



Early Number Fun Grade R Teacher Development Programme

Session Five Teacher Handbook

Name

School

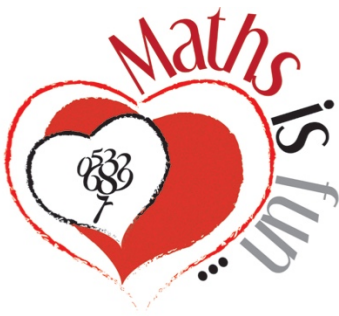
DECLARATION

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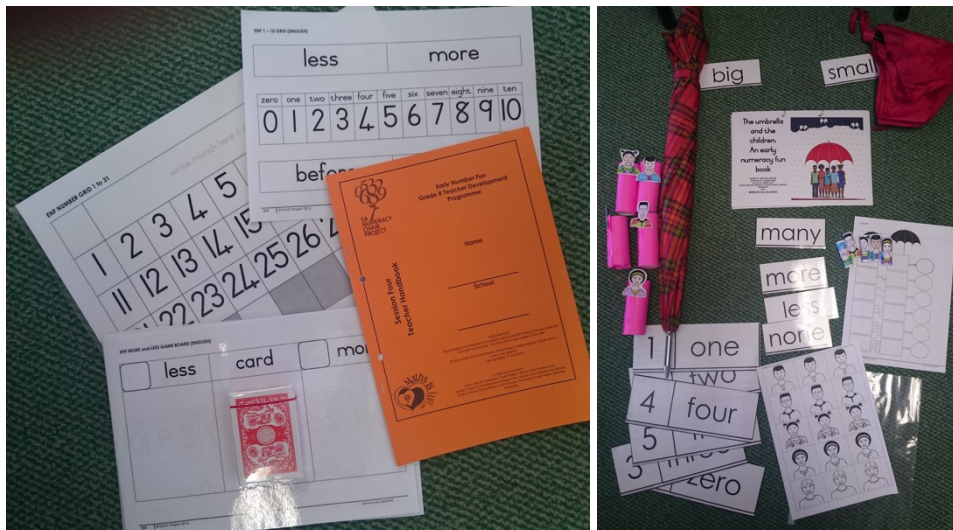
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Table of contents

Introduction to session	3
Variation	3
Reflection Activity	4
1. Using Umbrellas and Children story books for developing number sense	4
2. Patterning and puzzle activities	5
3. Playing card games for Cognitive Control and Numeracy Progression	6
	6
Growth mindset activities	8
I can work with numbers in different ways	8
Learner discussion	8
Thinking about numbers relationally	9
Some variations	9
Thinking about 1-10 relationally	11
Some variations	11
1 to 20 numeral track game	11
Thinking about numbers relationally for yourself	12

Introduction to session

In the first part of this session we will focus on teacher learning experiences of using the activities engaged with in session 4.



These included:

1. Using Umbrellas and Children story books for developing number sense
2. Patterning and puzzle activities
3. Playing card games for cognitive control and numeracy progression

Thinking about numbers relationally

In this session, our focus is on thinking about numbers relationally, rather than operationally. This means that we want to focus on the relationships between quantities in problems rather than jumping into whatever calculation we think needs to be carried out. In the first part of the session, we focus on a range of activities and resources that can be used in Grade R classrooms. Connecting between different ways of representing numbers and operations is described as a key element of good mathematical understanding. We deal with this idea of connecting between representations through a focus on incorporating **variation** – which we explain in the next section.

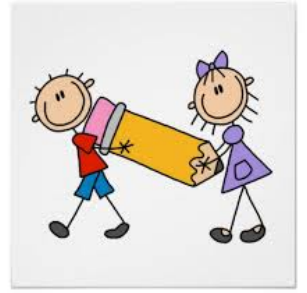
Later, we introduce some tasks that are aimed at developing our own thinking about numbers relationally. These tasks are not for use in your classroom (though you might want to use easier variations of them); they are for helping us to develop our own relational ways of thinking about and working with numbers.

