



# Early Number Fun Grade R Teacher Development Programme

## Session Two Teacher Handbook

Name

---

School

---

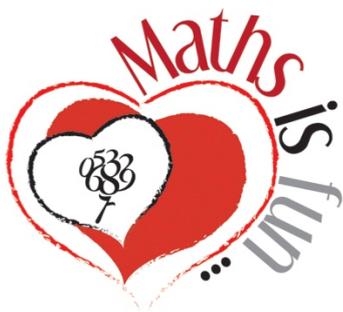
### DECLARATION

This booklet is not intended to be sold or used for profit making. It is used solely for educational purposes. You may photocopy pages if you wish.

© 2016 South African Numeracy Chair Project, Grahamstown, South Africa  
[www.ru.ac.za/sanc](http://www.ru.ac.za/sanc)  
Last updated: 12<sup>th</sup> May 2016

To cite this document:

South African Numeracy Chair Project. (2016). Early Number Fun  
Grade R Teacher Development Programme: Session Two Teacher Handbook.  
Grahamstown, South Africa: South African Numeracy Chair Project (Rhodes  
University).



## Table of contents

<b>Summary of the key ideas behind the activities in this session</b>	<b>3</b>
Assessment and progression	3
Using Story (narrative) approaches for developing number sense	4
Learner cognitive control	4
<b>Reflection Activity</b>	<b>6</b>
<b>Assessment Activity</b>	<b>7</b>
<b>Cognitive control activities using Space and Shape</b>	<b>8</b>
<b>Growth mindset activities</b>	<b>10</b>
I love working with numbers	10
Learner discussion	10
<b>Story-based activities – 5 monkeys in a tree</b>	<b>11</b>
<b>Creative activities</b>	<b>15</b>
Finger puppets	15
Making the puppets	15

## Summary of the key ideas behind the activities in this session

In the broad introduction in session one we explained the key ideas we focus on across the program. Here we will summarise the key ideas that are the focus of today's session (Session 2).

### Assessment and progression

In the first session we focused on use of an individual learner interview schedule in order to assess where learners are at. This is important to plan for activities that will enable progression to higher levels of learning. In this session we will review the findings from these assessments and discuss what these findings mean for further activities with the group as a whole and with individual or smaller groups of learners.

Additionally, the story activities that we focus on (see below) enable progression from context bound calculating to object bound counting and calculating through use of increasingly abstract representations for acting out number stories. Thus in terms of the progression framework given in the first session we are focusing on:

In this session our focus is on providing stories that give learners contexts for context-bound counting and progressions to object-bound counting. This area of progression is highlighted in the diagram below.

		Grade R	Gr R → 1	Gr 1 & 2	Gr 3 & 4	Gr 4 →
Cranfield et al.		Emergent numeracy Number sequences to 10	Learning to count and calculate + & - to 10/ number sequences to 20	Calculate by structuring + & - to 20/ number sequences to 20	Formal calculating	Counting and calculating up to 100 + & - to 100/ number sequences to 100
Wright et al. (LFIN)	EAS	0, 1, 2	3, 4	5		
	Structuring nos. 1 - 20	1, 2, 3				
	CPV				3	3
Buyse & Treffers		<b>Stages 1 to 4</b> Context bound – up to 4 objects Object bound – up to 10 objects Via symbolisation – unseen items/fingers	<b>Stages 5 &amp; 6</b> Count all Count on Count up to Count down	<b>Stages 7 &amp; 8</b> Stringing & splitting Doubles/halves Combining with 5 & 10 Partitions of 5 & 10		<b>Stages 9 &amp; 10</b> 2-digit + and -
Buyse, Treffers Visual progression						
Representations		Tallies, finger patterns, dot patterns	Models of... Line, group, combination, part-part-whole			

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

All children love a good story and especially love to interact with stories as they unfold. They show wonderful expressions of a wide range of emotions as stories unfold. Stories and books are also excellent for language and literacy development, developing learner concentration skills. They are also great for developing number sense when numbers are built into stories.

