



2017 TRAINING WORKSHOP NO.9  
**MATHEMATICS**



**FOUNDATION PHASE**



education

Department:  
Education

PROVINCE OF KWAZULU-NATAL

**Foundation phase  
Just-in-Time Training Workshop 9  
May 2017**

**Participants' Handout**

**Maths**



**Jika iMfundo**  
what I do matters

Endorsed by:



Jika iMfundo  
Foundation Phase JIT  
Workshop 9 Mathematics: May 2017  
Workshop guide for participants

In this workshop participants will find out more about the teaching of space and shape and mental mathematics in the Jika iMfundo FP Mathematics materials. You will also think more deeply about using the continuous assessment activities provided in the Jika iMfundo FP Mathematics materials.

Work in groups on all of the activity questions. Time guidelines are given and your facilitator will interact with you while you work. You will also be able to share key ideas together with the large group.

**Workshop plan**

8.00 – 8.30 – Arrival and distribution of materials for the workshop

8.30 – 09.30 – Session 1: Mental mathematics in the Foundation phase (60 min)

09.30-11.00 – Session 2: 2-D and 3-D shapes/objects in the Jika iMfundo lesson plans (1½ hours = 90 min)

11.00-11.30 – Break

11.30-12.30 – Session 3: Teaching position, views and direction (1 hour = 60 min)

12.30 – 13.30 – Session 4: Continuous assessment in Jika iMfundo FP Mathematics (1 hour = 60 min)

**Session 1: Mental mathematics in the Foundation phase (60 min)**

The purpose of this session is to talk about the value of mental mathematics and also to give teachers some ideas for participatory mental mathematics activities that can be used in conjunction with the Jika iMfundo Lesson Plans.

The Jika iMfundo FP Mathematics materials provide a daily counting and mental mathematics activity, directly under the teacher's notes.

**Materials:** When you work through this activity you could refer to your Term 2 lesson plans.

This activity should take about 60 minutes.

**Warm up activity: Bean bag bounce...**

Mental mathematics is the ability to calculate, estimate and check solutions quickly without the need for any tool other than one's own mind. Learners will do many written calculations but while doing these, they will also exercise their mental mathematics abilities.

Mental mathematics plays a very important role in the curriculum. The number bonds and multiplication table facts that learners are expected to know or recall fairly quickly are listed for each grade. Knowing these off by heart will help learners do calculations with bigger numbers more easily and efficiently. You need to gradually extend your learners mental mathematics skills – by giving them ample practice and also by trying to make it fun. Showing them where mental mathematics comes in useful in bigger calculations should also motivate them to learn the basics by heart.

Mental mathematics is used extensively to explore the higher number ranges through skip counting and by doing activities such as up and down the number ladder, e.g. the Grade 3 teacher might ask a series of chained questions. For example:

*Start with 796. Make that 7 more. Yes, it is 803. Make that 5 less. Yes, it is 798. Make that 10 more... 2 more... 90 more... 5 less...etc. These activities help learners to construct a mental number line which reinforces number concept.*

Learners can use mental strategies to calculate sums and differences by thinking about strategic compensations to make when they do these calculations. For example:

*Explain how to find the following sums/differences:*

$$302 + 99 =$$

$$189 + 582 =$$

$$473 - 98 =$$

$$105 - 57 =$$

Mental mathematics also helps learners develop skills of looking for patterns using linked questions and a series of sums that follow a pattern: For example:

*Can you find a quick way to find answers for these?*

$$31 - 10 =$$

$$31 - 11 =$$

$$31 - 12 =$$

$$31 - 13 =$$

$$31 - 14 =$$

$$18 + 8 = \dots\dots$$

$$28 + 8 = \dots\dots$$

$$48 + 8 = \dots\dots$$

$$78 + 8 = \dots\dots$$

$$98 + 8 = \dots\dots$$

$$108 + 8 = \dots\dots$$

Mental mathematics thus features strongly in both the counting and the number concept development sections relating to the topics of number and number patterns. Mental mathematics skills can be used in any mathematics topics, where basic calculations are needed or where basic bonds and tables assist with bigger calculations.

### **Activity 1**

1. Why is mental mathematics useful?
2. Design a chain of questions appropriate for Grade 1 and Grade 2 learners:
  - a. Write out the chain.
  - b. Explain what mental mathematics skill the chain you have designed is developing or testing.
3. How do compensations help learners do mental calculations?
4. How does pattern identification help learners do mental calculations?

Mental work was previously seen primarily as a means of testing a learners' memorisation of number facts on a regular basis. Memorisation is very important, but mental mathematics activities can also be about mental calculations involving strategic thinking (a mental activity) that draws on memorised knowledge. You should not overemphasise speed.

Overemphasizing speed causes learners to:

- get the idea that “right answer finding” and speed are the most important aspects of mental activity;
- children, who can give quick answers, “beat” those who are still trying to figure the answers out for themselves;

Allow thinking time, because this:

- encourages learners to grow their bank of mental problem solving strategies,
- creates many opportunities to expose learners to different ways of dealing with tasks by sharing their different ideas
- builds respect for “thinking time”.

Reading and writing in mental mathematics:

Learners can write down the final answer, but not all the steps: these must be done mentally. If learners are hesitating and struggling, you could write the question on the board, let learners look at it for a minute or so (read) and then cover it up again. All the time you are trying to encourage mental activity.

