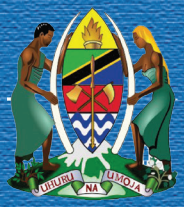

THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY

NATIONAL EXAMINATIONS COUNCIL OF TANZANIA

PUPILS' ITEM RESPONSE ANALYSIS REPORT ON THE STANDARD FOUR NATIONAL ASSESSMENT (SFNA), 2023

MATHEMATICS

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04E MATHEMATICS

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FOREWORD

The Mathematics Pupils' Items Response Analysis report on Standard Four National Assessment (SFNA), 2023 for Mathematics subject, has been prepared to provide feedback to pupils, teachers, curriculum developers, policy makers and other education stakeholders on how pupils responded to the assessment questions.

The report is composed of five sections, namely, the introduction, analysis of the pupils' responses to each question, analysis of the pupils' performance on each competence, conclusion, and recommendations.

Factors that influenced the pupils' performance on each item have been presented in this report. Analysis shows that the pupils had average performance in 2023 because 54.0 per cent of 1,545,076 pupils passed the assessment. This average performance was attributed to the pupils' ability to respond correctly to at least two of five parts of each question in the assessed competencies.

Nevertheless, a total of 710,680 pupils (50.6%) had weak performance on the assessed competencies due to their failure to identify descending and ascending sequences of numbers, convert one unit into another unit, apply different mathematical formulae and use Reading, Writing and Arithmetic (3R's) skills in answering the assessment questions.

The pupils' performance shows that they had average performance on *Applying the Concepts of Numbers to Communicate in Different Context* and *Applying Statistical Skills to Present Different Pieces of Information.* In addition, their performance on the remaining competencies was weak. Thus, the recommendations provided will enable educational stakeholders to improve pupils' performance on the assessed competencies.

The National Examinations Council of Tanzania extends its sincere appreciation to the examinations officers and other experts who participated in preparing this report at various stages.

Dr. Said A. Mohamed
EXECUTIVE SECRETARY

1.0 INTRODUCTION

The National Assessment of Standard Four Pupils in Mathematics subject was conducted on October, 2023. A total of 1,718,896 pupils were registered. Of whom, 1,545,076 (91.2%) sat for the assessment.

The analysis of the assessment results in 2023 in the Mathematics subject shows that 834,119 pupils, equivalent to 54.00 percent, passed. In 2022, a total of 1,083,166 pupils (49.70%) passed. This represents a 4.3 per cent increase in pupils' performance. The comparison of the pupils' grades in the 2023 and 2022 assessment years is indicated in Figure 1.

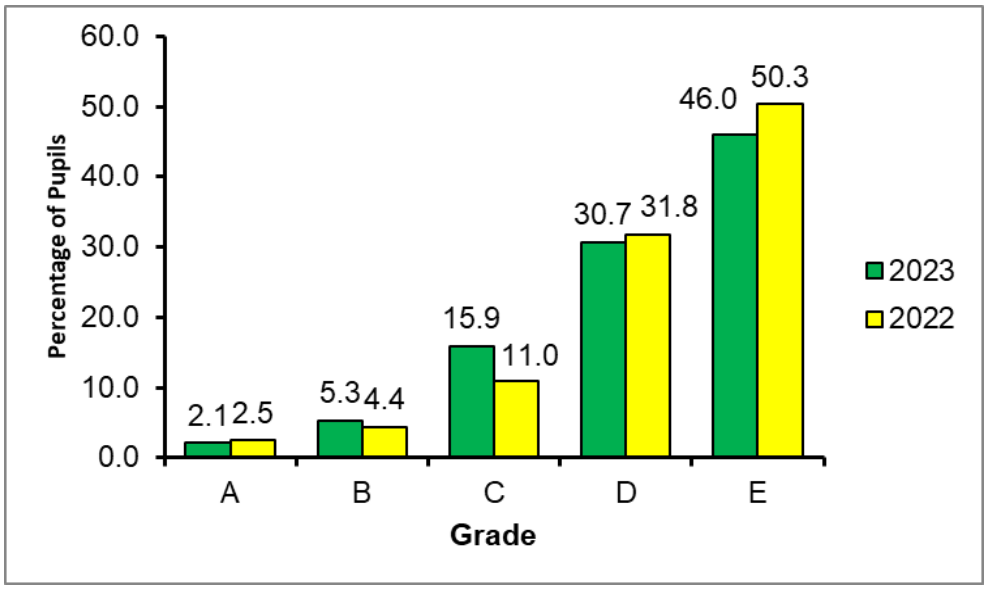


Figure 1: *Comparison of pupils' grades in 2023 and 2022*

The assessment paper in Mathematics had five (5) questions. Each question had parts (a), (b), (c), (d), and (e). The correct answer for each part was awarded two (2) marks. Hence, each question weighed ten (10) marks, making a total of 50 marks for the entire paper.

The pupils' responses to each question are analysed to identify why they passed or failed. Sample extracts from some pupils' responses are presented to illustrate how they responded to the questions.

The performance standards were determined using the percentage of the pupils who passed each question. Their performance on each question was categorised into four distinct groups as follows: 10 marks for *very good performance;* 8 marks for *good performance;* from 4 to 6 marks for *average performance*; and from 0 to 2 marks for *weak performance.* On the other hand, the performance standards by competence were done based on the percentage of pupils who passed in each competence, where 67–100 indicates *very good performance*, 34 – 66 indicates *average performance,* and 0 – 33 indicates *weak performance.*

2.0 ANALYSIS OF PUPILS' RESPONSES TO EACH QUESTION

Statistics of the pupils' performance on each question or specific competence in this report are presented using charts or tables. Different colours are used to represent the pupils' performance. These colours are green, light green, yellow and red for *very good*, *good*, *average* and *weak performance,* respectively.

Generally, the pupils' responses revealed average performance on Question 1 and 5 and weak performance on Questions 2, 3 and 4. In this section, performance on each question is analysed. Sample extracts are used to illustrate the pupils' responses to each question.

2.1 Question 1: Applying the Concepts of Numbers to Communicate in Different Contexts

This question had five parts that assessed the pupils' competence in applying the concepts of whole numbers to communicate in different contexts:

(a) Write XLII in Arabic number.
(b) Masota football team is 22 years old since its establishment. Write those years in Roman numbers.
(c) Write 2020 in words.
(d) Write the number whose ten thousand is 1, thousands 7, hundreds 4, tens 1 and ones 3.
(e) A father paid nine thousand and fifty shillings for electricity bill. Write down this amount in figures.

This question assessed the pupils' ability to write (a) XLII in Arabic, (b) 22 years in Roman numbers, (c) 2020 in words, (d) the number whose ten thousands is 1, thousands is 7, hundreds 4, tens 1 and ones 3 and (e) nine thousand fifty shillings in figures.

Analysis shows that the pupils' performance on this question was average since 677,742 pupils, equivalent to 43.86 per cent, scored from 0 to 2 marks. Among them, 27.54 per cent scored zero. On the other hand, 867,334 (56.14%) scored from 4 to 10 marks. Of whom 129,503 (8.38%) scored all 10 marks. A summary of the pupils' performance for question 1 is shown in Figure 2.

