# Foundations For Learning

## Intermediate Phase Mathematics Lesson plans

## First term

## Grade 5

Kindly send any response that you may have to:
Dr Jennifer J Joshua
E-mail: joshua.j@doe.gov.za

Department of Education
Sol Plaatje House
123 Schoeman Street
Pretoria
South Africa

Private Bag X895
Pretoria
0001

Tel: +27 12 312 6220
Fax: +27 12 312 6222
www.education.gov.za

© Department of Education
Design and layout: Shereno (012) 344 2817

# Contents

**1 Introduction ..... 5**

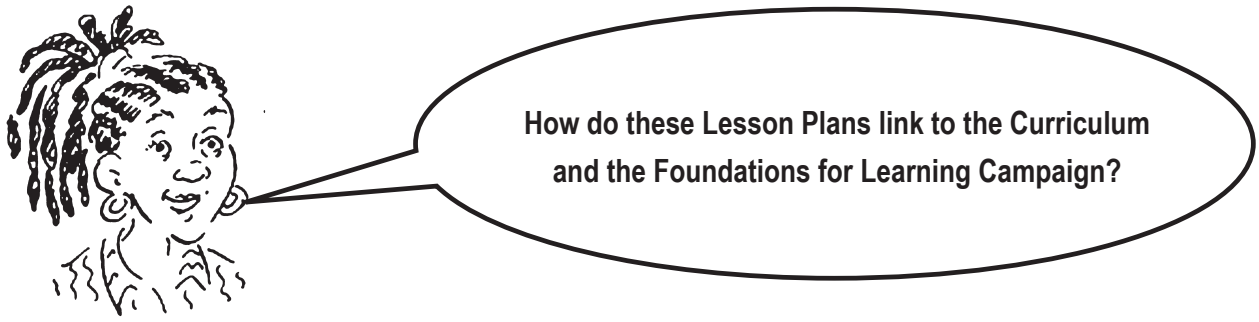
**2 Mathematics ..... 7**
Counting ..... 7
Mental and Number Sense ..... 9
Problem Solving ..... 10
Group teaching ..... 11
Group work ..... 11
Resources ..... 11

**3 First Term ..... 12**
Overview of Lesson Plans ..... 12
Overview of Assessment Tasks ..... 13
Lesson plans: ..... 17
Week 1: Overview ..... 17
Week 1: Lesson plans ..... 18
Week 2: Overview ..... 25
Week 2: Lesson plans ..... 26
Week 3: Overview ..... 37
Week 3: Lesson plans ..... 38
Week 4: Overview ..... 49
Week 4: Lesson plans ..... 50
Week 5: Overview ..... 59
Week 5: Lesson plans ..... 60
Week 6: Overview ..... 69
Week 6: Lesson plans ..... 70
Week 7: Overview ..... 79
Week 7: Lesson plans ..... 80
Week 8: Overview ..... 89
Week 8: Lesson plans ..... 90
Week 9: Overview ..... 99
Week 9: Lesson plans ..... 100
Week 10: Overview ..... 107
Week 10: Lesson plans ..... 108

## 1. INTRODUCTION

### BACKGROUND

The Foundations for Learning Assessment Framework which was distributed to all schools during 2008 contained 'milestones' for each grade. These milestones explain the content embedded in the Learning Outcomes and Assessment Standards, indicating the expected level of achievement of learners at the end of each quarter. This document contains lesson plans based on the milestones.




These lesson plans have been developed using:

- The NCS Learning Outcomes and Assessment Standards as the starting point
- The Milestones and
- Government Gazette 30880 of 14 March 2008, outlining the Foundations for Learning Campaign, which details the minimum expectations for the teaching of Literacy and Numeracy (Languages and Mathematics)