Variation

A key teaching idea running through the activities is 'variation'. This can relate to ways of changing the:

- 'setting' or the 'context' of the task
- the language we use to set the task (thinking across languages and the ways in which we ask questions)
- the representations that we use (including numbers seen in terms of quantities that can be counted, and numbers as lengths and heights)
- the numbers that we use within tasks, and how they relate to each other

Reflection Activity



Get into groups of 3-5 teachers who are from a different school to you.

Reflect on your use of the following activities from the last session.

1. Using Umbrellas and Children story books for developing number sense

In particular, reflect on learner responses to the story.

In what way did they enable (or not) the intended skills of:

- Context bound counting 1-5 and calculating (1 less)
- Object bound counting 1-5 and calculating (1 less) with fingers or drawings
- numeral and word recognition (1-5)
- compare quantities and develop language of more/ less/ many/ none
- develop comparative language for size – big and small; more and less
- recognition of words like 'more' 'less' 'big' 'small'
- develop a patterned sense of bonds to 5 (i.e. 5-0; 4-1; 3-2; 2-3; 1-4; 0-5)
- use written tallies and/or numbers to represent the patterned story of how the 'number of ...' changes in each place in each stage of the story (the 'worksheet')



Did you notice any progress in your learners in general (or in some in particular) in terms of each of these skills as your use of the resource progressed? Explain.

How did you adapt the activity format (if at all)?

Did any of the learners engage with the books to do imitative reading with each other? Were there any other ways that learners engaged with the book / story?

If so explain your experience of this.

NOTES:

Reflection Activity continued



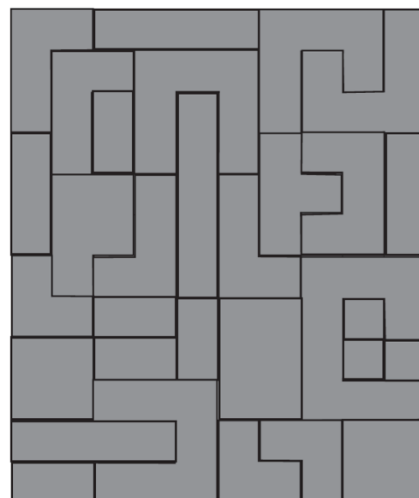
2. Patterning and puzzle activities

In the fourth session we worked with a number grid and some puzzle pieces.

- Reflect on your experiences of the use of **the activities**.
- Did you make any adaptations to the activities? If so, explain.
- What were the learner experiences of the activities?
- Do you have the 1 to 31 grid displayed in your classroom? If so, where?

	write month here if required								
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31									

NOTES:



Reflection Activity continued



3. Playing card games for Cognitive Control and Numeracy Progression

In the last session we introduced some playing card games.

- Some were to develop cognitive control:
 - Memory (concentration)
 - Dingaen's kraal
 - Snap
- Others had a mathematical focus
 - Ordering cards
 - Make 5
 - More or less
- Reflect on your experiences of playing the games with the learners e.g. which ones did you play, what preparation did you need before playing the game?
- Reflect on the learner experiences of playing the games
Did you notice any progress in your learners in general (or in some in particular) in terms of what they could do as played the games? Explain.
- Did you make any adaptations to the games?

	less	card		more
		3 ♠ ♠ ♠ ♠ 3		
	less	card		more
2 ♦ ♦ ♦ 2		3 ♠ ♠ ♠ ♠ 3	4 ♥ ♥ ♥ ♥ 4	

NOTES:

This section provides details of the activities that are be presented in this workshop.
Every workshop will have a similar section so you know where to look in the handbook.

Resources

Growth mindset activities

Page: 8

Thinking about numbers relationally

Page: 9

Thinking about 1-10 relationally

Page: 11

**Thinking about numbers relationally for
yourself**

Page: 12

Growth mindset activities



I can work with numbers in different ways

In this session, you will receive one of these posters to display in your classroom.



Learner discussion

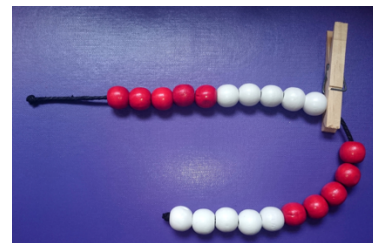
As you put this poster up, you could have a discussion with the learners about this.

