



SA  
NUMERACY  
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PROJECT

# Session Eight Teacher Handbook

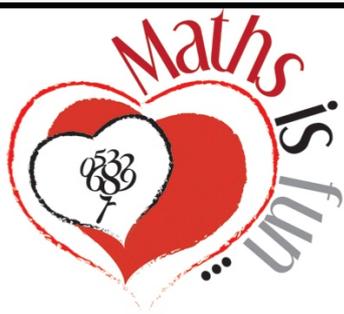
## Early Number Fun Grade R Teacher Development Programme

Name

\_\_\_\_\_

School

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To access resources for this session,  
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## Introduction to session

In the first part of this session we focus on teacher experiences of using the activities from session 7.

These included activities based on:

1. Dot patterns and dominos
2. Cognitive control activities using the Freeze game and Hopscotch

## Using story (narrative) approaches for developing number sense

In this session, we provide the third book in a series of story-books that have been written to support the transition from context based counting to object bound counting. This book is the Frogs and the Lily Pads.

Using story-books with images, and through encouraging learners to answer questions and represent what is happening in the stories with their fingers and puppets, learners will be supported in developing skills of:

- Context bound counting and calculating in the range 1 to 5
- Object bound counting and calculating 1 to 5
- Numeral recognition in the range 1 to 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'

The method of working with the stories with learners will encourage learners to:

- Focus on pictures, numerals and words and speak the key words and number names as the story unfolds
- Act out with facial expressions emotions and feelings communicated in the story
- Have a conversation with the reader
- Notice patterns
- Predict what might happen next
- Tell their own stories using story-boards and puppets
- Tell their own stories using their fingers to represent the number of frogs on different lily pads etc.
- Do imitative reading where they 'read' the story to others in the class

## 5 and 10-frames for developing a sense of 5 and 10

A ten frame is a simple graphic tool that allows learners to "see" numbers.

- 10-frames are useful tools for developing number sense within the context of ten.
- Arranging counters in different ways on the ten-frame prompts students to form mental images of the numbers represented.
- Understanding that numbers are composed of tens and ones is an important foundational concept, setting the stage for work with larger numbers.
- A strong sense of "ten" is a prerequisite for place-value understanding and mental calculations.

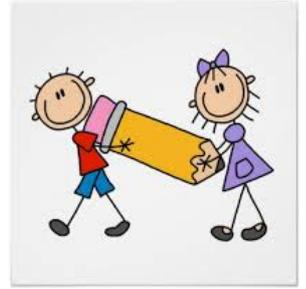
Children in Grade R and 1 should explore numbers with a five-frame first before moving on to a ten-frame. When the children are ready (much later in the Grade R year), introduce the 10-frame with the following **rule** to encourage a "standard way" to show numbers on the ten-frame.

*Always fill the top row first, starting on the left, the same way you read.  
When the top row is full, place counters on the bottom row, also from the left.*

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## Reflection Activity

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

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

- Black wooden trays
- Dot pattern cards and dominoes
- Freeze game and Hopscotch

1. Reflect on your experiences of the use of **these resources in class**.
2. Did you make any adaptations to the resources? If so, show / explain to the members of your group.
3. What were the learner experiences of the resources?

### 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**

**Cognitive control activities**

**Page: 6**

**Story-based activities – Frogs on the lily pad**

**Page: 7**

**Creative activities**

**Page: 9**

**5-frame activities**

**Page: 10 onwards**

# Cognitive control activities



## Spot the Difference activities

The aim of these activities is for learners to compare two dot patterns and to look for what is the same and what is different between them.

It is important to encourage the learners to explain the differences that they notice to develop their language of comparison. Use words about colour, shape, quantity, cardinal positions and so on.

<b>Skills:</b> <ul style="list-style-type: none"> <li>to develop executive functions of: Working memory and shifting attention</li> <li>to develop descriptive language of comparison</li> </ul>	<b>You need:</b> <ul style="list-style-type: none"> <li>Pack of 10 <b>Spot the Difference cards with dot patterns</b> (see below)</li> <li>Dry wipe markers &amp; cloth</li> </ul>	<b>Work with:</b> <ul style="list-style-type: none"> <li>We suggest working with smaller groups sitting in a circle on the mat or around a table</li> </ul>

## Using the activity

- Work with a group of learners in a circle.
- Each card is numbered. Learners work individually on one card at a time.
- When all learners are finished with a card, they pass the card onto the learner on their left.

## Ask learners to:

- Look at the top picture (the one above the dotted line)
- Look at the bottom picture (the one below the dotted line)
- Look for the *differences*
- Explain what they notice
- Circle or draw the missing pieces / parts (with a whiteboard marker)

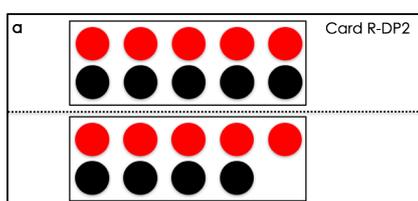
## Language development – some question prompts if needed

Ask learners:

- What is the same in both pictures?
- What is different?
- What is missing in the bottom picture?