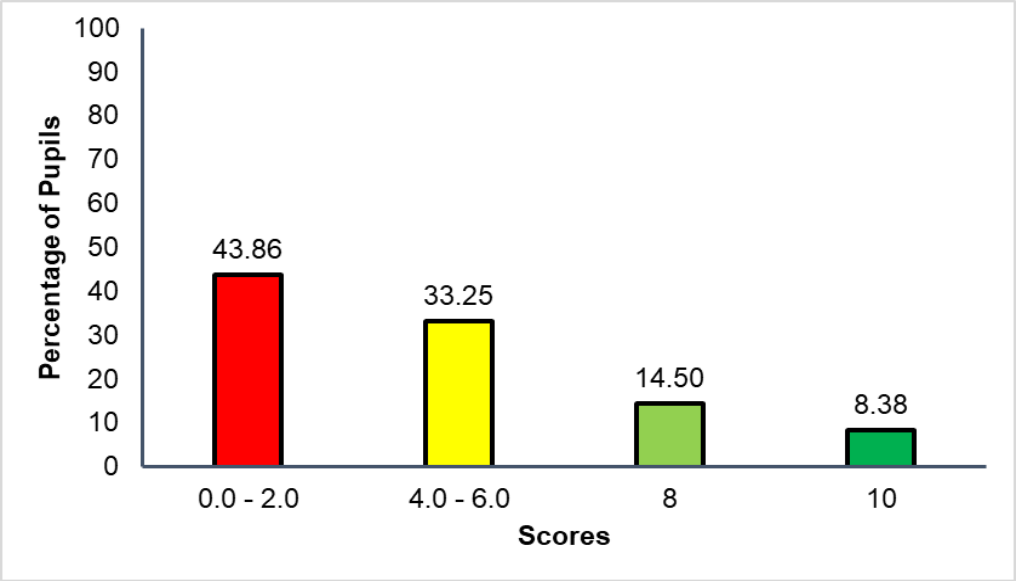


Figure 2: *Pupils' performance on Question 1*

As Figure 2 shows, 22.88 per cent of pupils had good performance. These pupils applied the Concepts of Numbers to Communicate in Different Contexts. In part (a), they correctly wrote XLII, in Arabic Number as 42, by identifying the value of each letter in the Roman numeral. In part (b), they correctly wrote 22 in Roman numerals as XXII, describing the number of years Masota football team had been existing.

In part (c), they correctly wrote 2020 in words as two thousand and twenty. In part (d), they correctly wrote the number whose ten thousands is 1, thousands 7, hundreds 4, tens 1, and ones 3 equals to 17413. In part (e), they correctly wrote nine thousand and fifty shillings paid for electricity bill in figures. Extract 1.1 shows a sample of the correct answers to Question 1.

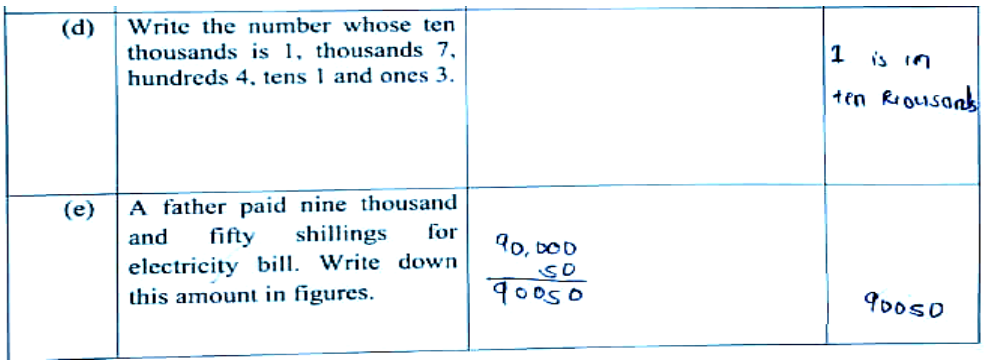
No.	Question	Working Space	Answer
1. (a)	Write XLII in Arabic numbers.	XLII T T 40+2 = 42	42
(b)	Masota football team is 22 years old since its establishment. Write those years in Roman numbers.	22 = XXII	XXII
(c)	Write 2020 in words.	Th H T O 2 0 2 0 TWO ~~THOUSHA~~ THOUSAND AND	TWENTY
(d)	Write the number whose ten thousands is 1, thousands 7, hundreds 4, tens 1 and ones 3.	10000 7000 400 10 3 17413	17413

Extract 1.1: A sample of a correct answer to Question 1

In Extract 1.1, the pupil gave the correct answers in part (a), (b), (c) and (d) using proper basic operations.

In contrast, 43.86 per cent of the pupils scored from 0 to 2 marks, indicating weak performance. This performance was due to their inability to apply the concepts of numbers to communicate in different contexts. In part (a), they failed to write XLII in Arabic numerals. For example, some pupils wrote incorrect answers, such as 1052, 10502, 62 and fourty-two. Likewise, in part (b), the pupils had difficulty in converting 22 years in Roman numbers as XXII. Most of them provided incorrect responses such as XLI, XVII, XXXII and XX. This shows that they had inadequate knowledge of Roman numerals from I - L

In part (c), they failed to write 2020 in words, indicating a lack of skills in writing whole numbers in words. Their most frequently incorrect responses written were “two hundred and twenty”, “twenty thousand and twenty” and “twenty twenty”. In part (d), they could not write the number whose ten thousand, thousands, hundreds, tens, and ones as 1, 7, 1 and 3 respectively. They failed to identify the place of values of numerical digits. For instance, a significant number of pupils wrote 3147; some pupils wrote 31471 whereas others separated the digits of numbers using commas hence writing 1, 7, 4, 1, 3 instead of 17413. In addition, in part (e) they failed to write numerically the value of “nine thousand fifty shillings” that was paid for electricity. For example, some pupils wrote 950; others wrote 90050. Also, some pupils who wrote 900050, whereas others wrote 9000 and 50. Extract 1.2 is illustrative.



Extract 1.2: A sample of incorrect responses to Question 1

In Extract 1.2, the pupil wrote the place value of 1 in part (d). In part (e), the pupil incorrectly wrote the given amount of money as 90,050 instead of 9,050.

2.2 Question 2: Applying the Concepts of Patterns to Solve Real-Life Problems

The question had five parts that assessed the pupils' competence in applying the concepts of patterns to solve real life problems. The question was as follows:

(a) Write the missing number in the following sequence: 90, 85, 80, 75, ____, 65

(b) Which is greater, 84×6 or 86×4?

(c) Fill in the missing number in the following sequence $\frac{1}{2}, \frac{1}{4}, \_\_\_\_\_, \frac{1}{16}$.

(d) A patient lost weight by 1 kg every month. If in the first month the patient had 90 kg, what was the weight in the sixth month?

(e) Write the operation used to get the following sequence: 99, 89, 79, 69, 59, 49, 39.

This question assessed the pupils' ability to (a) write the missing number in the sequence 90, 85, 80, 75, _ 65.; (b) identify a greater value between 84×6 and 86×4; (c) fill in the missing number in the sequence $\frac{1}{2}, \frac{1}{4}, \_\_\_\_\_, \frac{1}{16}$; (d) solve a word problem related to units of weight in descending order and (e) identify the operation used in the sequence 99, 89, 79, 69, 59, 49, 39.

