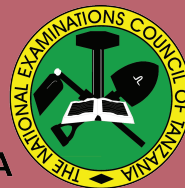
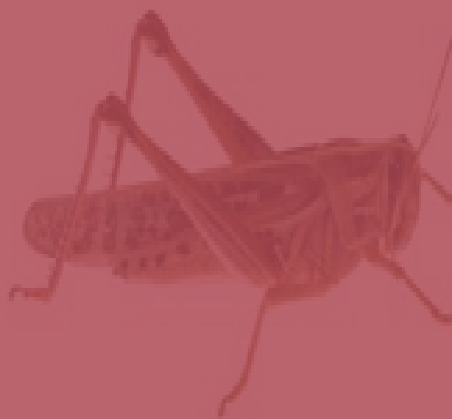




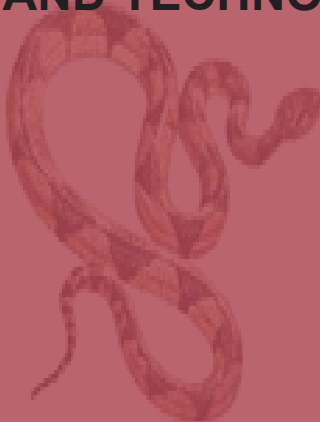
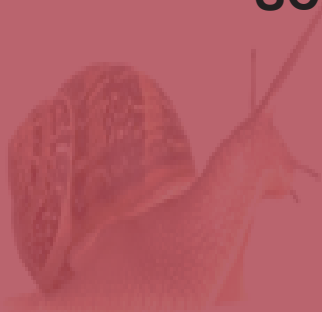
THE UNITED REPUBLIC OF TANZANIA
MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY
NATIONAL EXAMINATIONS COUNCIL OF TANZANIA



PUPILS' ITEM RESPONSE ANALYSIS REPORT ON THE STANDARD FOUR NATIONAL ASSESSMENT (SFNA) 2024



SCIENCE AND TECHNOLOGY





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05E SCIENCE AND TECHNOLOGY

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FOREWORD

The Pupils' item response analysis (PIRA) in the 2024 National Assessment for Standard Four (SFNA) in Science and Technology subject has been prepared to provide feedback to education stakeholders and other authorities to show how the pupils responded to Assessment questions. Pupils responses in the Assessment shows the knowledge and skills attained during the learning process.

This report analyses each question, thus good and poor performance of the pupils is presented for each question and the reasons why the pupils were able to respond correctly or incorrectly to questions has been presented. The factors that contribute to pupils' ability to respond correctly are being knowledgeable in the assessed competencies and understanding the demands of the question. Also, the reasons for pupils' failure to answer correctly included inadequate knowledge in assessed competencies and failure to understand the demands of the question.

The National Examinations Council of Tanzania anticipates that the feedback from this report will enable various educational stakeholders to take appropriate measures to improve the teaching and learning process for pupils.

The National Examinations Council of Tanzania expresses sincere gratitude to all who participated in the preparation of this report.



Prof. Said A. Mohamed
EXECUTIVE SECRETARY

1.0 INTRODUCTION

This report is on the National Assessment for Standard Four (SFNA) in Science and Technology subject that took place in October 2024. This assessment aimed to assess the competencies stipulated in the Primary Education Syllabus for standard III and IV in the subject of Science and Technology.

The assessment paper had five questions (5) that carried ten (10) marks each. Each question consisted of five (5) items and each item weighed two marks (02) making a total of 50. Questions were divided into two sections A and B. Section A consisted of three questions (03) and section B had two questions (02). Pupils were required to answer all questions.

In section A, pupils were required to choose the correct answer, match items and fill in the blanks. Section B required pupils to read a passage and then answer the questions given. Moreover, they were required to observe images and answer questions related to those images.

Analysis of pupil's results shows that, the general performance in Science and Technology subject was good since 1,530,373 pupils who sat for this assessment 1,344,657 pupils equivalent to 87.87 per cent passed and 185,616 pupils equivalent to 12.13 per cent failed.

Data analysis shows that for the year 2024 the performance of the pupils increased by 1.01 per cent compared to the year 2023.

The pupil's performance in this report is divided into four groups depending on scoring points as poor (0-2), average (4-6), good (8) and very good (10). Pupils with poor performance were considered to have failed the assessment, while those with average, good, and very good scores were considered to have passed the assessment.

This report analyses the level of performance of the pupils in each question. The performance is classified as poor, average or good if the percentage of pupil's performance in the question are in group 0-33, 34-66, and 67-100 respectively. This report also postulates the reasons for pupil's performance in each question and the number of pupils who responded to each question along with their passing percentages. Furthermore, this report discusses the reasons why pupils were able or unable to arrive at the correct answers according to the requirements of the questions.

Charts have been used to illustrate the performance levels in each question. Samples of the correct and incorrect responses were provided to show how pupils responded to the questions.

2.0 ANALYSIS OF PUPILS' PERFORMANCE IN EACH QUESTION

This part analyses pupils' performance in section A and B.

2.1 Section A: Multiple Choice, Matching and Filling in the Blanks spaces

This section comprises of multiple – choice questions, matching questions and fill-in-blanks questions. The pupils were required to answer all the questions.

2.1.1 Question 1: Performing investigations and Discoveries in Science and Technology

This question had five multiple choice items (i) – (v). A pupil was required to choose the letter with the correct answer from four options (A – D) and write it in the answer box. This question assessed pupils' competence in understanding various scientific investigation concepts.

Statistics shows that the pupil's performance in this question was good since out of 1,530,373 pupils who sat for this question 1,191,822 (77.88%) pupils passed and 338,551 (22.12%) pupils failed. The performance of the pupils in this question is shown in Figure 1.

