA Code of Life.

f. Scenario framing of items for a topic

The patterns observed indicate that the Life Sciences final examination question papers exhibited scenario framing that varied across topics over the three-year period and were based on real-life scenarios, making them relatable. In 2022, the scenarios focused on recalling information from real-life scenarios to draw the table of Protein Synthesis (Transcription), interpreting a table on Gene Mutation, and providing a sequential explanation of Gene Mutation and DNA profiling. In 2023, the scenarios focused on recalling knowledge based on Protein Synthesis, sequential explanation based on Gene Mutation and DNA replication, identification on Protein Synthesis and interpretation and extraction based on Gene Mutation.

In 2024, the scenarios focused on interpreting Protein Synthesis (Transcription), sequentially explaining Protein Synthesis (Transcription), and identifying concepts in Protein Synthesis (Transcription). The evaluation indicates a predictable pattern of contextual framing throughout the three-year period. However, these scenarios were used interchangeably, preventing learners from anticipating which scenario types would be used for which topics. This reflects an acceptable predictability.

It is important for the assessment body to continue using different scenario framings for items and varied question formatting and phrasing. Furthermore, the DBE can strengthen variation by alternating among source-interpretation, extract, and graph-based questions each year to ensure greater alignment with the CAPS.

Summary of findings and recommendations for the DBE Life Sciences DNA Code of Life topic

Table 3.2.2 below summarises identified patterns of predictability across key components of question paper design, along with corresponding recommendations to reduce predictability and strategies to maintain effective assessment practices without compromising variability.

Table 3.2.2: Summary of Findings and Recommendations on the Predictability of the 2022–2024 DBE Life Sciences DNA Code of Life Topic Paper 2

Identified unacceptable predictability on topic coverage
No unacceptable predictability in topic coverage. It is aligned with the requirements of the CAPS. The questions were not repeated, and the full scope of subtopics was adequately represented.
Recommendations to avoid unacceptable predictability on topic coverage

The DBE should continue to rotate subtopics and vary question types annually. Predictability should be within CAPS expectations, as this will continue to support a sound education that is fair and reliable.
Identified unacceptable predictability on content coverage
No identified unacceptable predictability on content coverage. Various formats and phrasing were used in rotation to assess this topic, in line with the CAPS requirements.
Recommendations to avoid predictable content coverage
The assessment body should continue to align the content with the CAPS requirements and use varied question formats and phrasing to prevent a pattern from developing.
Strategies to maintain content coverage that do not lead to a predictable question paper
Different subtopics should be assessed each year, in a rotational order, using varied formats and phrasing.
Identified unacceptable predictability on topic weighting
No unacceptable predictability was identified. The consistent weighting supports candidates in developing balanced competencies across the topic to achieve the required skills.
Recommendations to avoid unacceptable predictability on topic weighting
The assessment body should continue to align the content with the CAPS requirements and use varied question formats and phrasing to prevent a pattern from developing.
Strategies to maintain topic weighting that do not lead to a predictable question paper
The assessment body should increase variation by alternating the weighting of different subtopics each year to further align with the CAPS.
Identified unacceptable predictability on item types
No identified unacceptable predictability on item types.

Recommendations to avoid unacceptable predictability on item types
A variety of question categories should be used to complicate the perception of item types within each subtopic.
Strategies to maintain the assessment of item types that do not lead to a predictable question paper
The level of difficulty and cognitive levels should be varied across different item types to ensure that no pattern is recognised.
Identified unacceptable predictability on topic–skill pairing
No unacceptable predictability was identified on topic-skill pairing. Varied formats and phrasing were used to assess this topic over the three-year period.
Recommendations to avoid unacceptable predictability through topic–skill pairing
The assessment body should continue to use varied cognitive skills and varied question phrasing and format to assess DNA Code of Life.
Strategies to maintain topic–skill pairing that do not lead to a predictable question paper
Topic-skills pairing aligns with the CAPS requirements and varied cognitive skills should be employed rotationally annually.
Identified unacceptable predictability in the scenario framing of items
No identified unacceptable predictability in the scenario framing of items. Scenario framing varied across topics over the three-year period. They were based on real-life scenarios, which made them relatable.
Recommendations to avoid unacceptable predictability in scenario framing of items
The DBE can strengthen variation by alternating among source-interpretation, extract, and graph-based questions each year to ensure further alignment with the CAPS.
Strategies to maintain scenario framing of items that do not lead to a predictable question paper
Scenarios should be used alternately across topics to prevent learners from anticipating specific scenario types for particular topics.

Table 3.2.3 below summarises the analysis conducted to assess the predictability of the Meiosis topic in the DBE Life Sciences Paper 2 final examinations from 2022 to 2024.

Table 3.2.3: Findings on the Predictability of the Meiosis Topic for the DBE Life Sciences Paper 2 Final Examinations from 2022–2024

Topic: Meiosis							
Year	**Topic examined (✓) or not examined (X)**	**Content area/subtopics covered, including mark allocation**	**Overall weighting of the topic in marks**	**Item type/types (e.g., MCQ, essays, short answers, table, etc.) and marks allocated per content area/subtopic**	**Level of difficulty per item type used to examine the subtopic**	**Cognitive level per item type used to examine the subtopic**	**Skill assessed per subtopic**
2022	✓	Process of Meiosis =9	26	MCQ-4 Terminology-3 Match Column-2	Easy Easy Moderate	L1 L1 L2	Remembering

		Karyotype of Abnormal Meiosis (5)		Short Question-5 (Diagram-based)	Easy	L1	Remembering
		Number of Chromosomes (10)		Data Response-10 (Table interpretation)	Easy, Moderate, Difficult	L1, L2, L3	Interpretation. Remembering. Sequential Explanation.
2023	✓	Phases/Stages of Meiosis (7) (Prophase 1 & Metaphase 1)-15	22	MCQ-2 Terminology-3 Match Column-2 Short Question-15 (Diagram-based)	Moderate Easy Easy Easy, Moderate, Difficult	L2 L1 L2 L1, L2, L3	Identifying. Remembering. Sequential Explanation.
2024	✓	Process of Meiosis Phases/Stages of Meiosis II	24	MCQ-6 Terminology-4 Match Column-2 Short Question-12 (Diagram-based)	Easy Easy Moderate Easy, Moderate, Difficult	L1, L2 L1 L2 L1, L2, L3	Remembering. Identification. Drawing of Diagram.

Table 3.2.3 presents a comparative overview of the Meiosis topic across the three-year period. The analysis, presented in Sections a to f, evaluates whether the components listed in Table 3.2.3 have contributed to the predictability of the DBE Life Sciences final examination Paper 2 from 2022 to 2024.

a. Topic coverage

The findings indicate that Meiosis was consistently assessed in the three-year period of the NSC final examination question papers. This is in alignment with the CAPS requirements, as it should be assessed every year to evaluate learners' knowledge, understanding, and ability to analyse and solve problems related to Meiosis. The frequency of the topic over the three-year period demonstrates a predictable pattern in topic coverage. Predictability is at an acceptable level, as it aligns with the CAPS requirements. The questions were not repeated, and subtopics were adequately represented.

To maintain predictability at an acceptable level, the DBE should continue to rotate subtopics and vary question types every year. Predictability should be within CAPS expectations, as this will continue to support a sound education that is fair and reliable.

b. Content coverage

The findings indicate that Meiosis was consistently assessed in the three-year period of the NSC final examination question papers. This is in line with the CAPS requirements, as it should be assessed annually to evaluate learners' knowledge, understanding, and ability to analyse and solve problems related to Meiosis. The full scope of content was adequately assessed throughout the three-year period of the NSC Life Sciences final examination question papers.

Different formats and phrasing were used in rotation to assess the Process of Meiosis and Phases/Stages of Meiosis II, which appeared more frequently than others over the three-year period. The frequency of the topic indicates a predictable pattern in content

coverage. However, the CAPS requires that the topic be assessed on a year-to-year basis. The use of different question formats and phrasing in rotation to assess this topic suggests that the predictability of the content is within an acceptable range.

The alignment of content coverage with CAPS requirements ensures that the question papers are continuous, fair, and valid, and that content depth is assessed across cohorts. Therefore, the assessment body should continue to align the content with the CAPS requirements and use varied question formats, phrasing, and subtopics to prevent a pattern from developing.

c. Weighting of the topic

The analysis reveals that the allocation of marks for Meiosis has been inconsistent. A varied mark allocation has been allocated to Meiosis each year during the three-year period. In 2022, the allocation was 26 marks, a deviation of 5 marks from the CAPS requirement of 21. In 2023, the mark allocation decreased slightly to 22 marks, representing a deviation of 1 mark from the CAPS requirement of 21 marks. In 2024, the mark allocation increased slightly to 24 marks, representing a deviation of 2 marks from the CAPS requirement of 21 marks for Meiosis in Life Sciences Paper 2.

This varied weighting supports candidates in developing balanced competencies across the topic to achieve the required skills outlined in the CAPS requirements. Learners should be taught in an integrated way to understand the history, relevance, and application of science. This varied weighting of marks makes it difficult for learners to perceive a pattern, as different formats, phrasing, and subtopics have been alternated with varying weights to assess the topic. Therefore, this can be regarded as acceptable predictability, as the pattern is not obvious, but the weighting remained within the deviation range of the CAPS requirements.

The alignment of topic weighting with the requirements of the CAPS ensures that the question papers are continuous, fair, and valid. Therefore, the assessment body should continue to align the topic weighting with the CAPS requirements and use varied question formats, random weighting within the CAPS range of deviation, phrasing, and subtopics to ensure that no pattern develops.

d. Variation in item types

The evaluation indicates that over the three-year period, this topic was assessed using a variety of item types. The following item types were used alternatively to assess Meiosis: Multiple Choice, Terminology, Match Column, Short Questions (Diagram-based). MCQs were allocated 4 marks in 2022; in 2023, there was a slight decrease to 2 marks; and in 2024, there was a slight increase to 6 marks. The Terminology item types were allocated 3 marks in 2022 and 2023, then increased to 4 marks in 2024. The Match Column questions were allocated 2 marks consistently over the three-year period. Short Questions (Diagram-based) were allocated 5 marks in 2022; in 2023, there was a significant increase to 15 marks; and in 2024, there was a slight decrease to 12 marks. The Data Response (Table) questions were used only to assess the topic in 2022 and were worth 10 marks.

- The level of difficulty for Multiple Choice was classified as easy and moderate over the three-year period. Short Questions (Diagram-based) were classified as easy, moderate, and difficult over this period. Match Columns were classified as easy and moderate over the three-year period. Data Response questions (Table) were classified as easy, moderate, and difficult over the three-year period.
- Across the three-year period, the distribution of cognitive levels has varied slightly for item types. The cognitive levels for Multiple Choice have been allocated L1 and L2 over the three-year period with varied formats and phrasing.
- Short Questions (Diagram-based) were allocated L1, L2, and L3 over this period. Match Columns were allocated L1 and L2 over the three-year period. Data Response questions (Table) were allocated L1, L2, and L3 in 2022.

The evaluation and observed patterns indicate that different categories of questions, such as Multiple Choice, Match Columns, Terminology, Diagram-based, and Data Response, were used over the three-year period to assess Meiosis. This indicates that a variety of question categories were used, making it difficult to identify item types for each subtopic and thus reducing the predictability of the question papers. Although these formats were repeatedly employed, varied formats and phrasing were used to assess it over the three-year period.

Therefore, this is an acceptable predictability, as it aligns with the CAPS requirements. Different categories of questions have been used, and varied formats and phrasing have been alternatively employed. The assessment body should continue to use different categories of questions and alternate formats and phrasing within each category every year. The level of difficulty and cognitive levels should be varied to ensure that a pattern is not recognised.

e. Topic and skill pairing

The findings provide evidence that the Life Sciences final examination question papers demonstrate a structured and varied pairing of cognitive skills used to assess Meiosis over the three-year period. In 2022, the key skills assessed were: recalling information (Process of Meiosis, Karyotype of Abnormal Meiosis and Number of Chromosomes), interpretative skills (Number of Chromosomes), and sequential explanations (Number of Chromosomes).

In 2023, the skills assessed varied slightly: recalling information (Phase/Stages of Meiosis), identification (Prophase 1 and Metaphase 1), and sequential explanation (Prophase 1 and Metaphase 1). In 2024, the skills assessed were: recalling information (Process of Meiosis), identification (Phase/Stages of Meiosis II), and drawing diagrams (Phase/Stages of Meiosis II).

The evaluation indicates that a variety of cognitive skills were assessed over the three-year period, using different formats and phrasing. However, skills such as recalling information, interpreting knowledge, and sequential explanation were consistently employed each year but shifted depending on the phrasing, format, and subtopic of the question.

Although cognitive skills were repeatedly employed for this topic, varied formats, phrasing, and subtopics were used to assess it over the three-year period. Therefore, this can be regarded as an acceptable predictability, as it aligns with the CAPS. The assessment body should continue to use varied cognitive skills, varied question phrasing, formats, and subtopics to assess Meiosis.

f. Scenario framing of items for a topic

The patterns observed indicate that the Life Sciences final examination question papers exhibit scenario framing that varied across topics over the three-year period. They were based on real-life scenarios, which made them relatable. In 2022, the scenarios focused on recalling information from real-life situations to demonstrate understanding of the Meiosis process; there was also an interpretation of a table based on the number of Chromosomes and a sequential explanation of that number.

In 2023, the scenarios focused on recalling knowledge of the Stages of Meiosis and on a sequential explanation based on Prophase 1 and Metaphase 1. In 2024, the scenarios focused on recalling information about the Process of Meiosis, identifying the Stages of Meiosis II, and drawing diagrams based on the Stages of Meiosis II.

The evaluation indicates a predictable pattern of contextual framing throughout the three-year period. However, these scenarios were used interchangeably, preventing learners from anticipating which scenario types would be used for which topics. This reflects an acceptable predictability.

It is important for the assessment body to continue using different scenario framings for items and varied question formatting and phrasing. Furthermore, the DBE can strengthen variation by alternating among source-interpretation, extract, and graph-based questions each year to ensure further alignment with the CAPS.

Summary of findings and recommendations for the DBE Life Sciences Meiosis topic

Table 3.2.4 below summarises identified patterns of predictability across key components of question paper design, along with corresponding recommendations to reduce predictability, and strategies to maintain effective assessment practices without compromising variability.

Table 3.2.4: Summary of Findings and Recommendations on the Predictability of the 2022–2024 DBE Life Sciences Meiosis Topic Paper 2

Identified unacceptable predictability on topic coverage
No unacceptable predictability in topic coverage. It is aligned with the requirements of the CAPS. The questions were not repeated, and the full scope of subtopics was adequately represented.
Recommendations to avoid unacceptable predictability on topic coverage
The assessment body should continue to align the content with the CAPS requirements and use varied question formats and phrasing to prevent a pattern from developing.
Identified unacceptable predictability on content coverage
No unacceptable predictability was identified on content coverage. Various formats and phrasing were used in rotation to assess this topic, in line with the CAPS requirements.
Recommendations to avoid predictable content coverage

The assessment body should continue to align the content with the CAPS requirements and use varied question formats, phrasing, and subtopics to prevent a pattern from developing.
Strategies to maintain content coverage that do not lead to a predictable question paper
Different subtopics should be assessed each year, in a rotational order, using varied formats and phrasing.
Identified unacceptable predictability on topic weighting
No identified unacceptable predictability on topic weighting. Topic weighting was aligned with the CAPS requirements. Different question formats and phrasing were used in rotation to assess this topic.
Recommendations to avoid unacceptable predictability on topic weighting
Align the topic's weighting with the CAPS requirements, and use varied question formats, random weighting within the CAPS range of deviation, phrasing, and subtopics to ensure that no pattern develops.
Strategies to maintain topic weighting that do not lead to a predictable question paper
The assessment body should increase variation by alternating the weighting of different subtopics each year to further align with the CAPS.
Identified unacceptable predictability on item types
No unacceptable predictability on item types. Item types align with the CAPS requirements. Various categories of questions have been used, and varied formats and phrasing have been employed across item types.
Recommendations to avoid unacceptable predictability on item types
A variety of question categories should be used to complicate the perception of item types per subtopic.
Strategies to maintain the assessment of item types that do not lead to a predictable question paper
The level of difficulty and cognitive levels should be varied to ensure that a pattern is not recognised.
Identified unacceptable predictability on topic–skill pairing

No unacceptable predictability on topic-skill pairing. Varied formats, phrasing, and subtopics were used to assess it over the three-year period.
Recommendations to avoid unacceptable predictability through topic–skill pairing
Varied formats, phrasing, and subtopics were used to assess it over the three-year period.
Strategies to maintain topic–skill pairing that do not lead to a predictable question paper
Topic-skill pairing aligns with the CAPS requirements, and varied cognitive skills should be employed in rotation every year.
Identified unacceptable predictability in the scenario framing of items
No unacceptable predictability in the scenario framing of items. Scenario framing varied across topics over the three-year period. They were based on real-life scenarios, which made them relatable.
Recommendations to avoid unacceptable predictability in scenario framing of items
Continue using different scenario framings for items, and varied question formatting and phrasing.
Strategies to maintain scenario framing of items that do not lead to a predictable question paper
The DBE can strengthen variation by alternating among source-interpretation, extract, and graph-based questions each year to further align with the CAPS.

Table 3.2.5 below summarises the analysis conducted to assess the predictability of the Genetics and inheritance topic in DBE Life Sciences Paper 2 examinations from 2022 to 2024.

Table 3.2.5: Findings on the Predictability of the Genetics and Inheritance Topic for the DBE Life Sciences Paper 2 Examinations from 2022–2024

Topic: Genetics and Inheritance							
Year	**Topic examined (✓) or not examined (X)**	**Content area/subtopics covered, including mark allocation**	**Overall weighting of the topic in marks**	**Item type/types (e.g., MCQ, essays, short answers, table, etc.) and marks allocated per content area/subtopic**	**Level of difficulty per item type used to examine the subtopic**	**Cognitive level per item type used to examine the subtopic**	**Skill assessed per subtopic**
2022		Genetics & Inheritance concepts (8)	43	MCQ-4 Match Column-4	Easy Moderate	L1 L2	Remembering
		Pedigree (5)		Short Question-5 (Diagram-based)	Moderate	L1, L2	Interpreting. Remembering.
		Dihybrid (7)		Short Question-7 (Scenario + Table)	Moderate	L1, L2	Identifying. Interpreting.
		Blood Groups (7)		Data Response (Table)-7	Moderate, Difficult	L2, L3	Interpreting. Analysing.

							Calculation.
		Sex-linked (10)		Short Question-10 (Scenario)	Difficult, Very Difficult	L3, L4	Interpreting. Analysing. Calculation. Genetic Cross.
		Stem Cells (6)		Short Question-6 (Extract)	Easy	L1	Extraction. Explanation.
2023		Genetics & Inheritance Concepts (14)	37	MCQ -10 Terminology-2 Match Column-2	Easy, Moderate Easy Moderate	L1, L2 L1 L2	Remembering. Interpreting.
		Blood Groups (Pedigree diagram)-8		Short Question-8 (Diagram-based)	Easy, Moderate	L1, L2	Identifying. Interpreting.
		Polydactyly (Genetic Cross)-6		Short Questions-6 (Scenario)	Moderate	L2, L3, L4	Interpretation. Analyse. Solving Genetic Cross.
		Dihybrid cross (9)		Short Questions-9 (Scenario)	Moderate	L2, L3, L4	Interpretation.