The data show that a total of 1,545,076 pupils answered the question. Of whom, 359,009 (23.25%) scored from 4 to 10 marks. Thus, the pupils' performance in this question was weak. Figure 3 The summarises their performance on this question.

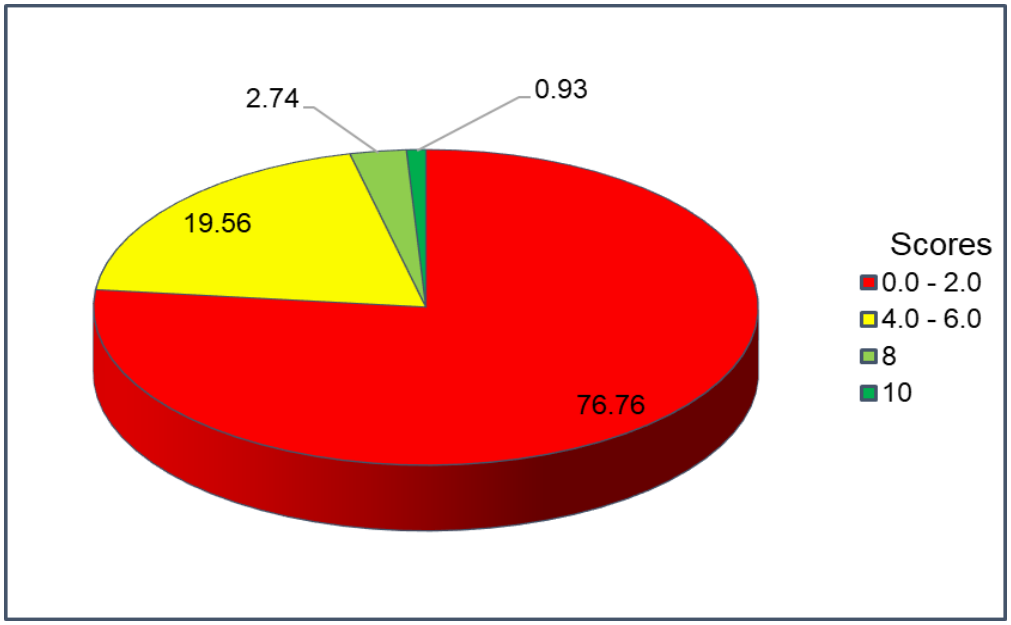
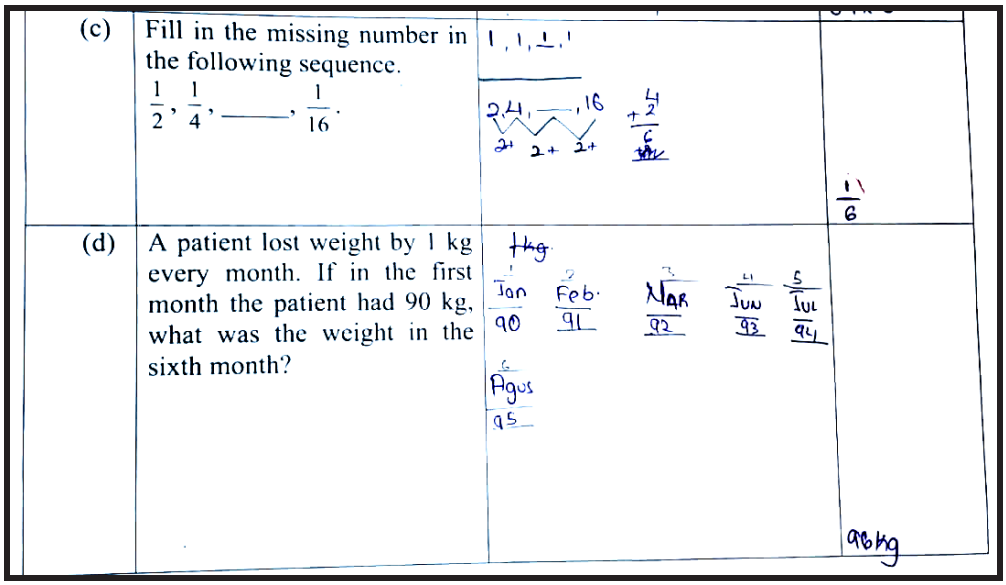


Figure 3: *Pupils' Performance on Question 2*

As Figure 3 shows, 1,186,067 of the pupils who attempted this question scored from 0 to 2 marks. These pupils failed to apply the concept of patterns to solve daily real life problems. In part (a), they failed to realise that the numbers in the given sequence differ by 5. For instance, several pupils subtracted 5 from 65 to get 60. In part (b), they failed to find the products 84×6 and 86×4 to identify the greater number. For instance, a considerable number of pupils wrote incorrect responses such as 4, 6, 4 and 86, instead of 86×4. In addition, other pupils responded that the given products are equal.

In part (c), these pupils failed to identify that the denominators of fractions in the given sequence are 2^1 2^2, 2^3 and 2^4. For instance, the pupils who wrote $\frac{1}{6}$ considered the denominators of $\frac{1}{2}, \frac{1}{4}$, _____, $\frac{1}{16}$ equal to even numbers 2, 4, 6 and 8. In part (d), these pupils

failed to subtract 1 kg 5 times from the 90 kg of the patient in the first month. For instance, most pupils multiplied 6 months by 90 kg to get 540 kg. In addition, some pupils added the product 1 kg and 5 to get 95 kg while others subtracted 6×5 from 90 to get 60 kg, contrary to the requirements of the question. In part (e), the pupils failed to identify the operation used to develop the sequence which was descending by 10. For instance, several pupils wrote *add* because they regarded the given pattern as the sequence in ascending order. In addition, other pupils wrote incorrect answers like division,10,39 and 40, contrary to the requirements of the question. Extract 2.1 shows part of the incorrect responses by one of the pupils.