The following **table** provides an example of how these three documents are linked for Grade 4 Mathematics:

| Learning Outcomes and Assessment Standards | Milestones for Mathematics for Grade 4 | Government Gazette: Daily Teacher Activities during Mathematics time Grades 4 - 6 | Grade 4 time allocation in Gazette |
|---|---|---|---|
| **LO1 AS1**<br><br>**LO1 AS4** | - Counting forwards and backwards in a variety of intervals (including 2s, 5s, 10s, 50s and 100s) between 0 and 1 000;<br>- Recognise the place value of digits in whole numbers to a minimum of 3-digit numbers | Oral and mental work | 10 minutes |
| | | Review and correct homework from previous day | 10 minutes |
| **LO3 AS1; 2; 3** | - Recognise, visualize and name 2-D shapes and 3-D objects in the environment<br>- Describe, sort and compare 2-D shapes and 3-D objects from the environment according to their geometric properties | Concept development and problem solving | 35 minutes |
| | | Give out homework | 5 minutes |

**How do I use the time allocated for Mathematics?**

The Government Gazette No 30880 provides the following breakdown of the formal teaching allocations for Mathematics and Languages in the Intermediate Phase per day:

| Grade | Daily total for Mathematics | Daily total for Languages | Total per week For Mathematics | Total per week For Languages |
|---|---|---|---|---|
| Grade 4, 5 and 6 | 1 hour | 1 hour 30 minutes | 5 hours | 7 hours 30 minutes |

The Gazette further guides teachers by detailing the type of activities that should be contained in the Daily Activities. In the Intermediate Phase for Mathematics these are:

- Oral and mental work
- Concept development
- Problem solving

**How, then can these lesson plans help teachers? What do they provide?**

These Lesson Plans are intended to assist teachers to pace their teaching, give them guidance when planning their assessment tasks and provide suggestions to enrich teaching practice. They are not intended to be prescriptive and teachers are not expected to abandon good practice in order to blindly follow the plans. The Plans provide:

- **An overview of the term** broken into weekly units – compare this with your Work Schedule and ask yourself the following questions: Does your Work Schedule include similar content? Do you reach approximately the same point at the end of each term? The overview provides a useful termly checklist.

- **An overview for each week** – broken down into daily units; this helps you to see the content included in the week's lesson plans, to see how it is paced and to make use of specific lesson plans. Milestones and Learning Outcomes and Assessment Standards for the week have been included. The latter have been numbered as AS1, 2, 3 etc. No sub-bullets are indicated.

- **Individual lesson plans for each week** for the different components in Languages and Mathematics. The lessons for the week are broken down into daily steps, providing teachers with a breakdown of content and suggestions for implementation. However the plans are not prescriptive and allow you to use your own way of presenting the lesson. They are rich in practical ideas drawn from Best Practice and as such can enrich implementation in the classroom.

- **Suggestions for the Assessment Tasks** for each term for each of the components
  Remember:

**How do teachers marry the activities in the Learner's Books and their own material with these Lesson Plans? Do the Lesson Plans replace the Learner's Books and Teacher's Guides?**

  Every class and learner is unique. There is no 'one size fits all'. Learners progress at different speeds and in different ways and you as the class teacher are best able to pace your teaching to the needs of your learners. You can introduce new material in an order that suits you and your learners.

These Lesson plans are not intended to replace the Teacher's Guides and Learner's Books or the material you have developed yourself:

- The Lesson Plans only provide some examples of worksheets for learners and some of the details as to how to present the lessons. You will need to provide further worksheets or activities from your own material or from textbooks.
- There will therefore be similarities between the Teacher's Guides and Learner's Books that you use and these Lesson Plans. However the order of content may be presented somewhat differently so you will need to match the content. These lessons are informed by the sequence of the milestones within the suggested Assessment Tasks per term provided in the Foundations for Learning document.

## 2. Teaching and learning mathematics in a Grade 4 classroom.

### Introduction

" C*onceptual understanding and computational fluency with whole numbers, fractions and decimals form the bedrock of mathematics learning in both early and later years*" ( NCTM: Navigating through numbers and operations).

By Grade 4 learners should have begun to develop a sense of how our number system is organised in that we group numbers in values of 10s and 100s.
They should be able to count fluently up to a 1 000 in different number groups (multiples) as

specified for Grade 3, to build and break down numbers in different ways in order to compare number values, order them and do calculations involving all four operations, including division. They have begun to explore the meaning and relationships between the different operations.

This is the foundation we assume that further learning can take place in Grade 4, allowing learners to extend their place value understanding to investigate bigger numbers and to work more with irrational numbers, including common fractions and decimal fractions; (in the context of measurement.)