Mental mathematics activities: There are many ways to allow learners to do mental mathematics activities that strengthen the calculation skills of learners. For example

- Number boards can allow for fun activities. For example, give a series of instructions that lead learners to shade blocks that create a picture. (e.g. Shade the block with the answer to  $1 + 1 = .$ ) The shaded blocks could be chosen to represent a picture of some sort. (e.g. if the shaded blocks are the numbers 2, 4, 22 and 44, these four blocks form the corners of a square.) Many other number board activities can be designed. Remember that they should require mental activity not just recognition.
- Create worksheets that have a series of activities that develop different calculation skills, especially the ability to compensate. Compensation is the manipulation of numbers in order to simplify a calculation – essentially, to make it easy to do the calculation mentally.
- Bingo games – design a series of questions (related to one/several operations/number concept/etc.) and play BINGO! (You could Google for the rules and for examples of maths BINGO.)

## Mental mathematics in Jika iMfundo

If you go through the full lesson plan set, just looking at the mental mathematics activities, you will see how they develop and offer a full range of mental mathematics activities each term. You could use other resources or simply adapt these activities if you want to vary the mental mathematics programme even more. The important thing is that you do some mental mathematics every day, to build up the strategic calculation abilities of learners in your class. This should take about **15 minutes** before main section of the mathematics lesson. It comprises of counting and mental calculations.

### Activity 2

Two mental mathematics extracts from each of the lesson plan sets for Grades 1, 2 and 3 for Term 2 are given below.

#### Look at the activities to see:

1. How do the activities vary across the three grades?
2. How do the planned mental mathematics cater for counting?
3. What other mental mathematics opportunities are provided?
4. How do these pairs of activities (provided daily in the lesson plans) cater for the CAPS requirements for mental mathematics?

### Grade 1 MM activities

#### Excerpt 1

##### 1.1 Counting (5 minutes)

- Count out objects (use counters/stones) reliably to 20.
- Count forwards and backwards in 1s from 1 to 30, starting from any given number.

##### 1.2 Recall and strategies (10 minutes)

Ask the learners to show you a number more than 3. Learners point to the numbers on their number boards with their finger. Ask the learners to tell the person sitting next to them how many more their number is than 3. Repeat with other examples e.g. *Show me a number less than 5/more than 7* etc.

#### Excerpt 2

##### 1.1 Counting (5 minutes)

- Count out objects (use counters) reliably to 20.
- Count forwards and backwards in 1s from 1 to 30, starting from any given number.

##### 1.2 Recall and strategies (10 minutes)

	Which is less?	Answer		Which is more?	Answer
1.	1 or 2?	1	6.	2 or 5?	5
2.	9 or 3?	3	7.	4 or 10?	10
3.	5 or 6?	5	8.	6 or 1?	6
4.	2 or 0?	0	9.	8 or 7?	8
5.	8 or 7?	7	10.	3 or 1?	3

## Grade 2 MM activities

### Excerpt 1

#### 1.1 Counting (5 minutes)

- Count forwards and backwards in 5s from 0 to 130.

#### 1.2 Mental mathematics activity (10 minutes)

	Give me a number(s) between:	Answer		Give me a number(s) between:	Answer
1.	45 and 47?	46	6.	15 and 17	16
2.	48 and 50?	49	7.	46 and 50	47, 48 and 49
3.	1 and 3	2	8.	22 and 24	23
4.	4 and 6?	5	9.	17 and 19	18
5.	23 and 26?	24 and 25	10.	40 and 43	41 and 42

### Excerpt 2

#### 1.1 Counting (5 minutes)

- Count forwards and backwards in 3s from 66 to 99.

#### 1.2 Mental mathematics activity (10 minutes)

	Calculate:	Answer		Calculate:	Answer
1.	$3 + 6 =$	9	6.	$5 + 4 =$	9
2.	$5 - 2 =$	3	7.	$6 - 1 =$	5
3.	$4 + 3 =$	7	8.	$7 + 2 =$	9
4.	$7 - 3 =$	4	9.	$3 - 0 =$	3
5.	$8 + 1 =$	9	10.	$0 + 10 =$	10

## Grade 3 MM activities

### Excerpt 1

#### 1.1 Counting (5 minutes)

- Count forwards and backwards in 4s from any number between 0 and 500. E.g. 104, 108, ...

#### 1.2 Mental mathematics activity (10 minutes)

	Calculate the following:	Answer		Calculate the following:	Answer
1.	Half of 12	6	6.	Double 9	18
2.	Double 12	24	7.	$3 + 3 + 3 =$	9
3.	Half of 6	3	8.	$3 + 3 + 3 + 3 + 3 =$	12
4.	Double 6	12	9.	Three more than fifteen	18
5.	Half of 9	$4 \frac{1}{2}$	10.	Three less than twelve	9

### Excerpt 2

#### 1.1 Counting (5 minutes)

- Count forwards and backwards in 3s from any number between 0 and 500. E.g. 103, 106, 109, ...

#### 1.2 Mental mathematics activity (10 minutes)

	Calculate the following:	Answer		Calculate the following:	Answer
1.	$10 - \underline{\quad} = 10$	0	6.	$11 - \underline{\quad} = 10$	1
2.	$15 - \underline{\quad} = 10$	5	7.	$12 - \underline{\quad} = 10$	2
3.	$19 - \underline{\quad} = 10$	9	8.	$13 - \underline{\quad} = 10$	3
4.	$16 - \underline{\quad} = 10$	6	9.	$17 - \underline{\quad} = 10$	7
5.	$18 - \underline{\quad} = 10$	8	10.	$14 - \underline{\quad} = 10$	4

## Session 2: 2-D and 3-D shapes/objects in the Jika iMfundo lesson plans (1½ hours = 90 min)

The purpose of this session is to give teachers the experience of drawing, naming and characterising 2-D and 3-D shapes/objects in order to enable to teach this content effectively.

