



**AFRICAN POPULATION AND HEALTH RESEARCH CENTER: EDUCATION  
RESEARCH PROGRAMME: MATHEMATICS TEACHER ASSESSMENT TOOL  
(BASELINE): THIS TOOL SHOULD BE ADMINISTERED TO TEACHERS OF  
MATHEMATICS IN STD. 6 IN THE SCHOOL VISITED**

*In the process of developing this study tool, several sources were consulted and mainly included the Human Sciences and Research council (HSRC) and the South Africa Consortium for Monitoring and Evaluating Educational Quality II – Kenya (SACMEQ II).*

**GENERAL INSTRUCTIONS TO THE TEACHER**

- Read these instructions carefully.
- It is important that you answer each question carefully and as accurately as possible.
- Respond to the questions by simply circling your answer among the choices provided.
- Please return the completed questionnaire to the research assistant. All information in this questionnaire will be treated confidentially.
- Thank you very much for the time and effort you have put into responding to this questionnaire.

**PART I: BACKGROUND INFORMATION**

**1.0 BACKGROUND INFORMATION**

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1.1	START TIME		<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>			
1.2	DATE OF INTERVIEW	(DD/MM/YYYY)	<input type="text"/>						
1.3	FIELD INTERVIEWER'S (FI) CODE		<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>			
1.4	FULL NAME OF THE TEACHER	_____							
1.4.1	TEACHER'S ID [TO BE ASSIGNED AT DATA ENTRY]		<input type="text"/>						
1.5	FULL NAME OF SCHOOL	_____							
1.6	CURRENT KENYA NATIONAL EXAMINATION INDEX FOR THE SCHOOL		<input type="text"/>						
1.7	PREVIOUS KENYA NATIONAL EXAMINATION INDEX FOR THE SCHOOL		<input type="text"/>						
1.8	FI: IN WHICH PROVINCE IS THE SCHOOL LOCATED? (USE PROVINCE CODES A		<input type="text"/>	<input type="text"/>					

BELOW)

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**CODE A:** 01=COAST; 02=CENTRAL; 03=EASTERN; 04=NAIROBI; 05=RIFT VALLEY; 06=WESTERN  
07=NYANZA; 08=NORTH EASTERN

1.9 FI: GIVE THE NAME OF THE DISTRICT WHERE THE SCHOOL IS  
LOCATED

1.10 START TIME FOR PART II

1.11 END TIME FOR PART II

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## **PART II: DIAGNOSING COMMON ERRORS MADE BY CHILDREN IN PRIMARY MATHEMATICS**

### **INSTRUCTIONS**

1. The diagnosis consists of **10** items.
2. Answer **ALL** the items in this tool.
3. Circle the letter next to your answer:

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1. As Mr. Makokha was assessing his learners' work from the day's lesson on multiplication, he noticed that Simiyu had invented an algorithm that was different from the one taught in class. Simiyu's work looked like this:

$$\begin{array}{r} 983 \\ \times 6 \\ \hline 488 \\ +5410 \\ \hline 5898 \end{array}$$

What is Simiyu doing here? (Mark ONE answer.)

- a) Simiyu is regrouping ("carrying") tens and ones, but this work does not record the regrouping.
  - b) Simiyu is using the traditional multiplication algorithm but working from left to right.
  - c) Simiyu has developed a method for keeping track of place value in the answer that is different from the usual algorithm.
  - d) Simiyu is not doing anything systematic. He just got lucky – what he has done here will not work in most cases.
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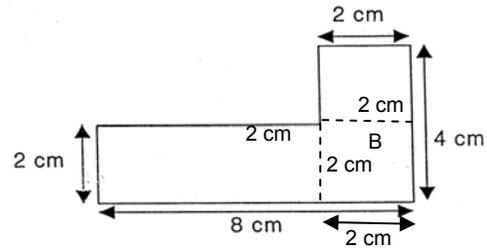
2. Mrs. Mwangi set her grade 6 Class the following problem:

Calculate the perimeter of the figure.

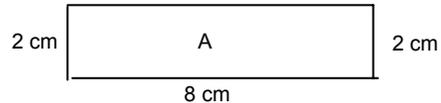
**Sally answered the question this way:**

I divided the figure into a rectangle and a square.

I then found the perimeter of each figure and added them.