2024		Genetics & Inheritance Concepts (3)	45	MCQ -2 Terminology-1	Easy Easy	L1 L2	Remembering.
		Dihybrid Cross (9)		Short Questions-9 (Scenario)	Easy, Moderate	L1, L2	Remembering. Interpretation.
		Blood Groups (Table)-13		Data Response-13 (Table)	Moderate, Difficult	L2, L3	Interpretation. Analysis. Creating. Draw a Bar Graph.
		Pedigree diagram-13		Short Question - 13 (Diagram-based)	Easy, Moderate	L1, L2	Identifying. Interpreting. Genetic Cross.
		Genetically Modified Maize-7		Short Question-7 (Passage/Extract)	Difficult	L3	Interpretation. Sequential Explanation.

Table 3.2.5 presents a comparative overview of the Genetics and Inheritance topic across the three-year period. The analysis, presented in Sections a to f, evaluates whether the components listed in Table 3.2.5 have contributed to the predictability of the DBE Life Sciences final examination Paper 2 from 2022 to 2024.

a. Topic coverage

The findings indicate that Genetics and Inheritance was consistently assessed across the three-year period of the NSC final examination question papers. This is in line with the CAPS requirements, as it should be assessed annually to evaluate learners' knowledge, understanding, and ability to analyse and solve problems related to Genetics and Inheritance. The full scope of topics was adequately assessed throughout the three-year period of the NSC final Life Sciences examination question papers.

The frequency of the topic demonstrates a predictable pattern in topic coverage. The predictability is acceptable, as it aligns with the CAPS requirements. The questions were not repeated, and subtopics were adequately represented.

To maintain predictability at an acceptable level, the DBE should continue to rotate subtopics and vary question types every year. Predictability should be within CAPS expectations, as this will continue to support a sound education that is fair and reliable.

b. Content coverage

The findings indicate that Genetics and Inheritance was consistently assessed across the three-year period. This is in line with the CAPS requirements, as it should be assessed annually to evaluate learners' knowledge, understanding, and ability to analyse and solve problems related to Genetics and Inheritance. The full scope of content was adequately assessed throughout the three-year period of the NSC final Life Sciences examination question papers.

Different formats and phrasing were used in rotation to assess Genetics and Inheritance Concepts, and Dihybrid Cross, which appeared more frequently than others over the three-year period. The frequency of the topic indicates a predictable pattern in content coverage. However, different question formats and phrasing were used in rotation to assess these topics. Therefore, the predictability of the content is within an acceptable range.

The alignment of content coverage with CAPS requirements ensures that the question papers are continuous, fair, and valid, and that content depth is assessed across cohorts. Therefore, the assessment body should continue to align the content with the CAPS requirements and use varied question formats, phrasing, and subtopics to ensure that a pattern does not develop.

***c.* Weighting of the topic**

The analysis reveals that the mark allocation for Genetics and Inheritance has not been consistent; different marks have been assigned to the topic each year. In 2022, the allocation was 43 marks, 5 below the CAPS requirement of 48 for this topic. In 2023, marks decreased significantly to 37, representing a deviation of 11 marks below the CAPS requirement of 48. In 2024, marks increased significantly to 45, which is 3 marks below the CAPS requirement of 48 for Genetics and Inheritance in Life Sciences Paper 2.

This varied weighting supports candidates in developing balanced competencies across the topic to achieve the required skills outlined in the CAPS. Learners should be taught in an integrated way to understand the history, relevance, and application of science. This varied weighting of marks makes it difficult for learners to perceive a pattern, as different formats, phrasing, and subtopics have been alternated with varying weights to assess the topic. Therefore, this can be regarded as an acceptable predictability, as the pattern is not obvious.

The alignment of topic weighting with the requirements of the CAPS ensures that the question papers are continuous, fair, and valid. Therefore, the assessment body should align the topic weighting with the CAPS requirements and use varied question formats, random weighting within the CAPS range of deviation, phrasing, and subtopics to ensure that no pattern develops.

d. Variation in item types

The evaluation indicates that over the three-year period, this topic was assessed using a variety of item types. The following item types were used alternatively to assess Genetics and Inheritance: Multiple Choice, Terminology, Match Column, Short Questions (Diagram-based, Scenarios, Table, and Extract), and Data Response (Table and Diagram).

MCQs were allocated 4 marks in 2022; in 2023, there was a slight decrease to 2 marks, and the mark allocation remained at 2 marks in 2024. The Terminology item types were allocated 2 marks in 2023 and 1 mark in 2024. The Match Column questions were allocated 4 marks in 2022 and were slightly reduced to 2 marks in 2023. Short Questions (Diagram-based, Scenarios, Table, and Extract) were allocated 28 marks in 2022; in 2023, the allocation decreased slightly to 21 marks, and in 2024 it decreased significantly to 16 marks. The Data Response (Table, Diagram) questions were allocated 7 marks in 2022 and were significantly increased to 26 marks in 2024.

- The level of difficulty for Multiple Choice was classified as easy and moderate over the three-year period. Short Questions (Diagram-based, Scenarios, Table, and Extract) were classified as easy, moderate, difficult, and very difficult over the three-year period. Match Columns were classified as easy and moderate over the three-year period. Data Response questions (Table and Diagrams) were classified as easy, moderate, difficult, and very difficult over the three-year period.
- Across the three-year period, the distribution of cognitive levels has varied slightly. The cognitive levels for Multiple Choice have been allocated L1 and L2 over the three-year period, with varied formats and phrasing.
- Short Questions (Diagram-based, Scenarios, Table, and Extract) were allocated L1, L2, L3, and L4 over the three-year period. Match Columns were allocated L1 and L2 over the three-year period. Data Response questions (Table and Diagrams) were allocated to L1, L2, and L3 only in 2022 and 2024.

The evaluation and observed patterns indicate that different question categories, such as Multiple Choice, Match Columns, Terminology, Diagram-based, Tables, and Data Response, were used over the three-year period to assess Genetics and Inheritance.

This indicates that a variety of question categories were used, which makes it difficult to identify item types by subtopic. Although these formats were repeatedly employed, varied phrasing was used, thereby reducing the predictability of the question papers over the three-year period.

Therefore, this is an acceptable predictability, as it aligns with the CAPS requirements. Different categories of questions have been used, and varied formats and phrasing have been alternatively employed. The assessment body should continue to use different categories of questions and alternate formats and phrasing within each category every year. The level of difficulty and cognitive levels should be varied to ensure that a pattern is not recognised.

e. Topic and skill pairing

The findings provide evidence that the Life Sciences final examination question papers demonstrate a structured and varied pairing of cognitive skills used to assess Genetics and Inheritance over the three-year period. In 2022, the key skills assessed were: recalling information (Genetics and Inheritance Concepts and Pedigree); identification (Dihybrid Cross); analysis (Blood Groups, Sex-linked); interpretation (Pedigree, Dihybrid Cross, Blood Groups, Sex-linked); analysis (Blood Groups and Sex-linked); calculation (Blood Groups, Genetic Cross); and extraction (Stem Cells).

In 2023, the skills assessed were: recalling information (Genetics and Inheritance Concepts); interpretation (Genetics and Inheritance Concepts, Blood Groups (Pedigree Diagram), Polydactyly Genetic Cross, Dihybrid Cross); identification (Blood Groups); and analysis (Polydactyly Genetic Cross). In 2024, the skills assessed were: recalling information (Genetics and Inheritance Concepts, Dihybrid Cross), interpretation (Dihybrid Cross, Blood Groups, Pedigree Diagram and Genetically Modified Maize), analysis (Blood Groups), drawing of graphs (Blood Groups), sequential explanation (Genetically Modified Maize), and creative skills (Blood Groups).

The evaluation indicates that a variety of cognitive skills were assessed over the three-year period, using different formats and phrasing. However, skills such as recall of information, interpretation of knowledge, application of knowledge, analytical skills, and

sequential explanation were consistently employed each year but shifted depending on the phrasing, format, and subtopic of the question.

Although cognitive skills were repeatedly employed for this topic, varied formats, phrasing, and subtopics were used to assess it over the three-year period. Therefore, this is an acceptable predictability, as it aligns with the CAPS. The assessment body should continue to use varied cognitive skills and varied question phrasing, format, and subtopics to assess evolution.

f. Scenario framing of items for a topic

The observed patterns indicate scenario framing that varied across topics over the three-year period. They were based on real-life scenarios, which made them relatable. In 2022, the scenarios focused on recalling information, interpreting, identifying, and calculating genetic crosses from real-life situations to demonstrate an understanding of Genetics and Inheritance.

In 2023, the scenarios focused on recalling knowledge, identifying, interpreting, and analysing real-life situations to demonstrate understanding of the topic. In 2024, the scenarios focused on recalling information, interpreting, identifying and creative skills from real-life scenarios to portray an understanding of Genetics and Inheritance.

The evaluation indicates a predictable pattern of contextual framing throughout the three-year period. However, these scenarios were used interchangeably, preventing learners from anticipating which scenario types would be used for which topics. This reflects an acceptable predictability.

It is important for the assessment body to continue using different scenario framings for items and varied question formatting and phrasing. Furthermore, the DBE can strengthen variation by alternating among source-interpretation, extract, and graph-based questions each year to ensure greater alignment with the CAPS.

Summary of findings and recommendations for the DBE Life Sciences Genetics and inheritance topic

Table 3.2.6 below summarises identified patterns of predictability across key components of question paper design, along with corresponding recommendations to reduce predictability and strategies to maintain effective assessment practices without compromising variability.

Table 3.2.6: Summary of Findings and Recommendations on the Predictability of the 2022–2024 DBE Life Sciences Genetics and Inheritance Topic Paper 2

Identified unacceptable predictability on topic coverage
No unacceptable predictability in topic coverage. It is aligned with the requirements of the CAPS. The questions were not repeated, and the full scope of subtopics was adequately represented.
Recommendations to avoid unacceptable predictability on topic coverage
The assessment body should continue to align the content with the CAPS requirements and use varied question formats and phrasing to prevent a pattern from developing.
Identified unacceptable predictability on content coverage
No unacceptable predictability was identified in content coverage. Different formats and phrasing were used in rotation to assess this topic, aligning with the CAPS requirements.
Recommendations to avoid predictable content coverage
The assessment body should continue to align the content with the CAPS requirements and use varied question formats, phrasing, and subtopics to prevent a pattern from developing.
Strategies to maintain content coverage that do not lead to a predictable question paper

Different subtopics should be assessed each year, in a rotational order, using varied formats and phrasing.
Identified unacceptable predictability on topic weighting
No unacceptable predictability on topic weighting. The varied weighting supports candidates in developing balanced competencies across the topic to achieve the required skills.
Recommendations to avoid unacceptable predictability on topic weighting
Align the topic's weighting with the CAPS requirements and use varied question formats.
Strategies to maintain topic weighting that do not lead to a predictable question paper
Strengthen variation by alternating weighting on different subtopics each year, to ensure further alignment with the CAPS.
Identified unacceptable predictability on item types
No unacceptable predictability on item types.
Recommendations to avoid unacceptable predictability on item types
A variety of question categories should be used to complicate the perception of item types within each subtopic.
Strategies to maintain the assessment of item types that do not lead to a predictable question paper
The level of difficulty and cognitive levels should be varied to ensure that a pattern is not recognised.
Identified unacceptable predictability on topic–skill pairing
No unacceptable predictability on topic-skill pairing. Varied formats, phrasing, and subtopics were used.
Recommendations to avoid unacceptable predictability through topic–skill pairing
Varied formats, phrasing, and subtopics were used to assess it.
Strategies to maintain topic–skill pairing that do not lead to a predictable question paper
Topic-skills pairing aligns with the CAPS requirements, and varied cognitive skills should be employed in rotation every year.
Identified unacceptable predictability in the scenario framing of items

No unacceptable predictability in the scenario framing of items. Scenario framing varied across topics over three years. They were based on real-life scenarios, which made them relatable.
Recommendations to avoid unacceptable predictability in scenario framing of items
Continue using different scenario framings for items, and varied question formatting and phrasing.
Strategies to maintain scenario framing of items that do not lead to a predictable question paper
The DBE can strengthen variation by alternating among source-interpretation, extract, and graph-based questions each year to further align with the CAPS.

Table 3.2.7 summarises the analysis conducted to assess the predictability of the Evolution topic in DBE Life Sciences Paper 2 examinations from 2022 to 2024.

Table 3.2.7: Findings on the Predictability of the Evolution Topic for the DBE Life Sciences Paper 2 Examinations from 2022–2024

Topic: Evolution							
Year	**Topic examined (✓) or not examined (X)**	**Content area/subtopics covered, including mark allocation**	**Overall weighting of the topic in marks**	**Item type/types (e.g., MCQ, essays, short answers, table, etc.) and marks allocated per content area/subtopic**	**Level of difficulty per item type used to examine the subtopic**	**Cognitive level per item type used to examine the subtopic**	**Skill assessed per subtopic**
2022	✓	Evolution Concepts (10)	54	MCQ -6 Terminology-2 Match Column-2	Easy Easy Moderate	L1 L1 L2	Remembering
		Reproductive Isolation (7)		Short Questions-7 (Extract)	Easy, Moderate	L1, L2	Remembering. Extraction.
		Human Evolution (5)		Short Questions-5 (Scenario)	Easy, Moderate	L1, L2	Remembering.
		Phylogenetic Tree & Out of Africa Hypothesis (14)		Short Questions-14 (Diagram-based)	Easy, Moderate	L1, L2, L3	Remembering. Identification. Interpretation. Analysing.

		Lamarckism (8)		Short Question-8 (Scenario + Table)	Easy, Moderate, Difficult	L1, L2, L3	Identification. Interpretation. Application. Analysing.
		Evolution in Present Times (Scientific Investigation)-10		Data Response-10 (Table)	Difficult, Very Difficult	L3, L4	Interpretation. Scientific investigation. Analytic.
2023	✓	Evolution Concepts (4)	54	MCQ-2 Terminology-2	Easy Easy	L1 L2	Remembering
		Darwinism (7)		Short Question-7	Moderate	L2	Sequential Explanation.
		Artificial Selection (8)		Short Question-8 (Graph)	Moderate, Difficult	L2, L3	Interpretation. Analytic.
		Scientific Investigation (12)		Data response-12 (Scenario + Table)	Moderate, Difficult, Very Difficult	L2, L3, L4	Interpretation. Scientific Investigation. Analytic.
		Human Evolution		Short Question-11 (Diagram-based)	Easy, Moderate	L1, L2	Interpretation. Calculation.

		Hominids (11)					Analytic.
		Human Evolution Skulls, Pelvis (12)		Short Question-12 (Diagram-based)	Easy, Moderate, Difficult	L1, L2, L3	Remembering. Interpretation. Sequential Explanation.
2024	✓	Evolution Concepts (13)	54	MCQ-8 Terminology-1 Match Column-2	Easy Easy Moderate	L1 L1 L2	Remembering. Comparison.
		Phylogenetic Tree (9)		Short Question-9 (Diagram-based)	Easy, Moderate	L1, L2	Remembering. Interpretation.
		Out of Africa Hypothesis-(9)		Short Question-9 (Passage)	Easy, Moderate	L2, L3	Remembering. Extraction.
		Darwinism/ Natural Selection (7)		Short Question-7 (Passage)	Easy, Difficult	L1, L2, L3	Remembering. Application of Knowledge. Sequential Explanation.
		Types of Variation		Data Response-12 (Scenario table)	Difficult, Very Difficult	L3, L4	Interpretation. Analytic. Creating.

		(Scientific Investigation) (12)					

Table 3.2.7 presents a comparative overview of the Evolution topic across the three-year period. The analysis, presented in Sections a to f, evaluates whether the components listed in Table 3.2.7 have contributed to the predictability of the DBE Life Sciences final examination Paper 2 from 2022 to 2024.

a. Topic coverage

The findings indicate that Evolution was consistently assessed throughout the three-year period of the NSC final examination question papers. This is in alignment with the CAPS requirements, as it should be assessed every year to evaluate learners' knowledge, understanding, and ability to analyse and solve problems related to Evolution. The full scope of topics was adequately assessed throughout the three-year period.

The frequency of the topic demonstrates a predictable pattern in topic coverage. Predictability is at an acceptable level, as it aligns with the CAPS requirements. The questions were not repeated, and subtopics were adequately represented.

To maintain predictability at an acceptable level, the DBE should continue to rotate subtopics and vary question types every year. Predictability should be within CAPS expectations, as this will continue to support a sound education that is fair and reliable.

b. Content coverage

Different formats, phrasing, and subtopics were used in rotation to assess Evolution Concepts, Human Evolution, and Darwinism, which appeared more frequently than others over the three-year period. The frequency of the topic indicates a predictable pattern in

content coverage. However, different formats and phrasing were used in rotation to assess these topics. Therefore, the predictability of the content is within an acceptable range.

To maintain predictability at an acceptable level, the DBE should continue to rotate subtopics and vary question types every year. Predictability should be within CAPS expectations, as this will continue to support a sound education that is fair and reliable.

c. Weighting of the topic

The analysis reveals that the mark allocation for Evolution has consistently remained at 54 marks throughout the three-year period. This allocation of marks is aligned with the CAPS Life Sciences, which prescribes that Evolution be allocated 54 marks in Paper 2. This consistent weighting supports candidates by helping them develop balanced competencies across subtopics, thereby achieving the required skills outlined in the CAPS. Although repeating the mark allocation can lead to perceived predictability, in this case, different subtopics have been alternated to assess the topic. Therefore, this is an acceptable predictability, as it aligns with the CAPS requirements.

To maintain predictability at an acceptable level, the DBE should continue to rotate subtopics and vary the allocation of marks every year. Predictability should be within CAPS expectations, as this will continue to support a sound education that is fair, continuous, and reliable.

d. Variation in item types

The evaluation indicates that over the three-year period, this topic was assessed using a variety of item types. The following item types were used alternatively to assess Evolution: Multiple Choice, Terminology, Match Column, Short Questions (Diagram-based, Scenarios, Table, Graph, Passage and Extract), and Data Response (Table, Scenario, and Diagram).

MCQs were allocated 6 marks in 2022; in 2023, there was a slight decrease to 2 marks; and in 2024, there was a significant increase to 8 marks. The Terminology item types were allocated two marks in 2022 and 2023, and in 2024, they decreased slightly to 1 mark. The Match Column questions were allocated 2 marks in 2022 and 2024. Short Questions (Diagram-based, Scenarios, Table, and Extract) were allocated 34 marks in 2022, 38 marks in 2023, and 25 marks in 2024. The Data Response (Table, Diagram, and Scenario) questions were allocated 10 marks in 2022 and 12 marks in 2023 and 2024.