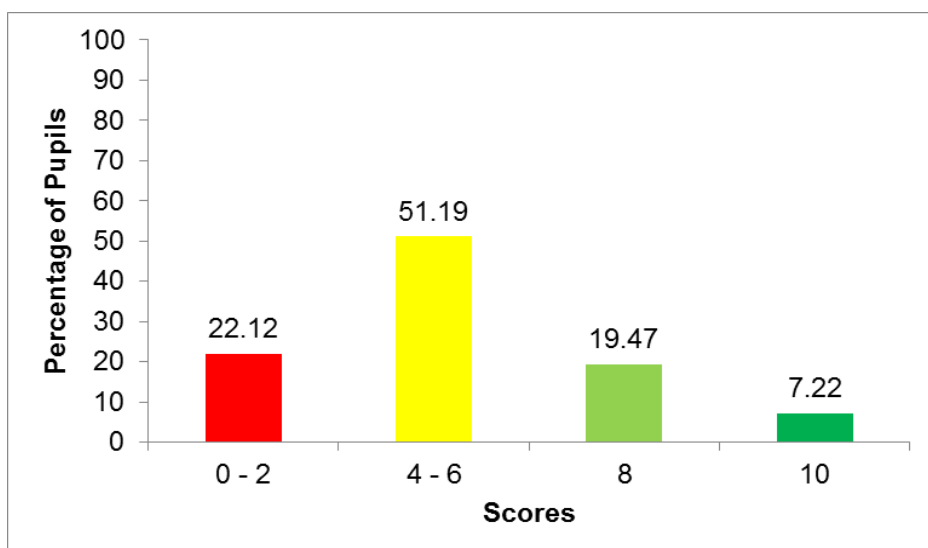


Figure 1: *The summary of pupils' performance in question 1*

Figure 1 shows that out of 77.88 per cent of the pupils who passed, 51.19 per cent scored 4 or 6 marks, 19.47 per cent scored 8 marks and 7.22 per cent scored all 10 marks for this question. However, few pupils (22.12%) per cent were not able to answer any item or they attempted correctly one of the items hence they scored 0 or 2 marks.

Pupils who had good performance were competent on the various scientific investigation concepts hence they selected the correct option. However, those who had poor performance lacked enough knowledge on assessed concepts. Analysis of pupils' responses in each item reveals the following:

In item (i) which assessed the pupils' ability to identify the characteristics of living organisms. The question asked:

- (i) Which ones are the characteristics of living things?
- A Movement, living and drinking
 - B Transpiration, death and reproduction
 - C Reproduction, movement and growth
 - D Death, reproduction and transpiration

The analysis shows that pupils who were able to opt for the correct answer C, *reproduction*, *movement* and *growth* had adequate knowledge in identifying essential characteristics of living things. They understood that reproduction is the increase in the number of living organisms and it ensures the continuity of life from generation to generation, while movement refers to progression from one place to another that involves changing of position or direction of an organism body or part of the body. Movement allows living organisms to obtain food and escape from danger in the environment. Additionally, the pupils understood that growth refers to an increase in size and weight.

Moreover, pupils who did not answer correctly lacked the ability to identify the characteristics of living organisms as outlined in the options. For example, pupils who chose option A, which included *movement*, *living* and *drinking* failed to understand that living and drinking are not characteristics of living things for example, living refers to the existence of the organisms while continuing with their daily activities in their environment. Furthermore, those choosing distractor B, *transpiration*, *death* and *reproduction* failed to understand that transpiration refers to loss of water through leaves in form of vapour and occurs only in plants and those who opted for distractor D, *death*, *reproduction* and *transpiration* failed to understand that death is the loss of the characteristic of being alive and not a characteristic of living organisms.

Item (ii) assessed pupil's ability to identify the natural disasters that degrade environment. The question was as follows:

- (ii) Due to environmental changes, there is a great increase in natural disasters that destroy the environment. What are those disasters?
- A Earthquakes, floods and storm
 - B Floods, cutting trees and storm
 - C Agriculture, floods and heavy rain
 - D Earthquakes, storm and agriculture

In this item, the correct answer was A: *earthquakes, floods and storms*. The pupils who responded correctly to this question had knowledge on the difference between disasters and their causes. They recognized that climate change is largely driven by human activities that lead to environmental destructions. They understood that, *Earthquakes, floods and storm* are among the natural disasters that are the result of climatic changes.

Pupils who chose the distractors B, C, and D demonstrated lack of understanding of the difference between the causes of disasters and the disasters themselves. Deforestation and agriculture for example are causes of disasters not disasters themselves. Agriculture that uses fertilizers and chemicals contribute to the production of greenhouse gases such as carbon dioxide (CO₂) and methane (CH₄). These contribute to global warming. Excessive deforestation leads to a decrease in forest areas, which are crucial for absorbing carbon dioxide gas from the atmosphere. The reduction of forests results in increasing levels of greenhouse gases in the atmosphere. Thus, options B, C and D were associated with disasters and their causes rather than disasters only.

Item (iii), assessed the pupil's ability to mention the precautions to take when walking on heavy rain accompanied with thunder. The question was as follows:

- (iii) Assume you are walking along the road heading home when there is heavy rain accompanied with thunder. What precaution do you have to take?
- A Not to stand under trees
 - B To walk faster
 - C To protect yourself with an umbrella
 - D To call for elders

In this item the correct answer was A: *not to stand under trees*. The pupils who answered this item correctly had knowledge that standing under trees during heavy rain accompanied by lightning and thunderstorm is dangerous, because trees attract thunder

which scientifically is light rays similar to electrical shock posing a risk to life. Additionally, when a thunder hits it is easier to fall on tall objects like trees and mountains. Also, falling of tree branches due to heavy rain accompanied with wind can be a risk to a person.

Pupils who failed this item chose the distractors, B, *to walk faster*, C, *to protect yourself with an umbrella*, and D, *to call for elders*. Walking *faster* for example cannot prevent harm from heavy rain accompanied with thunder likewise, *an umbrella* cannot provide any protection against getting harm from thunder and heavy rain. Those wrote to *call for elders* did not understand that this action cannot provide any scientific assistance to prevent such circumstances. Thus, these pupils did not have adequate knowledge of what safety precautions should be taken during heavy rain accompanied by thunder.

Item (iv), assessed the pupil's ability to give the reason which causes ice to float in water. The question was asked as follows:

- (iv) Amani was surprised to see ice floating in water. What caused ice to float in water?
- A Water was lighter than ice
 - B Ice was lighter than water
 - C The volume of ice and water was equal
 - D The weight of ice and water was equal

Pupils who opted for the correct response B, *ice was lighter than water* understood the characteristics of water in solid state which is ice. Also, they knew that for an object to float in water it must be lighter than water.