**Materials:** When you work through this activity you will need some paper and a pencil. You could refer to your Term 2 lesson plans.

In this session the following lesson plans from the Term 2 Jika iMfundo FP Mathematics materials are relevant:

- *Grade 1 Term 2 lessons 38, 39, 40.*
- *Grade 2 Term 2 lessons 39, 40.*
- *Grade 3 Term 2 lessons 25, 26, 27.*

This activity should take about 60 minutes. Your facilitator will guide you as you do the tasks and then discuss the way in which the tasks can be used in the classroom context afterwards.

You learned how to think about shapes analytically in a previous Jika iMfundo JIT (Term 3 2016). In that session a lot of theory was presented and many shapes were studied – you looked carefully at what makes up shapes, and what makes one shape the same as or different from another. You could go over those notes as they contained a large amount of information which should be part of your working knowledge as a teacher. In this session you will be given the opportunity to work again with 2-D and 3-D shapes/objects and consider how to teach this content to FP learners. First you revise the names and characteristics of 2-D shapes.

### **Activity 1**

Drawing 2-D shapes:

Draw the following shapes. While you do so, talk about ways in which they are the same and ways in which they are different.

1. Triangles – named according to lengths of sides
  - a. Equilateral triangle
  - b. Isosceles triangle
  - c. Scalene triangle
  
2. Triangles – named according to sizes of angles
  - a. Acute angled triangle
  - b. Obtuse angled triangle
  - c. Right angled triangle
  - d. Equilateral triangle
  - e. Isosceles triangle
  
3. Quadrilaterals
  - a. Square
  - b. Rectangle
  - c. Parallelogram
  - d. Rhombus
  - e. Kite
  - f. Trapezium
  - g. Irregular quadrilateral
  
4. Round shapes
  - a. Circle
  - b. Oval

Drawing 2-D shapes is not so difficult, because they are flat and the full outline can be seen and drawn on a flat piece of paper. The next activity is about 3-D objects. These are more difficult to draw and you need to practise and develop the technique of drawing them well. Take as much time as you need to develop this skill – it is worth it as once you have mastered the technique, you will be able to draw objects confidently and help your learners to do this as well. FP learners need to be able to recognise drawings of 3-D objects but they don't necessarily need to draw them.

### Activity 2

Drawing 3-D objects.

Draw the following objects. While you do so, talk about ways in which they are the same and ways in which they are different.

1. Shapes that can roll:
  - a. Cone
  - b. Cylinder
  - c. Ball shapes (round) - Sphere
  - d. Ball shapes (egg) – Ovoid
  
2. Box shapes - prisms
  - a. Cube
  - b. Rectangular prism
  - c. Triangular prism
  
3. Pyramids
  - a. Triangular pyramid
  - b. Square pyramid
  - c. Rectangular pyramid

The drawings that you have been doing are introduced to learners gradually over the Foundation Phase and also in the Intermediate Phase. It is essential for teachers to have a good grasp of the CAPS prescribed content so that you have the bigger picture of when and how the content is taught to learners.

The table below gives the overview of the curriculum requirements for 2-D and 3-D shapes/objects for Term 2 from the FP CAPS document (Grade 1, p. 51, Grade 2, p. 67 and Grade 1, p. 84). Notice that in Term 2, for Grades 1 and 2 the focus on 2-D shapes, while for Grade 3 the focus on 3-D objects.

<b>Grade 1 Term 2:</b> CAPS content 2-D shapes	<b>Grade 2 Term 2:</b> CAPS content 2-D shapes	<b>Grade 3 Term 2:</b> CAPS content 3-D objects
<b>Range of Shapes</b> Recognise and name 2-D shapes <ul style="list-style-type: none"> <li>• circles</li> <li>• triangles</li> <li>• squares</li> </ul>	<b>Range of shapes</b> Recognise and name 2-D shapes <ul style="list-style-type: none"> <li>• circles</li> <li>• triangles</li> <li>• squares</li> <li>• rectangles</li> </ul>	<b>Range of objects</b> Recognise and name 3-D objects in the classroom and in pictures <ul style="list-style-type: none"> <li>• ball shapes, (spheres)</li> <li>• box shapes (prisms)</li> <li>• cylinders</li> </ul>
<b>Features of shapes</b> Describe, sort and compare 2-D shapes in terms of: <ul style="list-style-type: none"> <li>• size</li> <li>• colour</li> <li>• straight sides</li> <li>• round sides</li> </ul>	<b>Features of shapes</b> Describe, sort and compare 2-D shapes in terms of: <ul style="list-style-type: none"> <li>• size</li> <li>• colour</li> <li>• shape</li> <li>• straight sides</li> <li>• round sides</li> </ul>	<b>Features of objects</b> Describe, sort and compare 3-D objects in terms of: <ul style="list-style-type: none"> <li>• 2-D shapes that make up the faces of 3-D objects</li> <li>• flat or curved surfaces</li> </ul>

NOTE: Remember that this is specifically the Term 2 overview. You should focus on this content for Term 2 but over the year you will study the content for each term in order to structure your teaching programme for the year.

