



education

Department:
Education

PROVINCE OF KWAZULU-NATAL

**Foundation Phase
Training Workshop 4: August 2015
Participants' Handout**

Maths



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what I do matters

Endorsed by:



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Workshop 4 Mathematics: August 2015
Workshop guide for participants

In this workshop you will find out more about error analysis – how to do it and how to use it productively in your class. The discussion is based on the DBE UNICEF guide, *Using learners' responses to inform the teaching of Mathematics*. Suggested times are given below. If you have more time and want to continue the discussions for longer you are free to do so.

Workshop plan

8.00 – 8.30 – Arrival and distribution of materials for the workshop
 8.30 – 9.30 – Activity 1: Group error analysis activity (1 hour = 60 min)
 9.30 – 10.30 – Activity 2: ANA learner marks analysis (1 hour = 60 min)
 10.30-11.00 – Tea
 11.00-13.30 – Activity 3, 4 and 5: Data Handling and Measurement error analysis. (2 ½ hours)
 13.30-14.30 - Lunch

Session 1: Activities 1 and 2

This session involves two activities to introduce you to the process of error analysis – using first learner responses as data and then learner marks as data. Each activity should take about 60 minutes. Your facilitator will guide you as you break into groups and have large group discussions throughout this time.

Activity 1: Group error analysis activity – using learners' responses as data

1. Study and complete the item. **ANA 2013 Grade 3 Mathematics Item 10.1 and 10.2**

10. Complete the table:

10.1	Count forwards in 100s	584				
10.2	Count backwards in 20s	320				240

2. Study the data (achievement data and some learners' responses given below) related to the item.
 What do the item statistics tell us?
Item 10.1: 37 % of learners answered the question correctly.
Item 10.2: 30% of learners answered the question correctly.

10. Complete the table:

10.1	Count forwards in 100s	584	684	784	884	984
10.2	Count backwards in 20s	320	300	280	260	240

10. Complete the table:

10.1	Count forwards in 100s	584	684	784	884	984
10.2	Count backwards in 20s	320	420	520	620	240

10. Complete the table:

10.1	Count forwards in 100s	584	585	586	587	588
10.2	Count backwards in 20s	320	310	320	330	240

10. Complete the table:

10.1	Count forwards in 100s	584	585	586	587	588
10.2	Count backwards in 20s	320	321	322	323	240

10. Complete the table:

10.1	Count forwards in 100s	584	4	5	8	100
10.2	Count backwards in 20s	320	3	2	0	240

X
X

3. Think about the knowledge required to answer the item.

a. Situate this knowledge in the curriculum.

b. What skills and knowledge would learners need to be able to answer this question correctly?

c. How did the learners achieve on this item?

4. Think about what learners might have been thinking when they got the wrong answers. Are there any common misconceptions evident? How can you explain the errors they made?

5. What does this activity (your error analysis) teach you about the way you would teach the content in the item?

Reflection: Refer to pages i, ii and iii of *Using learners' responses to inform the teaching of Mathematics*.

1. What is the difference between an error and a slip?

2. In what way is it useful to think about how learners think when they answer a mathematics question **correctly**?

3. In what way is it useful to think about how learners think when they answer a mathematics question **incorrectly**?

4. How can mathematics teachers be more responsive to their learners' errors?

Activity 2: ANA learner marks analysis – using learners’ marks as data

1. Study page iv. of the DBE UNICEF error analysis materials.
 - a. What information should be recorded on an assessment grid in order to do an item marks analysis?

 - b. Use the handout and information given at the end of this manual to draw up the assessment grid for the activity exemplar as it was done in the DBE UNICEF materials. (*Use handout*)

2. Study page v. of the DBE UNICEF error analysis materials.
 - a. In what way should learners’ marks be recorded in the marks sheets?
 - b. Record the exemplar marks and calculate the totals and percentages for these marks in your exemplar mark sheet. (*Use handout*)
 - c. What does marks’ analysis assist teachers to observe?

3. Study page vi. of the DBE UNICEF error analysis materials.
 - a. Why is it useful to work out class averages for learners’ tests?

 - b. Work out the class average for the marks in your exemplar mark sheet. (*Use handout*)

4. Study page vii. of the DBE UNICEF error analysis materials.
 - a. What is the final step in an item marks analysis for a learners’ test?

 - b. Work out the average per question for each item using the marks in your exemplar mark sheet. (*Use handout*)
 - c. Why is marks’ analysis a useful thing to do?

- 5. Study page viii. of the DBE UNICEF error analysis materials. What do steps 5, 6 and 7 recommend? How do these steps relate to the error analysis activity you did when you analysed Item 10 in Activity 1?

- 6. Review the front pages of the DBE UNICEF materials.
 - a. Are error analysis and item marks analysis related activities?

- b. What follow up activities would assist teachers to use item and error analysis optimally in their classes?

Session 2: Activities 3, 4 and 5

This session involves three activities in which you will work through items from the DBE UNICEF Error Analysis guide, *Using learners' responses to inform the teaching of Mathematics*. Each activity should take about 45 minutes. Your facilitator will guide you as you break into groups and report back on your discussions.