In this session we use provide the first of a series of story-books that have been written to support the transition from context based counting to object bound counting. 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  
(1-5 in the first 2 stories 1-10 in the 3rd)
- Object bound counting and calculating  
(1-5 in the first 2 stories 1-10 in the 3rd )
- numeral recognition  
(numerals 1-5 in the first 2 stories 1-10 in the 3rd)
- 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 and bonds to 10 - 3rd story)
- 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 (extension for learners ready for this aspect)

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
- 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 monkeys/frogs/children in different trees/lily pads/places etc.
- Do imitative reading where they 'read' the story to others in the class

## **Learner cognitive control**

In the first session we discussed 3 key cognitive control functions that should be developed. These were inhibition, flexibility and working memory. In today's session we share an activity that focuses on **shifting attention** (flexibility), which is the ability to shift attention from one aspect or mental state to another. Sorting shapes according to colour, shape or size allows for the development of the executive function of flexibility in thinking and also for development of mathematical and other language in describing the shapes and the relative sizes, number of sides, shape names etc. as learners are asked to explain the reasoning behind their sorting. The cognitive challenge is not in learners first chosen sorting method (although this is an excellent opportunity for supporting the development of language, particularly mathematical language – big, small, square, 3 sides, corners etc.) Rather it is in their needing to suppress this first choice in order to find a second sorting method.

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

## **Resources**

### **Reflection activities**

**Page: 6**

### **Assessment activities**

**Page: 7**

### **Cognitive control activities**

**Page: 8**

### **Growth mindset activities**

**Page: 10**

### **Story-based activities**

**Page: 11**

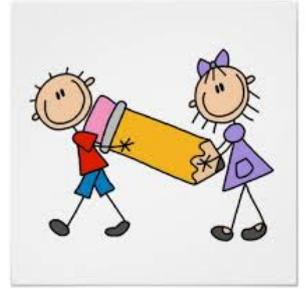
### **Creative activities**

**Page: 15**

---

## 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. Make notes in the space below.

- Memory Game
- Simon Says Game
- Wolfie Time Game

Use these questions to guide your reflection and discuss:

1. Have you tried the games/activities in your classroom?  
Explain - discuss
2. How did you organise the children to play the games?  
Explain - discuss
3. Were there any aspects of the activities/games that you adapted that you would like to share with the community?  
Explain - discuss
4. Will you use the activity/game again? Why?  
Explain - discuss

**NOTES:**

---

## Assessment Activity

---



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

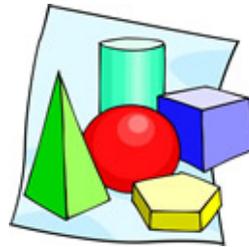
Use your learner assessment sheets to guide your discussion if need be. Make notes in the space below.

In your groups discuss the following:

1. Which part of the assessments did almost all your learners manage easily?  
Explain – discuss
2. Which part of the assessment did many of your learners struggle with? What activities might you use to strengthen this aspect over the next few months?  
Explain – discuss
3. Was there an aspect of the assessment that surprised you in terms of what your learners or a particular learner did in response?  
Explain – discuss.
4. Were there some learners who performed much better or much weaker than you expected?  
Explain – discuss
5. What learning or 'aha moments' did the individual assessment interviews enable for you?  
Explain – discuss

**NOTES:**

# Cognitive control activities using Space and Shape



## 1. Sort the shapes – Instructions

<b>Location:</b> Inside In small groups / pairs / individual work	<b>Resources required:</b> Shape cards	<b>Skills:</b> Development of attention switching, memory, shape recognition, geometric vocabulary
---	---	---

Have the children sort their shapes according to one of the following:

- Colour
- Size
- Patterns
- Shape
- Number of sides
- Curved or sharp.

- Ask learners to now sort the shapes in another way.
- Discuss the different ways learners sorted the shapes.
- Encourage using vocabulary such as: curved, straight, edge, corner, round, long, short, sides, sharp, pointy.
- Also direct learners' attention to which group of sorted shapes has **more** or **less** each time.
- Use the more and less word cards from the story to mark which groups has more or less.