In the next activity you will also need to refer to the extract from the English/IsiZulu dictionary (Appendix 1) giving definitions and examples of the key terms used in the CAPS extract above. Even though the content of space and shape is mostly visual there is a lot of terminology that is used to speak about the visual content that learners need to know and use. You should know and be able to use all of this terminology.

### Activity 3

Discuss the following questions in your group. Refer to the CAPS extract above in your discussion.

1. **Range of shapes/objects:**

What do learners have to know in order to be able to ‘Recognise and name’ the specified shapes/objects’?

2. **Features of shapes/objects:**

What do learners have to know in order to be able to ‘Describe, sort and compare’ the specified shapes/objects?

3. Study the content that is specified to answer the following questions:

- a. What is the progression from Grade 1 to Grade 2 in relation to 2-D shapes studied?
- b. Which aspects of the content activities in Grade 3 link to the 2-D content from Grades 1 and 2?
- c. How can teachers use these links to the advantage of the learner?

4. Vocabulary of 2-D and 3-D shapes/objects.

- a. Review the extract – discuss the given translations and how you would teach this vocabulary in FP classes.
- b. How can teachers make sure that they teach all of the vocabulary in the lessons that they present on the CAPS topics?

The Jika iMfundo lesson plans include lessons that take the learner through the progression of content recommended by CAPS. They provide many teaching activities as well as classwork and homework activities. You could also add to these examples once you have worked through the lesson plans yourself and identify areas where even more practice might be beneficial to learners.

When working with learners on Space and Shape content it is important to remember to bring concrete examples of the shapes/objects that you are working with. **You should allow learners to hold and work with the real objects.** You should also give lots of time to learners for them to draw shapes and talk about the shapes and their characteristics. This foundational knowledge of geometry is used in the higher grades.

### Activity 4

These are the Term 2 lessons about 2-D and 3-D shapes/objects in the Jika iMfundo FP Mathematics materials:

- *Grade 1 Term 2 lessons 38, 39, 40.*
- *Grade 2 Term 2 lessons 39, 40.*
- *Grade 3 Term 2 lessons 25, 26, 27.*

Refer to the lesson plans to analyse the activities and think about ways in which you would use these activities. Some extracts are given below for you to use in the discussion.

For each of the activities, discuss:

1. What content is covered and how it is presented.
2. How does it relate to the CAPS content specifications?
3. How would you use the activity?
4. Would you add to/change the activity in any way and if so, how and why?

*Grade 1 Term 2 lesson 38.*

**Activity 1: Whole class activity**

- Show the learners a triangle that looks like this: 
- Ask the learners *What shape is this?* (Answer: a triangle.)
- Discuss the fact that a triangle is still a triangle regardless of which way you hold it. Show a variety of orientations. E.g. 

**Activity 2: Whole class activity**

- Ask the learners to hold up a circle:
  - *How did you know that was a circle?* (Answer: it is round.)
  - Encourage learners to describe the features of a circle. (It has a round edge.)
- Ask the learners to hold up a square:
  - *How did you know that was a square?* (Answer: it has 4 sides that are the same length.)
  - Encourage learners to describe the features of a square. (It has straight sides, there are four sides, it has four square corners.)
- Ask the learners to hold up a triangle:
  - *How did you know that was a triangle?* (Answer: it has 3 sides.)
  - Encourage learners to describe the features of a triangle. (It has straight sides, there are three sides, it has three corners.)

**Activity 3: Learners work in groups**

- Give the learners a number of shapes (circles, squares, triangles) of various sizes and of different colours.
- Ask the learners to:
  - Sort the shapes. Ask *How did you sort your shapes?* (By shape/colour/size.)
  - Describe their sorting to the person sitting next to them. (Talk about the features that the sorting was based on.)
  - Sort their shapes again in a different way.
  - Describe their sorting to the person sitting next to them.
- Make sure the learners are able to sort the shapes according to size, and can recognise the biggest of 3 shapes, the smallest of 3 shapes, a shape which is smaller/bigger than another shape and so on.

*Grade 2 Term 2 lesson 40.*

**Activity 1: Whole class activity.**

- Do this activity practically with the learners.
- Give the learners a selection of plastic shapes/shape cut-outs of different sizes.
- Show the learners how to trace the sides of a circle and a triangle with their fingers.
- Ask: *What is difference between these two shapes?* (The triangle has straight sides. The circle has round sides. The triangle has 3 sides, the circle has one round (curved) side.)
- Ask the learners to trace the sides of a rectangle and a circle with their fingers.
- Ask: *What is difference between these two shapes?* (The rectangle has straight sides. The circle has round sides. The rectangle has 4 sides, the circle has one round (curved) side.)

- Ask the learners to trace the sides of a rectangle and a square with their fingers.
- Ask: *What is difference between these two shapes?* (The rectangle and the square both have straight sides. The rectangle and the square both have 4 sides.)
- Ask the learners to trace the sides of a rectangle and a triangle with their fingers.
- Ask: *What is difference between these two shapes?* (The rectangle and the rectangle both have straight sides. The rectangle has 4 sides. The triangle has 3 sides.)

**Activity 2: Whole class activity.**

- Ask the learners to sort the shapes according to straight and round sides:
  - *Straight sides:* triangles, squares and rectangles.
  - *Round sides:* circles.
- Ask the learners to sort the shapes according to the number of sides:
  - *Three sides:* triangles.
  - *Four sides:* squares and rectangles.
  - *One side:* circles.

*Grade 3 Term 2 lesson 25.*

**Activity 1: Whole class activity**

Take the children outside.