In each activity you will be guided by the same set of questions, as you critically review the content presented in the DBE UNICEF error analysis materials. Each item presented in the DBE UNICEF guide is based on the ANA 2013 questions. The guide contains material to assist you in the error analysis process.

As you discuss each item, think about how the content could be used to inform the teaching of mathematics. Make notes in the spaces on the copies of the UNICEF materials. Think about how and what you are reading applies to your district/school context and how you could put it to use.

Guiding questions for critical review of UNICEF error analysis materials:

Activity 3: Data Handling

Activity 4: Time

Activity 5: Capacity

1. Determine the **knowledge and skills** learners should have to be able to answer a specific question in the ANA question paper.
2. Identify where in the **CAPS** the **topic** is situated with respect to the Term and grade.
3. Identify the **mistakes/errors** learners made in answering the question. Are there any other errors you can think of that they could have made?
4. Determine **teaching strategies** to address learners understanding and misconceptions regarding the question.
5. How could you use this item content to inform your teaching of mathematics?

Optional – further item discussion:

Discuss the items relating to mass, length and position, in the same way as you have discussed the items above.

Activity 2: Exemplar test questions and marks for item marks analysis activity

Mathematics Assessment 1

Grade 3

Izibalo Izivivinyo 1

Iesi-3

Ibanga

1. Write a number sentence and the answer for: 100 and 1 and 80.
Bhala umusho wezinombolo nempendulo yalokhu: 100 no 1 no 80.

(2)

2. Write 231 in words.
Bhala 231 ngamagama.

(1)

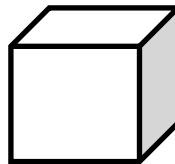
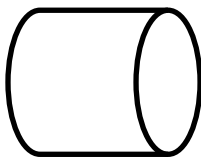
3. Colour any three numbers that are smaller than 276 in red.
Faka umbala obomvu kunoma yiziphi izinombolo ezintathu ezincane kunama-276.

(3)

222	277	269	276	297	300	212	247	279	218
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4. Circle the object that can slide and the draw a cross over the object that can roll and slide.
Kokelezela okushibilikayo bese udweba isiphambano kokugingqikayo kuphinde kushibilike.

(2)



5. Draw the shapes that make up this pyramid:
Dweba izimo ezakha le phiramidi:

(3)

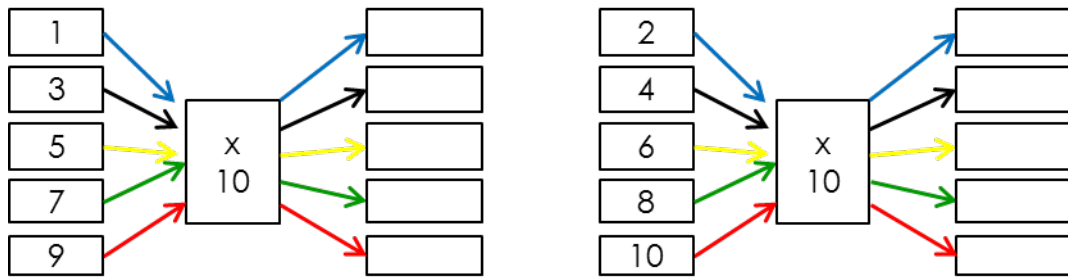


6. Complete the table by adding and subtracting:
Qedela leli thebula ngokuhlanganisa nokususa:

(4)

532	+10		-10		+100		-100	
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7. Complete the spider diagrams.
Qedela lo mdwebo owubulwembu.



(5)

8. You have only 3 roses, but you would like to give your mom 10 times more. How many roses do you want to give her? Write a number sentence and the answer.
Unezimbali ezi-3 kuphela, kodwa kumele uphe umama wakho eziphindwe ka-10 ngaphezulu. Zingaki izimbali ofuna ukuzinika umama wakho? bhala umusho wezinombolo kanye nempendulo.

(2)

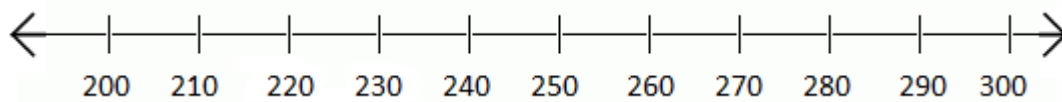
9. $195 + 16 = \underline{\quad}$

(1)

10. Show where you would find the numbers 207 and 282 on the number line below:

Khombisa ukuthi ungazitholaphi izinombolo 207 no 282 kulo mugqa wezinombolo ongezansi:

(2)



Total marks: 25
Isamba: 25

Sample of learner marks for the test – use this to complete the mark sheet in Activity 2.

Question number	1	2	3	4	5	6	7	8	9	10
Mark										
Learner's name										
Manono	2	1	3	2	3	3	4	2	1	1
	1	1	1	0	2	2	3	0	1	0
	0	0	2	1	1	2	2	0	0	0
	1	0	1	1	2	2	2	1	0	1
	0	1	2	2	1	3	1	0	0	0