## 2. On and Under – Instructions

<b>Location:</b> Inside or Outside In small groups or whole class	<b>Resources required:</b> Shape cards	<b>Skills:</b> Development of shape recognition, spatial reasoning, directional vocabulary, listening skills
---	---	---

- Give each learner three shape cards
- Ask them to name (if possible) and describe their shape to you and their friends
- Now have learners follow **spatial** directions such as:
  - Put your shape on, behind, on top of, in front of, under, next to
  - your body/head/foot, the chair, the table, your friend etc.

## Cognitive control activities using Space and Shape continued



### 3. SNAP! – Instructions

<b>Location:</b> Inside In small groups / pairs / individual work	<b>Resources required:</b> Shape cards	<b>Skills:</b> Development of attention switching, memory, shape recognition, inhibition, visual processing (fast reactions)
---	---	---

- Use the shape cards to play SNAP!
- Children divide shapes up equally. They take turns putting a shape in the middle of the table
- when two shapes match (they can decide what must match – the number of sides/colour/size/shape etc.), the first child to put their hands over the cards and says “Snap!”
- This child takes the cards in the pile.
- The game ends when one child runs out of cards to play.

### 4. Make pictures - Instructions

<b>Location:</b> Inside In small groups / pairs / individual work	<b>Resources required:</b> Shape cards	<b>Skills:</b> Development of creativity, shape recognition, fine motor development
---	---	--

In groups, or individually, encourage learners to build new shapes or pictures out of existing shapes. These can be something real or made-up. If working individually, learners can then draw a picture of their shape creation, give their picture to friend (you can keep all the pictures to use again later) and have their friend use the shapes to build the picture.

### 5. Show me the shape –Instructions

<b>Location:</b> Inside or outside In small groups / pairs / individual work	<b>Resources required:</b> Shape cards	<b>Skills:</b> Development of listening skills, geometric vocabulary, reasoning abilities
--	---	--

- Teacher says she is thinking of a shape, for example: “It has three sides. Two sides are longer than the other one”, then says “Show me the shape!”
- Learners find and hold up the matching shape from the collection, and name it (if possible).
- Name the shape.
- Each learner in a smaller group can have a turn to describe the shape.

### 6. Memory Game - Instructions

<b>Location:</b> Inside In small groups or pairs	<b>Resources required:</b> Shape cards	<b>Skills:</b> Development of working memory, shape recognition
--	---	--

- Lay four shapes out in a row.
- Talk about, describe and name each of the shapes in the row.
- Now ask the learners to close their eyes.
- Take one shape away. Ask the learners which one is missing. As they get more confident, add more shapes in the row.
- Pairs of learners can play this game too.

---

## Growth mindset activities

---



### ***I love working with numbers***

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



### ***Learner discussion***

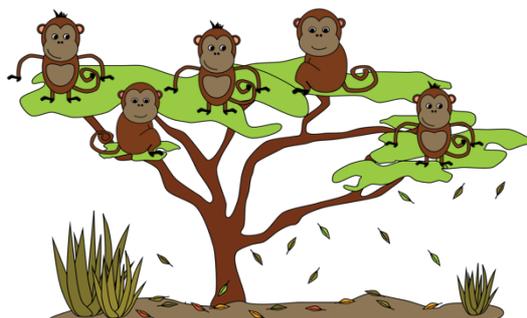
As you put this poster up, you could have a discussion with the learners about this.

- Perhaps you and your class could think of a name for this girl such as Busi
- Ask the learners:
  - “How many fingers does Busi have up?”
  - “How many fingers on one hand?”
  - “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?”
- Ask the learners:
  - “Do you love working with numbers?”
  - “How do you use numbers?”
- Point out the ‘5’ number symbol above her hands
- Ask the learners to count the flowers and talk about their colours
- Talk about Busi’s positive attitude and ask the learners to read along as you point to the words “I love working with numbers”.