- Ask one child to demonstrate rolling on the ground. Give others a turn to roll.
- Ask one child to demonstrate sliding. Give others a turn to slide.
- Do this many times until the concepts of *roll* and *slide* are established.

**Activity 2: Learners work in groups**

Return to the class

- **Note:** Help children to become familiar with the shape terminology by asking questions and allowing children to use the words they have learnt.
- Give each group of learners a variety of 3-D shapes (prisms, spheres and cylinders).
- Discuss the names of the shapes with the class. Ask learners to show each of the different shapes to the class, so that you can check that they know these names. Learners from each group should respond at the same time, holding up the shapes you call for:
- *Show me the prisms.* (Check that all learners are holding up prisms. Remind learners we also call these box shapes but the mathematical name for them is prisms.)
- *Show me the spheres.* (Check that all learners are holding up spheres. Remind learners we also call these ball shapes but the mathematical name for them is spheres.)
- *Show me the cylinders.* (Check that all learners are holding up cylinders.)
- Ask them to sort the objects into those that can roll (e.g. sphere) and those that can slide (e.g. prism, cube).
- *Which shapes can slide?* (Prism. They can also say pyramid if they know about pyramids.)
- *What can you tell me about the shapes that can slide?* (They have flat surfaces/faces/sides.)
- *Which shapes can roll?* (Sphere. They can also say cone if they know about cones.)
- *What can you tell me about the shapes that can roll?* (They have round surfaces/faces/sides.)
- *Are there any shapes that can roll and slide?* Allow learners to experiment (cylinder).
- *Why do they roll and slide?* (Because they have flat and curved surfaces.)
- Revision: Ask learners to show which surfaces are flat and which surfaces are curved.

### Session 3: Teaching position, views and direction (1 hour = 60 min)

The purpose of this session is to give teachers the experience of an activity that can be used to teach position, views and direction effectively.

**Materials:** Balloons, string and scrap paper. When you work through this activity you could refer to your Term 2 lesson plans.

In this session the following lesson plans from the Term 2 *Jika iMfundo FP Mathematics* materials are relevant (there is no prescribed work on position, views and direction for Grade 1 in Term 2):

- *Grade 2 Term 2 lessons 21 and 22.*
- *Grade 3 Term 2 lessons 28 and 29.*

This activity should take about 60 minutes. Your facilitator will guide you as you do the task and then discuss the way in which the task (or adaptations of the task) can be used in the classroom context afterwards.

Optimal learning for a Foundation Phase learner is facilitated by movement through three distinct phases or stages:

1. Kinaesthetic (body movement)
2. Three dimensional (objects)
3. Two dimensional (paper and pen, worksheets).

The integrated nature of the Foundation Phase curriculum – Mathematics, Language and Life Skills – can be used to advantage in the teaching of position, views and direction – since this will give opportunities for activities across the three phases mentioned above.

Outdoor physical education activities give an opportunity for you to help learners develop a sense of space, movement and position. When learners use large apparatus, they will be moving over, under, through, inside or in-between objects. They could also move along pathways that might be straight, curved or zigzagged. Dance also offers many opportunities for learners to hear, interpret instructions and use movement and positional language. Inviting learners to move with a variety of props (such as balloons, balls or ribbons) can be used to stimulate their own movement and descriptive language.

Introducing descriptive vocabulary (including mathematical vocabulary), commenting positively on a learner's movement, and encouraging learners to describe the movement of others, all facilitate the use of this mathematical vocabulary in a creative and meaningful way. Here are some definitions of important words in this topic (taken from the English/IsiZulu dictionary) in this topic to get you started:

Position	The place where something is, compared to other things that are around it.	E.g. the position of the ball is on top of the box. 	indawo	Indawo lapho okuthile kuqhathanisw a khona nokunye okukanye nakho.	Isb. Indawo lapho kukhona ibhola khona yiphezulu kwebhokisi.
views (top view, side view, front view)	What you see when you look at a shape from different positions. E.g. This is the top, front and side view of an aeroplane. 		ukuvelela (ukuvelela ngaphezulu, ukuvela ohlangothini)	Lokho okubona uma ubuka isimo usivelele ezinhlangothini. Isb. Yiphezulu leli, yingaphambili leli kanti yicala lendizamshini elinye. 	

Direction	The path along which anything moves, points or lies. E.g. When you write in your book, the direction in which you write is from left to right.	inkomba	Umugqa ongalandelwa yinoma yini ehambayo. Isb. Uma ubhala encwadini yakho usuka kwesokunxele uye kwesokudla.
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Each of the topics has lots of different mathematical words used to talk about them. For example:

- Positional words are: on top, above, next to, etc.
- Different views we can talk about are the top, front and side views.
- Direction is given using words such as left and right.

### **Activity 1**

1. Write as many different mathematical words you can think of that are used in the following contexts:
  - a. position
  - b. views
  - c. direction
2. Brainstorm some ideas for activities that you could do in lessons on position, views and direction.

### **Activity 2**

Using balloons to teach position, views and direction.

1. Make the balloon landing kit.
2. Discuss:
  - a. the directions in which the balloon flies
  - b. where it is at certain points on its flight and where it lands
  - c. what views could be seen from it as it flies and when it has landed.

The Jika iMfundo lesson plans include lessons on position, views and direction for Grades 2 and 3 in Term 2 (as per CAPS). The balloon activity you have just worked through is not included, but you could decide to use it in the place of some of the set activities should you prefer. It is important for you the teacher to decide what will be the most meaningful way to teach the prescribed content and you can always change or add to the lesson plans in ways that you think will benefit your learners. In the next activity you can go through some more of the Jika iMfundo lesson plan activities.