The pupils who chose the distractors A, *water was lighter than ice*, C, *the volume of water and ice was equal* and D, *the weight of ice and water were equal* lacked understanding of the law of floatation and density.

Those who selected distractor A, *water is lighter than ice*, did not realize that lighter substances are the ones that float on liquids.

However, liquid can float on another liquid when such liquids have different density like oil float in water. Pupils who chose distractor C, failed to understand that when substances are of the same volume then one cannot float on another. Similarly, those who opted for distractor D, lacked competence to identify that the standard measurement of water in liquid state is volume and not weight. Generally, these pupils lacked knowledge on the law of floatation of substances.

Item (v), required the pupils to mention the method that will be used to change matter from liquid state to vapour state. The question was as follows:

- (v) Teacher Ufura wants to change water from liquid to gaseous state. Which method does she required to use?
- A Freezing
 - B Boiling
 - C Filtering
 - D Melting

The correct answer was B, *boiling*. Pupils who answered this question correctly had a sufficient knowledge about changes in states of matter, from one form to another for example, a matter that is in liquid state changes into vapour (gas) through the process of boiling through increasing heat.

Pupils who chose distractor A, *freezing* did not understand that freezing is the change of liquid to solid state. Those who selected distractor C, *filtering* lacked knowledge of the fact that filtering is the process used to separate two different substances or more of different physical states (solid and liquid) using special apparatus like sieve/filter paper, such as separating water and sand. Similarly, pupils who chose distractor D, *melting* did not grasp that melting is the change of a solid into a liquid state, such as melting of fat into oil.

2.1.2 Question 2: Maintaining Health and the Environment

This question had five matching items (i) – (v). In each item the pupil was required to match statements concerning groups of food nutrients in **List A** with the corresponding nutrient names in **List B**, and then write the letters of the correct answer in the provided brackets. The question asked as follows:

Answer items (i) - (v) by matching the given statements about the groups of food nutrients in **List A** with the names of respective nutrients in **List B**. Write the letter of the correct answer in the bracket provided.

List A	Answer	List B
(i) Nutrients that provides the body with energy	()	A Minerals and water
(ii) Nutrients that helps the body to grow	()	B Fats
(iii) Nutrients that are found in various fruits	()	C Carbohydrates
(iv) Nutrients that provides the body with heat and energy	()	D Vitamins
(v) Nutrients that strengthen bones and regulate body temperature	()	E Fats and minerals
		F Protein
		G Protein and carbohydrates

The question assessed the pupil's ability in identifying groups of food that constitute a balanced diet and its function. Pupils who performed well were able to match accurately various food groups with their corresponding nutrient names. Those who failed to match correctly had insufficient knowledge on the concept of a balanced diet hence, failed to matched various groups of food with their functions in the body.

Statistical analysis shows that this question had poor performance in this assessment as out of 1,530,373 pupils who

attempted the question 634,001 (41.43%) passed and 896,372 (58.57%) pupils failed. The summary of the pupil's performance in question 2 is shown in Figure 2.

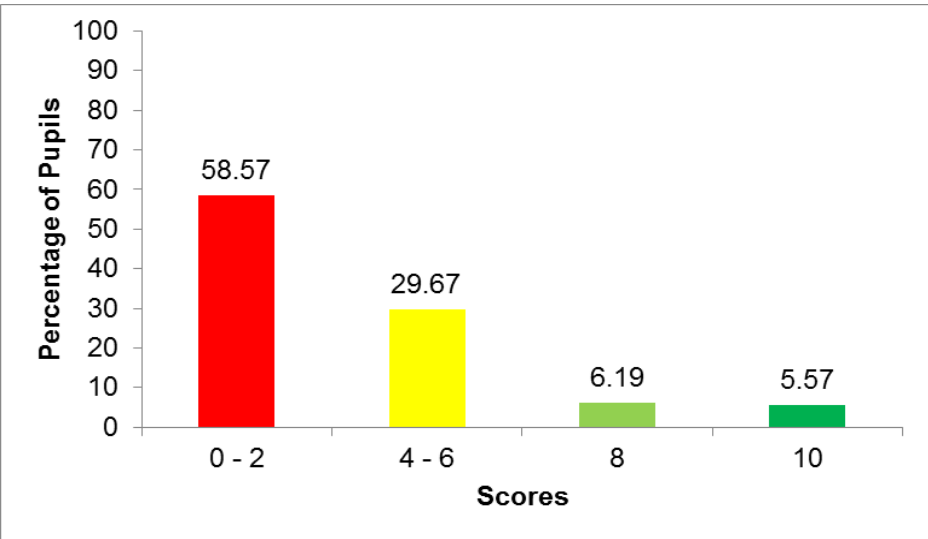


Figure 2: *The summary of pupils' performance in question 2*

Figure 2 shows that 41.43 per cent of the pupils passed as they were able to score 4 to 10 marks. However, 6.19 per cent scored 8 marks and 5.57 per cent scored all 10 marks allocated to this question. 58.57 per cent of the pupils were able to answer only one item and scored 2 marks or were not able to answer any item hence scored 0 marks.

The analysis shows that a large number of the pupils (58.57%) who failed this question were incompetent in identifying the functions of various nutrients in the body and in matching them with their sources. They matched the food groups incorrectly. For example, item (i) assessed pupils' understanding in identifying nutrients that provide energy to the body. Most of these pupils chose distractor A, *minerals* and *water*, B, *fats*, and F, *proteins*. These pupils did not understand the functions of these nutrients. Minerals and water for example help to strengthen body tissues and assist in the digestion of food, while the function of water is to regulate body temperature and provide adequate hydration. Pupils who opted for fats lacked an understanding that the function of

fats is to provide warmth to the body and those who chose proteins did not recognize that the role of proteins is to build and repair worn out body tissues.

Pupils who selected the correct answer C, *carbohydrates* were able to understand the function of carbohydrates is to provide energy to the body. They were also able to understand various sources of carbohydrates food that are available in the environment like, cassava, potatoes, raw and cooked bananas and familiar items.