- The level of difficulty for Multiple Choice was classified as easy and moderate over the three-year period. Short Questions (Diagram-based, Scenarios, Table, Graph, Passage and Extract) were classified as easy, moderate, and difficult over this period. Match Columns were classified as easy and moderate over the three-year period. Data Response questions (Table, Diagram and Scenario) were classified as easy, moderate, difficult, or very difficult over the three-year period.
- Across the three-year period, the distribution of cognitive levels has varied slightly = The cognitive levels for Multiple Choice have been allocated L1 and L2, with varied format and phrasing.
- Short Questions (Diagram-based, Scenarios, Table, and Extract) were allocated to L1, L2, L3, and L4 over this period. Match Columns were allocated to L1 and L2 in 2022 and 2024. Data Response questions (Table, Diagram and Scenario) were allocated to L1, L2, L3, and L4 over the three-year period.

The evaluation and observed patterns indicate that different categories of questions, such as Multiple Choice, Match Columns, Terminology, Diagram-based, Tables, and Data Response, were used over the three-year period to assess Evolution.

This indicates that a variety of question categories were used, which makes it difficult to identify item types for each subtopic. Although these formats were repeatedly employed, varied subtopics and phrasing were used, thereby reducing the predictability of question papers over the three-year period.

Therefore, this is an acceptable level of predictability, as it aligns with the CAPS requirements. Different categories of questions have been used, and varied formats and phrasing have been alternatively employed. The assessment body should continue to use different categories of questions and alternate formats and phrasing within each category every year. The level of difficulty and cognitive levels should be varied to ensure that a pattern is not recognised.

e. Topic and skill pairing

The findings provide evidence that the Life Sciences final examination question papers demonstrate a structured and varied pairing of cognitive skills, used to assess Evolution over the three-year period. In 2022, the key skills assessed were: recalling information (Evolution Concepts, Reproductive Isolation, Human Evolution, Phylogenetic Tree, and Out of Africa Hypothesis); extraction (Reproductive Isolation); identification (Human Evolution and Lamarckism); analytic skills (Phylogenetic Tree and Out of Africa Hypothesis); and interpretation (Evolution in Present Times).

In 2023, the skills assessed were: recalling information (Evolution Concepts, Human Evolution Skulls, Pelvis); sequential explanation (Darwinism, Human Evolution Skulls, Pelvis); interpretation (Artificial Selection, Scientific Investigation, Human Evolution Skulls, Pelvis); and calculation (Human Evolution Hominids). In 2024, the skills assessed were: recalling information (Evolution Concepts, Phylogenetic Tree, Out of Africa Hypothesis, Darwinism/Natural Selection), interpretation (Phylogenetic Tree and Types of Variants), extraction (Out of Africa Hypothesis), application (Darwinism), sequential explanation (Darwinism), comparison skills (Evolution Concepts), and analytic skills (Types of Variants).

The evaluation indicates that a variety of cognitive skills were assessed over the three-year period, using different formats and phrasing. However, there are skills such as recall of information, interpretation of knowledge, application of knowledge, analytical

skills, and sequential explanation that were consistently employed each year but showed shifts depending on the phrasing, format, and subtopic of the question.

Although cognitive skills were repeatedly employed for this topic, varied formats, phrasing, and subtopics were used to assess it over the three-year period. Therefore, this is an acceptable predictability, as it aligns with the CAPS. The assessment body should continue to use varied cognitive skills and varied question phrasing, format, and subtopics to assess Evolution.

f. Scenario framing of items for a topic

The observed patterns indicate scenario framing that varied across topics over the three-year period. They were based on real-life scenarios, which made them relatable. In 2022, the scenarios focused on recalling information, interpretation, scientific investigation, application of knowledge, identification, and extraction skills from real-life scenarios.

In 2023, the scenarios focused on recalling knowledge, identification, scientific investigative skills, sequential explanation, calculation, interpretation, and analysing real-life scenarios. In 2024, the scenarios focused on recalling information, interpretation, comparison, application, creative and scientific investigative skills, sequential explanation, and extraction skills from real-life scenarios to illustrate an understanding of evolution.

The evaluation indicates a predictable pattern of contextual framing throughout the three-year period. However, these scenarios were used interchangeably, preventing learners from anticipating which scenario types would be used for which topics. This reflects an acceptable predictability.

It is important for the assessment body to continue using different scenario framings for items and varied question formatting and phrasing. Furthermore, the DBE can strengthen variation by alternating among source-interpretation, extract, and graph-based questions each year to ensure further alignment with the CAPS.

Summary of findings and recommendations for the DBE Life Sciences Evolution topic

Table 3.2.8 below summarises identified patterns of predictability across key components of question paper design, along with corresponding recommendations to reduce predictability, and strategies to maintain effective assessment practices without compromising variability.

Table 3.2.8: Summary of Findings and Recommendations on the Predictability of the 2022–2024 DBE Life Sciences Evolution Topic Paper 2

Strategies to maintain content coverage that do not lead to a predictable question paper
Different subtopics should be assessed each year, in a rotational order, using varied formats and phrasing.
Identified unacceptable predictability on topic weighting
No unacceptable predictability on topic weighting. The varied weighting supports candidates in developing balanced competencies across the topic to achieve the required skills.
Recommendations to avoid unacceptable predictability on topic weighting
Align the topic's weighting with the CAPS requirements and use varied question formats.
Strategies to maintain topic weighting that do not lead to a predictable question paper
Strengthen variation by alternating weighting on different subtopics each year, to ensure further alignment with the CAPS.
Identified unacceptable predictability on item types
No unacceptable predictability on item types.
Recommendations to avoid unacceptable predictability on item types
A variety of question categories should be used to complicate the perception of item types within each subtopic.
Strategies to maintain the assessment of item types that do not lead to a predictable question paper

The level of difficulty and cognitive levels should be varied to ensure that a pattern is not recognised.
Identified unacceptable predictability on topic–skill pairing
No unacceptable predictability on topic-skill pairing. Varied formats, phrasing, and subtopics were used.
Recommendations to avoid unacceptable predictability through topic–skill pairing
Varied formats, phrasing, and subtopics were used.
Strategies to maintain topic–skill pairing that do not lead to a predictable question paper
Topic-skill pairing aligns with the CAPS requirements, and varied cognitive skills should be employed in rotation every year.
Identified unacceptable predictability in the scenario framing of items
No unacceptable predictability in the scenario framing of items. Scenario framing varied across topics over the three-year period. They were based on real-life scenarios, which made them relatable.
Recommendations to avoid unacceptable predictability in scenario framing of items
Continue using different scenario framings for items, and varied question formatting and phrasing.
Strategies to maintain scenario framing of items that do not lead to a predictable question paper
The DBE can strengthen variation by alternating among source-interpretation, extract, and graph-based questions each year to further align with the CAPS.

Conclusions

The evidence presented indicates that the evaluation of Life Sciences DBE Paper 2 for the period 2022 to 2024 does not demonstrate unacceptable predictability. The CAPS mandated that the following topics in Life Sciences Paper 2 be assessed annually: Evolution, DNA Code of Life, Meiosis, Genetics and Inheritance. The repetition of these topics does not constitute unacceptable predictability, as it aligns with policy requirements. The content is based on varied subtopics, item types, and skill pairings, and its focus shifts annually to ensure that learners do not perceive it as predictable.

The structure of the Life Sciences question papers remained consistent over the three-year period of 2022 to 2024, to support continuity, fairness, and alignment with the CAPS standards. The content, cognitive skills, and item types were varied annually to prevent unacceptable predictability. This implies that Life Sciences Paper 2, from 2022 to 2024, does not exhibit unacceptable predictability and maintains a balanced, policy-compliant assessment structure that is fair and valid.

3.3: LIFE SCIENCES PAPER 1 & 2

This section presents an analysis of the IEB final examination question papers from 2022 to 2024 for Life Sciences Paper 1 & 2 topics. The findings for each topic are summarised in Tables 3.3.1–3.3.10.

Table 3.3.1 summarises the analysis conducted to assess the predictability of the Population Ecology topic in the IEB Life Sciences Paper 1 and Paper 2 examinations from 2022 to 2024.

Table 3.3.1: Findings on the Predictability of the Population Ecology Topic for the IEB Life Sciences Paper 1 Examinations from 2022–2024

Topic: Population Ecology							
Year	**Topic examined (✓) or not examined (X)**	**Content area/subtopics covered, including mark allocation**	**Overall weighting of the topic in marks**	**Item type/types (e.g., MCQ, essays, short answers, table, etc.) and marks allocated per content area/subtopic**	**Level of difficulty per item type used to examine the subtopic**	**Cognitive level per item type used to examine the subtopic**	**Skill assessed per subtopic**
2022	✓	Population Ecology Concepts (6)	40	MCQ-6	Easy, Moderate	L1, L2	Remembering. Interpretation.
		Social Organisations (6)		Short Question-5	Easy	L1, L2	Remembering Explanation.
		Population Growth/ Estimation		(Source-based & Graph) Short Questions-24	Easy, Moderate, Difficult Very Difficult	L1, L2, L3, L4	Remembering. Interpretation. Analysis.

		(24)					Sequential Explanation.
		Population Density Factors (8)		(Source-based) Short Question-8	Easy, Moderate	L1, L2	Explanation. Remembering. Identification.
		Predation (8)		(Source-based) Short Question-8	Moderate, Difficult	L2, L3	Drawing of Graph. Explanation.
		Population Pyramids (10)		Match Column-6 (Source-based) Short Question-4	Moderate Easy	L2 L1, L2	Remembering. Interpretation.
2023	✓	Population Pyramids (6)	50	Short Questions-6 (Data Response)	Easy, Moderate	L1, L2	Interpretation. Comparison.
		Population Density		Scientific Scenario & Graph-8	Moderate, Difficult, Very Difficult	L1, L2, L3, L4	Interpretation. Analysis. Application.

		Scientific Investigation-8					
		Predation & Social Organisation (13)		Short Question-13 (Source-based)	Easy, Moderate	L1, L2, L3	Drawing. Explanation. Extraction.
		Ecological Succession (10)		Short Question-10 (Diagram-based)	Easy, Moderate	L1, L2	Identify. Tabulation. Explanation.
		Population Size-5 (Mark recapture)		Short Question-5	Easy, Moderate	L1, L2	Calculation. Remembering.
		Competition (8)		Short Question-8 (Source-based & Graph)	Easy, Moderate	L1, L2	Interpretation. Remembering.
2024	✓	Population Ecology Concepts (10)	63	Match Column-10	Easy	L2	Comparison

		Population Pyramids (4)		Short Question (4) (Source-based)	Moderate, Difficult	L2, L3	Calculation. Interpretation.
		Predation (18)		(Source-based) Short Question (11) Plot Graph-7	Easy, Moderate, Difficult Easy, Moderate	L1, L2, L3 L1, L2	Remembering. Explanation. Extraction from Source. Plotting Graph.
		Population Size (17)		(Source-based) Short Question-17	Easy, Moderate, Difficult	L1, L2, L3, L4	Extraction from Source. Explanation. Application. Evaluate.
		Ecological Succession (14)		Data Response-14 (Graph)	Easy Moderate	L1, L2	Remembering. Explanation. Comparison.

Table 3.3.1 presents a comparative overview of the Population Ecology topic across the three-year period. The analysis, presented in Sections a to f, evaluates whether the components listed in Table 3.3.1 have contributed to the predictability of the IEB Life Sciences final examination (Paper 1 and Paper 2) from 2022 to 2024.

a. Topic coverage

The findings indicate that Population Ecology was consistently assessed across the three-year period of the IEB NSC final examination papers. This is in alignment with the IEB Life Sciences subject assessment guideline requirements, which require assessment at different levels, including knowledge, comprehension, application, evaluation, analysis, and synthesis of scientific knowledge.

The frequency of the topic over the three-year period of the IEB NSC final examination question papers does not give a clear sense of what to expect, but the paper measures what is expected in the IEB SAGs. The predictability is at an acceptable level, as it is aligned to the requirements of the IEB SAGs, which provide the topic with a set number of questions. The questions were not repeated, and the full scope of subtopics was adequately represented.

To maintain predictability at an acceptable level, the IEB should continue varying subtopics in line with the Life Sciences IEB subject assessment guideline. Predictability should be within the CAPS and the IEB SAGs' expectations, as this will continue to support a sound, fair, and reliable education.

b. Content coverage

The frequency of the topic indicates a predictable pattern in content coverage. However, the CAPS and the IEB SAGs require that the topic be assessed on a year-to-year basis. The use of varied subtopics and question phrasing, rotated to examine this topic, suggests that the predictability of the content is acceptable.

The content coverage aligned with the requirements of the IEB Life Sciences subject assessment guideline, but did not comply with the CAPS requirements, as Population Ecology fell within the Grade 11 scope of work. The question papers were continuous, fair, and valid, and the depth of content was assessed across cohorts. Therefore, the assessment body should continue to align the content with the requirements of the IEB Life Sciences SAGs and use varied question formats, phrasing, and subtopics to prevent a pattern from developing.

c. Weighting of the topic

The analysis reveals that the allocation of marks for Population Ecology varied from year-to-year. In 2022, the mark allocation was 40 marks; in 2023, it increased to 50 marks; and in 2024, it increased to 63 marks. The varied weighting supports candidates in developing balanced competencies across the topic, thereby achieving the required cognitive skills outlined in the IEB Life Sciences SAGs. The varied weighting of marks makes it difficult for learners to perceive a pattern, as different formats, phrasing, and subtopics are alternated with varying weighting to assess the topic. Therefore, this can be considered an acceptable level of predictability, since the pattern is not obvious.

The alignment of the topic's weighting with the requirements of the IEB SAGs ensures that the question papers are continuous, fair, and valid. The IEB does not assign topic marks, but marks are allocated to AIMS. Therefore, the assessment body should assign marks to the topic to assess its alignment with the SAGs.

d. Variation in item types

The evaluation indicates that over the three-year period, this topic was assessed using a variety of item types. The following item types were used alternatively to assess Population Ecology: Match Column, Short Questions (Diagram-based, Graph, Source-based), Data Response (Graph), Scientific Scenario, and Plotting of Graph.

Short Questions (Source-based and Graph) were allocated 40 marks in 2022. Data Response was allocated 6 marks in 2023. Short Questions (Source-based and Diagram-based) were allocated 35 marks in 2023, which was a slight decrease from 2022. Scientific Scenario and Graph were allocated 8 marks in 2023. Match Column was allocated 10 marks in 2024. Short Questions (Source-based) were allocated 32 marks in 2024, which was a slight decrease from 2023. Data Response was allocated 17 marks in 2024, which was a significant increase from 2023. Graph plotting was allocated 7 marks in 2024.

- The level of difficulty for Short Questions (Diagram-based) was classified as easy, moderate, and difficult over the three-year period. Match Columns were classified as easy and moderate only in 2024. Data Response questions (Graph) were classified as easy and moderate in 2023 and 2024. Short Questions (Source-based) were classified as easy, moderate, difficult, or very difficult over the three-year period. Plotting of Graphs was classified as easy and moderate. Scientific Scenarios and Graphs were classified as moderate, difficult, and very difficult in 2023.
- Across the three-year period, the distribution of cognitive levels had slightly varied. Short Questions (Diagram-based and Source-based) were allocated L1, L2, L3, and L4 over the three-year period. Match Columns were allocated L2 in 2024. Data Response questions were allocated L1, L2, L3, and L4 in 2023 and 2024. Plotting of graphs was allocated L1 and L2 in 2024.

The evaluation and observed patterns indicate that different categories of questions, such as source-based and data-response questions, were used regularly to examine the topic over the three-year period. The different categories of questions were allocated varied levels of difficulty and varied cognitive levels. Although these formats were repeatedly employed, varied phrasing was used to assess the topic, making it difficult to discern any predictability. The item types are aligned with IEB SAGs that Life Science question papers include objective-type questions and a variety of short- and long-form questions.

The IEB should continue to use different categories of questions and alternate formats and phrasing within each category every year. The level of difficulty and cognitive levels should be varied to ensure that a pattern is not recognised.

e. Topic and skill pairing

The findings provide evidence that the IEB Life Sciences final examination question papers demonstrate a structured and varied pairing of cognitive skills, used to assess Population Ecology over the three-year period. In 2022, the key skills paired with the subtopic Population Growth/Estimate (elephants) were: recall, interpretation, analysis, and sequential explanation. For the subtopic Population Density, the skills examined were: explanation, remembering, and identification. For the subtopic of Predation, the skills used were drawing a graph and explanation.

In 2023, the skills used to assess the subtopic of Population Pyramids were data interpretation and comparison. For the subtopic Population Density, the skills assessed were: interpretation, analysis, and application. For Predation and Social Organisations, the skills assessed were: drawing graphs, explaining the concept, and extracting information. For Ecological Succession, the skills assessed were: identification, tabulation, and explanation. For Population Size, the skills assessed were: calculation and remembering. For Competition, the skills assessed were: interpretation and remembering.

In 2024, the skill used to assess Population Ecology Concepts was comparison. For Population Pyramids, the skills assessed were: calculation and interpretation. For Predation, the skills assessed were: remembering, explaining, extracting, and plotting a graph. For Population Size, the assessed skills were extraction, explanation, application, and evaluation. For Ecological Succession, the skills used were: remembering, explaining, and comparing.

The evaluation indicates that a variety of cognitive skills were assessed throughout the three-year period. However, there are skills such as recalling information, interpreting knowledge, sequential explanation, analysis, and drawing graphs that were consistently employed each year but shifted depending on the phrasing, format, and subtopic of the question.

Although cognitive skills were repeatedly employed for this topic, varied formats, phrasing, and subtopics were used to assess it. Therefore, this can be regarded as an acceptable predictability, as it aligns with IEB SAGs. The assessment body should continue to use varied cognitive skills and varied question phrasing, formats, and subtopics to assess Population Ecology.

f. Scenario framing of items for a topic

The observed patterns indicate scenario framing that varied across topics over the three-year period. The scenarios were based on real life, making them more relatable. In 2022, the scenarios focused on recalling information from real-life situations to illustrate understanding of Population Growth/Estimate, with reference to elephants, through interpreting, analysing, and sequentially explaining the information.

In 2023, the scenarios focused on comparing and interpreting Population Pyramids, drawing graphs based on Predation and Social Organisations, calculating Population Size, and recalling information. In 2024, the scenarios focused on recalling information and plotting graphs based on Predation information from real-life scenarios. The scenario also focused on the application and evaluation of information, with a focus on Population size. The scenarios were used alternatively over the three-year period, preventing learners from anticipating specific scenario types for specific topics. This reflects an acceptable level of predictability in framing scenario items for a topic.

It is important for the assessment body to continue using different scenario framings for items and varied question formatting and phrasing. The IEB can strengthen variation by alternating source extraction, comparison, calculation, and graph-based questions each year.

Summary of findings and recommendations for the IEB Life Sciences Population Ecology topic

Table 3.3.2 below summarises identified patterns of predictability across key components of question paper design, along with corresponding recommendations to reduce predictability, and strategies to maintain effective assessment practices without compromising variability.