### **Activity 3**

These are the Term 2 lessons on position, views and direction in the Jika iMfundo FP Mathematics materials:

- *Grade 2 Term 2 lessons 21 and 22.*
- *Grade 3 Term 2 lessons 28 and 29.*

Refer to the lesson plans to analyse the activities and think about ways in which you would use these activities. Some extracts are given below for your reference.

For each of the activities, discuss:

1. What content is covered and how it is presented.
2. How does it relate to the CAPS content specifications?
3. How would you use the activity?
4. Would you add to/change the activity in any way and if so, how and why?

Grade 3 lesson 29

**Activity 1:** Whole class activity.

- Show the learners a cap.
- Show the cap in different positions and ask them which side is the front, back and sides of the cap.
- Draw sketches of the views on the board and label them, to help learners remember the vocabulary.
- *Which view did we not look at?* (The top view.) Show learners the top view and draw it onto the board, (The drawings on the board should look like this when you have drawn them all.)

Front view	Back view	Side view	Top view
			

**Activity 2:** Learners work in groups.

- Learners place their bags on their tables.
- Ask them to show you the front view. (The view they can see from where they are standing.)
- Ask them to show you the top view. (The view they can see if they looked over the top.)
- *What about the side view....how many side views are there?* (Usually four sides for a rectangular prism-shaped bag. One is the front, one is the back, and the other two are called the sides)
- *Is it the same as the front view?* (Front and side views are not the same.) *Why?* (The front has the part that can be opened.)
- *What is the back view?* (Learners show you the back view of their school bags.) *Is it different from the front view?* (Yes) *Why?* (The back usually has the carry straps on it).

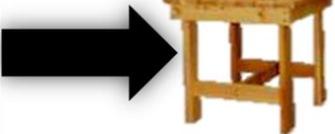
**Activity 3:** Learners work in pairs

- Place one bag and one book on the table between the two learners.
- Each learner takes turns to describe what they see. (The views should be the opposite for each person in the pair, e.g. if the book is on the right of the bag for one child, it will be on the left of the bag for the other.)
- Learners could other objects between them and describe the views they get from opposite sides to each other.

Grade 2 lesson 21

**Activity 1:** Whole class activity.

- Ask the learners to stand *next* to their desks or *on* the carpet.
- Show the direction cards to the learners and allow learners demonstrate the meanings.

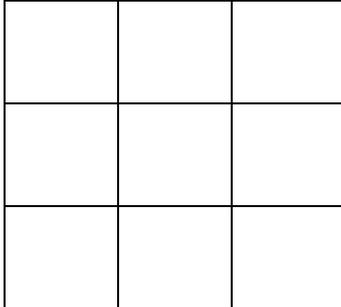
		
		Learners say what they did e.g. I moved to the <i>right</i> , I moved to the <i>left</i> , I moved to be <i>next</i> to my desk, I moved to the <i>front</i> of my desk, I moved to <i>behind</i> my desk.

**Activity 2:** Whole class activity

- Play *Simon says*, i.e. do various movement where learners do the actual movement using words such as:
- Simon says move to the *left*
- Simon says move to the *right*,
- Simon says move *next to*,
- Simon says move *in front of*,
- Simon says move *behind*.
- Give individual learners the opportunity to make a sentence using any of the words, with the rest of the class doing the action and repeating the sentence.

**Activity 3:** Whole class activity

- Draw a grid like this on the board.



- Ask different learners to come to the board and draw the following shapes in the grid:
  - Draw a circle in the top left block of the grid
  - Draw a square in the bottom right block of the grid
  - Draw a circle in the middle of the grid.
  - Draw a square one block up from your first square.
  - Make up other instructions till the grid is full. Allow learners to make up instructions too, if possible.

#### Session 4: Continuous assessment in Jika iMfundo FP Mathematics (1 hour = 60 min)

The purpose of this session is to assist teachers to use the continuous assessment activities in the Jika iMfundo Lesson Plans.

**Materials:** When you work through this activity you could refer to your Term 2 tracker and Lesson Plans.

This activity involves sets of questions to guide the discussion for about 90 minutes. Your facilitator will guide you as you break into groups and have large group discussions throughout this time.

Continuous assessment activities are provided in the tracker each term. There is a different activity (oral or practical) every week. The description of the activity is brief with the link to the relevant CAPS content. The activities are always given in relation to the content that is being taught in that week. This means that you should plan to do the activities in the lessons that link to the content of the activity. The number of days over which the content is taught varies according to the CAPS weighting.

On-going formal or informal oral and practical assessment should be done virtually every day in your class. This means you will record a mark for a few learners for a certain criterion (according to the given practical or oral activity in the tracker) from the curriculum almost every day. *You need to decide how many learners to assess every day, so that you assess your whole class in the time allocated to each assessment activity.*

The oral and practical activities can be assessed using the checklists and rubrics with criteria which are provided in the trackers. The following activities give you an opportunity to use exemplars of the checklists and the rubrics from the trackers for Grades 1 to 3.