We need to give greater emphasis in Grade 4 to multiplication and division of bigger numbers and help learners to be able to use the properties of numbers to do related calculations; for example how to use the distributive property when multiplying
34 x 23 for example, by breaking down the calculation into (34 x 20) + (34 x 3) to make the task more manageable.

We also need to expose learners to a wider range of different problem solving situations where these operations are used. At the same time it is important to further develop learners' computational fluency by extending the number range they are able to count in and practice their mental calculation skills.

It is important to remember that learners in Grade 4 are not yet expected to use formal algorithms like column addition or subtraction and should still be encouraged to develop their own strategies for doing different calculations. There is a tendency to impose methods standard methods on learners too early which does not support their natural developmental inclination towards making sense of numbers and number relationships in their own way.

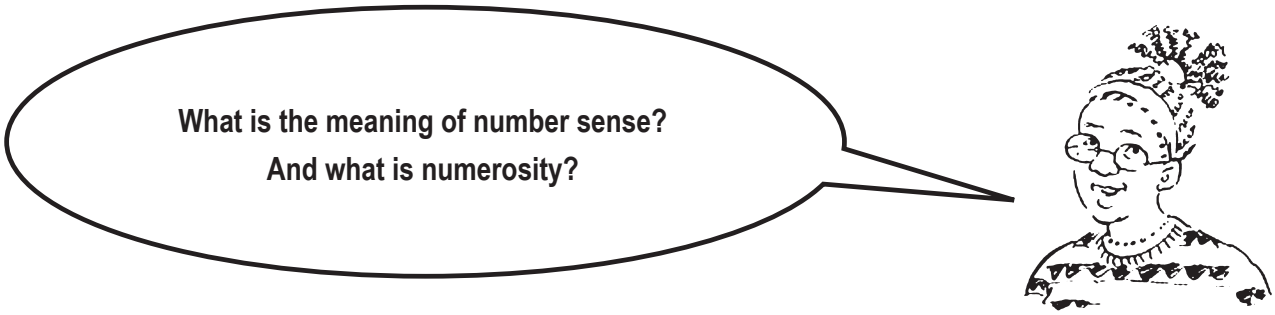
Many learners at this level for example, may still find it helpful for example to use drawings or diagrams to represent their thinking in relation to situations of sharing or grouping (multiplication and division) This should not be discouraged. Remember that a learner in Grade 4 is in transition from relying on concrete thinking and representations to being able to function more abstractedly. So to rush him/her would not allow the development of moving from one mode to another to takes it natural course.

Another key principle to consider is that learners learn a great deal from one another. So when giving them the chance to come up with their own ways to calculate or solve a measurement problem for example, it is important that make space in your lesson for learners to share and communicate their thinking with the rest of the class.

A further important change is that in many classes, learners in Grade 4 are moving into English as a medium of instruction which in many cases is not their home language. It is impossible to conduct a maths class for such learners entirely in English and expect them to communicate their thinking in a language they are not yet fluent in. One should still allow the space for learners to express

themselves freely in their own language and then mediate the "mathematical conversations" in ways that every learner understands. This is very challenging, but simply ignoring the issue will only stifle your learners' mathematical development and leave them frustrated, where they may for example well understand a concept or process well, but not yet have the tools to express themselves clearly in English.

**MENTAL AND NUMBER SENSE ACTIVITIES**




Many teachers are in a hurry for their learners to know facts off by heart. However, knowing facts off by heart is no indication that the learner understands what they are doing or that they will be able to use these facts in different contexts. It is much, much more important that you design activities which will help your learners develop a sense of number because it is this sense of number that learners use when trying to build up an understanding of computational strategies. You cannot teach number sense; you can only help learners acquire it by exposing them to various activities which allow learners to construct knowledge for themselves. Encouraging learners to reflect on what they are doing and then talk about it is helping these learners to develop a sense of number.