Table 3.3.2: Summary of Findings and Recommendations on the Predictability of the 2022–2024 IEB Life Sciences Population Ecology Topic Papers 1 & 2

Identified unacceptable predictability on topic coverage
No unacceptable predictability in topic coverage. It is aligned with the requirements of the IEB Life Sciences SAGs. The questions were not repeated, and the full scope of subtopics was adequately represented.
Recommendations to avoid unacceptable predictability on topic coverage
The assessment body should continue to align the content with the IEB Life Sciences SAGs' requirements and use varied question formats and phrasing to prevent a pattern from developing.
The IEB should consider aligning their topic coverage with the CAPS requirements.
Identified unacceptable predictability on content coverage
No identified unacceptable predictability on content coverage. The different subtopics were used in rotation to assess this topic, which is aligned with the IEB Life Sciences SAGs requirements.

Recommendations to avoid predictable content coverage
The assessment body should continue to use varied question formats, phrasing, and subtopics to ensure that no pattern develops.
Strategies to maintain content coverage that do not lead to a predictable question paper
The IEB should consider complying with the CAPS requirements, as Population Ecology fell under the Grade 11 scope of work. Different subtopics should be assessed each year, in a rotational order, using varied formats and phrasing.
Identified unacceptable predictability on topic weighting
No unacceptable predictability identified. The varied weighting of the mark allocation makes it difficult for learners to perceive a pattern, as different subtopics are weighted differently.
Recommendations to avoid unacceptable predictability on topic weighting
The IEB should continue to use varied question formats, random weighting, phrasing, and subtopics to prevent a pattern from developing.
Strategies to maintain topic weighting that do not lead to a predictable question paper
The IEB do not have topic weighting; only marks are allocated to AIM 1-3. The IEB should consider aligning topic weighting with requirements of the CAPS. This will enhance variation by alternating the weighting among subtopics each year to ensure alignment with the CAPS.
Identified unacceptable predictability on item types

No unacceptable predictability on item types. Item types align with the IEB SAGs requirements. Various categories of questions have been used, and varied formats and phrasing have been employed across item types.
Recommendations to avoid unacceptable predictability on item types
A variety of question categories should be used to complicate the perception of item types within each subtopic.
Strategies to maintain the assessment of item types that do not lead to a predictable question paper
The level of difficulty and cognitive levels should be varied across item types to ensure that no pattern is recognised.
Identified unacceptable predictability on topic–skill pairing
No unacceptable predictability on topic-skill pairing. Varied cognitive skills, phrasing, and subtopics were used.
Recommendations to avoid unacceptable predictability through topic–skill pairing
The IEB should continue to use varied cognitive skills and varied question phrasing, formats, and subtopics to assess Population Ecology.
Strategies to maintain topic–skill pairing that do not lead to a predictable question paper
Topic-skill pairing should align with the CAPS requirements, and varied cognitive skills should be employed in rotation every year.
Identified unacceptable predictability in the scenario framing of items
No unacceptable predictability in the scenario framing of items. Scenario framing varied across the topic over the three-year period. The scenarios were based on real life, making them more relatable.

Recommendations to avoid unacceptable predictability in scenario framing of items
The assessment body should continue to use different item-framing scenarios and varied question formatting and phrasing each year.
Strategies to maintain scenario framing of items that do not lead to a predictable question paper
The IEB can strengthen variation by alternating source extraction, comparison, calculation, and graph-based questions each year.

Table 3.3.3 summarises the analysis conducted to assess the predictability of the Evolution topic in the IEB Life Sciences Paper 1 and Paper 2 examinations from 2022 to 2024.

Table 3.3.3: Findings on the Predictability of the Evolution Topic for the IEB Life Sciences Papers 1 & 2 Examinations from 2022–2024

Topic: Evolution							
Year	**Topic examined (✓) or not examined (X)**	**Content area/subtopics covered, including mark allocation**	**Overall weighting of the topic in marks**	**Item type/types (e.g., MCQ, essays, short answers, table, etc.) and marks allocated per content area/subtopic**	**Level of difficulty per item type used to examine the subtopic**	**Cognitive level per item type used to examine the subtopic**	**Skill assessed per subtopic**
2022	✓	Evolution Theories	40	Short Questions-12 (Source-based)	Easy, Moderate	L1, L2	Remembering
		Evidence of Evolution Theory		Short Question-4	Easy	L1	Remembering
		Natural Selection (Darwinism)		Scientific Scenario-8	Easy, Moderate, Difficult Very Difficult	L1, L2, L3, L4	Interpretation Analysis

							Evaluate and Creating Sequential Explanation
		Lamarckism's Theory		Shorts Questions-5	Easy, Moderate	L1, L2	Remembering Explanation
		Speciation		Short Questions-6 (Source-based)	Easy, Difficult	L1, L3	Remembering Application
		Phylogenetic Tree		Short Questions-5 (Diagram-based)	Moderate	L2	Interpretation
2023	✓	Evolution Concepts	100	Evolution Concepts Terminology (4)	Evolution Concepts Terminology - Easy	Evolution concepts L1	Remembering
		Human Evolution (Fossil Record)-3		Terminology-5 Match Column-3	Terminology - Easy Match Column Moderate	L1 L2	Remembering Comparison

		Fossil Record		Data Response-3	Data Response - Moderate	L3	Calculation
		Human Evolution Anatomical differences between Bipedal and Quadrupedal		Short Questions Short Questions-6 (Diagram-based) & (Source-based)-3	Short Questions - Easy	L1	Remembering
		Cladogram-6 Diagram		Short Questions-6 (Diagram-based) Source-based Terminology-2 Calculation-3	Short Questions - Easy, Moderate Easy Moderate	L1, L2 L1 L2	Remembering Sequential Explanation Remembering Calculation
		Evolution Theories		Terminology-4 Description-3	Easy Moderate	L1 L2	Remembering Description

		Evidence of Evolution		Short Questions-3	Moderate	L2	Remembering
		Cladogram		Short Questions-5 (Diagram-based)	Moderate	L1, L2	Interpretation Explanation
		Speciation		Short Questions-9	Difficult	L2, L3	Sequential Explanation
		Biodiversity		Short Questions-3	Moderate	L1, L2	Remembering Explanation
		Natural & Artificial Selection (40)		Essay-40 (Source-based)	Moderate, Difficult	L2, L3	Interpretation Comparison Extraction from Sources
2024	✓	Evolution Theories	58	MCQ-9	Easy, Moderate, Difficult	L1, L2, L3	Identifying Remembering Interpretation
		Human Evolution		Short Questions-8	Easy, Moderate	L1, L2	Remembering

		(Skulls)		(Infographic) Match Column-3 Terminology-1 Short Questions-4	 Moderate Easy Moderate	 L2 L1 L2	 Explanation Remembering Explanation
		Human Evolution (Cultural Evidence)		Match Column-4 Short Questions-4	Moderate Difficult	L2 L3	Comparison Interpretation Explanation
		Evolution theories (Scientists)		Match Column-4 Short Questions-4	Easy Moderate	L1 L2	Remembering Explanation
		Speciation		Short Questions (Text/source)	Easy, Moderate, Difficult	L1, L2, L3	Extraction from Text Interpretation Sequential Explanation

Table 3.3.3 presents a comparative overview of the Evolution topic across the three-year period. The analysis, presented in Sections a to f, evaluates whether the components listed in Table 3.3.3 have contributed to the predictability of the IEB Life Sciences final examination (Paper 1 and Paper 2) from 2022 to 2024.

a. Topic coverage

The findings indicate that Evolution was consistently assessed across the three-year period of the IEB NSC final examination question papers. This is in alignment with the IEB Life Sciences subject assessment guidelines, which require assessment at different levels, including knowledge, comprehension, application, evaluation, analysis, and synthesis of scientific knowledge.

The frequency of the topic over the three-year period does not give a clear sense of what to expect, but the test measures what is expected by IEB SAGs. The predictability is acceptable, as it aligns with the requirements of the IEB SAGs, which specify a set number of questions for each topic. The questions were not repeated, and the full scope of subtopics was adequately represented.

To maintain predictability at an acceptable level, the IEB should continue varying subtopics in line with the Life Sciences IEB subject assessment guideline. Predictability should be within the CAPS and the IEB SAGs' expectations, as this will continue to support a sound, fair, and reliable education.

b. Content coverage

The frequency of the topic indicates a predictable pattern in content coverage. However, the CAPS and the IEB SAGs require that the topic be assessed on a year-to-year basis. The use of varied subtopics and question phrasing, rotated to examine this topic, suggests that the predictability of the content is acceptable.

The content coverage was aligned with the requirements of the IEB Life Sciences subject assessment guideline and complied with the CAPS requirements. The question papers were continuous, fair, and valid, and the depth of content was assessed across cohorts. Therefore, the assessment body should continue to align the content with the requirements of the IEB Life Sciences SAGs and use varied question formats, phrasing, and subtopics to prevent a pattern from developing.

c. Weighting of the topic

The analysis reveals that the allocation of marks for Evolution varied from year-to-year. In 2022, the marks allocated were 40; in 2023, they increased significantly to 100; and in 2024, they decreased significantly to 58. The varied weighting supports candidates in developing balanced competencies across the topic, thereby achieving the required cognitive skills outlined in the IEB Life Sciences SAGs. The varied weighting of marks makes it difficult for learners to perceive a pattern, because different formats, phrasing, and subtopics are alternated with varying weighting to assess the topic. Therefore, this can be considered an acceptable level of predictability, since the pattern is not obvious.

The IEB does not allocate marks to topics; instead, marks are allocated to AIMS 1-3, making it difficult to discern a pattern in topic weighting. The IEB should consider assigning a mark allocation to the topic to assess its alignment with the SAGs.

d. Variation in item types

The evaluation indicates that varied item types were used to examine Evolution each year. The item types were allocated different marks each year.

- Across the three-year period, the distribution of levels of difficulty slightly varied for similar item types assessing Evolution. Short Questions (Diagram-based, Table, Descriptions) were classified as easy, moderate, and difficult over this period. Match

Columns were classified as easy, moderate, and difficult in 2023 to 2024. Data Response questions were allocated difficult in 2023. Essay questions were allocated as moderately difficult in 2023.

- The distribution of cognitive levels slightly varied for item types assessing Evolution. The cognitive levels for Multiple Choice were allocated L1, L2, and L3 in 2024, with varied subtopics.
- Short Questions (Diagram-based, Table, Descriptions) were allocated L1, L2, and L3 over this period, with varied subtopics. Match Columns were allocated L1, L2, and L3 in 2023 and 2024. Data Response questions were allocated L3 and L4 only in 2023.

The evaluation and observed patterns indicate that different categories of questions, such as Multiple Choice, Match Columns, Terminology, Short Questions, Essay, and Data Response, were used over the three-year period to assess Evolution. This indicates that a variety of question categories made it difficult to recognise patterns, thereby decreasing the predictability of the question papers. Although these formats were repeatedly employed for Evolution, varied subtopics were used to assess it; therefore, this is a positive indicator of predictability. The assessment body should continue to use different question categories and alternate subtopics within each category every year. The level of difficulty and cognitive levels should be varied to ensure that a pattern is not recognised.

e. Topic and skill pairing

The findings provide evidence that the question papers demonstrate a structured and varied pairing of cognitive skills used to assess Evolution over the three-year period. In 2022, the key skills assessed were: remembering, interpreting, analysing, evaluating, creative skills, applying knowledge, and sequencing to assess Evolution Theories, Evidence of Evolution Theory, and Natural Selection (Darwinism). In 2023, the skills assessed were: recalling information, interpretation, comparison, calculations, identification of structure, source interpretation, and extraction skills to examine Evolution Concepts, Human Evolution (Fossil Record, Speciation, Biodiversity, Cladogram).

In 2024, skills assessed were: identification, recalling information, interpretation, identifying, explanation, extraction, analysing information and sequential explanation, to examine Evolution Theories, Human Evolution (Skulls), Human Evolution (Cultural Evidence), and Evolution Theories.

The evaluation indicates that a variety of cognitive skills have been assessed over the three-year period, with different subtopics each year. However, there are skills such as identification, interpretation, sequential explanation, and extraction that are consistent each year but shift depending on the assessed subtopic. Although cognitive skills were repeatedly employed in Evolution, varied subtopics were used to assess it. Therefore, this is a positive predictability. The assessment body should continue to use varied cognitive skills and varied subtopics to assess Evolution.

f. Scenario framing of items for a topic

The observed patterns indicate scenario framing that varied across topics over the three-year period. The scenarios were based on real life, which made them relatable. In 2022, the scenarios focused on recalling information from real-life scenarios to illustrate an understanding of Evolution Theories, Lamarckism's Theory, Speciation, and Evidence of Evolution Theory. Interpreting, analysing, and sequentially explaining information were used to assess Natural Selection and the Phylogenetic Tree.

In 2023, the scenarios focused on comparison, extraction, recalling of knowledge, and interpretation based on Biodiversity, Speciation and Human Evolution (Fossil Record). In 2024, the scenarios focused on recalling information and extraction, based on Human Evolution (Cultural Evidence). Information from real-life scenarios and the scenario in the paper also focused on application of information and evaluation of speciation.

The scenarios were used alternately over the three-year period, preventing learners from anticipating specific scenario types for specific topics. This reflects an acceptable predictability for scenario framing of items. It is important for the assessment body to continue using different scenario framings for items and varied question formatting and phrasing. The IEB can strengthen variation by alternating source extraction, comparison, calculation, and graph-based questions each year.

Summary of findings and recommendations for the IEB Life Sciences Evolution topic

Table 3.3.4 below summarises identified patterns of predictability across key components of question paper design, along with corresponding recommendations to reduce predictability, and strategies to maintain effective assessment practices without compromising variability.

Table 3.3.4: Summary of Findings and Recommendations on the Predictability of the 2022–2024 IEB Life Sciences Evolution Topic Papers 1 & 2

Identified unacceptable predictability on topic coverage
No unacceptable predictability in topic coverage. It is aligned with the requirements of the IEB Life Sciences SAGs. The questions were not repeated, and the full scope of subtopics was adequately represented.
Recommendations to avoid unacceptable predictability on topic coverage
The assessment body should continue to align the content with the IEB Life Sciences SAGs' requirements and use varied question formats and phrasing to prevent a pattern from developing.
The IEB should consider aligning their topic coverage with the CAPS requirements.
Identified unacceptable predictability on content coverage

No identified unacceptable predictability on content coverage. The different subtopics were used in rotation to assess this topic, which is aligned with the IEB Life Sciences SAGs requirements.
Recommendations to avoid predictable content coverage
The assessment body should continue to use varied question formats, phrasing, and subtopics to ensure that no pattern develops.
Strategies to maintain content coverage that do not lead to a predictable question paper
Different subtopics should be assessed each year, in a rotational order, using varied formats and phrasing.
Identified unacceptable predictability on topic weighting
No unacceptable predictability identified. The varied weighting of the marks makes it difficult for learners to perceive a pattern, as different subtopics are weighted differently to assess the topic.
Recommendations to avoid unacceptable predictability on topic weighting
The IEB should continue to use varied question formats, random weighting, phrasing, and subtopics to ensure that no pattern develops.
Strategies to maintain topic weighting that do not lead to a predictable question paper
The IEB do not have topic weighting; only marks are allocated to AIM 1-3. The IEB should consider aligning topic weighting with CAPS requirements. This will enhance variation by alternating the weighting of subtopics each year to ensure a continuous, fair, and valid assessment.
Identified unacceptable predictability on item types

No unacceptable predictability on item types. Item types align with IEB SAGs requirements. Various categories of questions have been used, and varied formats and phrasing have been employed across item types.
Recommendations to avoid unacceptable predictability on item types
A variety of question categories should be used to make it difficult to infer item types for each subtopic.
Strategies to maintain the assessment of item types that do not lead to a predictable question paper
The level of difficulty and cognitive levels should be varied across item types to ensure that no pattern is recognised.
Identified unacceptable predictability on topic–skill pairing
No unacceptable predictability on topic-skill pairing. Varied cognitive skills, phrasing, and subtopics were used to assess the topic over this three-year period.
Recommendations to avoid unacceptable predictability through topic–skill pairing
The IEB should continue to use varied cognitive skills and varied question phrasing, formats, and subtopics to assess Population Ecology.
Strategies to maintain topic–skill pairing that do not lead to a predictable question paper
Topic-skill pairing should align with the CAPS requirements, and varied cognitive skills should be employed in rotation every year.
Identified unacceptable predictability in the scenario framing of items

No unacceptable predictability in the scenario framing of items. Scenario framing varied across the topic over the three-year period. The scenarios were based on real life, which made them relatable.
Recommendations to avoid unacceptable predictability in scenario framing of items
The assessment body should continue to use different item-framing scenarios and varied question formatting and phrasing year to year.
Strategies to maintain scenario framing of items that do not lead to a predictable question paper
The IEB can strengthen variation by alternating source extraction, comparison, calculation, and graph-based questions each year.

Table 3.3.5 summarises the analysis conducted to assess the predictability of the Human Reproduction topic in the IEB Life Sciences Paper 1 and Paper 2 examinations from 2022 to 2024.

Table 3.3.5: Findings on the Predictability of the Human Reproduction Topic for the IEB Life Sciences Papers 1 & 2 Examinations from 2022–2024

Topic: Human Reproduction							
Year	**Topic examined (✓) or not examined (X)**	**Content area/subtopics covered, including mark allocation**	**Overall weighting of the topic in marks**	**Item type/types (e.g., MCQ, essays, short answers, table, etc.) and marks allocated per content area/subtopic**	**Level of difficulty per item type used to examine the subtopic**	**Cognitive level per item type used to examine the subtopic**	**Skill assessed per subtopic**
2022	✓	Fertilisation Sperm Cell & Ovum (8)	38	Short Questions (Micrograph)-8	Terminology - Easy Short Questions - Easy, Moderate	L1 L1, L2	Remembering Explanation
		Menstrual Cycle & PCOS Syndrome (16)		Data response-(16) (Graph & Text)	Easy, Moderate, Difficult Very Difficult	L1, L2, L3, L4	Remembering Extraction from Source Calculation Interpretation

							Application
		Human Reproduction (14)		Match Column (14)	Easy, Moderate	L1, L2	Remembering Comparison
2023	✓	Female Reproductive System (7)	24	MCQ-7	Easy, Moderate	L1, L2	Remembering Identification of Structures
		Male Reproductive System (Sperm cell)-5		Short Questions (Diagram-based)-5	Easy	L1, L2	Drawing Remembering
		Scientific Investigation (Sperm cell)-12		Data response (Table)-12	Easy, Moderate, Difficult Very Difficult	L1, L2, L3, L4	Remembering Analysing Application Plotting Graph

2024	✓	Menstrual Cycle in Elephant vs Human-3	62	Short Questions-3	Easy	L1	Remembering
		Contraception in Mammals (19)		Short Questions (Source-based) & Table (19)	Easy, Moderate, Difficult	L1, L2, L3	Remembering Description Calculation Sequential Explanation
		Pregnancy Maternal Age and Health Risks (40)		Essay (Source-based) (40)	Moderate, Difficult	L2, L3	Interpretation Extraction from Source Sequential Explanation

Table 3.3.5 presents a comparative overview of the Human Reproduction topic across the three-year period. The analysis, presented in Sections a to f, evaluates whether the components listed in Table 3.3.5 have contributed to the predictability of the IEB Life Sciences final examination (Paper 1 and Paper 2) from 2022 to 2024.

a. Topic coverage

The findings indicate that Human Reproduction was consistently assessed across the three-year period of the IEB NSC final examination question papers. The frequency of the topic demonstrates a predictable pattern in topic coverage.