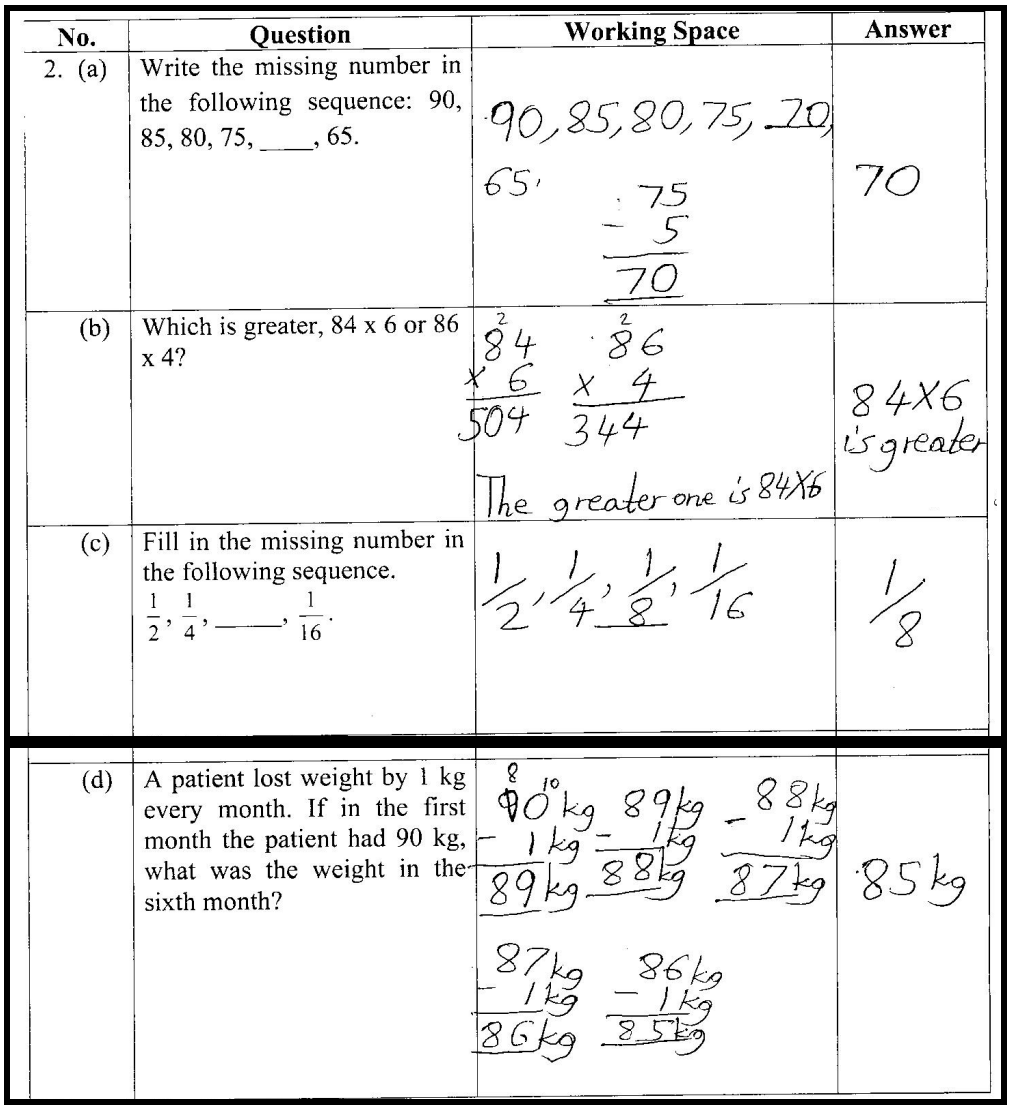


Extract 2.1: A sample of incorrect responses to Question 2

In Extract 2.1, the pupil demonstrated insufficient skills in identifying the missing numbers of a sequence in part (c). In part (d), the candidate failed to identify the operation used in forming the descending sequence.

Conversely, 3.68 per cent of the pupils who answered this question scored 8 to 10 marks with 0.93 percent scoring all 10 marks. The pupils who scored all marks subtracted 5 from 75 to get 70, which was the missing number in part (a). In part (b), they correctly calculated the product 84×6 and 86×4 to get 504 and 344 respectively. Hence, they identified 84×6 as the greater number.

In part (c), the pupils failed to identify the denominators of the fractions in the given sequence as 2^1, 2^2, 2^3 and 2^4. Hence, the missing fraction was $\frac{1}{8}$. In part (d), the pupils subtracted 1 kg from 90 kg, 89 kg, 88 kg, 87 kg and 86 kg of the patient in the first, second, third, fourth and fifth month respectively, to get the weight of the patient in the six month which was 85 kg. In part (e), the pupils knew that the subtraction operation was used to develop a sequence which was decreasing by 10. A sample of the correct answers is shown in Extract 2.2.



Extract 2.2: A sample of the correct responses to Question 2

In Extract 2.2, the pupil correctly applied the concepts of patterns to solve problems in all parts of the question and got the correct answers.

2.3 Question 3: Applying Number Relations to Solve Problems in Different Contexts

This question had five parts, which assessed the pupils' ability of pupils to apply the concepts of basic

mathematical operations to solve problems. The question was as follows:

(a) A book has 91 pages. If each page has 13 pictures, find the total number of pictures in the book.

(b) Calculate 36×8;

(c) Add;

	Hours	minutes
	14	30
+	8	40

(d) John slept for 3 hours and 45 minutes. How many minutes did he sleep in total?

(e) Subtract;
sh.1980 – sh.1300 =

This question assessed the pupils' ability to (a) employ the multiplication operation in solving the given word problem, (b) calculate the product of given numbers, (c) add the units of time, (d) solve a word problem on the units of time and (e) perform subtraction operation on money.

The statistical data shows that 1,545,076 pupils attempted this question, with 36,439 (2.36%) scoring 8 marks, 21,152 (1.37%) scoring 10 marks, 266,451 (17.25%) scoring from 4 to 6 marks and 1,221,034 (79.03%) scoring from 0 to 2 marks. Generally, the pupils' performance on this question was weak. Figure 4 summarises the pupils' performance on Question 3.

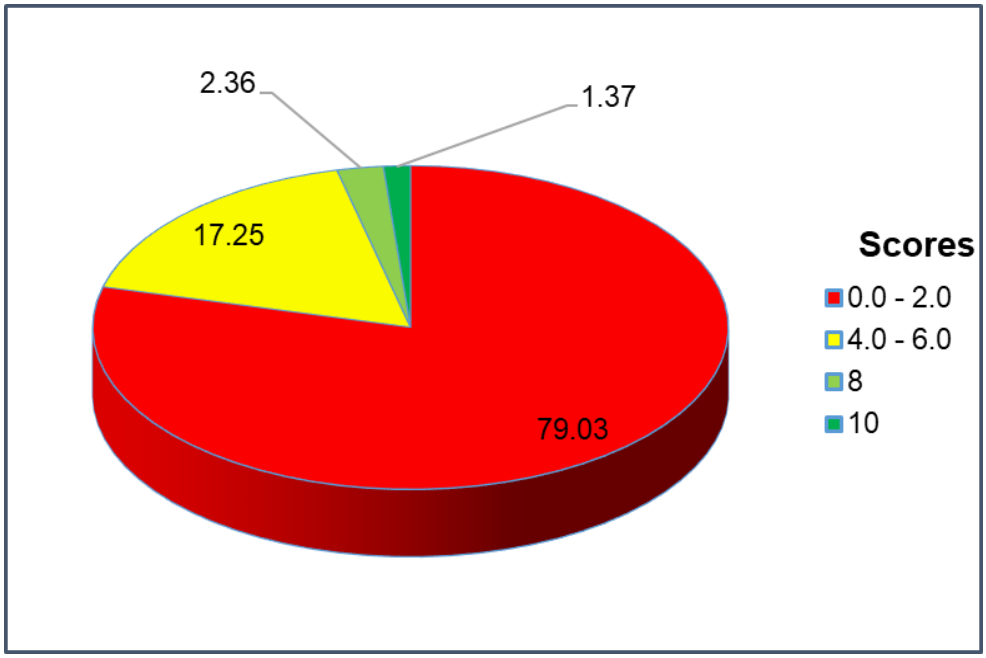
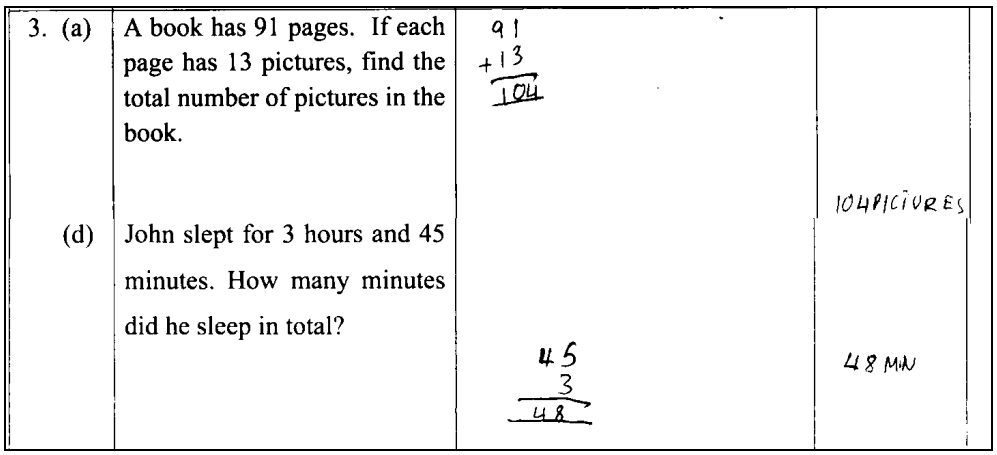