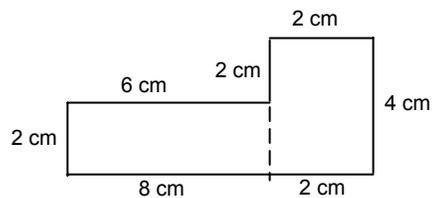
$$\begin{aligned}
 P &= (2 + 8 + 2 + 8) \text{ cm} + (2 + 2 + 2 + 2) \text{ cm} \\
 &= 20 \text{ cm} + 8 \text{ cm} \\
 &= 28 \text{ cm}
 \end{aligned}$$



**Makau answered the question this way:**

I drew a line to make two rectangles, but did not separate them. I then calculated the perimeter like this:

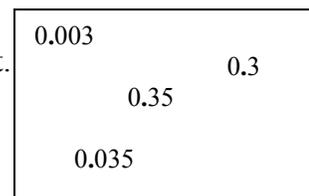
$$P = 2 + 6 + 2 + 2 + 4 + 2 + 8 = 26 \text{ cm}$$



Which of the following is correct?

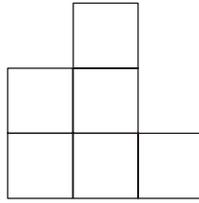
- A. Sally is right.
- B. Makau is wrong because he did not use the middle line.
- C. Makau is wrong because he has put in an extra 2 cm.
- D. The correct answer is 20 cm

3. Four boys are working on this problem together.  
They want to arrange the decimal numbers from smallest to largest.  
Which one of the following statements is true?



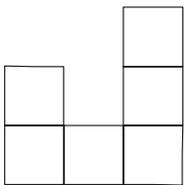
- A. Andrew said: The smallest is 0.003 because it has the highest, number of decimal places, **and** 3 is smaller than 35.
- B. Moses said: 0.003 is smaller than 0.035 because  $\frac{3}{1000}$  is smaller than  $\frac{35}{1000}$
- C. Michael said: The largest is 0.3 because it has the fewest decimal numbers.
- D. Peter said: The largest is 0.3 because  $\frac{3}{10}$  is bigger than  $\frac{35}{100}$

4. The sketch below shows a drawing of a building as seen from the front.

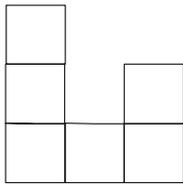


Which of the following sketches shows the **back view** of the building?

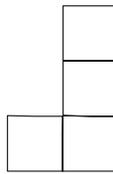
**Circle the letter that shows the answer.**



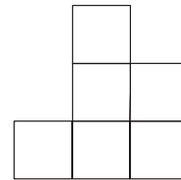
**A**



**B**

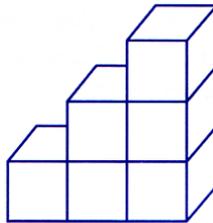
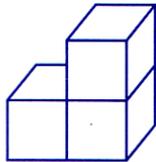


**C**



**D**

- 5.



**Step 1**

**Step 2**

**Step 3**

Miss Musa is exploring number patterns with her class. She asks her class to find a pattern which will enable them to find the number of blocks in **any** Step. The class begins to explore the problem and come up with the following statements. Which of these is **not correct**?

- A. Step 7 contains 26 blocks.
- B. The number of blocks in Step  $n$  is calculated by: Number =  $1 + 2 + 3 + \dots + n$
- C. The number of blocks in Step  $n$  is given by: Number =  $\frac{n(n+1)}{2}$
- D. The number of blocks in Step 10 is given by: Number =  $\frac{10^2 \times 10}{2}$

6. Fatuma seems to have difficulty with some multiplication problems involving decimals, but solves other problems correctly. Look carefully at her solutions.

Name: *Fatuma*

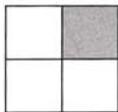
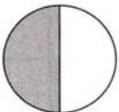
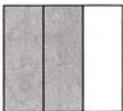
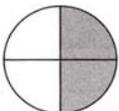
<p>A. <math>\begin{array}{r} \\$6.45 \\ \times 3 \\ \hline \\$19.35 \end{array}</math></p>	<p>B. <math>\begin{array}{r} 32.7 \\ \times .5 \\ \hline 16.35 \end{array}</math></p>
<p>C. <math>\begin{array}{r} 21.8 \\ \times .4 \\ \hline 87.2 \end{array}</math></p>	<p>D. <math>\begin{array}{r} 4.35 \\ \times 2.3 \\ \hline 1305 \\ \hline 870 \\ \hline 100.05 \end{array}</math></p>

Which exercise is (are) incorrect? *Circle all that apply.*

- A.
- B.
- C.
- D.