- Reflect as a class on the name you have given to this girl e.g. Busi
- Refer the learners back to poster one: **I love working with numbers**
- Ask the learners:
 - “How many fingers does Busi have up on her left hand / on her right hand?”
 - “How many fingers altogether?”
 - “Can you show me the same number of fingers as Busi?”
 - “How do you think Busi uses numbers in her life?”
 - Why do you think Busi loves working with numbers?”
- Point out the ‘5’ and ‘2’ number symbols on the poster
- Ask the learners to count the the blocks / dots and dice dots
- Point out to the learners that they are working with numbers in many different ways
- Ask the learners:
 - “Do you love working with numbers?”
 - “How do you use numbers?”

Talk about Busi’s positive attitude

Ask the learners to read along as you point to the words “I can work with numbers in different ways”.

Thinking about numbers relationally



What does it mean to know 1-5?

You need:

A blank 5 square number track for each pair (i.e. the blank 5-frame from your flash card pack)



5 double-sided counters for each pair of learners

Learners work in pairs.

Each pair needs ten counters, five in one colour for Player 1 and five in another colour for Player 2

- How many squares in the track?
- Would the number be the same if we counted from the other end?
- Place counters to keep track of the count.

Work in pairs for this activity:

Step 1: Player 1 can place 1 or 2 of their counters on the track.

Step 2: Player 1 says 'There are __ counters on the track'

Step 3: Player 2 can place 1 more or 2 more of their counters on the track.

Step 4: Player 2 says a sentence that matches their action

e.g. 'I added two counters to your one counter. Now there are three counters altogether'

Step 5: Player 1 has to show this number sentence on their fingers, e.g. show one finger, open two more fingers to make three fingers and say:

'First there was one (show one finger), then you added two more (open two more fingers). Now there are three.'

Step 6: Player 1 can now add 1 or 2 more of their counters to the track and the repeat steps 2-5 above in turns.

Some variations

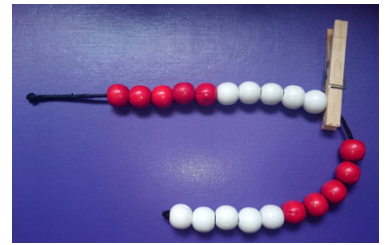
Change the sentence to focus to saying the numbers that are 'inside' other numbers, e.g.

Three and one are inside four,

Four is made up of three and one

- Player 1 starts with 5 counters on the track, Player 2 can remove one or two counters and say what they have done. Player 1 shows and describes the 'taking away' action on their fingers
- As children become familiar with writing numbers, a focus on writing number sentences or number and word sentences that match the actions can be included, e.g. 3 and 2 make 5 or $5 = 3 \text{ and } 2$

Thinking about numbers relationally continued



What does it mean to know 1-5?

More activities using the five track

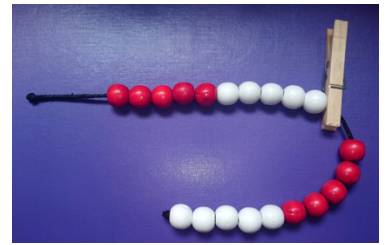
- Point to a 'position' on the number track
Show how many squares to this position on your fingers. How many more fingers to make 5?
- Take turns to write the numerals 1 to 5 into your number track
- Player 1 places their counter at 1.
Player 2 places their counter in any other square.
How many jumps from 1 to get to __?
- Player 1 places their counter at 5.
Player 2 places their counter in any other square.
How far between the two counters?

Discussion

Look at the number of different ways in which questions have been phrased within the paired activities above. Notice that we have connected between number track, fingers, spoken language and numerical symbols.

Can you teach us how to play one of these games in isiXhosa or Afrikaans?

Thinking about 1-10 relationally



Numbers within numbers

You need:	Learners work in pairs
<ul style="list-style-type: none">• One bead string per pair• 1 to 20 number track for each pair• 5 paper clips per pair• 2 double-sided counters	

1. Make 8, 6, 9, 7, 10 on the bead string, seeing them and saying them as '5 and ...'
Show these combinations on your fingers as you make each one.