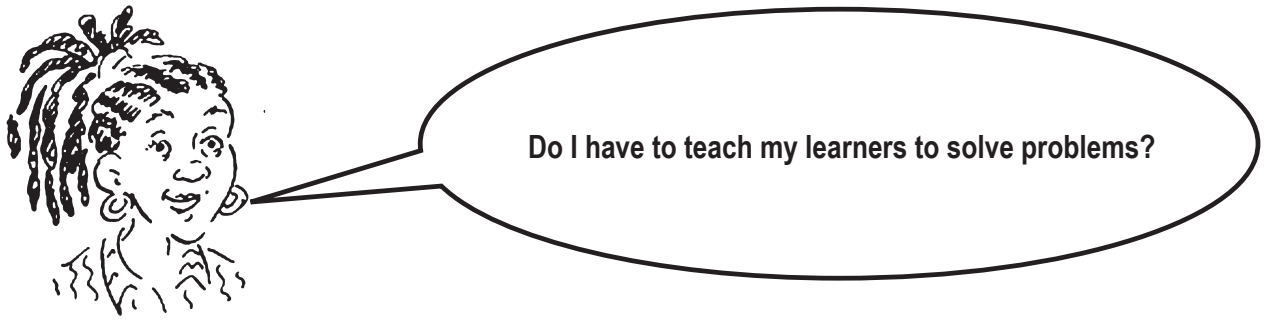
You will find learners at different levels of readiness in your class. Your programme should meet the needs of all the learners i.e. learners who are ready to move on should not be kept at the same level as learners who are still developing these essential skills.

Different kinds of knowledge (physical, social and logico-mathematical) play a role in developing learners' number sense and knowledge:

- *Physical* knowledge is the knowledge that the learner acquires from relating mathematical situations to physical models or representations; (this is more important at the Foundation Phase level, although some learners in Grade 4 are still reliant on using counters for example to represent numbers).
- *Social* knowledge can only be learnt by telling. So for examples naming numbers as decimals or fractions or using particular symbols to represent mathematical relationships is social knowledge that a learner needs to be told and cannot find out for himself/herself.
- *Logico-mathematical* knowledge refers to the type of knowledge that learners construct for themselves e.g. noticing the pattern in the place value system; or finding out that to subtract 456 – 345 they can add on from 345 to 456 to find the solution is something a learners can find out for themselves as their number sense develops over time.

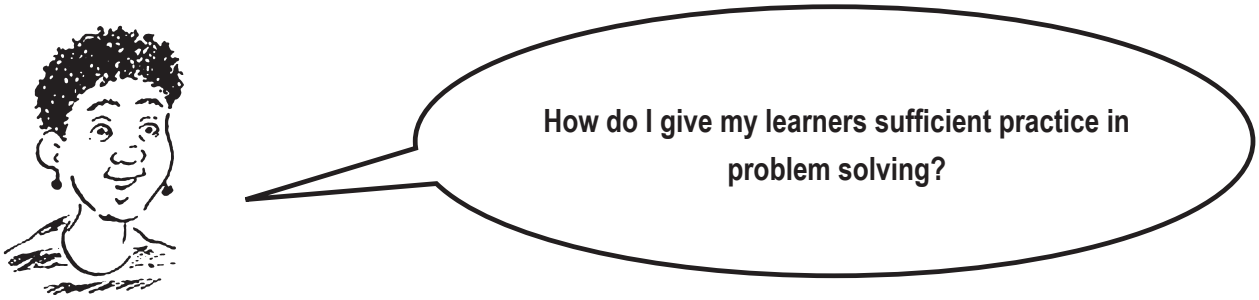
Your role as a teacher rather is to support your learners' development by providing appropriate activities that enable them to pass from one level of number level to the next where they integrate the different kinds of knowledge to solve particular problems or do calculations with number.