Item (ii) assessed pupils' knowledge of nutrients that support body growth. The correct answer was F, *proteins*. Pupils who responded correctly to this item were able to know proteinous food like meat, milk and fish main function is to support body growth. However, those who chose the distractors; D, *vitamins*, C, *carbohydrates*, and G, *proteins* and *carbohydrates* did not understand various functions of these nutrients. The function of vitamins is to protect the body from diseases, and can be found in vegetables and fruits. The function of carbohydrates is to provide the body with energy. Moreover, option G included two types of nutrients that have different functions explained above.

Item (iii) assessed pupils understanding in identifying nutrients that are found in various fruits. The correct answer was D, *vitamins*. Pupils who responded correctly to this item had sufficient knowledge on various types of nutrients present in different fruits and their functions. The function of vitamins is to protect the body against diseases. Moreover, they understood that one of the major sources of vitamins is various fruits that are available in our daily environment such as, oranges, mangoes and pawpaws.

Pupils who failed in this item chose either of the distractors A, *minerals* and *water* and B, *fats*. They did not understand that minerals help to strengthen body tissues while water help in regulation of body temperature and the function of fats is to provide warmth to the body.

Item (iv) assessed pupils' ability to identify the types of nutrients that provide the body with heat and energy. In this item pupils who chose the correct answer B, *fat*, had adequate knowledge on role of fats in the body which is to provide the body with heat and energy. More often, they understand that fats can be found in various food substances such as, peanuts, groundnuts, coconuts, butter, fish and meat. Most of the pupils who failed in this question chose distractor C, *carbohydrates*. These pupils failed to understand that carbohydrates are nutrients that provide the body with energy and not heat.

Item (v) assessed pupils' ability in identifying types of the nutrients that strengthen bones and regulate body temperature. The correct answer was A, *minerals* and *water*. Pupils who answered this item correctly were able to identify various types of nutrients, their functions and their sources.

They had knowledge that various minerals that are present in food and water helps in various body functions. Such minerals include; fluorine, chlorine, sodium and calcium.

However, pupils who failed this item lacked competence in recognizing the different types of nutrients, their roles and their sources; for example, some wrote vitamins and carbohydrates. These pupils did not understand that the function of vitamins is to protect the body while carbohydrates is to provide body energy.

2.1.3 Question 3: Applying fundamentals of Science and Technology

The question had five items (i) – (v). A pupil was required to choose the correct answer for each item from the options provided in the box and write it in the space provided. The question was as follows:

Answer items (i) - (v) by choosing the correct answer from the box and write it in the space provided.

speaker, screen, volume button, battery, antenna, electrical wire, socket

Questions

- (i) In which device is a television electrical plug inserted?

- (ii) Which part of the radio is used to receive signals?

- (iii) Which part of the radio is used to increase and reduce sound?

- (iv) Which part of the radio is used to produce sound?

- (v) Which part of the television is used to display pictures?

This question assessed pupil's competence in Applying Information and Communication Technology (ICT) tools specifically on the application of the parts of a television and radio.

A total of 1,530,373 pupils attempted this question. Out of which 1,021,746 (66.76%) pupils gave the correct answer and 508,627 (33.24%) pupils failed to provide the correct answer. Generally, the performance in this question was average. Pupil's performance in this question is shown in Figure 3.

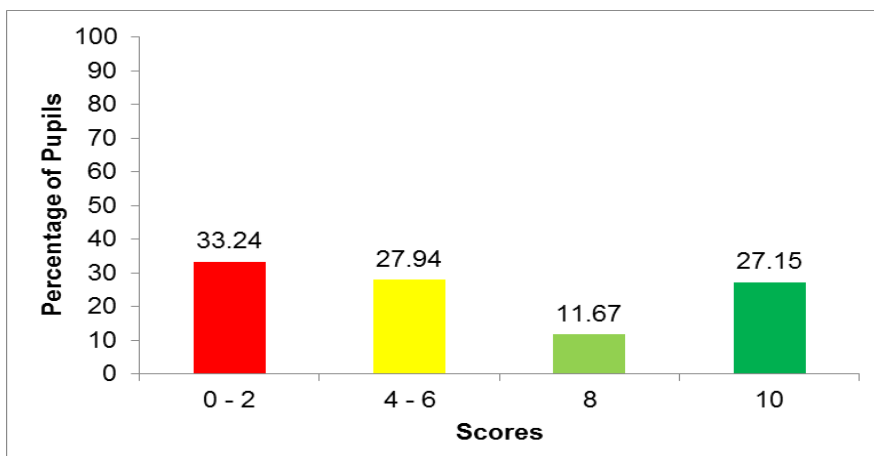


Figure 3: *The summary of pupils' performance in question 3*

Figure 3 shows that pupils who scored 4 to 10 marks were 66.76 per cent. Among them 27.94 per cent scored 4 to 6 marks 11.67 per cent scored 8 marks and 27.15 per cent scored all 10 marks allocated for this question.

Pupils who scored higher marks had adequate ability to identify functions of radio and television devices specifically its parts. Extract 1.1 is a sample of correct response from the pupil in this question.

(i)	In which device is a television electrical plug inserted?	<u>Socket</u>
(ii)	Which part of the radio is used to receive signals?	<u>Antenna</u>
(iii)	Which part of the radio is used to increase and reduce sound?	<u>Volume button</u>
(iv)	Which part of the radio is used to produce sound?	<u>Speaker</u>
(v)	Which part of the television is used to display pictures?	<u>Screen</u>

Extract 1.1: *A sample of a pupil's correct response to question 3*

Extract 1.1 shows a sample of the response from a pupil who was able to identify correctly parts of a radio and television and its functions.

Moreover, Figure 3 shows that 33.24 per cent of the pupils scored 0 or 2 marks. These pupils scored lower marks because they failed to provide correct responses in most items of the question.

For example, Item (i) which required the pupils to identify the electrical device into which the plug of the television is inserted. The correct answer was *socket*. Statistical analysis shows that, most of the pupils who failed this item, wrote *battery* and *electrical wire*. These pupils did not understand the functions of these devices. A battery is a device that stores electrical energy and operates through a chemical process, whereby chemical energy is converted into electrical energy. Furthermore, an electrical wire is a device used to transport electrical energy.