---

## Story-based activities – 5 monkeys in a tree

---



### 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 tree has more or less monkeys?”
  - 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 monkeys in the tree.
  - 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.

- Have one learner be the **small** tree holding 5 monkeys (using five puppets).  
Have another learner be the **big** tree (s/he can stand on a chair to be taller) – at the start this learner has no monkeys.  
Allow another learner to be the one moving the monkeys between the trees.
- Point to the ‘small tree’ and say to the learners “here are the 5 monkeys in the small tree and no monkeys in the big tree 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 ‘trees’
  - i.e. more; big and 5-five at the foot of the small tree and less; small; and 0-zero at the foot of the big tree.
- Ask the other learners if they agree with the cards placed by the trees.
- Then ask learners what happened next in the story.
- The learner tasked with moving the monkeys takes the one monkey from the small tree to the big tree.
- Now ask learners “How many monkeys are there now in each tree? Which tree has more monkeys?”
- At each stage ask the learners: “How many monkeys are there altogether in both trees?”.
- Ask learners to change the cards at the bottom of each tree.  
The card for the size of the tree will stay and the more and less will stay until the 3<sup>rd</sup> monkey jumps.
- Continue like this for each stage of the story.

It is important to emphasise that there are always 5 monkeys and they are shared between the trees in different combinations of 5.

i.e. 5 and 0; 4 and 1; 3 and 2; 2 and 3; 1 and 4; 0 and 5.

## POST STORY CONSOLIDATIONS

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

### Flashcards and fingers

<b>Resources required:</b> Numeral and number word flash cards	<b>Skills:</b> 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.

### Finger puppets

<b>Resources required:</b> Crayons, prestik, glue or sellotape, scissors Sheets of monkeys (5 monkeys per learner)	<b>Skills:</b> Numeral and number word recognition, relating fingers with the numerals and words. The colouring and cutting is also important for developing fine motor co-ordination.
--	---