The fact that it is consistently included in the question paper indicates that it is aligned with the IEB Life Sciences SAGs requirements. The predictability is acceptable, as it aligns with the requirements of the IEB Life Sciences SAGs. The questions were not repeated, and subtopics were rotated. The IEB should maintain varied subtopics, phrasing, and formats to prevent a pattern from developing and to support a sound education that is fair, continuous, and reliable.

b. Content coverage

The frequency of the topic indicates that Human Reproduction has a predictable pattern in content coverage. However, the CAPS and the IEB SAGs require that the topic be assessed on a year-to-year basis. The use of varied subtopics and question phrasing, rotated to examine this topic, suggests that the predictability of the content is acceptable.

The content coverage was aligned with the requirements of the IEB Life Sciences subject assessment guideline and complied with the CAPS requirements. The question papers were continuous, fair, and valid, and the depth of content was assessed across cohorts. Therefore, the assessment body should continue to align the content with the requirements of the IEB Life Sciences SAGS and use varied question formats, phrasing, and subtopics to prevent a pattern from developing.

c. Weighting of the topic

The analysis reveals that the allocation of marks for Human Reproduction varied from year-to-year. In 2022, the mark allocation was 38 marks; in 2023, it decreased significantly to 24 marks; and in 2024, it increased significantly to 62 marks. The varied weighting supports candidates in developing balanced competencies across the topic to achieve the required cognitive skills outlined in the IEB Life Sciences SAGs.

The varying weighting of the marks makes it difficult for learners to perceive a pattern. Different formats, phrasing, and subtopics have been alternated with varying weights to assess the topic. Therefore, this can be regarded as an acceptable level of predictability, as the pattern is not obvious.

The IEB does not allocate marks to topics; instead, marks are allocated to AIMS 1-3, making it difficult to discern a pattern in topic weighting. The IEB should consider assigning mark allocations to the topic to assess its alignment with the SAGs.

d. Variation in item types

The evaluation indicates that varied item types were used to examine Human Reproduction each year. The item types were assigned different marks for each subtopic each year. In 2022, the item types used to examine the topic were: Short Questions (Micrograph), Terminology, Data Response (Graph and Text), and Match Column. In 2023, the item types were: Multiple Choice, Short Questions (Diagram-based), and Data Response (Table). In 2024, the assessment for this topic consisted of Short Questions (Source-based) and a source-based essay.

- Across the three-year period, the distribution of levels of difficulty varied for similar item types assessing Human Reproduction. Short Questions (Diagram-based, Table, Descriptions) were classified as easy, moderate, and difficult over this period. Data Response questions were classified as easy, moderate, and difficult.

- Across the three-year period, the distribution of cognitive levels varied for item types assessing Human Reproduction. The cognitive levels for Short Questions (Diagram-based, Table, Descriptions) were allocated L1, L2, and L3 over this period, with varied subtopics. Data Response questions were allocated L1, L2, L3, and L4.

The evaluation and observed patterns indicate that different question categories, such as Multiple Choice, Match Columns, Short Questions, Essay, and Data Response, were used over the three-year period to assess Human Reproduction. The evidence indicates that a variety of question categories were used, making it difficult to recognise a pattern. Although these formats were repeatedly employed for Human Reproduction, varied subtopics were used to assess it over this three-year period. The assessment body should continue to use different question categories and alternate subtopics within each category every year. The level of difficulty and cognitive levels should be varied to ensure that a pattern is not recognised.

e. Topic and skill pairing

The findings provide evidence that the Life Sciences final examination question papers demonstrate a structured and varied pairing of cognitive skills used to assess Human Reproduction over the three-year period. In 2022, the key skills assessed were: remembering, interpretation, extraction, comparison, calculation and application of knowledge, as well as sequential explanation to examine Fertilisation, Menstrual Cycle, and Human Reproduction.

In 2023, the skills assessed were: recalling information, identifying structure, drawing a graph, and analysing the Female and Male Reproductive Systems (including Sperm Cells). In 2024, the skills assessed were: recalling information, interpretation, sequential explanation, extraction from sources, calculation and description, to examine the Menstrual Cycle in Elephant vs Human, Contraception in Mammals and Pregnancy-Maternal Age, and Health Risk.

The evaluation indicates that a variety of cognitive skills have been assessed over the three-year period, with different subtopics each year. However, skills such as remembering (recalling), interpretation, sequential explanation, and extraction remain consistent each year, while the subtopics used to assess them vary.

Although cognitive skills were repeatedly employed for Human Reproduction, varied subtopics were used to assess it over this three-year period. Therefore, predictability is acceptable. The assessment body should continue to use a variety of cognitive skills and subtopics to assess Human Reproduction.

f. Scenario framing of items for a topic

The observed patterns indicate scenario framing that varied across topics, making the scenarios more relatable by drawing on real-life experiences. In 2022, the scenarios focused on recalling information from real-life situations to demonstrate understanding of Fertilisation based on Sperm Cell and Ovum, and on interpreting and extracting information from sources to assess the Menstrual Cycle and PCOS Syndrome.

In 2023, the scenarios focused on identifying structures, drawing graphs, applying information, and recalling knowledge related to the Female Reproductive System and the Male Reproductive System (including Sperm Cells). In 2024, the scenarios focused on recalling information, calculation, and extraction from sources on the Menstrual Cycle in Elephants vs Humans, Contraception in Mammals, and Pregnancy: Maternal Age and Health Risk.

The scenarios were used alternatively, preventing learners from anticipating specific scenario types for specific topics. This reflects an acceptable level of predictability in the scenario framing of items for this topic.

Summary of findings and recommendations for the IEB Life Sciences Human Reproduction topic

Table 3.3.6 below summarises identified patterns of predictability across key components of question paper design, along with corresponding recommendations to reduce predictability and strategies to maintain effective assessment practices without compromising variability.

Table 3.3.6: Summary of Findings and Recommendations on the Predictability of the 2022–2024 IEB Life Sciences Human Reproduction Topic Papers 1 & 2

Identified unacceptable predictability on topic coverage
No unacceptable predictability in topic coverage. It is aligned with the requirements of the IEB Life Sciences SAGs. The questions were not repeated, and the full scope of subtopics was adequately represented.
Recommendations to avoid unacceptable predictability on topic coverage
The assessment body should continue to align the content with the IEB Life Sciences SAGs' requirements and use varied question formats and phrasing to prevent a pattern from developing. The IEB should consider aligning their topic coverage with the CAPS requirements. The IEB should consider specifying topics over the strands in Grade 12.
Identified unacceptable predictability on content coverage
No identified unacceptable predictability on content coverage. Different subtopics were used in rotation to assess this topic, aligning with the IEB Life Sciences SAGs.
Recommendations to avoid predictable content coverage
The assessment body should continue to use varied question formats, phrasing, and subtopics to ensure that no pattern develops.
Strategies to maintain content coverage that do not lead to a predictable question paper
Different subtopics should be assessed each year, in a rotational order, using varied formats and phrasing.
Identified unacceptable predictability on topic weighting
No unacceptable predictability identified. The varied weighting of marks makes it difficult for learners to perceive a pattern, as different subtopics are weighted differently to assess the topic.
Recommendations to avoid unacceptable predictability on topic weighting
The IEB should continue to use varied question formats, random weighting, phrasing, and subtopics to ensure that no pattern develops.

Strategies to maintain topic weighting that do not lead to a predictable question paper
The IEB do not have topic weighting; only marks are allocated to AIM 1-3. The IEB should consider aligning topic weighting with requirements of the CAPS. This will strengthen variation by alternating weighting on different subtopics each year, to ensure continuous, fair and valid assessment.
Identified unacceptable predictability on item types
No unacceptable predictability on item types. Item types align with the IEB SAGs requirements. Various categories of questions have been used, and varied formats and phrasing have been employed across item types.
Recommendations to avoid unacceptable predictability on item types
A variety of question categories should be used to make it difficult to infer item types for each subtopic.
Strategies to maintain the assessment of item types that do not lead to a predictable question paper
The level of difficulty and cognitive levels should be varied across item types to ensure that no pattern is recognised.
Identified unacceptable predictability on topic–skill pairing
No unacceptable predictability on topic-skill pairing. Varied cognitive skills, phrasing, and subtopics were used to assess the topic.
Recommendations to avoid unacceptable predictability through topic–skill pairing
The IEB should continue to use varied cognitive skills and varied question phrasing, formats, and subtopics to assess Human Reproduction.
Strategies to maintain topic–skill pairing that do not lead to a predictable question paper
Topic-skill pairing should align with CAPS requirements, and varied cognitive skills should be employed rotationally every year.
Identified unacceptable predictability in the scenario framing of items
No unacceptable predictability in the scenario framing of items. Scenario framing varied across topics over the three-year period, making them more relatable because they are based on real-life scenarios.
Recommendations to avoid unacceptable predictability in scenario framing of items
The assessment body should continue to use different item-framing scenarios and varied question formatting and phrasing year to year.
Strategies to maintain scenario framing of items that do not lead to a predictable question paper
The IEB can strengthen variation by alternating source extraction, comparison, calculation, and graph-based questions each year.

Table 3.3.7 summarises the analysis conducted to determine the level of Genetics and Genetic Engineering in the Inventories topic for the IEB Life Sciences Paper 1 and Paper 2 examinations from 2022 to 2024.

Table 3.3.7: Findings on the Predictability of the Genetics and Genetic Engineering Topic for the IEB Life Sciences Papers 1 & 2 Examinations from 2022–2024

Topic: Genetics and Genetic Engineering							
Year	**Topic examined (✓) or not examined (X)**	**Content area/subtopics covered, including mark allocation**	**Overall weighting of the topic in marks**	**Item type/types (e.g., MCQ, essays, short answers, table, etc.) and marks allocated per content area/subtopic**	**Level of difficulty per item type used to examine the subtopic**	**Cognitive level per item type used to examine the subtopic**	**Skill assessed per subtopic**

2022	✓	Genetics Concepts (7)	59	Definitions-4 Match Column-2 Terminology-1	Easy Moderate Easy	L1 L2 L1	Remembering Comparison
		Pedigree Diagram on CEP (12)		Short Questions (Source-based) (12)	Moderate Difficult	L2, L3, L4	Interpretation Calculation Application Explanation
		Woman's Contribution in Genetic Studies (40)		Essay-40 (Source-based)	Moderate Difficult	L2, L3, L4	Interpretation Extraction from Source Sequential Explanation

							Analyse and Evaluate
2023	✓	Genetic Concepts (5)	36	Match Column-5	Moderate	L2	Remembering Comparison
		Genetic Engineering Insulin Production (9)		Short Questions-9 (Diagram-based)	Easy Moderate	L1, L2	Remembering Explanation
		Human Genome Project (3)		Short Questions (Text)-3	Easy	L1, L2	Explanation
		Pedigree Diagram (Leigh syndrome)-9		Short Questions-9 (Diagram-based)	Moderate Difficult	L2, L3	Interpretation Application Calculation

		Selective Breeding (10)		Short Questions Scientific Scenario (10)	Easy Moderate	L1, L2	Interpretation Extraction Explanation
2024	✓	Genetic Concepts (2)	25	Match Column-2	Easy	L2	Remembering
		Pedigree Diagram (Ichthyosis)-14		Short Questions-14 (Diagram-based)	Easy Moderate Difficult, Very Difficult	L1, L2, L3, L4	Remembering Explanation Interpretation
		Genetic Engineering (9)		Short Questions-9 (Text & diagram)	Easy Moderate	L1, L2	Remembering Explanation

Table 3.3.7 presents a comparative overview of the Genetics and Genetic Engineering topic across the three-year period. The analysis, presented in Sections a to f, evaluates whether the components listed in Table 3.3.7 have contributed to the predictability of the IEB Life Sciences final examination (Paper 1 and Paper 2) from 2022 to 2024.

a. Topic coverage

The findings indicate that Genetics and Genetic Engineering were consistently assessed across the three-year period of the IEB NSC final examination question papers. The frequency of the topic demonstrates a predictable pattern in topic coverage. Subtopics have varied over the years as the topic has evolved.

The fact that it is consistently included in the question paper indicates that it is aligned with the IEB Life Sciences SAGs requirements that the strand in which the topic appears should be assessed every year. The predictability is acceptable, as it aligns with the requirements of the IEB Life Sciences SAGs. The questions were not repeated, and subtopics were represented in rotation. The IEB should continue to vary subtopics, phrasing, and formats to prevent a pattern from developing and to support a sound education that is fair, continuous, and reliable.

b. Content coverage

The findings indicate that Genetics and Genetic Engineering have been constantly assessed over the three-year period. The frequency of the topic indicates a predictable pattern in content coverage. However, the CAPS and the IEB SAGs require that the topic be assessed on a year-to-year basis. The use of varied subtopics and question phrasing, rotated to examine this topic, suggests that the predictability of the content is acceptable.

The content coverage was aligned with the requirements of the IEB Life Sciences subject assessment guideline and complied with the CAPS requirements. The question papers were continuous, fair, and valid, and the depth of content was assessed across cohorts. Therefore, the assessment body should continue to align the content with the requirements of the IEB Life Sciences SAGs and use varied question formats, phrasing, and subtopics to prevent a pattern from developing.

c. Weighting of the topic

The analysis reveals that the allocation of marks for Genetics and Genetic Engineering varied from year-to-year between 2022 and 2024. In 2022, the mark allocation was 59 marks; in 2023, it decreased significantly to 36 marks; and in 2024, it decreased to 25 marks. The varied weighting supports candidates in developing balanced competencies across the topic, thereby achieving the required cognitive skills outlined in the IEB Life Sciences SAGs. The varying weighting of the marks makes it difficult for learners to perceive a pattern. Different formats, phrasing, and subtopics have been alternated with varying weights to assess the topic. Therefore, this can be considered an acceptable level of predictability, since the pattern is not obvious.

IEB does not allocate marks to topics; instead, marks are allocated to AIMS 1-3, making it difficult to discern a pattern in the weighting of topics. The IEB should consider assigning a mark allocation to the topic to assess its alignment with the SAGs.

d. Variation in item types

The evaluation indicates that varied item types were used to examine Genetics and Genetic Engineering each year. The item types were allocated marks differently for each subtopic each year. In 2022, the item types used to examine the topic were: Short Questions (Source-based), Terminology, Definitions, Essay (Source-based) and Match Column. In 2023, the Match Column, Short Questions (Diagram-based, Text) and Short Questions (Scientific Scenario). In 2024, the assessment of this topic consisted of Short Questions (Diagram and Text) and a Match Column section.

- Across the three-year period, the distribution of levels of difficulty varied for similar item types assessing Genetics and Genetic Engineering. Short Questions (Diagram-based, Table, Descriptions) were classified as easy, moderate, difficult, and very difficult over this period. Match Columns were classified as easy and moderate over the three-year period.

- Across the three-year period, the distribution of cognitive levels varied for item types. The cognitive levels for Short Questions (Diagram-based, Table, Descriptions) were allocated L1, L2, L3, and L4 over this period, with varied subtopics. The Match Column was allocated L2 over the three-year period.

The evaluation and observed patterns indicate that different question categories, such as Match Columns, Short Questions, and Essays, were used over the three-year period to assess Genetics and Genetic Engineering. The evidence indicates that varied categories of questions were used, which makes it difficult to recognise a pattern in the question papers over the three-year period. Although these formats were repeatedly employed in Genetics and Genetic Engineering, various subtopics were used to assess them. The assessment body should continue to use different categories of questions and alternate subtopics assigned to each category every year. The level of difficulty and cognitive levels should be varied to ensure that a pattern is not recognised.

e. Topic and skill pairing

The findings provide evidence that the Life Sciences final examination question papers demonstrate a structured and varied pairing of cognitive skills, used to assess Genetics and Genetic Engineering over the three-year period. In 2022, the key skills assessed were: remembering, interpreting, extracting, comparing, calculating, analysing, evaluating, and applying knowledge to assess Genetic Concepts, Pedigree Diagrams, and Women's Contribution in Genetic Studies. In 2023, the skills assessed were: recalling information, comparison, explanation, interpretation and extraction skills to examine Genetics and Genetic concepts, Genetic Engineering (Insulin Production), the Human Genome Project, Pedigree Diagram, and Selective Breeding.

In 2024, the skills assessed were: recalling information, interpretation and sequential explanation, to assess Genetic Concepts, Pedigree Diagrams and Genetic Engineering. The evaluation indicates that a variety of cognitive skills have been assessed over the three-year period, with different subtopics each year. However, there are skills such as remembering (recalling), comparison, and sequential explanation, and a shift is evident in the varied subtopics employed to assess them. The observation portrays that Genetic

Concepts has been assessed with the same cognitive skills (recalling and comparison) over the three-year period. This is an unacceptable predictability for subtopic and skills pairing, as learners may perceive a pattern for the subtopic.

Although cognitive skills and one subtopic were repeatedly employed for Genetics and Genetic Engineering, varied subtopics were used to assess them over this three-year period. Therefore, predictability is acceptable. The assessment body should continue to use a variety of cognitive skills and subtopics to assess Genetics and Genetic Engineering.

f. Scenario framing of items for a topic

The observed patterns indicate scenario framing that varied across topics over the three-year period. Scenarios were based on real life, which made them relatable. In 2022, the scenarios focused on recalling and comparing information from real-life situations to demonstrate understanding of Genetic Concepts. Interpreting information, calculation and application of information from sources were used to assess Pedigree Diagrams on CEP. Sequential explanation, analysis, evaluation and extraction were used to assess Women's Contribution in Genetic Studies.

In 2023, the scenarios focused on recalling and comparing information and were used to assess Genetic Concepts. The application of information and the interpretation of knowledge were used to assess the Human Genome Project. Interpretation, application, and extraction were used to assess Pedigree Diagrams and Selective Breeding. In 2024, the scenarios focused on recalling information, extracting from sources, and interpreting to assess Genetic Concepts, Pedigree Diagrams, and Genetic Engineering.

The scenarios were used alternatively over the three-year period, preventing learners from anticipating specific scenario types for specific topics. This reflects an acceptable level of predictability for the scenario framing of items in this topic.

Summary of findings and recommendations for the IEB Life Sciences Genetics and Genetic Engineering topic

Table 3.3.8 below summarises identified patterns of predictability across key components of question paper design, along with corresponding recommendations to reduce predictability and strategies to maintain effective assessment practices without compromising variability.