Pupils who answered correctly demonstrated competence in understanding various electrical devices and how electricity can be connected for them to function. They recognized that an electrical socket is a device with two or three holes where an electrical plug and other similar devices are inserted. The plug is a device with two or three pins that fit into the electrical socket.

Item (ii) assessed pupils' ability to identify the part of a radio which is used to receive signals. Pupils who chose the correct answer *antenna* demonstrated a clear understanding of this device and its function. An antenna is a metal device that is connected to a radio or television for the purpose of receiving broadcast signals of sound or picture waves.

Pupils who failed to provide correct answers to this item wrote responses like *speaker* and *volume button*. These pupils lacked competence in understanding these devices and their functions. A speaker is a device that uses electrical power to

convert energy into sound and it is used in devices like radio and television. The volume button is a component found in a radio or television that is used to increase or decrease the sound level.

Item (iii), required the pupils to identify part of the radio which is used to increase and decrease the volume. The correct answer was *the volume button*. Many pupils were able to respond correctly to this item. They were able to recognize various parts of a radio specifically the volume button. However, some pupils failed to respond correctly and wrote *speaker*. These pupils did not realize that a speaker helps to release sound so that people can hear what has been spoken in the radio or television.

Item (iv), assessed pupils' ability to identify parts of a radio that is used to produce sound. The correct answer was *speaker*. Pupils who answered correctly demonstrated an understanding of the various parts of a radio and functions. They understood that in order for sound to be produced and heard there must be a speaker. However, most of the pupils who responded incorrectly wrote *volume button*. These pupils failed to understand that the function of volume button is volume adjustment.

Item (v), assessed pupils' ability to identify the parts of a television that is used to display pictures. The correct answer was *screen*. Most of the pupils showed competence by knowing that a screen is the part of a television which displays images and text. They also understood that a screen is the surface of a television that displays characters, advertisements and other content. The pupils who failed to provide correct answers wrote *socket* and *volume button*. These pupils had inadequate knowledge on the roles played by these devices as explained in (i) and (iii) above.

Extract 1.2 provides a sample of an incorrect response from one of the pupils to question 3.

(i)	In which device is a television electrical plug inserted?	<u>See Screen.</u>
(ii)	Which part of the radio is used to receive signals?	<u>battery.</u>
(iii)	Which part of the radio is used to increase and reduce sound?	<u>Speaker.</u>
(iv)	Which part of the radio is used to produce sound?	<u>Volume button.</u>
(v)	Which part of the television is used to display pictures?	<u>antenna.</u>

Extract 1.2: *A sample of a pupil's incorrect response to question 3*

In extract 1.2 the pupil failed to identify parts of the radio and television and the functions and hence failed in all items of the question.

2.2 Section B: Short Answer Questions

This section had two questions. In the first question, the pupil was required to read a passage of information and answer the questions. Moreover, the next question required the pupil to examine the images provided and then respond to the questions.

2.2.1 Question 4: Maintaining Health and the Environment

This question comprised of a passage of information that a pupil was required to read and then answer questions based on that passage. The question was as follows:

Read the following passage and answer the questions that follow.

People living with HIV/AIDS are supposed to eat a balanced diet. Such diet provides the body with all the required nutrients. Such nutrients give energy to the body, repair worn out body parts and

increase body immunity. The function of the body immunity is to enable the body to fight against opportunistic diseases such as diarrhoea, tuberculosis, fungus and rashes. These diseases are caused by low body immunity. However, it is advised that a person living with HIV/AIDS should eat watery food to recover the water lost in the body.

Questions

(a) What kind of a diet is advised to HIV/AIDS victim?

(b) What is the function of nutrients in the body? Give two functions.

(i) _____

(ii) _____

(c) Identify two opportunistic diseases that a HIV/AIDS person may acquire.

(i) _____

(ii) _____

(d) Why HIV/AIDS victim get opportunistic diseases?

(e) Why is it advised for a HIV/AIDS victim be given more watery food? Give one reason.

This question assessed pupils' competence in explaining the concept of immunity in view of the importance of a balanced diet for HIV/AIDS victims.

Statistics shows that the pupil's performance in this question was average since out 1,530,373 pupils who sat for this question 916,291 (59.87%) pupils passed and 614,082 (40.13%) pupils

failed. The performance of the pupils in this question is shown in Figure 4.

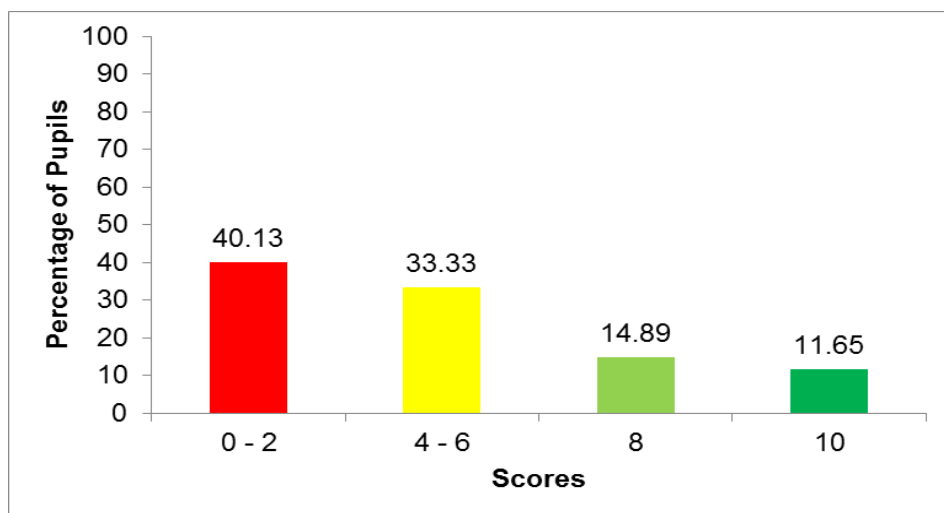


Figure 4: *The summary of pupil's performance in question 4*

Figure 4 shows that most of the pupils (59.87%) were able to understand the passage and recognize the demand of each question whereby 33.33 per cent of the pupils scored 4 to 6 marks, 14.89 per cent scored 8 marks and 11.65 per cent scored all 10 marks allocated to this question. However, 40.13 per cent scored 0 or 2 marks.