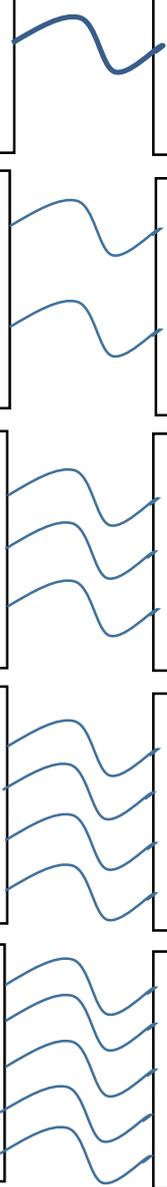
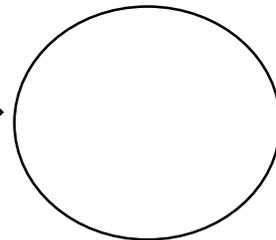
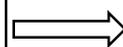
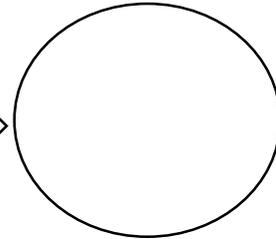
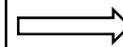
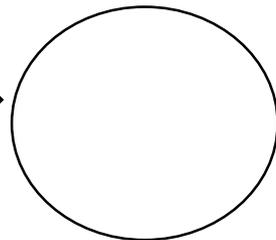
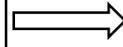
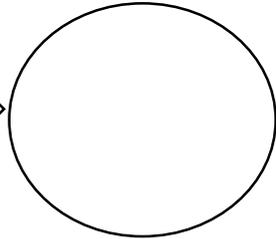
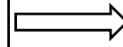
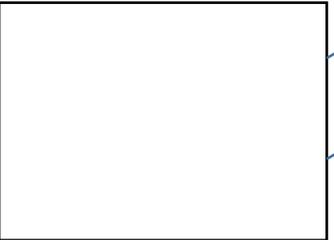
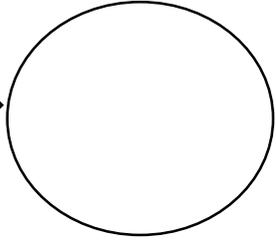
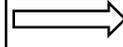
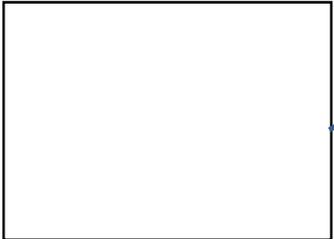
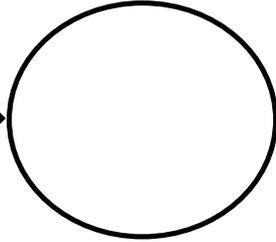
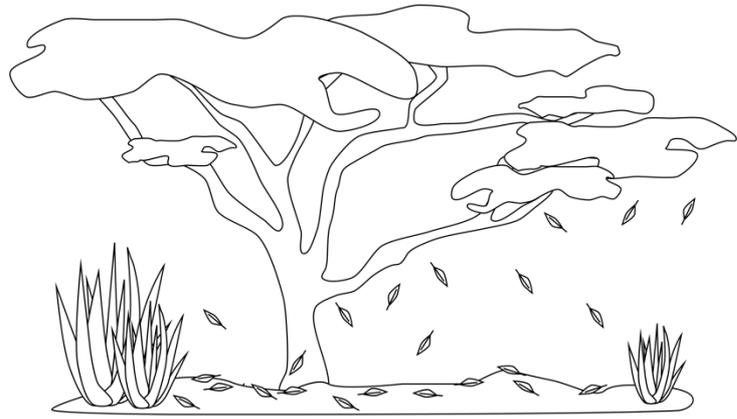
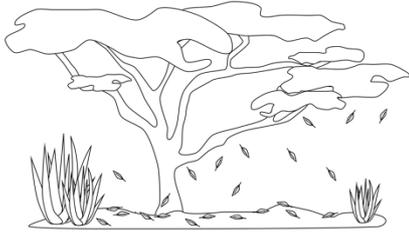
- Get learners to colour in 5 monkey puppets and then cut them out to turn them into a finger puppet using prestik, glue or sellotape.
- Learners put the 5 monkeys on one hand and then using their hands, they 'act out' each part of the story, step-by-step.
- The one hand with the 5 monkey puppets and the other with no monkeys represents the start of the story with 5 monkeys in the small tree and no monkeys in the big tree.
- Ask learners to remember what happened next in the story and get them to 'act it out' by moving the monkey puppets one at a time to the other hand.
- At each stage ask: "How many monkeys in the small tree? How many monkeys in the big tree? How many monkeys altogether?"