Figure 4: *Pupils' Performance on Question 3*

Further analysis shows that 50.91 per cent of the pupils who attempted Question 3 scored zero. These pupils failed to attempt this question correctly as they lacked skills in applying number relations to solve problems in different contexts. In part (a), they failed to apply the multiplication operation to calculate the total number of pictures in the book. For example, one pupil added 91 pages by 13 pictures to get 101 pictures. Another pupil divided 91 pages to 13 pictures to get 7 pictures. Also, in part (b), most pupils failed to find the value of the given expression. The pupils' responses indicate that the most common incorrect answers were 286, 268 and 2272.

In part (c), they failed to add the units of time. For instance, a considerable number of pupils added the given units to get 22 hours and 70 minutes, contrary to the reading and writing regulations of units of time. In addition, some pupils got 22 hours and 10 minutes. These pupils were unable to add a group of 60 minutes from the

minutes' side to the sum of 14 hours and 8 hours. Similarly, in part (d), they failed to add the given units of time. For example, several pupils considered 45 minutes to be the only time in minutes spent by John sleeping. Other pupils added 3 hours and 45 minutes to get 48 minutes. These pupils had insufficient skills in adding units of time. In part (e), they failed to find the value of the given expression for money. For instance, some pupils added that amount of money to get sh. 3,280, contrary to the requirements of the question. A sample part of incorrect answers is presented in Extract 3.1.



Extract 3.1: A sample of the incorrect responses to Question 3

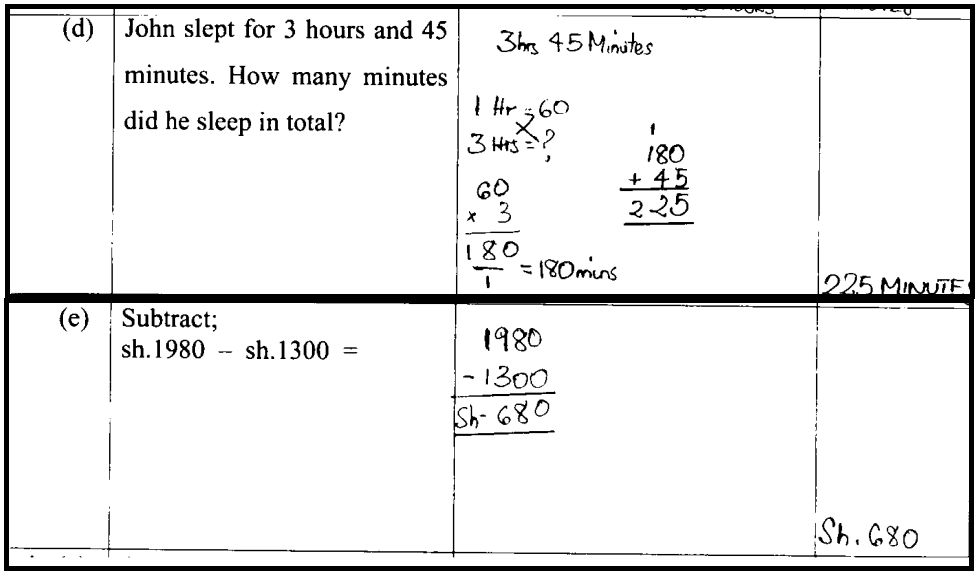
Extract 3.1 shows that the pupil failed to apply the skills of basic mathematical operations to real-life situations. In part (a), the pupil added the number of pages to the number of pictures in each page instead of multiplying 91 pages by 13 pictures. In part (d), the pupil added 3 hours to 45 minutes instead of adding 180 minutes and 45 minutes.

Despite the pupils' weak performance, 21,152 (1.37%) of the pupils answered the question correctly. In part (a), they calculated the

91×13 correctly to get 1,183 pictures in the book. In part (b), they correctly calculated 36×8 to get 288.

In addition, in part (c) they correctly added time in hours and minutes to get 23 hours and 10 minutes. In part (d), they multiplied 3 hours by 60 minutes to get 180 minutes and then added 45 minutes to get 225 minutes. In part (e), they correctly subtracted the given amounts of money to get sh. 680. A sample of the correct responses to the question is shown in Extract 3.2.

3. (a)	A book has 91 pages. If each page has 13 pictures, find the total number of pictures in the book.	1pg = 13 pictures 91pg = ? 91 13 273 91 1183 pg	1183 PAGES
(b)	Calculate 36×8;	36 x 8 288	288
(c)	Add; Hours minutes 14 30 + 8 40	Hours Minutes 14 30 8 40 22 70 +1 -60 23 10	23 HOURS 10 MINUTES



Extract 3.2: A sample of the correct responses to Question 3

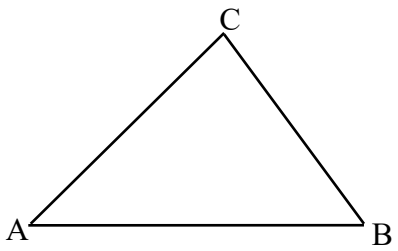
In Extract 3.2, the pupil correctly answered all parts of the question by demonstrating adequate knowledge of basic mathematical operations and their application in real-life situations.

2.4 Question 4: Applying the Concepts of Shapes and Figures to Solve Different Problems

Question 4 had five parts that assessed pupils' competence in applying the concepts of shapes and figures to solve different problems, as follows:

(a) A rectangle has a length of 100 centimetres and a width of 50 centimetres. What is its perimeter?

(b) Write the name of the following figure:



(c) A rectangle has a perimeter of 80 cm and a length of 25 cm. Find its width.