Look at Maitha's worksheet about fractions and use it to answer question 7, 8 and 9.

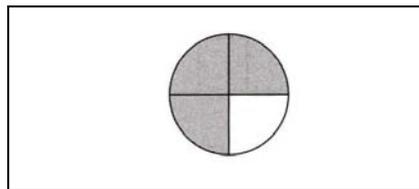
What Part is Shaded? Name: *Maitha*

<p>A.  Write a fraction. <math>\frac{1}{3}</math></p>	<p>B.  Write a fraction. <math>\frac{1}{2}</math></p>
<p>C.  Write a fraction. <math>\frac{2}{1}</math></p>	<p>D.  Write a fraction. <math>\frac{2}{2}</math></p>

7. Which answer(s) is/are correct? *Circle all that apply.*

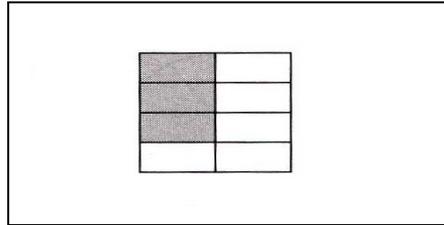
- A.
- B.
- C.
- D.

8. How would Maitha answer the following two exercises using her incorrect procedure?



Write the fraction \_\_\_\_\_

9.



Write the fraction \_\_\_\_\_

10. Mr Godana is teaching his grade 6 class about the relative sizes of fractions. He tells them a story about a birthday party where Namwamba eats  $\frac{1}{2}$  of one cake, and Nyagaka eats  $\frac{5}{8}$  of another cake of the same size. Who ate the most? Which of the following children is correct?

- A. Salim says eighths are very small pieces because there are so many, but halves are bigger because there are only two. Therefore, Namwamba ate the most because halves are bigger than eighths.
- B. Lawrence says Nyagaka ate the most because there are 5 eighths and only 1 half.
- C. Mariam says  $\frac{1}{2}$  is the same as  $\frac{4}{8}$  which is smaller than  $\frac{5}{8}$ . Therefore, Nyagaka ate the most.
- D. Jane says that Namwamba and Nyagaka ate the same amount of cake.

11. Mrs Karichu class conducted a survey of 100 learners to find who preferred playing video games and who preferred watching television. The class constructed the following table from the data:

	Prefer television	Prefer video game
Number of learners	40	60

Mrs Karichu asked the class to write statements based on this information. For each statement, indicate whether it accurately reports preferences of learners in the survey, by circling ACCURATE, INACCURATE, or NOT SURE.

	Accurate	Inaccurate	Not sure
A. The ratio of learners who prefer TV to all learners is 2:5	1	2	3
B. TV is 40% more popular than video games	1	2	3
C. Learners who prefer video games outnumber those who prefer TV by a ratio of 3 to 2	1	2	3
D. Learners prefer video games to TV by a ratio of 6 to 4	1	2	3
E. $\frac{4}{6}$ of the learners prefer video games to TV	1	2	3
F. Video games are preferred by 20% more of the learners than TV is	1	2	3

Steve is having difficulty solving percent problems. Take a look at his test paper and answer question 12 and 13.

		Name <u>Steve</u>
A. What number is 30% of 180?		
$\begin{array}{r} 180 \\ \times .30 \\ \hline 000 \\ 540 \\ \hline 54.00 \end{array}$	Answer: <u>54</u>	
B. 15% of what number is 240?		
$\begin{array}{r} 240 \\ \times .15 \\ \hline 1200 \\ 240 \\ \hline 36.00 \end{array}$	Answer: <u>36</u>	
C. What percent of 40 is 28?		
$\begin{array}{r} 40 \\ \times .28 \\ \hline 320 \\ 80 \\ \hline 11.20 \end{array}$	Answer: <u>11.2</u>	

12. Which exercise is (are) correct? *Circle all that apply.*

- A.
- B.
- C.
- D. All of the above

13. Which of the following problems is Steve likely to get correct using his procedure? *Circle all that apply.*

- A. All are correct
- B. Seventy is 14% of what number?
- C. What percent of 125 is 25?
- D. What number is 80% of 54?