#### Activity 1

*Grade 1: This is a practical activity on the topic of length*

Week 2 Assessment Activity: PRACTICAL INFORMAL		Mark:
CAPS: Measurement: Length Activity: Estimate, measure and record lengths using non-standard measures. Use language to talk about ordering and comparing lengths		/7
Mark (percentage)	Criteria (1 mark for each criteria achieved)	
1 (0%-29%) 1 of 7 criteria	Able to compare the length of two objects by placing them next to each other	
2 (30%-39%) 2 of 7 criteria	Able to compare the length of more than two objects by placing them next to each other	
3 (40%-49%) 3 of 7 criteria	Able to order the length of two or more objects by placing them next to each other	
4 (50%-59%) 4 of 7 criteria	Able to use language to talk about the comparison of lengths (e.g. longer, shorter, longest shortest)	
5 (60%-69%) 5 of 7 criteria	Able to estimate and record length using non-standard measures (e.g. the train is 5 blocks long)	
6 (70%-79%) 6 of 7 criteria	Able to measure and record length using non-standard measures	
7 (80%-100%) 7 of 7 criteria	Able to compare and order length using non-standard measures	

1. Study the description of the task:
  - a. What CAPS content area does it relate to?
  - b. What specific content from the CAPS topic does the activity assess?
  - c. What mark is allocated to the activity?
  - d. Is the activity formal or informal? What does this mean?
  - e. Where will you record the mark for this assessment?
2. The marks/percentages are given in the left hand column. The criteria are given in the right hand column.
  - a. How do the criteria relate to each other?
  - b. How would you allocate marks using this checklist?

3. Unpack each of the seven criteria – explain what evidence in learners’ work would lead to them achieving each of the criteria. Use drawings in your explanations of necessary to show what you would look for in learners’ work.

**Activity 2**

*Grade 2: This is an oral activity on the topic of addition and subtraction*

<b>Week 3 Assessment Activity: ORAL FORMAL</b>		Mark:
CAPS: Number operations and relationships: Addition and subtraction		
Activity: Family facts, building up and breaking down, use doubles and near doubles to add		/7
Mark (percentage)	Criteria (1 mark for each criteria achieved)	
<b>1 (0%-29%) 1 of 7 criteria</b>	Able to identify family facts for given numbers	
<b>2 (30%-39%) 2 of 7 criteria</b>	Able to double given numbers	
<b>3 (40%-49%) 3 of 7 criteria</b>	Able to identify near doubles of given numbers	
<b>4 (50%-59%) 4 of 7 criteria</b>	Able to use family facts to compensate when adding/subtracting	
<b>5 (60%-69%) 5 of 7 criteria</b>	Able to use doubles to compensate when adding/subtracting	
<b>6 (70%-79%) 6 of 7 criteria</b>	Able to use near doubles to compensate when adding/subtracting	
<b>7 (80%-100%) 7 of 7 criteria</b>	Able to use building up and breaking down when adding/subtracting	

1. Study the description of the task:
  - a. What CAPS content area does it relate to?
  - b. What specific content from the CAPS topic does the activity assess?
  - c. What mark is allocated to the activity?
  - d. Is the activity formal or informal? What does this mean?
  - e. Where will you record the mark for this assessment?
  
2. The marks/percentages are given in the left hand column. The criteria are given in the right hand column.
  - a. How do the criteria relate to each other?
  - b. How would you allocate marks using this checklist?
  
3. Unpack each of the seven criteria – explain what evidence in learners’ work would lead to them achieving each of the criteria. Use drawings in your explanations of necessary to show what you would look for in learners’ work.

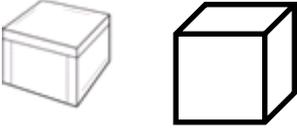
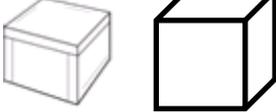
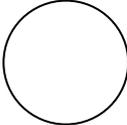
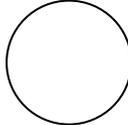
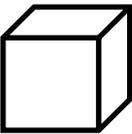
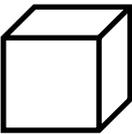
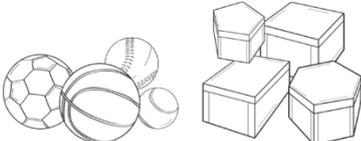
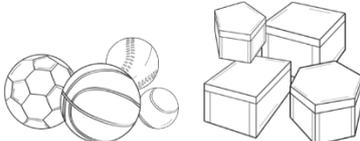
**Activity 3**

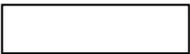
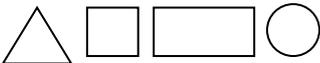
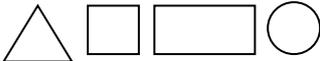
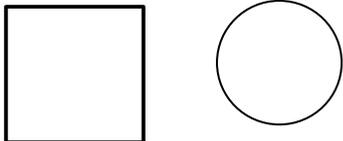
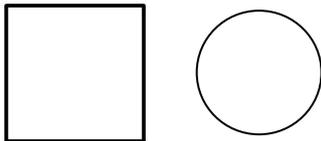
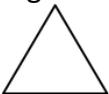
*Grade 3: This is a practical activity on the topic of position and direction*