(d) A football ground of Mtakuja school has a perimeter of 480 m and a width of 40 m. Find its length.

(e) The perimeter of a square is 60 cm. Find the length of one side.

This question assessed the pupils' ability to apply the concepts of shapes and figures to solve: (a) solve a word problem on the perimeter of a rectangle (b) write the name of the given figure, (c) find the width of a rectangle (d) find the length of a football ground and (e) solve a word problem on the perimeter of a square.

The analysis done shows that a total of 1,545,076 pupils answered this question. Among them 1,264,918 pupils (81.87%) scored from 0 to 2 marks. Therefore, they had weak performance. However, 280,158 pupils (18.13%) had good performance as they scored from 4 to 10 marks. A summary of their performance is shown in Figure 5.

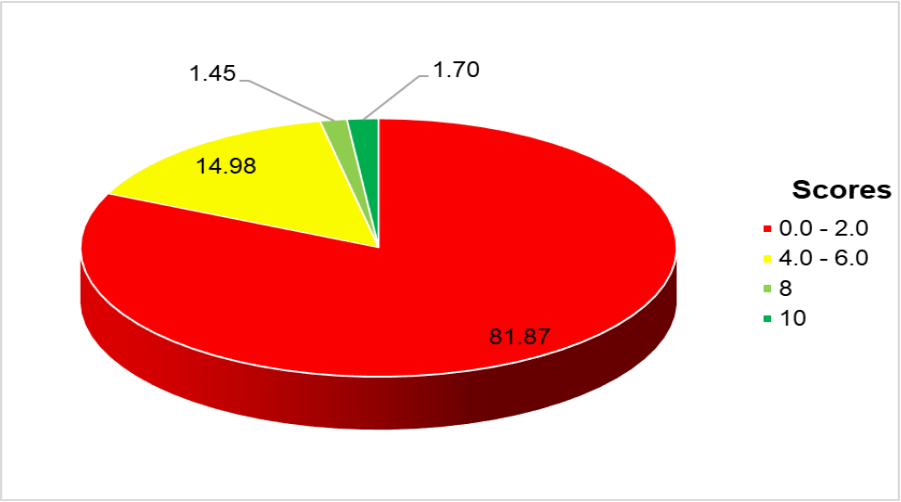


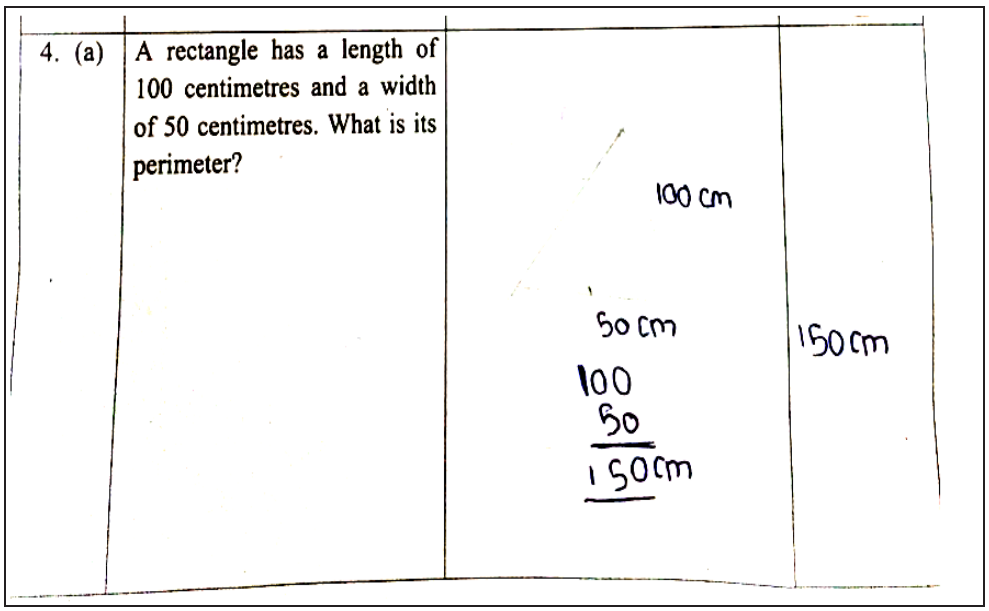
Figure 5: *Pupils' Performance on Question 4*

Further data analysis shows that 449,191 pupils, equivalent to 29.07 per cent, scored zero. In part (a), they failed to recall the formula for calculating the perimeter of the rectangle with a length of 100 centimetres and a width of 50 centimetres. They added its length and width without multiplying them by 2. In part (b), a few pupils failed to write the name of the given figure in the question. They wrote *equilateral triangle* and *isosceles triangle* whereas others wrote *rectangle*.

In part (c), most pupils failed to find the width of a rectangle with a perimeter of 80 cm and a length of 25cm. They lacked the skills of reasoning in real-life contexts. Hence, they came up with different incorrect answers, like those who decided to add 80 cm and 25 cm to get 105 cm as the width of the rectangle, which is not correct. Others multiplied 80 cm by 25 cm to get 2,000 cm^2, which is incorrect. Furthermore, other pupils subtracted 25 cm from 80 cm to get 55 cm as the width of the rectangle, which was also not correct.

In part (d), most pupils failed to apply the concepts of shapes and figures to solve various problems. For instance, several pupils added the perimeter (480 m) and the width (40 m) of the football ground to get 520 m as the length of the football ground, which was not correct. Furthermore, some pupils multiplied 480 m by 40 m but did not get the correct product of the two numbers; they wrote 19,200 m, which was incorrect. In part (e), the majority failed to use the formula for calculating the perimeter of a square to find the length of one side of a square whose perimeter was 60 cm. For instance, some pupils multiplied the given perimeter and the number of sides and got 240 cm which is incorrect. Others divided 60 cm by 2 and obtained 30 cm, which was incorrect. A few pupils copied the 60 cm as the length of

one side of the square, contrary to the requirements of the question. Extract 4.1 shows part of the pupil's incorrect responses to Question 4.

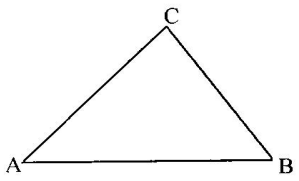
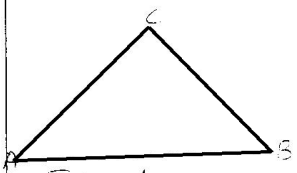
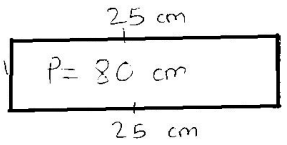
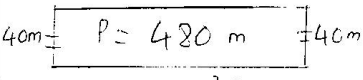


Extract 4.1: A sample of the incorrect responses to Question 4

In Extract 4.1, the pupil added the given perimeter and width, contrary to the requirements of the question.