Table 3.3.8: Summary of Findings and Recommendations on the Predictability of the 2022–2024 IEB Life Sciences Genetics and Genetic Engineering Topic Papers 1 & 2

Identified unacceptable predictability on topic coverage
No unacceptable predictability in topic coverage. It is aligned with the requirements of the IEB Life Sciences SAGs. The questions were not repeated, and the full scope of subtopics was adequately represented.
Recommendations to avoid unacceptable predictability on topic coverage
The assessment body should continue to align the content with the IEB Life Sciences SAGs' requirements and use varied question formats and phrasing to prevent a pattern from developing.
The IEB should consider aligning their topic coverage with the CAPS requirements. The IEB should consider specifying topics over the strands in Grade 12.
Identified unacceptable predictability on content coverage
No identified unacceptable predictability on content coverage. Different subtopics were used in rotation to assess this topic, which is aligned with the IEB Life Sciences SAGs requirements.

Recommendations to avoid predictable content coverage
A variety of question categories should be used to make it difficult to infer item types for each subtopic.
Strategies to maintain content coverage that do not lead to a predictable question paper
Different subtopics should be assessed each year, in a rotational order, using varied formats and phrasing.
Identified unacceptable predictability on topic weighting
No unacceptable predictability identified. The varied weighting of the marks makes it difficult for learners to perceive a pattern, as different subtopics are weighted differently to assess the topic.
Recommendations to avoid unacceptable predictability on topic weighting
The IEB should continue to use varied question formats, random weighting, phrasing, and subtopics to ensure that no pattern develops.
Strategies to maintain topic weighting that do not lead to a predictable question paper
The IEB do not have topic weighting; only marks are allocated to AIM 1-3. The IEB should consider aligning the topic weighting with requirements of the CAPS. This will enhance variation by alternating the weighting of subtopics each year to ensure a continuous, fair, and valid assessment.
Identified unacceptable predictability on item types
No unacceptable predictability on item types. Item types align with IEB SAGs requirements. Various categories of questions have been used, and varied formats and phrasing have been employed across item types.

Recommendations to avoid unacceptable predictability on item types
A variety of question categories should be used to make it difficult to infer item types for each subtopic.
Strategies to maintain the assessment of item types that do not lead to a predictable question paper
The level of difficulty and cognitive levels should be varied across item types to ensure that no pattern is recognised.
Identified unacceptable predictability on topic–skill pairing
No unacceptable predictability on topic-skill pairing. Varied cognitive skills, phrasing, and subtopics were used to assess the topic.
Recommendations to avoid unacceptable predictability through topic–skill pairing
The IEB should continue to use varied cognitive skills and varied question phrasing, formats, and subtopics to assess Genetics and Genetic Engineering.
Strategies to maintain topic–skill pairing that do not lead to a predictable question paper
Topic-skill pairing should align with the CAPS requirements, and varied cognitive skills should be employed in rotation every year.
Identified unacceptable predictability in the scenario framing of items
No unacceptable predictability in the scenario framing of items. Scenario framing varied across the topic; the scenarios were based on real life, which made them relatable.
Recommendations to avoid unacceptable predictability in scenario framing of items

The assessment body should continue to use different item-framing scenarios and varied question formatting and phrasing year to year.
Strategies to maintain scenario framing of items that do not lead to a predictable question paper
The IEB can strengthen variation by alternating source extraction, comparison, calculation, and graph-based questions each year.

Table 3.3.9 below summarises the analysis conducted to assess the predictability of the DNA Code of Life topic in the IEB Life Sciences Paper 1 and Paper 2 examinations from 2022 to 2024.

Table 3.3.9: Findings on the Predictability of the DNA Code of Life Topic for the IEB Life Sciences Papers 1 & 2 Examinations from 2022–2024

Topic: DNA Code of Life							
Year	**Topic examined (✓) or not examined (X)**	**Content area/subtopics covered, including mark allocation**	**Overall weighting of the topic in marks**	**Item type/types (e.g., MCQ, essays, short answers, table, etc.) and marks allocated per content area/subtopic**	**Level of difficulty per item type used to examine the subtopic**	**Cognitive level per item type used to examine the subtopic**	**Skill assessed per subtopic**

2022	✓	DNA Code of Life Concepts (4)	20	Match Column-2 Terminology-3	Easy Easy	L2 L1	Remembering Extraction from Source
		Protein Synthesis (CRISPR)-7		Short Questions-7 (Source-based & Codon table)	Easy, Moderate, Difficult, Very Difficult	L1, L3, L4	Remembering Interpretation Application Analysis
		DNA Profiling (9)		Short Questions-9 (Diagram-based)	Easy, Moderate Difficult	L2, L3	Remembering Interpretation of Diagram Analysis
2023	✓	DNA Structure (15)	33	Short Questions-15 (Infographic)	Easy, Moderate, Difficult	L1, L2, L3, L4	Remembering Comparison Analysis Explanation

		Protein Synthesis (Translation)-9		Short Questions-9 (Diagram-based)	Easy, Difficult	L1, L2, L3	Remembering Application
		DNA Profiling-9		Short Questions-9 (Text based)	Easy, Moderate	L1, L2	Extraction from Text Interpretation Explanation
2024		DNA Monomer (Nucleotide)-3	42	Short Questions (Diagram-based) (3)	Easy Moderate	L1, L2	Drawing Remembering
		DNA Profiling (8)		Terminology-3 Short Questions-5	Easy Moderate	L1 L2	Remembering Explanation
		Protein Synthesis (Antibiotics)-12		Short Questions (Diagram-based) (12)	Easy, Moderate, Difficult	L1, L2, L3	Identification Remembering Sequential Explanation

		Gene Mutation (19)		Short Questions (Information text & tables)-19	Easy, Moderate Difficult, Very Difficult	L1, L2, L3, L4	Remembering Interpretation Explanation

Table 3.3.9 presents a comparative overview of the DNA Code of Life topic across the three-year period. The analysis, presented in Sections a to f, evaluates whether the components listed in Table 3.3.9 have contributed to the predictability of the IEB Life Sciences final examination (Paper 1 and Paper 2) from 2022 to 2024.

a. Topic coverage

The findings indicate that DNA Code of Life was consistently assessed across the three-year period of the IEB NSC final examination question papers. The frequency of the topic demonstrates a predictable pattern in topic coverage. Different subtopics have varied over the years to examine the topic.

The fact that it is consistently included in the question paper indicates that it is aligned with the IEB Life Sciences SAGs requirements that the strand in which the topic appears should be assessed every year. The predictability is acceptable, as it aligns with the requirements of the IEB Life Sciences SAGs. The questions were not repeated, and varied subtopics were represented in rotation. The IEB should continue to vary subtopics, phrasing, and formats to prevent a pattern from developing, thereby supporting a sound education that is fair, continuous, and reliable.

b. Content coverage

The findings indicate that DNA Code of Life has been constantly assessed over the three-year period. The frequency of the topic indicates a predictable pattern in content coverage. However, the CAPS and the IEB SAGs require that the topic be assessed on a year-to-year basis. The use of varied subtopics and question phrasing, rotated to examine this topic, suggests that the predictability of the content is acceptable.

The content coverage was aligned with the requirements of the IEB Life Sciences subject assessment guideline and complied with the CAPS requirements. The question papers were continuous, fair, and valid, and the depth of content was assessed across cohorts. Therefore, the assessment body should continue to align the content with the requirements of the IEB Life Sciences SAGs and use varied question formats, phrasing, and subtopics to prevent a pattern from developing.

c. Weighting of the topic

The analysis reveals that the mark allocation for DNA Code of Life varied from year-to-year between 2022 and 2024. In 2022, the mark allocation was 20 marks; in 2023, it increased significantly to 33 marks; and in 2024, it increased further to 42 marks. The varied weighting supports candidates in developing balanced competencies across the topic, thereby achieving the required cognitive skills outlined in the IEB Life Sciences SAGs. The varying weighting of the marks makes it difficult for learners to perceive a pattern. Different formats, phrasing, and subtopics have been alternated, with varying weights to assess the topic. Therefore, this is an acceptable predictability, as the pattern is not obvious.

The IEB does not allocate marks to topics; instead, marks are allocated to AIMS 1-3, making it difficult to discern a pattern in topic weighting. The IEB should consider assigning a mark allocation to the topic to assess its alignment with the SAGs.

d. Variation in item types

The evaluation indicates that a variety of item types were used to examine DNA Code of Life each year from 2022 to 2024. The item types were allocated different marks, with different subtopics each year. In 2022, the item types used to examine the topic were: Short Questions (Source-based and Diagram-based) and Match Column. In 2023, the item types used were: Short Questions (Diagram-based and Infographic). In 2024, the item types were: Short Questions (Diagram, Tables and Text) and Terminology.

- Across the three-year period, the distribution of levels of difficulty varied for similar item types assessing DNA Code of Life. Short Questions (Diagram-based, Tables, Text and Infographic) were classified as easy, moderate, difficult, and very difficult over this period. Match Columns were classified as easy in 2022.
- The distribution of cognitive levels varied for similar item types. The cognitive levels for Short Questions (Diagram-based, Tables, Text, and Infographic) were allocated to L1, L2, L3, and L4 over the three-year period, with varied subtopics. The Match Column was allocated to L2 in 2022.

The evaluation and pattern observed indicate that different categories of questions, such as Match Columns and Short Questions, were used over the three-year period to assess DNA Code of Life. The evidence indicates that a variety of question categories were used, making it difficult to recognise patterns. Although these formats were repeatedly employed for DNA Code of Life, varied subtopics were used to assess it over the three-year period. The assessment body should continue to use different categories of questions and alternate subtopics assigned to each category every year. The level of difficulty and cognitive levels should be varied to ensure that a pattern is not recognised.

e. Topic and skill pairing

The findings provide evidence that the Life Sciences final examination question papers demonstrate a structured and varied pairing of cognitive skills used to assess DNA Code of Life over the three-year period. In 2022, the key skills were: remembering, extracting

from sources, interpreting, applying, and analysing to assess DNA Code of Life Concepts, Protein Synthesis, and DNA Profiling. In 2023, the skills assessed were: recalling information, applying knowledge, extracting, interpreting, and explaining.

In 2024, the skills assessed were: drawing, remembering information, explanations, and identification, used to assess DNA Monomer (Nucleotide), DNA Profiling, Protein Synthesis (Antibiotics), and Gene Mutation. The evaluation indicates that a variety of cognitive skills have been assessed over the three-year period, with different subtopics each year. However, skills such as remembering (recalling), interpretation, and extraction have been consistently employed, though a shift is evident in the varied subtopics used to assess them. The assessment body should continue to use varied cognitive skills and varied subtopics to assess DNA Code of Life.

f. Scenario framing of items for a topic

The observed patterns indicate scenario framing that varied across topics. Scenarios were based on real life, which made them relatable. In 2022, the scenarios focused on recalling, extracting information from sources, interpreting, and analysing real-life situations to demonstrate understanding of DNA Code of Life Concepts.

In 2023, the scenarios focused on recalling, drawing graphs, application, extraction from sources, interpretation, and explanation based on DNA Structure, DNA Profiling and Protein Synthesis (Translation). In 2024, the scenarios focused on recalling information, extracting information from sources, drawing graphs, providing sequential explanations, and interpreting information to assess DNA Monomer (Nucleotide), DNA Profiling, Protein Synthesis (Antibiotics), and Gene Mutation. The scenarios were used alternatively over the three-year period, preventing learners from anticipating specific scenario types for specific topics. This reflects an acceptable level of predictability in framing scenario items for this topic.

Summary of findings and recommendations for the IEB Life Sciences DNA Code of Life topic

Table 3.3.10 below summarises identified patterns of predictability across key components of question paper design, along with corresponding recommendations to reduce predictability, and strategies to maintain effective assessment practices without compromising variability.

Table 3.3.10: Summary of Findings and Recommendations on the Predictability of the 2022–2024 IEB Life Sciences DNA Code of Life Topic Papers 1 & 2

Identified unacceptable predictability on topic coverage
No unacceptable predictability in topic coverage. It is aligned with the requirements of the IEB Life Sciences SAGs. The questions were not repeated, and the full scope of subtopics was adequately represented.
Recommendations to avoid unacceptable predictability on topic coverage
The assessment body should continue to align the content with the IEB Life Sciences SAGs' requirements and use varied question formats and phrasing to prevent a pattern from developing.
IEB should consider aligning their topic coverage with the CAPS requirements. The IEB should consider specifying topics over the strands in Grade 12.
Identified unacceptable predictability on content coverage
No identified unacceptable predictability on content coverage. The varied item types and phrasing were used in rotation to assess this topic, which is aligned with the IEB Life Sciences SAGs requirements.

Recommendations to avoid predictable content coverage
A variety of question categories should be used to make it difficult to infer item types for each subtopic.
Strategies to maintain content coverage that do not lead to a predictable question paper
Different subtopics should be assessed each year, in a rotational order, using varied formats and phrasing.
Identified unacceptable predictability on topic weighting
Unacceptable predictability identified on topic weighting. The mark allocations varied over the three-year period.
Recommendations to avoid unacceptable predictability on topic weighting
The IEB should continue to use varied question formats, random weighting, phrasing, and subtopics to ensure that no pattern develops.
Strategies to maintain topic weighting that do not lead to a predictable question paper
The IEB do not have topic weighting; only marks are allocated to AIM 1-3. The IEB should consider aligning topic weighting with requirements of the CAPS. This will strengthen variation by alternating weighting on different subtopics each year to ensure continuous, fair, and valid assessment.
Identified unacceptable predictability on item types
No unacceptable predictability on item types. Item types align with the IEB SAGs requirements. Various categories of questions have been used, and varied formats and phrasing have been employed across item types.
Recommendations to avoid unacceptable predictability on item types
A variety of question categories should be used to make it difficult to infer item types for each subtopic.
Strategies to maintain the assessment of item types that do not lead to a predictable question paper
The level of difficulty and cognitive levels should be varied across item types to ensure that no pattern is recognised.

Identified unacceptable predictability on topic–skill pairing
No unacceptable predictability on topic-skill pairing. Varied cognitive skills, phrasing and formats were used to assess the topic.
Recommendations to avoid unacceptable predictability through topic–skill pairing
The IEB should continue to use varied cognitive skills and varied question phrasing, formats, and subtopics to assess DNA Code of Life.
Strategies to maintain topic–skill pairing that do not lead to a predictable question paper
Topic-skill pairing should align with the CAPS requirements, and varied cognitive skills should be employed rotationally every year.

Table 3.3.11 below summarises the analysis conducted to assess the predictability of the Meiosis topic in the IEB Life Sciences Paper 1 and Paper 2 examinations from 2022 to 2024.

Table 3.3.11: Findings on the Predictability of the Meiosis Topic for the IEB Life Sciences Papers 1 & 2 Examinations from 2022–2024

Topic: Meiosis							
Year	**Topic examined (✓) or not examined (X)**	**Content area/subtopics covered, including mark allocation**	**Overall weighting of the topic in marks**	**Item type/types (e.g., MCQ, essays, short answers, table, etc.) and marks allocated per**	**Level of difficulty per item type used to examine the subtopic**	**Cognitive level per item type used to examine the subtopic**	**Skill assessed per subtopic**

				content area/subtopic			
2022	✓	Process of Meiosis	13	Terminology-5 Match Column-2 Short Questions-6	Easy, Moderate	L1, L2	Description Comparison Interpretation from Source
2023	✓	Phases of Meiosis (9)	9	Short Questions-4 Drawing-5 (Diagram-based)	Easy, Moderate	L1, L2, L3	Remembering Interpretation of Diagram Drawing
2024	✓	Phases of Meiosis	20	Match Column-1 Short Questions-15 (Diagram-based)	Easy Easy, Moderate	L1 L1, L2, L3	Remembering Drawing Construction of Flow Chart
		Abnormal Meiosis		Data Response-4 (Table)	Moderate, Difficult	L2, L3	Interpretation of Data

Table 3.3.11 presents a comparative overview of the Meiosis topic across the three-year period. The analysis, presented in Sections a to f, evaluates whether the components listed in Table 3.3.11 have contributed to the predictability of the IEB Life Sciences final examination (Paper 1 and Paper 2) from 2022 to 2024.

a. Topic coverage

The findings indicate that Meiosis was consistently assessed across the three-year period of the IEB NSC final examination question papers. The topic's frequency shows a predictable pattern of coverage, but subtopics have varied in their examination over the years.

The fact that it is consistently included in the question paper indicates that it is aligned with the IEB Life Sciences SAGs requirements that the strand in which the topic appears should be assessed every year. The predictability is acceptable, as it aligns with the requirements of the IEB Life Sciences SAGs. The questions were not repeated, and subtopics were rotated. The IEB should continue to vary subtopics, phrasing, and formats to prevent a pattern from developing and to support a sound, fair, and continuous education. and reliable.

b. Content coverage

The findings indicate that Meiosis has been constantly assessed over the three-year period. The frequency of the topic indicates a predictable pattern in content coverage. However, the CAPS and the IEB SAGs require that the topic be assessed on a year-to-year

basis. The use of varied subtopics and question phrasing, rotated to examine this topic, suggests that the predictability of the content is acceptable.

The content coverage aligned with the IEB Life Sciences SAGs and complied with CAPS requirements. The question papers were continuous, fair, and valid, and the depth of content was assessed across cohorts. Therefore, the assessment body should continue to align the content with the requirements of the IEB Life Sciences SAGs and use varied question formats, phrasing, and subtopics to prevent a pattern from developing.

c. Weighting of the topic

The analysis reveals that the mark allocation for Meiosis varied from year-to-year between 2022 and 2024. In 2022, the mark allocation was 13 marks; in 2023, it decreased slightly to 9 marks; and in 2024, it increased significantly to 24 marks.

The varied weighting supports candidates in developing balanced competencies across the topic, thereby achieving the required cognitive skills outlined in the IEB Life Sciences SAGs. The varying weighting of the marks makes it difficult for learners to perceive a pattern. Different formats, phrasing, and subtopics have been alternated with varying weights to assess the topic. Therefore, this is an acceptable predictability, as the pattern is not obvious.

The IEB does not allocate marks to topics; instead, marks are allocated to AIMS 1-3, making it difficult to discern a pattern in topic weighting. The IEB should consider assigning a mark allocation to the topic to assess its alignment with the SAGs.

d. Variation in item types

The evaluation indicates that varied item types were used for Meiosis each year from 2022 to 2024. The item types were assigned different marks for each subtopic each year. In 2022, the item types used to examine Meiosis were: Terminology, Match Column, and Short Questions. In 2023, the item types used were: Short Questions and Drawing of Graphs. In 2024, the item types used were: Short Questions (Diagram), Match Column, and Data Response (Table).

- Across the three-year period, the distribution of levels of difficulty varied for similar item types assessing Meiosis. Short Questions (Diagram-based) were classified as easy, moderate, and difficult over this period. Match Columns were classified as easy and moderate, Data responses were classified as moderate and difficult, and Drawing of Graphs was classified as easy and moderate.
- The distribution of cognitive levels varied for item types. The cognitive levels for Short Questions (Diagram-based) were allocated L1, L2, and L3, with varied subtopics. The Match Column was allocated L2 over the three years; Data Responses were allocated L2 and L3; and Drawing of Graphs were allocated L1, L2, and L3.