### Extension activities

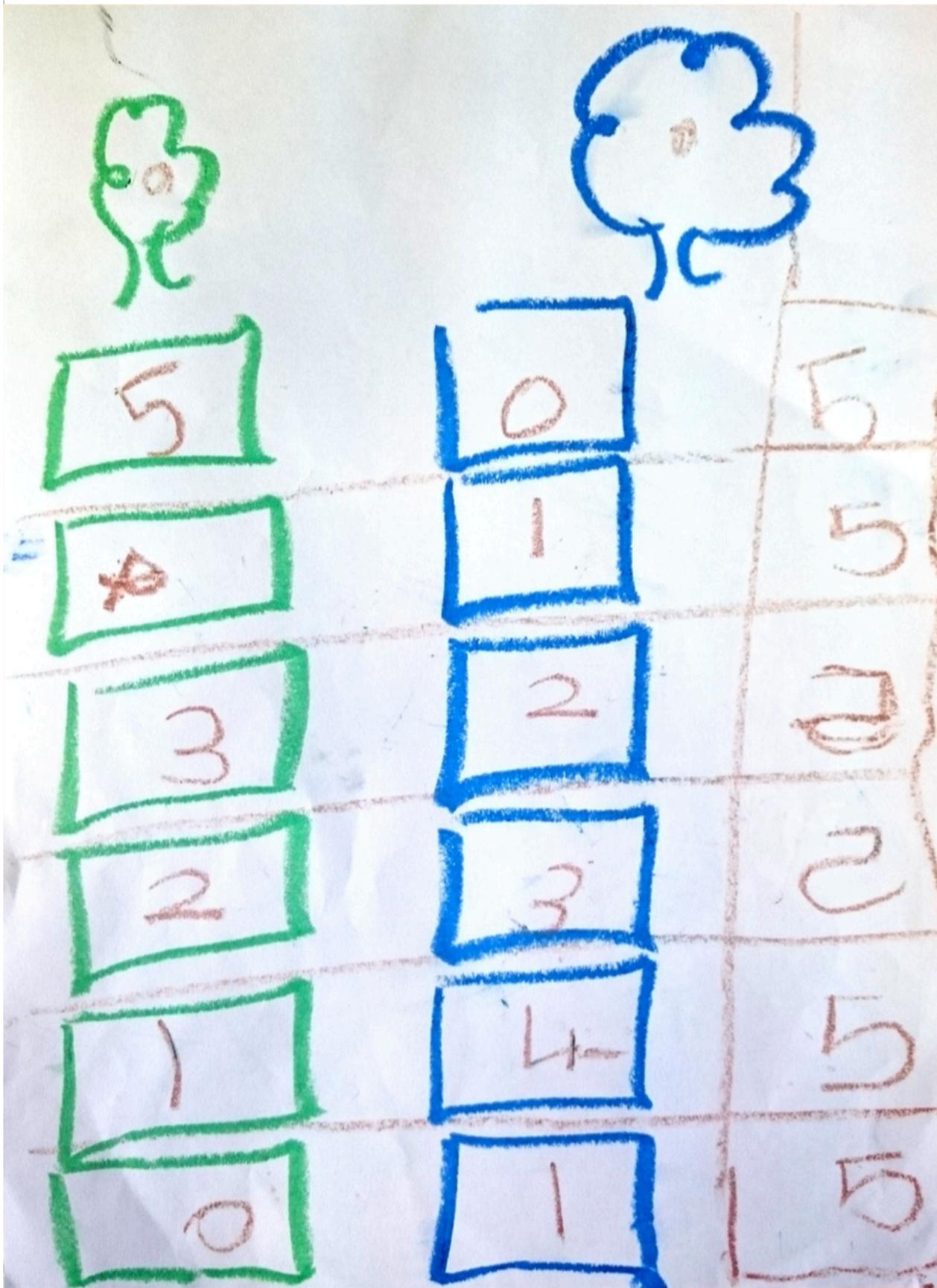
Below are some ideas for extending the learning using other activities.

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 monkeys. 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 tree page of the story book. Learners can place their coloured monkeys on the trees using prestik and then move them from one tree to the other as they tell/enact the story
3. Some learners may be ready to represent the story stages by drawing dots or lines for monkeys or writing numbers to show what happens each stage of the monkey story. You can give them a template (see next page for a template) for the story or allow them to come up with a way to draw the story their own way. Encourage the learners to see the pattern in the number representations down each column.  
The next page shows an example of what one pair of learners did after working with the story in the way described above.
4. 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.
5. Of course other learning can be integrated across the story activities based on discussion of the monkeys:
  - "Have they seen monkeys before – if so where?"
  - "Why do monkeys often live in trees?"
  - "What colour is a monkey's fur?"
  - "What do monkeys eat?"
  - "How many fingers and toes do monkeys have?" and so on.

# Template



Example of representing the story with dots, lines and numerals



---

## Creative activities

---



### **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 monkeys	
Crayons	
Scissors	
Prestik, glue or sellotape	

1. Give each learner a strip of 5 monkeys
2. Allow learners to colour each monkey  
Learners might want to colour the main monkey talking in the story a different colour to the others or put the first letter of the monkey's name on it  
i.e. M for Minky Monkey, A for Annie Apie or I for Inki Inkawu
3. Get learners to cut out each monkey (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