<b>Week 3 Assessment Activity: ORAL FORMAL</b>		Mark:
CAPS: Space and shape – position and direction		/7
Activity: Find objects on maps; give and follow directions on an informal map		
Mark (percentage)	Criteria	
<b>1 (0%-29%)</b>	Unable to find objects on a map. Cannot give/follow directions related to an informal map	
<b>2 (30%-39%)</b>	Can find objects on a map but unable to give and follow directions using an informal map	
<b>3 (40%-49%)</b>	Can find objects on a map but only able to give and follow directions using an informal map with constant assistance	
<b>4 (50%-59%)</b>	Can find objects on a map and can follow directions using an informal map but cannot give directions unless continually assisted	
<b>5 (60%-69%)</b>	Can find objects on a map but only able to give and follow directions using an informal map with a little assistance	
<b>6 (70%-79%)</b>	Can find objects on a map but only able to give and follow directions using an informal map with no assistance but makes a few mistakes	
<b>7 (80%-100%)</b>	Competently finds objects on a map and gives and follows directions using an informal map	

1. Study the description of the task:
  - a. What CAPS content area does it relate to?
  - b. What specific content from the CAPS topic does the activity assess?
  - c. What mark is allocated to the activity?
  - d. Is the activity formal or informal? What does this mean?
  - e. Where will you record the mark for this assessment?
  
2. The marks/percentages are given in the left hand column. The criteria are given in the right hand column.
  - a. How do the criteria relate to each other?
  - b. How would you allocate marks using this rubric?
  
3. Unpack each of the seven criteria – explain what evidence in learners’ work would lead to them achieving each of the criteria. Use drawings in your explanations of necessary to show what you would look for in learners’ work.

**Appendix 1: Dictionary extract: Space and shape**

Mathematics word	Diagram/explanation	Isihumusho	Umdwebo/incazelo
ball shapes (spheres)	A 3-dimensional (3D) shape that is perfectly round. Example: 	okuyibhola	Unhlangothintathu (3D) oyindilinga egcwele. Isibonelo: 
box shapes / prisms /cube	A box-shaped solid object that has six identical faces. E.g. 	okusabhokisi	Into ebambekayo eyakheke njengebhokisi elinezinhlangothi eziyisithupha ezifanayo. Isb. 
circle	A 2-dimensional (2D) shape that is perfectly round. E.g. 	indilinga	Unhlangothi-mbili (2D) oyimbulunga ngokugcwele. Isb. 
colour (red, blue, green, yellow)	The shade of things that we see. Red – e.g. blood is red. Blue – e.g. the sky is blue on a sunny day Green – e.g. fresh grass and the leaves of trees are green. Yellow –e.g. butter is yellow; ripe lemons are yellow.	umbala (bomvu, sasibhakabhaka, phuzi, satshani)	Into ibukeka ihlihlihlwe ngokubukeka kanjani. Okubomvu ungathi kuhlikihlwe ngegazi. Utshani buluhlaza. Isibhakabhaka siluhlaza futhi kodwa hhayi njengotshani.
cylinder	A figure that is shaped like a can. It has two flat circular faces (sides) and one curved surface. E.g. 	isilinda	Yisakhiwo esakheke njengekani. Sinezinhlangothi (izingxenye) ezimbili ezendlekele kanye nolulodwa olugobile. Isb. 
face	The flat surface of a 3-D shape. e.g. You can see three of the faces of this prism (box shape). 	ubuso	Ukhlangothi oluyisicaba lwesimo sikanhlangothintathu. Isb. Ungakwazi ukubona izinhlangothi ezintathu eziyisicaba zesimo esiyibhokisi. 
3-D objects (3-dimensional objects)	Objects such as balls (spheres) and boxes (prisms). E.g. 	onhlangothintathu	Izinto ezinjengamabhola (izimbulunga) kanye namabhokisi (amaphrizimu). Isb. 

prism	(see box shape)	ibhokisi	(Bheka isimo esiyibhola)
rectangle	A shape with 4 straight sides and 4 square corners. E.g. 	unxande	Isimo esinezinhlangothi ezi-4 eziqondile kanye namakhona ama-4. Isb.
round / curved sides	An edge of a shape that is curved. e.g. a circle has a round (curved) edge. 	isiyingi / izinhlangothi ezigobile	Unqenqema lwesimo olugobile Isb isiyingi sinonqenqema olkugobile. 
2-D shapes (2-dimensional shapes)	Shapes such as triangles, squares, rectangles, circles, etc. E.g. 	onhlangothi- mbili	Yizimo ezifana nonxantathu, izikwele, onxande, iziyingi, njll. Isb. 
size	How big something is in comparison to something else.		
sphere	(see ball shape)	imbulunga	(Bheka isimo esiyibhola)
square	A shape with 4 straight sides which are equal in length and 4 square corners. E.g. 	isikwele	Isimo esinezinhlangothi ezi-4 eziqondile kanye namakhona ayizikwele ama-4. Isb. 
straight sides/round sides	A straight side is not curved and a round side is curved. E.g. a square has straight sides and a circle has round sides. 	kuqondile	Uhlangothi oluqondile kalugobile kanti lunohlangothi olugobile. Isb. Isikwele sinezinhlangothi eziqondile kanti isiyingi sinezinhlangothi ezigobile. 
surface	The faces of a shape make up its surface – this is the outside area of a 3-D object. A surface can be flat or curved. E.g. A sphere is has one curved surface, a cone has one curved surface and one flat surface (or face).	uhlangothi	Izinhlangothi zesimo ziwubuso besimo leso – kanti lolu wuhlangothi olungaphandle lukanhlangothintathu (3-D). uhlangothi lungaqonda noma lugobe. Isb. Indilinga inohlangothi olulodwa olugobile, ikhowuni inohlangothi olugobile kanye noluyisicaba.
triangle	A shape with three straight sides. E.g. 	unxantathu	Yisimo esinezinhlangothi ezintathu eziqondile. Isb. 