Conversely, 25,682 pupils, equivalent to 3.14 per cent, scored full marks. In part (a), they successfully calculated the perimeter of a rectangle with a length of 100 centimetres and a width of 50 centimetres since they recalled the formula for calculating the perimeter of the rectangle. Thus, they got the correct answer which is 300 centimetres. In part (b), they correctly wrote triangle as the name of the given figure. In part (c), a few pupils managed to find the width of a rectangle with a perimeter of 80 cm and a length of 25 cm as they used the formula that Perimeter = 2(Length + Width) by substituting and computing correctly. They correctly got 15 cm as the width of the

$(\text{length} + \text{width}) \times 2$ to get the length of 200 cm. In part (e), they correctly used the formula $\text{length} \times 4$ to get length of 15 cm. A sample of the correct responses is shown in Extract 4.2.

No.	Question	Working Space	Answer
(b)	Write the name of the following figure: 	 Triangle	Triangle.
(c)	A rectangle has a perimeter of 80 cm and a length of 25 cm. Find its width.	 25 cm + 25 cm = 50 cm 80 cm − 50 cm = 30 cm 2) 30 cm = 15 cm 25 cm, 25 cm, 15 cm, + 15 cm = 80 cm	Width = 15cm
(d)	A football ground of Mtakuja school has a perimeter of 480 m and a width of 40 m. Find its length.	 40 m + 40 m = 80 m 480 m − 280 m = 400 m 2) 400 m = 200 m 200 m, 200 m, 40 m, + 40 m = 480 m	Length = 200 m

Extract 4.2: A sample of the correct responses to Question 4

In Extract 4.2, the pupil managed to provide the correct response to each part of the question. The pupil used the formula for calculating perimeter correctly.

2.5 Question 5: Applying Statistical Skills to Present Different Pieces of Information

Question 5 had five parts that assessed the pupils' competence in applying the concepts of statistical skills to present different pieces of information. The question stated as follows:

Study the following pictograph which shows the school harvests, and then answer the questions that follow:

Year	Sacks
2015	
2016	
2017	

1 sack represents 1,000 kg

(a) Which year did the school harvest most?

(b) How many kilograms of crops did the school harvest in 2017?

(c) In which year did the school harvest a small amount of crops?

(d) What is the difference in kilograms between the crops harvested in the year 2015 and 2017?

(e) In which year did the school harvest 6,000 kilograms?

This question assessed the pupils' ability in applying statistical skills to present different pieces of information as follows: (a) to identify the year in which the school harvested most, (b) to calculate the total kilograms harvested by the school in the year 2017, (c) to identify the year in which the school harvested a small amount of crops, (d) to calculate the difference in kilograms between the crops harvested in the year 2015 and 2017 and (e) to identify the year in which the school harvested 6,000 kilograms.

The analysis done shows that 394,127 (25.51%) of the pupils scored from 8.0 to 10 marks; 565,177 (36.58%) scored from 4.0 to 6.0 marks; and 582,772 (37.91%) scored from 0 to 2.0 marks. Generally, the pupils had average performance on the question because 959,304 (62.09%) scored from 4 to 10 marks. Figure 6 summarises their performance on Question 5.

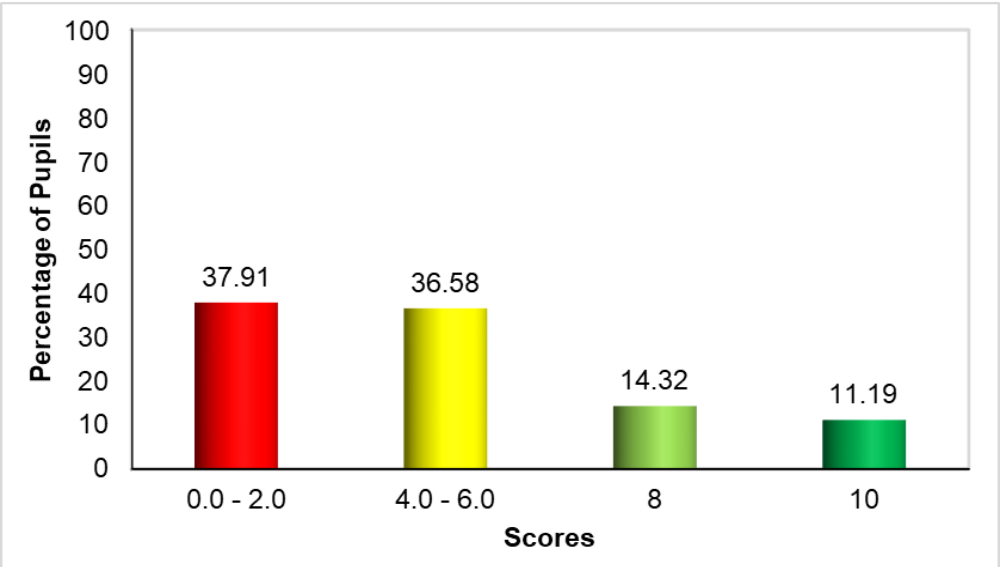


Figure 6: *Pupils' Performance on Question 5*

Figure 6 shows that 19 per cent of the pupils who attempted question 5 managed to provide the correct answers. The pupils were competent in applying statistical skills to present information. In part (a), they used the information in the pictograph to determine 2016 as the year in which the school obtained the most harvest.

In part (b), they calculated the total kilograms harvested by the school as 4x 1,000kg= 4,000kg. In part (c), they realized that 2015 was the year in which the school harvested a small amount of crops. In part (d), they correctly calculated the difference between the crops harvested in the year 2015 and 2017 in kilograms as follows: They first calculated the total crops harvested in 2017 as 4 x 1000 kg = 4,000 kg and the total crops harvested in 2015 as 3 x 1,000kg=3,000kg. Thereafter, they subtracted the crops harvested in 2015 from those of 2017 to get 1,000 kg, which was the correct answer. In part (e), they counted the number of bags each year which enabled them to identify 2016 as the year in which the school harvested 6,000 kilograms. Extract 5.1 is illustrative.

No.	Question	Working Space	Answer
(b)	How many kilograms of crops did the school harvest in 2017?	1000 kg 1000 kg 1000 kg + 1000 kg 4000 kg	4000 kg
(c)	In which year did the school harvest little amount of crops?	2015 = 1000 kg 1000 kg + 1000 kg 3000 kg 2015	2015
(d)	What is the difference in kilograms between the crops harvested in the year 2015 and 2017.	2015 = 1000 1000 -1000 3000 kg 4000 kg -3000 kg 1000 kg 2017 = 1000 1000 1000 -1000 4000 kg	1000 kg
(e)	In which year did the school harvest 6,000 kilograms?	2016 = 1000 kg 1000 kg 1000 kg 1000 kg 1000 kg + 1000 kg 6000	2016

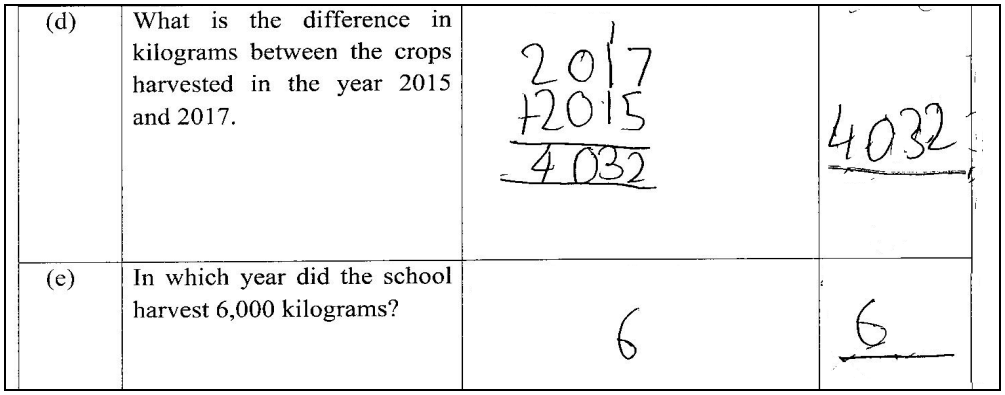
Extract 5.1: A sample of the correct responses to Question 5

Extract 5.1 shows that the pupil correctly used statistical knowledge and skills to answer all parts of question 5.