The evaluation and pattern observed indicate that different categories of questions, such as Match Columns, Short Questions and Data Responses, and Drawing of Graphs, were used over the three-year period to assess Meiosis. The evidence indicates that varied categories of questions were used, which makes it difficult to recognise an over the three-year period. Although these formats were repeatedly employed for Meiosis, varied subtopics were used to assess it. The assessment body should continue to use different categories of questions and alternate subtopics assigned to each category every year. The level of difficulty and cognitive levels should be varied to ensure that a pattern is not recognised.

e. Topic and skill pairing

The findings provide evidence that the Life Sciences final examination question papers demonstrate a structured and varied pairing of cognitive skills for assessing Meiosis. In 2022, the key skills used were description, comparison, and interpretation of sources to assess

the Process of Meiosis. In 2023, the skills assessed were: recalling information, interpreting diagrams, and drawing graphs to assess Phases of Meiosis. In 2024, the skills used were: recalling information, interpreting data, constructing flow charts, and drawing graphs to assess Phases of Meiosis and Abnormal Meiosis.

The evaluation indicates that a variety of cognitive skills have been assessed over the three-year period, with different subtopics each year. However, skills such as remembering (recalling) and data interpretation were consistently employed across the three years, though the subtopics used to assess them shifted. Therefore, the level of predictability is acceptable. The assessment body should continue to use a variety of cognitive skills and subtopics to assess Meiosis.

f. Scenario framing of items for a topic

The patterns observed indicate that the Life Sciences final examination question papers exhibit scenario framing that varied across topics; the scenarios were based on real life, making them relatable. In 2022, the scenarios focused on the description, interpretation, and comparison of information from real-life situations to demonstrate an understanding of the Process of Meiosis. In 2023, the scenarios focused on recalling, interpreting diagrams, and drawing graphs to assess Phases of Meiosis. In 2024, the scenarios focused on recalling information, constructing flow charts, and interpreting data from sources to assess Meiosis. The scenarios were used alternatively over the three-year period, preventing learners from anticipating specific scenario types for specific topics. This reflects an acceptable predictability for scenario framing of items.

Summary of findings and recommendations for the IEB Life Sciences Meiosis topic

Table 3.3.12 below summarises identified patterns of predictability across key components of question paper design, along with corresponding recommendations to reduce predictability, and strategies to maintain effective assessment practices without compromising variability.

Table 3.3.12: Summary of Findings and Recommendations on the Predictability of the 2022–2024 IEB Life Sciences Meiosis Topic Papers 1 & 2

Identified unacceptable predictability on topic coverage
No unacceptable predictability in topic coverage. It is aligned with the requirements of the IEB Life Sciences SAGs. The questions were not repeated, and the full scope of subtopics was adequately represented.
Recommendations to avoid unacceptable predictability on topic coverage
The assessment body should continue to align the content with the IEB Life Sciences SAGs' requirements and use varied question formats and phrasing to prevent a pattern from developing.
IEB should consider aligning their topic coverage with the CAPS requirements. The IEB should consider specifying topics over the strands in Grade 12.
Identified unacceptable predictability on content coverage
No identified unacceptable predictability on content coverage. The varied item types and phrasing were used in rotation to assess this topic, which is aligned with the IEB Life Sciences SAGs requirements.
Recommendations to avoid predictable content coverage
A variety of question categories should be used to make it difficult to infer item types for each subtopic.
Strategies to maintain content coverage that do not lead to a predictable question paper
Different subtopics should be assessed each year, in a rotational order, using varied formats and phrasing.
Identified unacceptable predictability on topic weighting

Unacceptable predictability identified on topic weighting. The mark allocations were consistent in two successive years on the same subtopic.
Recommendations to avoid unacceptable predictability on topic weighting
The IEB should continue to use varied question formats, random weighting, phrasing, and subtopics to ensure that no pattern develops.
Strategies to maintain topic weighting that do not lead to a predictable question paper
The IEB do not have topic weighting; only marks are allocated to AIM 1-3. The IEB should consider aligning topic weighting with requirements of the CAPS. This will enhance variation by alternating the weighting across subtopics each year, ensuring a continuous, fair, and valid assessment.
Identified unacceptable predictability on item types
No unacceptable predictability on item types. Item types align with the IEB SAGs requirements. Various categories of questions have been used, and varied formats and phrasing have been employed across item types.
Recommendations to avoid unacceptable predictability on item types
A variety of question categories should be used to make it difficult to infer item types for each subtopic.
Strategies to maintain the assessment of item types that do not lead to a predictable question paper
The level of difficulty and cognitive levels should be varied across item types to ensure that no pattern is recognised.
Identified unacceptable predictability on topic–skill pairing
No unacceptable predictability on topic-skill pairing. Varied cognitive skills, phrasing and formats were used to assess the topic.
Recommendations to avoid unacceptable predictability through topic–skill pairing
The IEB should continue to use varied cognitive skills and varied question phrasing, formats, and subtopics to assess Meiosis.

Strategies to maintain topic–skill pairing that do not lead to a predictable question paper
Topic-skill pairing should align with the CAPS requirements, and varied cognitive skills should be employed in rotation every year.

Table 3.3.13 below summarises the analysis conducted to determine the level of predictability for the Endocrine system topic in the IEB Life Sciences Paper 1 and Paper 2 examinations from 2022 to 2024.

Table 3.3.13: Findings on the Predictability of the Endocrine System Topic for the IEB Life Sciences Papers 1 & 2 Examinations from 2022–2024

Topic: Endocrine System							
Year	**Topic examined (✓) or not examined (X)**	**Content area/subtopics covered, including mark allocation**	**Overall weighting of the topic in marks**	**Item type/types (e.g., MCQ, essays, short answers, table, etc.) and marks allocated per content area/subtopic**	**Level of difficulty per item type used to examine the subtopic**	**Cognitive level per item type used to examine the subtopic**	**Skill assessed per subtopic**
2022	✓	Endocrine Glands (7)	7	Match Column-7	Easy	L1	Identification

2023	✓	Endocrine Glands (5)	14	Short Questions-5 (Diagram-based)	Easy	L1	Remembering
		Homeostasis of Glucose (9)		Short Questions-9 (Infographic)	Moderate	L2	Interpretation of Infographic Explanation
2024	**X**	Not Assessed	0	None	None	None	None

Table 3.3.13 presents a comparative overview of the Endocrine System topic across the three-year period. The analysis, presented in Sections a to f, evaluates whether the components listed in Table 3.3.13 have contributed to the predictability of the IEB Life Sciences final examination (Paper 1 and Paper 2) from 2022 to 2024.

a. Topic coverage

The findings indicate that the Endocrine System was consistently assessed from 2022 to 2023 but not in 2024 in the IEB NSC final examination question papers. The frequency of the topic demonstrates a predictable pattern in topic coverage, but different subtopics have been varied over the years to examine the topic.

The fact that it was not assessed in 2024 indicates it is not aligned with the CAPS requirements, which require it to be assessed every year, but it was aligned with the IEB Life Sciences SAGs, which focus on assessing the strand rather than topics. The predictability is acceptable, as it aligns with the requirements of the IEB Life Sciences SAGs. The questions were not repeated, and subtopics were

rotated. The IEB should continue to vary subtopics, phrasing, and formats to prevent a pattern from developing, thereby supporting a sound education that is fair, continuous, and reliable.

b. Content coverage

The findings indicate that the Endocrine System has not been constantly assessed over the three-year period, as it was not assessed in 2024. The frequency of the topic indicates a predictable pattern in content coverage, though it was not assessed in 2024. However, the CAPS requires that the topic be assessed on a year-to-year basis. The IEB does not assess topics but rather strands, which were assessed on a different topic in 2024. The use of varied subtopics and question phrasing, rotated to examine this topic in 2022 and 2023, suggests that the predictability of the content is acceptable.

The content coverage was aligned with the requirements of the IEB Life Sciences SAGs. Therefore, the assessment body should continue to align the content with the requirements of IEB Life Sciences SAGs and use varied question formats, phrasing, and subtopics to prevent a pattern from developing.

c. Weighting of the topic

The analysis reveals that the mark allocation for the Endocrine System varied from year-to-year between 2022 and 2024. In 2022, the allocation was 7 marks; in 2023, it increased significantly to 14 marks; in 2024, the topic was not assessed. The varied weighting supports candidates in developing balanced competencies across the topic, thereby achieving the required cognitive skills outlined in the IEB Life Sciences SAGs. The varying weighting of the marks makes it difficult for learners to perceive a pattern. Different formats, phrasing, and subtopics have been alternated with varying weights to assess the topic. Therefore, this can be regarded as an acceptable level of predictability, as the pattern is not obvious.

IEB does not allocate marks to topics; instead, marks are allocated to AIMS 1-3, making it difficult to discern a pattern in topic weighting. The IEB should consider assigning a mark allocation to the topic to assess its alignment with the SAGs.

d. Variation in item types

The evaluation indicates that a variety of item types were used to examine the Endocrine System in 2022 and 2023. The item types were allocated different marks for different subtopics in 2022 and 2023. In 2022, the item type was Match Column; in 2023, it was Short Questions (Diagram-based, Infographic).

Over the two years (2022 to 2023), the distribution of difficulty levels varied. Short Questions (Diagram-based, Infographic) were classified as easy and moderate over this period. Match Columns were classified as easy in 2022.

Across the two years, the distribution of cognitive levels varied for item types. The cognitive levels for Short Questions (Diagram-based, Infographic) were allocated L1 and L2 in 2023. The Match Column was allocated L1 in 2022. The evidence indicates that a variety of question types were used, making it difficult to recognise patterns in question papers. The assessment body should continue to use different categories of questions and alternate subtopics assigned to each category every year. The level of difficulty and cognitive levels should be varied to ensure that a pattern is not recognised.

e. Topic and skill pairing

The findings provide evidence that the Life Sciences final examination question papers demonstrate a structured and varied pairing of cognitive skills used to assess the Endocrine System in 2022 and 2023. In 2022, the key skills used were identification of information to assess Endocrine Glands. In 2023, the skills assessed were: recalling information, interpreting infographics, and explaining Endocrine Glands and the Homeostasis of Glucose.

The evaluation indicates that a variety of cognitive skills have been assessed over the two-year period, with different subtopics each year. Therefore, the predictability is acceptable. The assessment body should continue to use a variety of cognitive skills and subtopics to assess the Endocrine System.

f. Scenario framing of items for a topic

The observed patterns indicate scenario framing that varied across topics; the scenarios were based on real life, which made them relatable. In 2022, the scenarios focused on identifying information from real-life situations. In 2023, the scenarios focused on recalling, interpretation and explanation, based on Endocrine Glands and Homeostasis. The scenarios were used alternately in 2022 and 2023, preventing learners from anticipating which scenario types would appear for particular subtopics. This reflects an acceptable level of predictability in framing scenario items for this topic.

Summary of findings and recommendations for the IEB Life Sciences Endocrine System topic

Table 3.3.14 summarises identified patterns of predictability across key components of question paper design, along with corresponding recommendations to reduce predictability, and strategies to maintain effective assessment practices without compromising variability.

Table 3.3.14: Summary of Findings and Recommendations on the Predictability of the 2022–2024 IEB Life Sciences Endocrine System Topic Papers 1 & 2

Identified unacceptable predictability on topic coverage
No unacceptable predictability in topic coverage. It is aligned with the requirements of the IEB Life Sciences SAGs. The questions were not repeated, and the full scope of subtopics was adequately represented.
Recommendations to avoid unacceptable predictability on topic coverage
The assessment body should continue to align the content with the IEB Life Sciences SAGs' requirements and use varied question formats and phrasing to prevent a pattern from developing.
The IEB should consider aligning their topic coverage with the CAPS requirements. The IEB should consider specifying topics over the strands in Grade 12.
Identified unacceptable predictability on content coverage
No identified unacceptable predictability on content coverage. The varied item types and phrasing were used in rotation to assess this topic, which is aligned with the IEB Life Sciences SAGs requirements.
Recommendations to avoid predictable content coverage
A variety of question categories should be used to make it difficult to infer item types for each subtopic.
Strategies to maintain content coverage that do not lead to a predictable question paper
Different subtopics should be assessed each year, in a rotational order, using varied formats and phrasing.
Identified unacceptable predictability on topic weighting

No unacceptable predictability identified on topic weighting. The mark allocations varied in two successive years, and varied formats and phrasing were used.
Recommendations to avoid unacceptable predictability on topic weighting
The IEB should continue to use varied question formats, random weighting, phrasing, and subtopics to ensure that no pattern develops.
Strategies to maintain topic weighting that do not lead to a predictable question paper
The IEB do not have topic weighting; only marks are allocated to AIM 1-3. The IEB should consider aligning topic weighting with requirements of the CAPS. This will enhance variation by alternating the weighting of subtopics each year, ensuring a continuous, fair, and valid assessment.
Identified unacceptable predictability on item types
No unacceptable predictability on item types. Item types align with IEB SAGs requirements. Various categories of questions have been used, and varied formats and phrasing have been employed across item types.
Recommendations to avoid unacceptable predictability on item types
A variety of question categories should be used to make it difficult to infer item types for each subtopic.
Strategies to maintain the assessment of item types that do not lead to a predictable question paper
The level of difficulty and cognitive levels should be varied across item types to ensure that no pattern is recognised.
Identified unacceptable predictability on topic–skill pairing
No unacceptable predictability on topic-skill pairing. Varied cognitive skills, phrasing and formats were used to assess the topic.
Recommendations to avoid unacceptable predictability through topic–skill pairing
The IEB should continue to use varied cognitive skills and varied question phrasing, formats, and subtopics.

Strategies to maintain topic–skill pairing that do not lead to a predictable question paper
Topic-skill pairing should align with the CAPS requirements, and varied cognitive skills should be employed rotationally every year.

Table 3.3.15 below summarises the analysis conducted to determine the level of predictability for the Reproduction in Vertebrates topic in the IEB Life Sciences Paper 1 and Paper 2 examinations from 2022 to 2024.

Table 3.3.15: Findings on the Predictability of the Reproduction in Vertebrates Topic for the IEB Life Sciences Papers 1 & 2 Examinations from 2022–2024

Topic: Reproduction in Vertebrates							
Year	**Topic examined (✓) or not examined (X)**	**Content area/subtopics covered, including mark allocation**	**Overall weighting of the topic in marks**	**Item type/types (e.g., MCQ, essays, short answers, table, etc.) and marks allocated per content area/subtopic**	**Level of difficulty per item type used to examine the subtopic**	**Cognitive level per item type used to examine the subtopic**	**Skill assessed per subtopic**
2022	✓	Reproductive Strategies-11	13	MCQ-2 Short Questions-	Easy Moderate,	L2 L1, L2, L3, L4	Remembering Interpretation

		(Investigation)		(Source-based) & Table-11	Difficult, Very Difficult		Analysis Evaluate
2023	✓	Reproductive Strategies (13)	13	MQC-2 Short Questions-11 (Textbox -based)	Easy Moderate, Difficult	L2 L2, L3	Remembering Interpretation of Text Application Drawing of Graph
2024	✓	Reproductive Strategies	15	Short Questions-15 (Source-based)	Easy, Moderate	L1, L2	Remembering Extraction from Source

Table 3.3.15 presents a comparative overview of the Reproduction in Vertebrates topic across the three-year period. The analysis, presented in Sections a to f, evaluates whether the components listed in Table 3.3.15 have contributed to the predictability of the IEB Life Sciences final examination (Paper 1 and Paper 2) from 2022 to 2024.

a. Topic coverage

The findings indicate that Reproduction in Vertebrates was consistently assessed across the three-year period of the IEB NSC final examination question papers. The frequency of the topic demonstrates a predictable pattern in topic coverage.

The fact that it is consistently included in the question paper indicates that it is aligned with the IEB Life Sciences SAGs requirements that the strand in which the topic appears should be assessed every year. Predictability is at an acceptable level, as it aligns with the requirements of the IEB Life Sciences SAGs and no questions were repeated. The IEB should continue to vary phrasing and formats to prevent a pattern from developing, thereby supporting a sound education that is fair, continuous, and reliable.

b. Content coverage

The findings indicate that Reproduction in Vertebrates has been constantly assessed over the three-year period. The frequency of the topic indicates a predictable pattern in content coverage. However, the CAPS and the IEB SAGs require that the strand in which the topic appears should be assessed on a year-to-year basis. The use of varied question phrasing in rotation to examine this topic suggests that the predictability of the content is acceptable.

The content coverage was aligned with the requirements of the IEB Life Sciences subject assessment guideline, and complied with the CAPS requirements. Therefore, the assessment body should continue to align the content with the requirements of IEB Life Sciences SAGs and use varied question formats and phrasing to prevent a pattern from developing.

c. Weighting of the topic

The analysis reveals that the mark allocation for Reproduction in Vertebrates was consistent over the three-year period. In 2022 and 2023, the mark allocation was 13 marks; in 2024, it increased to 15 marks. The consistent weighting indicates a predictable pattern in topic weighting; however, different formats and phrasing have been alternated to assess the topic.

The IEB does not allocate marks to topics; instead, marks are allocated to AIMS 1-3, making it difficult to discern a pattern in topic weighting. The IEB should consider assigning a mark allocation to the topic to assess its alignment with the SAGs.

d. Variation in item types

The evaluation indicates that varied item types were used to examine Reproduction in Vertebrates each year. In 2022, the item types used were: Short Questions (Source-based and Table), and MCQs. In 2023, the item types used were: Multiple Choice and Short Questions (Text-based). In 2024, the assessment of this topic was based on Short Questions (Source-based).

- Across the three-year period, the distribution of levels of difficulty varied. Short Questions (Source-based and Text-based) were classified as easy, moderate, difficult, or very difficult. MCQs were classified as easy.
- Across the three-year period, the distribution of cognitive levels has varied slightly for item types. The cognitive levels for Short Questions (Source-based, Text-based) were allocated L1, L2, L3, and L4 over this period, with varied formatting and phrasing. The MCQ was allocated L2 and L3 over the three-year period.

The evaluation and pattern observed indicate that different categories of questions, such as MCQs and Short Questions, were used over the three-year period to assess Reproduction in Vertebrates. The evidence indicates that a variety of question types were used, making it difficult to recognise patterns in the question papers. Although these formats were repeatedly employed for Reproduction in Vertebrates, varied question formats and phrasing were used to assess it over the three-year period. The assessment body should

continue to use different categories of questions and varied formats and phrasing within each category. The level of difficulty and cognitive levels should be varied to ensure that a pattern is not recognised.

e. Topic and skill pairing

The findings provide evidence that the Life Sciences final examination question papers demonstrate a structured and varied pairing of cognitive skills for assessing Reproduction in Vertebrates. In 2022, the key skills assessed were recalling, interpreting, analysing, and evaluating information to assess Reproduction in Vertebrates. In 2023, the skills assessed were: recall, interpretation, and application of skills to assess Reproductive Strategies in Vertebrates. In 2024, the skills assessed were: recalling information and extracting information from sources to examine Reproductive Strategies in Vertebrates.