**PROBLEM SOLVING**



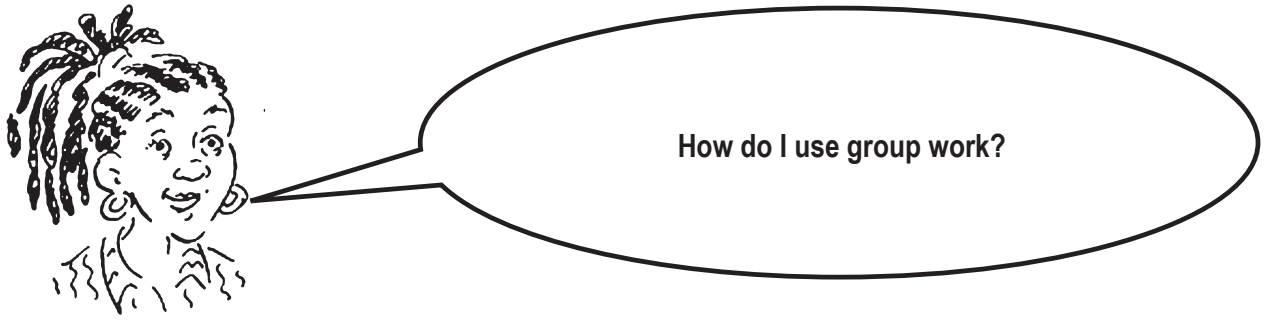

There are many different ideas as to what problem solving is and its value for young learners. However, one of the focal points of the Mathematics Learning Area is that learners be exposed to problems on a regular basis.

By placing information in context, problem solving becomes a powerful activity and is one of the main vehicles for developing number sense. Therefore you need to constantly challenge learners with realistic, real-life problems without first teaching prerequisite tools or operations. In order to fulfill the purpose of word problems, learners should regularly be given problems which are new to them and for which they do not possess routine methods of finding the answer.




The objective of giving word problems is to provide your learners with opportunities to make sense of mathematics, to put their own ideas and initiative into practice, to develop new knowledge, take note of how others solve the problem and to reflect on their own thinking. The practice of only presenting real-life problems after a set of skills and knowledge where only numbers are used is developed, should not to be encouraged. Rather problems themselves are the vehicle for helping learners to see the relevance of why we need to manipulate numbers in particular ways, so that we are able to solve problems that have meaning in our lives. Exposing learners to a variety of problems enables them to develop their ability to interpret problems, and this helps to give meaning to the concept of the operations.

**GROUP TEACHING OR GROUP WORK**




Although learners can learn much by working in groups, working in groups may also be detrimental to learning. When implemented in the wrong way, having learners woirk in groups may result in many learners being idele and nort learning much. The best way to prevent this from happening, is to precede group work with individual work on the same task, to ensure that each learners engages with the task personally and has own ideas about it before starting to work with others. The main value of group work is that it provides learners with opportunities to express their own ideas. Having to tell others how you thought to do something, for example to solve a problem, forces the learner to clarify his/her own thoughts. In the process of doing so, learners ideas often develop further.

**RESOURCES**

The Government Gazette No 30880 provides a list of recommended resources for Mathematics which schools should endeavour to provide. In addition to exercise books, Learner's Books, Workbooks and basic stationery which most schools already have, refer to the list of suggested equipment for the Intermediate Phase,  that we believe re essential to have available to conduct your teaching and learning programme successfully.

## FIRST TERM OVERVIEW OF LESSON PLANS

| | Week 1 | Week 2 | Week 3 | Week 4 | Week 5 | Week 6 | Week 7 | Week 8 | Week 9 | Week 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Oral and mental work** | Count collections of objects up to 1000 | | | Count in different intervals | Counting and measuring in context | | | Count in different intervals | | |
| | | Addition of single digit numbers | | Addition of multiples of 10 and 100 | | | | | | Addition and subtraction |
| | | | | | | Multiplication facts | | | Multiplication facts | |

| | Week 1 | Week 2 | Week 3 | Week 4 | Week 5 | Week 6 | Week 7 | Week 8 | Week 9 | Week 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Conceptual development and problem solving** | Express numbers and quantities in words, in expanded notation and with tally table | | | | | | | | | |
| | | Express numbers in expanded notation and with flard cards | | | | | | | | |
| | | | Express numbers in positional notation | | | | | | | |
| | | | Problems that involve addition and subtraction | | Equal sharing problems | | Money problems that involve addition and subtraction | Problems in the context of measurement. | Problems that involve multiplication, grouping and sharing | |
| | | | | | Measure length | | | Measure length. | | |
| | | | | Fractions as parts and as units of measurement. Decimal notation for tenths. | | | | Fractions in the context of measurement | | |
| | | | | Extend number patterns | | Extend number patterns | | | | Extend and design number patterns |
| | | Make and analyse 3-dimensioanl objects | | | | Polygons. | | | | Properties of polygons |
| | Make tally tables | | | | | | Data collection, representation and analysis | | | |