2. How many beads are hidden?

3. Write and complete bonds of 10 number sentences:

$$10 = 7 + _$$

$$_ + 5 = 10$$

$$10 = 8 + _$$

$$2 \text{ and } _ \text{ makes } 10$$

$$10 - 4 = _$$

$$9 \text{ more than } _ \text{ makes } 10$$

$$7 \text{ less than } 10 \text{ is } _$$

Some variations

- Split 7 counters between two hands. How many in each hand?
- Create all the bonds of 7, writing the equivalence sentences: $7 = 0 + 7 = 1 + 6 = 2 + \dots$
- Repeat steps 4 and 5 above for bonds of other numbers between 6 and 10

1 to 20 numeral track game

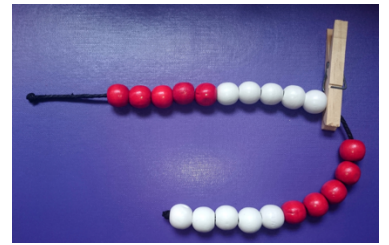
Objective: to capture paper clips from the numeral track

1. Place paper clips randomly on different numbers.
2. Place both counters on any empty number.
3. Take turns. When it is your turn, you can jump 1 or 2, going forward or back.
4. Tell your partner what your choice is and make the jump.
5. Who wins the most paper clips?

Discussion

Do you think these games are useful and practical for using in your classroom? What planning would you have to do to support learners' working? What are some of the difficulties?

Thinking about numbers relationally for yourself



Seeing numbers in relation to other numbers

<p>Mathematical object of learning:</p> <p>Emphasis is on seeing numbers, not just as quantities but in relation to other numbers:</p> <ul style="list-style-type: none">• as 'within' larger numbers• as 'between' friendly numbers like multiples of 10• as 'close to' particular friendly numbers	<p>You need:</p> <p>Different coloured strips: 7cm, 15 cm, 30 cm</p>
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- Who is taller, me or Mike? How much taller?
Which coloured strip best shows the difference in our heights?
- If we both stand on chairs, which strip shows the difference in our heights now?
- If I stand on a chair, which strip shows the difference in our heights now?
- Why is this helpful?
- How would you work out?
$$\begin{array}{r} 202 \\ 178 - \\ \hline \end{array}$$
- Can you work it out more quickly using '**heights & chairs**' thinking?
- Use 'heights and chairs' thinking to write equivalent number sentences for these problems :
$$\begin{array}{r} 406 \\ 398 - \\ \hline \end{array} \quad \begin{array}{r} 481 \\ 459 - \\ \hline \end{array}$$
- What about: 49
$$\begin{array}{r} 52 + \\ \hline \end{array}$$
- Can we use '**fists and counters**' thinking to work this out more quickly?
- Which would work for?
$$\begin{array}{r} 67 + 83 \\ 156 + 58 \end{array}$$

Discussion

Thinking relationally reduces the need for more complex calculations and keeps 'number sense' in play. What do you think about 'thinking relationally'?

1 to 10 Numeral Track - English

one 1	two 2	three 3	four 4	five 5	six 6	seven 7	eight 8	nine 9	ten 10
one 1	two 2	three 3	four 4	five 5	six 6	seven 7	eight 8	nine 9	ten 10
one 1	two 2	three 3	four 4	five 5	six 6	seven 7	eight 8	nine 9	ten 10

1 to 10 Numeral Track - Afrikaans

een 1	twee 2	drie 3	vier 4	vyf 5	ses 6	sewe 7	agt 8	nege 9	tien 10
een 1	twee 2	drie 3	vier 4	vyf 5	ses 6	sewe 7	agt 8	nege 9	tien 10
een 1	twee 2	drie 3	vier 4	vyf 5	ses 6	sewe 7	agt 8	nege 9	tien 10

1 to 10 Numeral Track - isiXhosa

nye	bini	thathu	ne	hlanu	thandathu	sixhenxe	sibhozo	lithoba	lishumi
1	2	3	4	5	6	7	8	9	10
nye	bini	thathu	ne	hlanu	thandathu	sixhenxe	sibhozo	lithoba	lishumi
1	2	3	4	5	6	7	8	9	10
nye	bini	thathu	ne	hlanu	thandathu	sixhenxe	sibhozo	lithoba	lishumi
1	2	3	4	5	6	7	8	9	10

1 to 20 Numeral Track