## Encourage learners to talk about:

### Using this card as an example:



The number of dots they see

e.g. "There are 10 dots at the top. There are 9 dots at bottom."

How the dots are organised and positioned

e.g. "The dots are in two rows – one with 5 and one with two."

The colours of the dots

e.g. "There are 5 black dots at the top and only four at the bottom."

The shape of the pattern

e.g. "The dots at the top make a rectangle."

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## Story-based activities – Frogs on the lily pad

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### Getting started with the story book

First read the story to your learners. This could be with the whole class on the mat or with smaller groups of learners on the mat while other learners are occupied with other activities.

As you read,

- pause to ask the questions such as “which pad has more or less frogs?”
- encourage learners to use expressions to act out the story
- Allow learners to point to the story. It is laminated so they can touch it. For example, when counting the frogs on the lily pads.
- Point out the words – **more, less, big, small** and the **numeral** and **number** words on each page that describe what is happening.  
Ask learners to repeat these words as you point to them.

### Re-enact the story

Now get learners to re-enact the story from memory.

- Draw two lily pads on the floor with chalk.  
Allow 5 learners to act out the story.
- Point to the ‘small lily pad’ and say to the learners “here are the 5 frogs on small lily pad and no frogs on the big lily page like at the start of our story – do you agree? Are there 5 here?”.
- Ask individual learners to put the word cards and number cards at the feet of the ‘pads’
  - i.e. more; big and 5-five under the small lily pad and less; small; and zero under the big lily pad.
- Ask the other learners if they agree with the cards placed by the lily pads.
- Then ask learners what happened next in the story.
- The learner tasked with moving the frogs takes two frogs from the small lily pad to the big lily pad.
- Now ask learners “How many frogs are there now on each lily pad? Which lily pad has more frogs?”
- At each stage ask the learners: “How many frogs are there altogether on both lily pads?”.
- Ask learners to change the cards at the bottom of each lily pad.
- Continue like this for each stage of the story.

It is important to emphasise that there are always 5 frogs and they are shared between the lily pads in different combinations of 5:

i.e. 5 and 0; 3 and 2; 2 and 3; 0 and 5

### What is the same and different from ‘Monkeys in the Tree’ and ‘Umbrella and Children’ books?

- *Same*: Still working in the number range 1 to 5
- *Different*: Counting in twos and the concepts of 2 more and 2 less

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## Story-based activities – Frogs on the lily pad

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### POST STORY CONSOLIDATIONS

These activities can be done in the days and weeks following these activities.

#### Flashcards and fingers

<b>Resources required:</b>	<b>Skills:</b>
Numeral and number word flash cards	Numeral and number word recognition, relating fingers with the numerals and words.

- Using a flash card, ask learners: "Show me this many fingers".
- Once learners can recognise the words and numerals together switch to hiding the numeral and focusing only on the word recognition.

#### Extension activities

Below are some ideas for extending the learning using other activities.

1. For learners who are easily managing to act out the story with finger puppets, encourage them to begin to show the story with only their fingers (no puppets). In this case you are progressing them to object-based counting as fingers represent the frogs. Emphasise the jumping movement with "wheeeee" as a finger on one hand goes down and then appears on the other hand.
2. Encourage learners to tell other students the story using the final blank lily pad page of the story book. Learners can place their coloured frogs on the lily pads using prestik and then move them from one lily pad to the other as they tell/enact the story
3. Encourage learners to 'read' the story to you or to other learners as they show each page to the audience. Such imitative reading is a first step towards reading.
4. Of course, other learning can be integrated across the story activities based on discussion of the frogs:
  - "Have they seen frogs before – if so where?"
  - "What colour are frogs?"
  - "What do frogs eat?"
  - "How many toes do frogs have?"
  - and so on.

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## Creative activities

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### Finger puppets

The finger puppets can be used as representations for enacting the Early Number Fun Story books on their fingers and on the blank pages for telling the story at the end of the book.

### Making the puppets

<b>Resources required:</b>	Development of colouring skills, fine motor coordination (cutting skills), imagination and creative play
Photocopies of frogs	
Crayons	
Scissors	
Prestik, glue or sellotape	

1. Give each learner a strip of 5 frogs
2. Allow learners to colour each frogs  
Learners might want to colour the main frog in the story a different colour to the others or put the first letter of the frog's name on it  
i.e. F for Freddie Frog, P for Pietie Padda or S for Sami isele
3. Get learners to cut out each frog (with a big square so that it can be rolled into a finger puppet).
4. Get learners to stick each rolled puppet with a piece of prestik, glue or sellotape
5. Get the learners to place the puppets onto their fingers

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## 5-frame activities

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For all of these activities, we suggest working with smaller groups on the mat

**Remember the Golden Rule:**

**Always fill the top row first, starting on the left, the same way you read.  
When the top row is full, place counters on the bottom row, also from the left.**

### Five Frame Tell About

**Mathematical object of learning:**

- developing number sense within the context of 5
- help learners to form mental images of the numbers represented

**For each learner, you need:**

- Blank 5-frame



- Set of counters

- Have children show 3 on their five-frame.
- After hearing from several children, try other numbers from 0 to 5.
- Children may place their counters on the five-frame in any manner.
- Ask learners what they see. What they observe will be different from child to child.
- For example, with four counters, a child with two on each end may say, "It has a space in the middle," or "It's two and two."
- There are no wrong answers. Focus attention on how many more are needed to make 5 or how far away from 5 a number is.