The analysis of pupil's responses shows that many pupils (59.87%) were competent on clarify the concept of body immunity specifically a balanced diet for HIV/AIDS victims. Hence, they were able to respond correctly 2 to 5 items. For example, in respond to item (a), which required pupils to identify the type of diet recommended for HIV/AIDS victims. Most of the pupils were able to write the correct answer *a balanced diet*. These pupils had knowledge that a balanced diet is a meal that contains all the food groups that incorporates the nutrients in a right and appropriate proportion. They also knew that a balance diet is recommended to be used by HIV/AIDS victims since it contains nutrients that help to strengthen body health for example, proteins assist in body

growth and strengthen body immunity. Extract 2.1 shows a sample of a pupil's correct response to question 4.

(a) What kind of a diet is advised to HIV/AIDS victim?
Balanced diet is a kind of a diet that is advised to HIV/AIDS victim

(b) What is the function of nutrients in the body? Give two functions.

(i) It gives energy to the body.

(ii) It increases body immunity.

(c) Identify two opportunistic diseases that a HIV/AIDS person may acquire.

(i) Diarrhoea.

(ii) Tuberculosis.

(d) Why HIV/AIDS victim get opportunistic diseases?
HIV/AIDS victim gets opportunistic diseases because of low bod immunity.

(e) Why is it advised for a HIV/AIDS victim be given more watery food? Give one reason.
It is advised for a HIV/AIDS victim to be given more watery food inorder to recover the water lost in the body.

Extract 2.1: A sample of a pupil's correct response to question 4

Extract 2.1 shows a sample of a response from a pupil who responded correctly to all five (5) items. This pupil understood well the demand of the question.

Some of the pupils failed to respond correctly according to the given passage. Most of these pupils wrote; *nutrients* and *watery food*. These pupils who were unable to respond correctly lacked knowledge on concept of a balanced diet, nutrients and watery food. They failed to understand that nutrients are the individual substances or components that organisms need for growth, metabolism and overall health. They include; carbohydrates, proteins, vitamins, fats/oils, minerals and water. Whereas watery

foods refer to foods that have high-water content. These foods are beneficial for maintaining fluid balance in the body. Examples of watery foods are fruits, vegetables and soups.

This indicates that the pupils did not understand the passage properly.

Item (b) measured the pupil's ability of mentioning two functions of nutrients in the body. The correct answer to this item was one of the following; *providing energy to the body*, *repairing worn out body parts* and *increasing body immunity*. Pupils who were able to answer the question correctly understood the passage and were able to identify functions of the nutrients. Some pupils who failed in this item wrote groups of food such as *carbohydrates* and *fats*, answers which were not even in the passage. This implied that pupils failed to understand what was the required answer.

Item (c) assessed the pupils' ability of identifying two opportunistic diseases that a person with HIV/AIDS may acquire. Pupils who answered this part correctly mentioned; *diarrhea*, *tuberculosis*, *fungus* and *rashes*. This indicates that these pupils were able to identify opportunistic diseases based on the passage they read. They had knowledge of opportunistic diseases as diseases that affect the body immunity system and weaken the ability of the body to fight infections. People with opportunistic diseases are likely to get infections caused by bacteria, viruses and other parasites. Moreover, some pupils provided incorrect answers such as; *low body immunity*, *however it is lack of balanced diet* and *should eat watery food*. These pupils lacked knowledge about opportunistic diseases hence they provided irrelevant answers.

Item (d) required pupils to explain why HIV/AIDS victims get opportunistic diseases. Most of the pupils failed to provide the correct answer. Some wrote; *diarrhoea* and *tuberculosis*. These pupils did not have the ability discern correct responses from the passage instead of stating a reason they listed the diseases. They also demonstrated that, they were not aware of the reasons why a HIV/AIDS victim acquires opportunistic diseases. Opportunistic

diseases are due to various reasons including weakening of body immunity and hence lead to body weakness. However, a few pupils were able to answer this part of the question correctly by writing, *because HIV/AIDS causes low body immunity*. These pupils understood that HIV/AIDS affects body immunity and makes the body weak to fight against various diseases including opportunistic ones.

Item (e), measured the pupil's ability to explain why it is advised for a HIV/AIDS victim to be given more watery food. Few pupils were able to answer correctly, by stating that *it helps to add/restore lost body fluid/water*. These pupils were competent and understood the importance of watery food to HIV/AIDS victims. They understood that watery food assists in food digestion and nutrient absorption which is essential for general health. They also understood that, HIV/AIDS victim lost a lot of water through frequent vomiting and diarrhoea. Some pupils provided unrelated answers, such as *body immunity* and *so that body can fight against diseases*. This indicates that these pupils did not understand the requirement of the question and what they were expected to answer. Extract 2.2 shows a sample of a pupil's incorrect response to question 4.

(a) What kind of a diet is advised to HIV/AIDS victim?
give energy to the body

(b) What is the function of nutrients in the body? Give two functions.
 (i) tuberculosis
 (ii) diarrhoea

(c) Identify two opportunistic diseases that a HIV/AIDS person may acquire.
 (i) HIV
 (ii) AIDS

(d) Why HIV/AIDS victim get opportunistic diseases?
give first aid

(e) Why is it advised for a HIV/AIDS victim be given more watery food? Give one reason.
Ge give energy in the body
lost in the body