Conversely, 422,949 (27.37%) of the pupils scored zero. These pupils failed to interpret the information given in the pictograph due to the following reasons: In part (a), most of them wrote 6 which was the number of sacks instead of the year 2016 in which the school

harvested the most. In part (b), they failed to multiply 4 sacks by 1,000 kg to get 4,000 kg. Most pupils wrote the number of sacks harvested in 2017 which is 4 sacks. In part (c), they failed to determine that the school harvested a small amount in 2015.

In part (d), most pupils subtracted 2015 from 2017 to get 2. In addition, others added 2015 and 2017 to get 4,032. In part (e), they failed to divide 6,000 kg by 1,000 kg to get 6 bags which would be compared with the given years to identify the year with those bags. Others divided 6,000 kg by 1,000 kg correctly to get 6 sacks, but they could not determine that the school got six sacks in 2016. Extract 5.2 shows parts of of incorrect answers to this question.



Extract 5.2: A sample of incorrect responses to Question 5

Extract 5.2 shows a sample of a pupil's responses who failed to correctly answer parts (d) and (e) of Question 5.

3.0 ANALYSIS OF PUPILS' PERFORMANCE ON EACH COMPETENCE

The mathematics assessment paper consisted of five (5) questions that had specific competencies in *Applying the Concepts of Numbers to Communicate in Different Contexts, Applying the*

Concepts of Patterns to Solve Real life Problems, Applying Mathematical Operations to Solve Problems, Applying the Concepts of Shapes and Figures to Solve Different Problems and *Applying Statistical Skills to Present Different Information.*

The data analysis shows that the pupils had weak performance on three (03) competencies and average performance on two (02) competences. In addition, the comparison of performance on each competence in SFNA 2023 and 2022 shows that the pupils' performance in *Applying the Concepts of Patterns to Solve Problems in Everyday Life* has slightly decreased by 0.7 per cent. However, the performance of pupils on *Applying Statistical Skills to Present Different Information, Applying the Concepts of Numbers to Communicate in Different Contexts, Applying number relations to solve problems in different contexts* and *Applying the Concepts of Shapes and Figures to Solve Different Problems* has increased by 48.96, 15.95, 3.81 and 3.54 per cent respectively (See Appendices A and B).

4.0 CONCLUSION

The analysis of the assessment results in the mathematics subject shows that 834,119 pupils, equivalent to 54.00 per cent passed with grades A to D in 2023. Moreover, the overall performances in the assessed main competencies is as follows: *Using Mathematical Language to Present Ideas or Arguments in Real Life Contexts* (59.12%), *Applying Skills of Reasoning and Proof in Real life Contexts* (22.11%), and *Using Mathematics to Solve Problems in Different Contexts* (18.13%).

However, their performance on each specific competency shows that the specific competence of *Applying of Statistical Skills to Present Different Information (*62.09%) and *Applying the Concepts of Numbers to Communicate in Different Contexts* (56.14%) were averagely performed. In addition, the remaining specific competence were poorly performed, as follows: *Applying the Concepts of Patterns to Solve Problems in Everyday Life* (23.24%), *Applying Number Relations to Solve Problems in Different Contexts* (20.97), and *Applying the Concepts of Shapes and Figures to Solve Different Problems* (18.13%).

The weak performance on these competencies was due to pupils' failures to identify the descending and ascending sequences of numbers, convert one unit to another and apply different mathematical formulae in answering the questions.

5.0 RECOMMENDATIONS

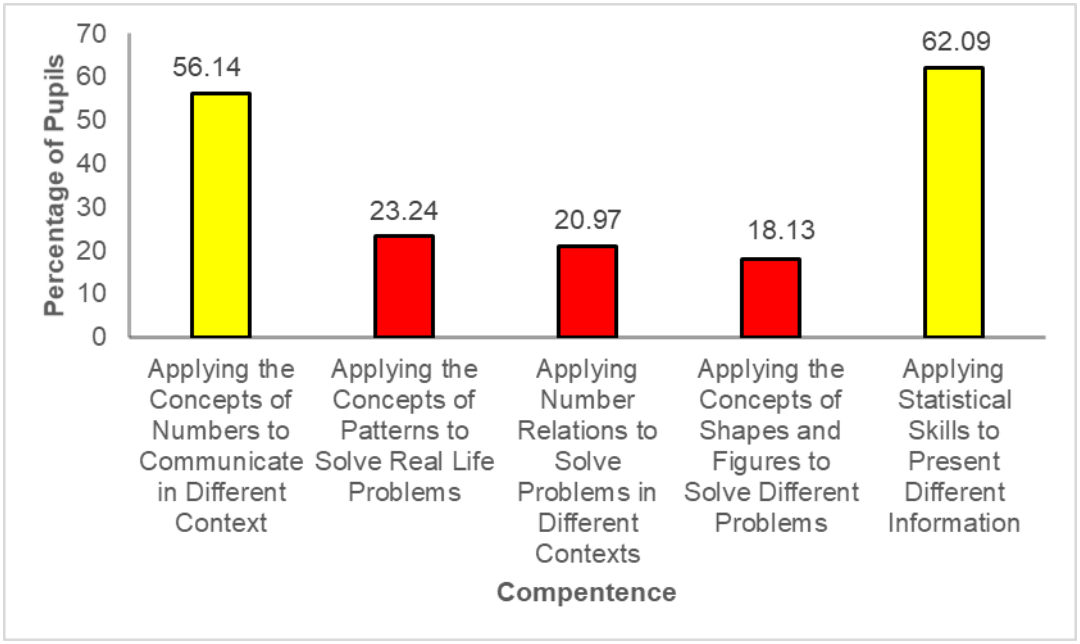
To improve the performance of the Standard Four Pupils on the specific competencies which were poorly performed, the report recommends the following:

(a) Teachers should apply Mathematical Operations to teach pupils to identify increasing or decreasing sequences.

(b) Teachers should demonstrate the relationship between hours and minutes and insist the pupils to apply the relationship during the addition or subtraction of time.

(c) Teachers should apply real objects to distinguish various figures such as rectangles, squares and triangles. Moreover, they should put more emphasis on the use of the correct formulae to find the perimeter of various figures.

Appendix A: Pupils' Performance on each Competence SFNA 2023



Appendix B: Comparison of Pupils' Performance on each Competence SFNA 2023 and 2022