### Discussion Ideas/Possible Questions to Ask:

- Observe how learners group their counters
- "What can you tell me about 3 by looking at your mat?" A child might answer: "It is 2 and 1"

### Extension

Do the same activity with a 10-frame

### Building Sets

**Mathematical object of learning:**

- developing number sense within the context of 5
- help learners to form mental images of the numbers represented

**For each learner, you need:**

- Blank 5-frame



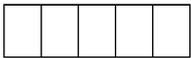
- Set of counters

- Call out a number to the students, such as 4, and have them show that amount on their frame.
- They may place the counters in any manner.
- Ask if they can place the 4 counters down in a different way.
- Try other numbers from 0-5.
- Have your students make observations about their placement of counters.
- For example:
  - It has a space in the middle.
  - It's two and two

## 5-frame activities continued

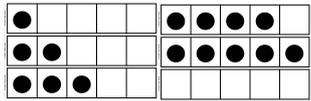


### Roll and Build

<p><b>Mathematical object of learning:</b></p> <ul style="list-style-type: none"> <li>developing number sense within the context of 5</li> <li>help learners to form mental images of the numbers represented</li> </ul>	<p><b>For each learner, you need:</b></p> <ul style="list-style-type: none"> <li>Blank 5-frame</li> </ul>  <ul style="list-style-type: none"> <li>1 dice</li> <li>Set of counters</li> </ul>
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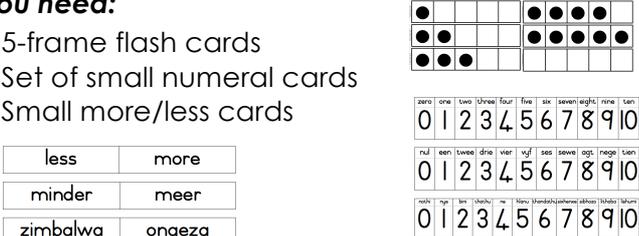
- Learners roll one dice and build that amount on their five frame with counters

### Five Frame Flash

<p><b>Mathematical object of learning:</b></p> <ul style="list-style-type: none"> <li>developing number sense within the context of 5</li> <li>help learners to form mental images of the numbers represented</li> </ul>	<p><b>You need:</b></p> <ul style="list-style-type: none"> <li>5-frame flash cards</li> </ul> 
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- Flash a five frame card to your learners
- Ask them to say how many dots they saw.
- To challenge learners ask them to identify one more or one less than the amount of dots.
- To extend, have them tell you how many empty spaces there are or how many more are needed to make 5.

### Assigning a numeral to the frame

<p>Mathematical object of learning:</p> <ul style="list-style-type: none"> <li>developing number sense within the context of 5</li> <li>help learners to form mental images of the numbers represented</li> </ul>	<p><b>You need:</b></p> <ul style="list-style-type: none"> <li>5-frame flash cards</li> <li>Set of small numeral cards</li> <li>Small more/less cards</li> </ul> 
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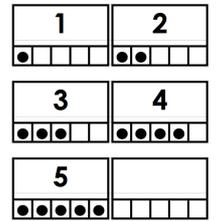
- Lay out the set of numeral cards and more/less cards
- Place a 5-frame flash card in front of the learners
- Ask a learner to match a numeral card to a five frame
- Leave the 5-frame card and add another flash card
- Ask a learner to say if this card is *more* or *less* than the first one
- Ask them to select the word
- Repeat

## 5-frame activities continued



### Ordering frames

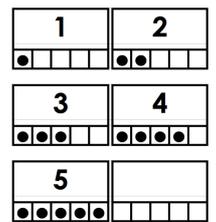
<p><b>Mathematical object of learning:</b></p> <ul style="list-style-type: none"> <li>• developing number sense within the context of 5</li> <li>• help learners to form mental images of the numbers represented</li> </ul>	<p><b>You need:</b></p> <ul style="list-style-type: none"> <li>• 1 set of 5-frame game cards per learner</li> </ul>
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- Shuffle the cards and ask a learner to put them in order from smallest to biggest
- If they are able to do that, ask them to put in order from biggest to smallest

### Five Frame Memory Game (with numeral recognition)

<p><b>Mathematical object of learning:</b></p> <ul style="list-style-type: none"> <li>• developing number sense within the context of 5</li> <li>• help learners to form mental images of the numbers represented</li> </ul>	<p><b>You need:</b></p> <ul style="list-style-type: none"> <li>• 3 sets of 5-frame game cards per pair/group</li> </ul>
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- Lay the cards face down like you do for the Memory game in 3 rows and 3 columns
- Learners turn over two cards at a time looking for two cards that represent the same number
- While playing, encourage children who do NOT count the dots

# 5 Frame Board

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