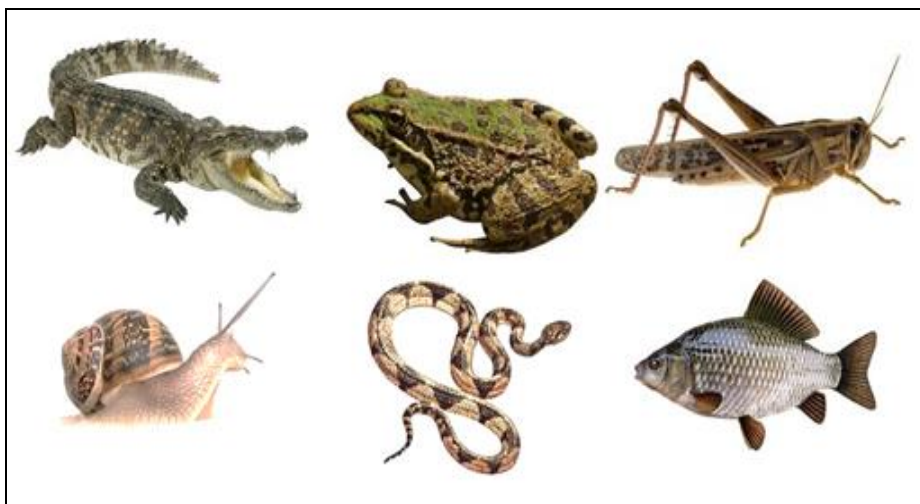
Extract 2.2: A sample of pupil's incorrect response to question 4

Extract 2.2 shows a sample from a pupil who wrote unrelated answers to all items of this question. This shows the pupil did not understand the passage he/she read.

2.2.2 Question 5: Performing investigations and discoveries in Science and Technology

This question had five (5) items. A pupil was required to observe the picture and then answer the questions. The question asked:

Observe the animals shown in the pictures and answer the questions that follow:



Questions

(a) Identify two animals that move by jumping.

(i) _____

(ii) _____

(b) Identify the crawling animal which has dangerous poison.

(c) Which animal has hard shell in its body?

(d) What is an advantage of a hard shell for the animal that you have mentioned in item (c). Give one advantage.

(e) Which animal dies within short period of time after being removed from its original environment?

The question assessed pupils' competence in investigating things that are found in the environment specifically in recognizing various types of living things.

The performance of the pupils in this question was good since out of 1,530,373 pupils who sat for this question, 1,285,988 (84.03%) pupils passed and 244,385 (15.97%) pupils failed. Statistics shows that this question had good performance compared to other questions in this assessment. Figure 5 shows the summary of pupils' performance in this question.

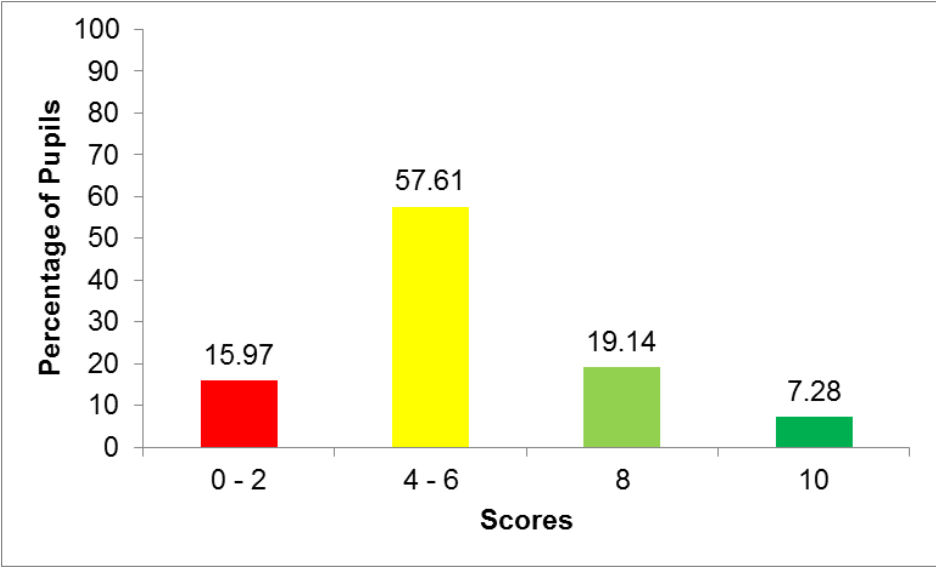


Figure 5: *The summary of pupils' performance in question 5*

Figure 5 shows that 84.03 per cent of the pupils passed and were able to score 4 to 10 marks; whereby 19.14 per cent scored 8 marks and 7.28 per cent scored all 10 marks allocated to this question. However, 15.97 per cent of the pupils were not able to answer any items or able to answer only one item hence they scored 0 or 2 marks.

Statistics in figure 5 shows that, 84.03 per cent of the pupils were able to respond 2 to 5 items. These pupils had adequate knowledge of to recognising various animals in their environment. Extract 3.1 is a sample of a pupil's correct response to question 5.

(a) Identify two animals that move by jumping.

(i) Crasshopper

(ii) Frog

(b) Identify the crawling animal which has dangerous poison.

Snake.

(c) Which animal has hard shell in its body?

Snail.

(d) What is an advantage of a hard shell for the animal that you have mentioned in item (c). Give one advantage.

The shell protect the snail from danger.

(e) Which animal dies within short period of time after being removed from its original environment? Fish.

Extract 3.1: A sample of pupil's correct response to question 5

Extract 3.1 shows a response from a pupil who correctly responded to all items of this question. This indicates that the pupil had adequate knowledge on how various animals adapt to their environment.

Few pupils (15.97%) failed to identify various animals in their environment. Some of these pupils (6.85%) were able to respond correctly to only one item and obtain 2 marks. The remaining (9.12%) pupils scored 0 marks since failed in all items. Extract 3.2 is a sample of a pupil who responded incorrectly to question 5.

(a) Identify two animals that move by jumping.
 (i) Fish
 (ii) Snak

(b) Identify the crawling animal which has dangerous poison.
Frog

(c) Which animal has hard shell in its body?
Fish

(d) What is an advantage of a hard shell for the animal that you have mentioned in item (c). Give one advantage.
Legs

(e) Which animal dies within short period of time after being removed from its original environment? Frog

Extract 3.2: A sample of pupil's incorrect response to question 5

Extract 3.2 shows a sample of pupil's incorrect response to question 5. The pupil wrote irrelevant answers to all items of the question, for example, in item (d) instead of naming the advantage of a hard shell for the animal mentioned in item (c) he/she wrote *legs* something which was not related to the demand of the question. This shows the pupil had inadequate knowledge of identifying animals that were presented in the picture.