The evaluation indicates that a variety of cognitive skills have been assessed over the three-year period. However, there are skills, such as remembering (recalling), that have been consistently used, yet a shift is evident in the varied formats and phrasing of the questions used to assess them. Therefore, the predictability is acceptable. The assessment body should continue to use varied cognitive skills and varied question formats and phrasing to assess Reproduction in Vertebrates.

f. Scenario framing of items for a topic

The observed patterns indicate scenario framing that varied across topics; the scenarios were based on real life, which made them relatable. In 2022, the scenarios focused on recalling, interpreting, analysing, and evaluating information from real-life situations to demonstrate understanding of Reproductive Strategies in Vertebrates.

In 2023, the scenarios focused on recalling, interpreting text, and application to assess Reproductive Strategies in Vertebrates. In 2024, the scenarios focused on recalling information and extraction from sources to assess Reproductive Strategies in Vertebrates. The scenarios were used alternatively over the three-year period, preventing learners from anticipating specific scenario types for specific topics. This reflects an acceptable level of predictability in framing scenario items for this topic.

Summary of findings and recommendations for the IEB Life Sciences Reproduction in Vertebrates topic

Table 3.3.16 below summarises identified patterns of predictability across key components of question paper design, along with corresponding recommendations to reduce predictability, and strategies to maintain effective assessment practices without compromising variability.

Table 3.3.16: Summary of Findings and Recommendations on the Predictability of the 2022–2024 IEB Life Sciences Reproduction in Vertebrates Topic Papers 1 & 2

Identified unacceptable predictability on topic coverage
No unacceptable predictability in topic coverage. It is aligned with the requirements of the IEB Life Sciences SAGs. The questions were not repeated, and the full scope of subtopics was adequately represented.
Recommendations to avoid unacceptable predictability on topic coverage
The assessment body should continue to align the content with the IEB Life Sciences SAGs' requirements and use varied question formats and phrasing to prevent a pattern from developing.
The IEB should consider aligning their topic coverage with the CAPS requirements. The IEB should consider specifying topics over the strands in Grade 12.
Identified unacceptable predictability on content coverage

No identified unacceptable predictability on content coverage. Varied item types and phrasing were used in rotation to assess this topic, which is aligned with the IEB Life Sciences SAGs requirements.
Recommendations to avoid predictable content coverage
A variety of question categories should be used to make it difficult to infer item types for each subtopic.
Strategies to maintain content coverage that do not lead to a predictable question paper
Different subtopics should be assessed each year, in a rotational order, using varied formats and phrasing.
Identified unacceptable predictability on topic weighting
No unacceptable predictability identified on topic weighting. The mark allocations were consistent in two successive years on the same subtopic of Reproductive Strategies in Vertebrates.
Recommendations to avoid unacceptable predictability on topic weighting
The IEB should continue to use varied question formats, random weighting, phrasing, and subtopics to ensure that no pattern develops.
Strategies to maintain topic weighting that do not lead to a predictable question paper
The IEB do not have topic weighting; only marks are allocated to AIM 1-3. The IEB should consider aligning the topic weighting with requirements of the CAPS. This will enhance variation by alternating the weighting of subtopics each year, ensuring a continuous, fair, and valid assessment.
Identified unacceptable predictability on item types

No unacceptable predictability on item types. Item types align with the IEB SAGs requirements. Various categories of questions have been used, and varied formats and phrasing have been employed across item types.
Recommendations to avoid unacceptable predictability on item types
A variety of question categories should be used to make it difficult to infer item types for each subtopic.
Strategies to maintain the assessment of item types that do not lead to a predictable question paper
The level of difficulty and cognitive levels should be varied across item types to ensure that no pattern is recognised.
Identified unacceptable predictability on topic–skill pairing
No unacceptable predictability on topic-skill pairing. Varied cognitive skills, phrasing and formats were used to assess the topic.
Recommendations to avoid unacceptable predictability through topic–skill pairing
The IEB should continue to use varied cognitive skills and varied question phrasing, formats, and subtopics to assess Reproduction in Vertebrates.
Strategies to maintain topic–skill pairing that do not lead to a predictable question paper
Topic-skill pairing should align with the CAPS requirements, and varied cognitive skills should be employed in rotation every year.

Table 3.3.17 summarises the analysis conducted to determine the level of predictability for the Reproduction in Flowering Plants topic in the IEB Life Sciences Paper 1 and Paper 2 examinations from 2022 to 2024.

Table 3.3.17: Findings on the Predictability of the Reproduction in Flowering Plants Topic for the IEB Life Sciences Papers 1 & 2 Examinations from 2022–2024

Topic: Reproduction in Flowering Plants							
Year	**Topic examined (✓) or not examined (X)**	**Content area/subtopics covered, including mark allocation**	**Overall weighting of the topic in marks**	**Item type/types (e.g., MCQ, essays, short answers, table, etc.) and marks allocated per content area/subtopic**	**Level of difficulty per item type used to examine the subtopic**	**Cognitive level per item type used to examine the subtopic**	**Skill assessed per subtopic**
2022	✓	Reproduction in Flowering Plants (14)	14	Short Questions-14	Easy, Moderate	L1, L2	Interpretation Drawing Identifying Remembering
2023	**X**	Not Assessed	0	None	None	None	None
2024	✓	Reproduction in Flowering Plants (3)	30	Terminology-3	Easy	L1	Extraction from Source

		Concepts					
	✓	Sexual & Asexual Reproduction (7)		Short Questions-7	Easy	L1, L2	Comparison Tabulate Explanation
	✓	The Flower (10)		Short Questions-7 Calculation-3	Easy, Moderate	L1, L2	Remembering Identifying Parts Calculation
	✓	Polyploidy (4)		Short Questions-4	Easy	L2	Explanation
	✓	Seeds (6)		Short Questions-6	Easy, Moderate	L1, L2	Remembering Explanation

Table 3.3.17 presents a comparative overview of the Reproduction in Flowering Plants topic across the three-year period. The analysis, presented in Sections a to f, evaluates whether the components listed in Table 3.3.17 have contributed to the predictability of the IEB Life Sciences final examination (Paper 1 and Paper 2) from 2022 to 2024.

a. Topic coverage

The findings indicate that Reproduction in Flowering Plants has not been assessed consistently across the three-year period. The topic was not assessed in 2023 because the IEB assesses strands rather than topics. The frequency of the topic over the three-year period does not give a clear sense of what to expect. Predictability is at an acceptable level; questions were not repeated, and subtopics were represented.

To maintain predictability at an acceptable level, the IEB should assess the topic year-to-year and continue to vary subtopics in line with the IEB Life Sciences subject assessment guideline. Predictability should be within the CAPS and the IEB SAGs' expectations, as this will continue to support a sound, fair, and reliable education.

b. Content coverage

The findings indicate that the topic was not assessed continuously over the three-year period. The frequency of the topic does not indicate a predictable pattern in content coverage. The use of varied subtopics and question phrasing, rotated to examine this topic in 2022 and 2024, suggests that the content's predictability is acceptable.

The content coverage was aligned with the requirements of the IEB Life Sciences subject assessment guideline, but did not comply with the CAPS requirements. The assessment body should continue to align the content with the requirements of the IEB Life Sciences SAGs and use varied question formats, phrasing, and subtopics to prevent a pattern from developing.

c. Weighting of the topic

The analysis reveals that the mark allocation for Reproduction in Flowering Plants varied from year-to-year between 2022 and 2024 and was not assessed in 2023. In 2022, the allocation was 14 marks; in 2024, it increased significantly to 30 marks. The varied weighting

supports candidates in developing balanced competencies across the topic to achieve the required cognitive skills outlined in the IEB Life Sciences SAGs. The varied weighting of marks makes it difficult for learners to perceive a pattern, as different formats, phrasing, and subtopics are alternated with varying weighting to assess the topic. Therefore, this can be regarded as an acceptable level of predictability, as the pattern is not obvious.

The alignment of the topic's weighting with the requirements of the IEB SAGs ensures that the question papers are continuous, fair, and valid. The IEB does not assign topic marks, but marks are allocated to AIMS. Therefore, the assessment body should consider assigning a mark allocation to the topic to assess its alignment with the SAGs.

d. Variation in item types

The evaluation indicates that a variety of item types were used to examine Reproduction in Flowering Plants between 2022 and 2024. The item types were assigned different marks for each subtopic each year. In 2022, the item type used was a Short Question to examine Reproduction in Flowering Plants. In 2024, the item types used to examine the topic were terminology, source extraction, and Short Questions.

- In 2022 and 2024, the distribution of levels of difficulty varied. Short Questions were classified as easy and moderate between 2022 and 2024. Terminology was classified as easy and moderate in 2024.
- The distribution of cognitive levels varied for item types. The cognitive levels for Short Questions were allocated L1 and L2 between 2022 and 2024, with varied subtopics. The Terminology question was allocated L1 in 2024.

The evaluation and pattern observed indicate that different categories of questions, such as Short Questions and Terminology, were used in 2022 and 2024. The evidence indicates that a variety of question types were used, making it difficult to recognise patterns in question papers. Although these formats were repeatedly employed for Reproduction in Flowering Plants, varied subtopics were used to assess it in 2022 and 2024. The assessment body should continue to use different categories of questions and alternate

subtopics assigned to each category every year. The level of difficulty and cognitive levels should be varied to ensure that a pattern is not recognised.

e. Topic and skill pairing

The findings provide evidence that the Life Sciences examination question papers demonstrate a structured and varied pairing of cognitive skills. In 2022, the key skills assessed for Reproduction in Flowering Plants were remembering, interpreting, drawing, and identifying.

In 2024, the key skills used were: extraction from sources, comparison, tabulation, explanation, calculation, remembering, and interpretation, to assess understanding of concepts in Reproduction in Flowering Plants: Sexual and Asexual Reproduction, the flower, polyploidy, and seeds. The evaluation indicates that a variety of cognitive skills were assessed throughout 2022 and 2024, with different subtopics each year. Therefore, this is a positive predictability. The assessment body should continue to use a variety of cognitive skills and subtopics to assess Reproduction in Flowering Plants.

f. Scenario framing of items for a topic

The observed patterns indicate scenario framing that varied across topics; the scenarios were based on real life, which made them relatable. In 2022, the scenarios focused on recalling information, interpreting, drawing graphs, and identifying information from real-life scenarios based on Reproduction in Flowering Plants.

In 2024, the scenarios focused on extracting information from sources, comparing, tabulating information, and explaining real-life scenarios based on Reproduction in Flowering Plants, Sexual and Asexual Reproduction, and the Flower and Seeds. The scenarios were used alternatively over the two-year period, preventing learners from anticipating specific scenario types for specific topics. This reflects an acceptable level of predictability in framing scenario items for a topic.

It is important for the assessment body to continue using different scenario framings for items and varied question formatting and phrasing. The IEB can strengthen variation by alternating source extraction, comparison, calculation, and graph-based questions each year.

Summary of findings and recommendations for the IEB Life Sciences Reproduction in Flowering Plants topic

Table 3.3.18 below summarises identified patterns of predictability across key components of question paper design, along with corresponding recommendations to reduce predictability and strategies to maintain effective assessment practices without compromising variability.

Table 3.3.18: Summary of Findings and Recommendations on the Predictability of the 2022–2024 IEB Life Sciences Reproduction in Flowering Plants Topic Papers 1 & 2

Identified unacceptable predictability on topic coverage
No unacceptable predictability in topic coverage. It is aligned with the requirements of the IEB Life Sciences SAGs. The questions were not repeated, and the full scope of subtopics was adequately represented.
Recommendations to avoid unacceptable predictability on topic coverage
The assessment body should continue to align the content with the IEB Life Sciences SAGs' requirements and use varied question formats and phrasing to prevent a pattern from developing. The IEB should consider aligning their topic coverage with the CAPS requirements. The IEB should consider specifying topics over the strands in Grade 12.

Identified unacceptable predictability on content coverage
No identified unacceptable predictability on content coverage. Different subtopics were used in rotation to assess this topic, which is aligned with the IEB Life Sciences SAGs requirements.
Recommendations to avoid predictable content coverage
A variety of question categories should be used to make it difficult to infer item types for each subtopic.
Strategies to maintain content coverage that do not lead to a predictable question paper
Different subtopics should be assessed each year, in a rotational order, using varied formats and phrasing.
Identified unacceptable predictability on topic weighting
No unacceptable predictability identified. The varied weighting of the marks makes it difficult for learners to perceive a pattern, as different subtopics are weighted differently to assess the topic.
Recommendations to avoid unacceptable predictability on topic weighting
The IEB should continue to use varied question formats, random weighting, phrasing, and subtopics to prevent a pattern from developing.
Strategies to maintain topic weighting that do not lead to a predictable question paper
The IEB do not have topic weighting; only marks are allocated to AIM 1-3. The IEB should consider aligning topic weighting with requirements of the CAPS. This will strengthen variation by alternating the weighting of different subtopics each year to ensure continuous, fair and valid assessment.

Identified unacceptable predictability on item types
No unacceptable predictability on item types. Item types align with IEB SAGs requirements. Various categories of questions have been used, and varied formats and phrasing have been employed across item types.
Recommendations to avoid unacceptable predictability on item types
A variety of question categories should be used to make it difficult to infer item types for each subtopic.
Strategies to maintain the assessment of item types that do not lead to a predictable question paper
The level of difficulty and cognitive levels should be varied across item types to ensure that no pattern is recognised.
Identified unacceptable predictability on topic–skill pairing
No unacceptable predictability on topic-skill pairing. Varied cognitive skills, phrasing, and subtopics were used.
Recommendations to avoid unacceptable predictability through topic–skill pairing
The IEB should continue to use varied cognitive skills and varied question phrasing, formats, and subtopics to assess Reproduction in Flowering Plants.
Strategies to maintain topic–skill pairing that do not lead to a predictable question paper
Topic-skill pairing should align with CAPS requirements, and varied cognitive skills should be employed in rotation every year.

Conclusions

The evidence presented indicates that the evaluation of the Life Sciences IEB Paper 1 and Paper 2 question papers for the period 2022 to 2024 does not demonstrate unacceptable predictability. Although the IEB Life Sciences emphasises strands more than topics, the assessed content was based on varied subtopics, item types, and skill pairings, with an annual shift in content focus to ensure learners do not perceive it as predictable. The structure of the Life Sciences question papers remained consistent over three years (2022 to 2024) to support continuity, fairness, and alignment with IEB Life Sciences SAGs standards. The content, cognitive skills, and item types were varied annually to prevent unacceptable predictability. This implies that the IEB Life Sciences question papers from 2022 to 2024 do not exhibit unacceptable predictability and maintain a balanced, valid assessment structure that is policy-compliant and fair.

PART IV: DISCUSSIONS, CONCLUSIONS, AND GENERAL RECOMMENDATIONS

Section 4: Discussions, Conclusions, and General Recommendations

Sections 3.1–3.3 presented the findings of the evaluation of each topic assessed in the DBE and IEB Life Sciences NSC examination papers. These findings were derived from a systematic analysis of examination papers administered between 2022 and 2024 to identify patterns of predictability across the sampled subjects. Building on these findings, this chapter discusses the results in relation to the study's conceptual framework and broader principles of educational assessment. It also presents evidence-based recommendations informed by the observed trends and concludes by reflecting on the implications of the findings for assessment quality, validity, and future examination design.

4.1 Discussions

The analysis of Life Sciences examination question papers from the DBE and the IEB for the period 2022 to 2024 reveals a deliberate balance between curriculum compliance and assessment validity. The findings indicate that, although certain topics recurred annually, this repetition is embedded within the CAPS and IEB assessment frameworks and therefore does not constitute unacceptable predictability.

For DBE Paper 1, the consistent inclusion of core topics, such as Human Reproduction, the Human Nervous System, and Plant Responses to the Environment, reflects curriculum requirements rather than redundancy in assessment design. Importantly, variation in subtopics, cognitive demand, and item construction demonstrates a considered approach to assessment design. This aligns with the principles of valid assessment, which require comprehensive content coverage and the assessment of a range of cognitive skills, including knowledge recall, application, analysis, and evaluation. The consistent examination structure further enhances fairness and reliability by ensuring that learners are assessed under comparable conditions across examination cycles.

Similarly, DBE Paper 2 maintained alignment with CAPS by consistently assessing foundational topics such as Evolution, Genetics, and Meiosis. However, variation in question framing, contextualisation, and the integration of scientific skills reduces the likelihood of rote learning or examination gaming. Shifts in emphasis within these topics, for example, from conceptual understanding to data interpretation or problem-solving, ensure that learners engage with the content at multiple cognitive levels. These findings reinforce the argument that predictability in topic inclusion does not necessarily translate into predictability in assessment outcomes.

The IEB examination papers, although organised around broader conceptual strands rather than fixed curriculum topics, exhibited similar patterns. Their emphasis on conceptual integration and higher-order thinking is reflected in the use of varied item types, authentic contexts, and interdisciplinary questioning. The consistency in examination structure across the reviewed years supports reliability, while the diversity in content focus and skills pairing ensures that assessments remained unpredictable. This demonstrates adherence to sound assessment principles, whereby both the breadth and depth of learners' knowledge and competencies are evaluated.

Across both assessment bodies, the findings suggest that predictability is effectively managed through deliberate variation in assessment design. The recurrence of key topics serves curricular integrity, while the diversity in assessment approaches safeguards against superficial learning strategies. This balance is essential for maintaining the validity, reliability, fairness, and educational integrity of high-stakes examinations.

4.2 Conclusions

Based on the evidence reviewed, it can be concluded that Life Sciences examination papers from both the DBE and the IEB for 2022 to 2024 do not demonstrate unacceptable predictability. Although certain topics recurred annually, this is a direct consequence of curriculum policy requirements rather than a flaw in assessment design. The consistent variation in subtopics, cognitive levels, item types, and contextual focus ensures that examinations remain valid, fair, and reliable.

Both the DBE and the IEB maintained consistent examination structures to promote standardisation and fairness while simultaneously incorporating sufficient variation to challenge learners and assess a broad range of knowledge, skills, and cognitive abilities. Consequently, the assessment practices observed uphold the principles of high-quality educational assessment and do not promote rote memorisation or narrowly focused examination preparation strategies.

4.3 General Recommendations

The following recommendations are proposed:

- Examination bodies should continue to diversify cognitive levels within recurring topics, ensuring that examination questions assess higher-order thinking skills such as analysis, synthesis, and evaluation.
- Examination designers should adopt multi-year rotation matrices to regulate the recurrence of subtopics, skills, item types, and scenario framing across examination cycles.
- Moderation processes at the assessment body level should incorporate explicit cross-year comparisons to identify emerging patterns, particularly in subjects where improving learner performance has raised concerns about examination predictability.
- The development and expansion of item-type and scenario banks should be prioritised to diversify question structures, reduce reliance on familiar templates, and minimise unintentional patterning.
- Routine predictability audits should be implemented using the six analytical dimensions presented in this study to support continuous monitoring and prevent the emergence of unintended examination patterns.