Further analysis of pupils' responses in each item reveals that in item (a) which assessed the pupils' ability to identify two animals that move by jumping, many pupils answered correctly by naming *grasshopper* and *frog*. These pupils observed correctly the images of various animals provided to them and realized that a grasshopper and frog are animals that move by jumping. However, few pupils failed to identify correctly the animals and provided answers such as, *snake* and *snail*. This indicates that these pupils did not have sufficient knowledge that a snake and a snail move by crawling and not by jumping.

Item (b) assessed the pupils' ability to identify a crawling animal which has dangerous poison. Many pupils answered this item correctly by writing *snake*. Most of the pupils identified accurately

that a snake is an animal that has no legs hence, moves by crawling and has dangerous poison. However, few pupils answered incorrectly by writing *crocodile*. This indicated that these pupils failed to recognize the difference between snakes and crocodiles in terms of their movement. Crocodile have four walking legs and a hard skin while snakes have no legs and crawl.

Item (c) measured the pupil's ability to observe and identify an animal with a hard shell. Some pupils answered this item correctly and named the animal as *snail*. These pupils observed and recognized that a snail is an animal that crawl and has hard shell that is shiny, patterned color, spiral shaped and which is made up of protein fibers. However, most of the pupils were unable to accurately identify it and named the animal as *crocodile*. These pupils failed to distinguish between a hard skin and a hard shell. A crocodile is an animal that has a tough skin and does not possess a shell.

Item (d), required the pupils to mention the advantage of the snail shell. Few pupils answered correctly by writing the *shell helps snails to hide from an enemy/not to be harmed from enemy*. These pupils recognized that when a snail comes in contact with danger it uses its shell to hide so as to keep away from danger. They demonstrated the ability to observe, recognize and articulate the function of the snail's shell. However, many pupils provided irrelevant answers such as it gives us money, sinking in water bodies, *it gives us food because it jumps*. These pupils showed inability to recognise what they were supposed to answer.

Item (e) required the pupils to name the animal which dies within short period of time after being removed from its original environment. The correct answer to this item was *fish*. Many pupils provided the correct answer and understood that fish obtain oxygen from the water through their gills and transport it in the blood through blood vessels. So, in order for oxygen to pass, gills must be wet. When fish is out of its original environment

(water) dies suddenly because gills dry out and limit transportation of oxygen through blood vessels.

Pupils who answered incorrectly wrote crocodile and snake. These pupils lacked knowledge on what was asked, for example, crocodile uses lungs for breathing, allowing them to breathe on land and when in water. Additionally, crocodiles have skin that can withstand temperature and dryness enabling them to survive in different environmental conditions.

Furthermore, snakes use lungs for breathing hence they are able to adapt to different environment.

3.0 ANALYSIS OF PUPILS' PERFORMANCE IN EACH COMPETENCE

The Standard Four National Assessment (SFNA) questions of 2024 in Science and Technology subject assessed 3 main competences which are; Performing Scientific Investigation and Technological Discovery, Applying fundamentals of Science and Technology and Maintaining Health and Environment as stipulated in the Primary School Syllabus for standards III and IV in Science and Technology subject. The analysis shows that out of the three competences assessed the pupils had good performance of (80.96%) in the competence of Performing Scientific Investigation and Technological Discovery. However, they had average performance of (66.76%) and (50.65%) in the competence of Applying Fundamentals of Science and Technology and Maintaining Health and Environment.

The comparison of pupils' performance between the year 2023 and 2024 shows an increase of 8.34 per cent from 57.78% in year the 2023 to 66.12% in year 2024. However, there was an increase of 15.19 per cent performance in the competence of Performing Investigations and Discoveries in Science and Technology, 6.83 per cent in the competence of Applying Fundamentals of Science and Technology and 3.01 per cent in the competence of Maintaining Health and the Environment respectively.

The summary of the statistical performance in each competence is shown in the Appendix.

4.0 CONCLUSION

Generally, the performance level of the pupils in Standard Four National Assessment (SFNA) for year 2024 in each competence in 05E Science and Technology subject was average since 66.12 per cent of the pupils passed the assessment. The performance for year 2024 had increased by 8.34 per cent as compared to the year 2023 which was 57.78 per cent. The analysis of the pupil's responses shows that pupils who passed the assessment had adequate knowledge regarding various assessed competences. Those pupils who failed had inadequate knowledge on the various assessed competences. Some of these pupils failed to identify the demands of the question and had inadequate knowledge in assessed concepts.

5.0 RECOMMENDATIONS

In order to improve the performance in Science and Technology subject the following are recommended:

- (a) During teaching and learning process, pupils should be instructed to learn through observation and investigation of real things like real food stuffs that are found in their environment that contain different groups of food nutrients such as proteins, fats, carbohydrates, minerals and vitamins. This will enable pupils to understand easier various concepts they learned and make them have lasting memory.
- (b) Teachers should use various teaching/learning techniques such as songs, flyers, role play, charts etc. This will increase pupils' attention and participation during the teaching and learning process.

- (c) Teachers should invite health experts from relevant authorities to provide education on the concept of a balanced diet, focusing on food groups and their importance. Pupils should be informed on how to get a balanced diet based on foods that are available in their local environment.
- (d) Teachers should incorporate Information and Communication Technology (ICT) in the teaching and learning process, especially for complex concepts. Such as animations (simulation) and videos. This, will assist pupils to acquire adequate knowledge on what they have learned.

APPENDIX

THE COMPARISON OF THE PUPILS' PERFORMANCE IN EACH COMPETENCE IN SFNA 2024 AND 2023 IN THE SCIENCE AND TECHNOLOGY SUBJECT

S/N	Competence	SFNA 2024				SFNA 2023			
		Question Number	Performance in each Question (%)	Average performance on each competence (%)	Remarks	Question Number	Performance in each Question (%)	Average performance in each competence (%)	Remarks
1.	Applying fundamental s of Science and Technology	3	66.76	66.76	Average	5	59.93	59.93	Average
2.	Performing Scientific Investigation and Technologic al Discovery	1	77.88	80.96	Good	1	85.65	65.77	Average
		5	84.03			4	45.88		
3.	Maintaining Health and Environment	2	41.43	50.65	Average	2	42.83	47.64	Average
		4	59.87			3	52.44		