## FIRST TERM ASSESSMENT OVERVIEW

**Important note:** The primary value and purpose of assessment is to gather sound information on what knowledge they have and how they think, to inform you as their teacher, so that you can focus your teaching on providing opportunities for your learners' knowledge and thinking to develop further and become more sophisticated than what it was when you assessed it.

| | Milestones for Assessment Task | Suggested activities for Assessment |
|---|---|---|
| **Week 1** | • Counting structured given collections of objects (pictures and marks) up to 10 000, recording the result by writing the number name, by showing it with Flard cards and by writing it in expanded notation. | **Day 3,** Activities 2, 3 and 4: Counting and using tallies.. |
| **Week 2** | • Counting structured given collections of objects (pictures and marks) up to 10 000, recording the result by writing the number name, by showing it with Flard cards and by writing it in expanded notation.<br>• Mentally add and subtract single-digit numbers. . | **Day 1:** Activity 2: Observe how learners add small quantities.<br>**Days 2, 3 and 5:** Informal assessment of learners' counting ability and understanding of place value. |
| **Week 3** | • Solve problems by addition.<br>• Solve problems by subtraction.<br>• Write number names in words, and in expanded notation.<br>• Describes, sorts and compares physical two-dimensional shapes and three-dimensional objects from drawings or pictures according to properties including number and/or shape of faces. . | **Day 2:** Activity 2: Worksheet with problems. .<br>**Day 4:** Activity 2: Formal assessment with a written task (Annexure J).<br>**Day 5**: Activity 3: Written task on faces of prism and pyramid. |
| **Week 4** | • Solve problems by addition.<br>• Solve problems by subtraction.<br>• Solve problems that involve more than one operation.<br>• Write numbers up to 1 000 in condensed positional notation.<br>• Write number names in words, and in expanded notation. | **Day 1:** Activity 2 and **Day 2**: Activity 1:<br>Observe the level of sophistication of learners' work on given problems, and possible progress in this regard.<br>**Day 4**: Formal assessment task (like Grade 4 term 1 Annexure N, possibly with bigger numbers). |
| **Week 5** | • Solve problems involving measurement, involving fractions including halves, thirds, quarters, fifths, eighths and tenths and mixed numbers involving these fractions, expressed in words. | **Day 4:** Take in classwork books to assess work done in class during Activity 1. |

| | | |
|---|---|---|
| **Week 6** | • Investigate and extend number patterns looking for general rules or a relationship, including patterns of learners' own making.<br>• .Multiplication. | **Day 1:** Take in learners' descriptions of patterns they have investigated, and read it carefully to assess their understanding of the patterns as well as their writing ability.<br>**Day 5**: Activity 1: Formal assessment by means of the multiplication worksheet (Annexure S) or similar. |
| **Week 7** | • Solve problems that involve addition and subtraction. | **Day 2:** This lesson provides a very good opportunity to assess the level of sophistication of learners' subtraction strategies. |
| **Week 8** | • Uses the appropriate SI unit to estimate, measure, record and compare lengths.<br>• Solves problems involving selecting, calculating with and converting between appropriate SI units:Millimetres↔centimetres Centimetres↔ metres Metres↔ kilometers.<br>• Use appropriate measuring instruments to appropriate levels of precision including rulers, metre sticks, tape measures and trundle wheels to measure length.<br>• Investigates and approximates (alone and/or as a member of a group or team): perimeter using rulers, metre sticks, tape measures and trundle wheels. | **Day 1:** Use the consolidation activity as an assessment..<br>**Days 2 and 3**: Informal assessment of learners' knowledge of measuring length..<br>. |
| **Week 9** | • Solve problems that involve repeated addition.<br>• Solve problems that involve grouping and sharing.. | **Days 2 to 4:** Observe the level of sophistication of learners' computational work on given problems, and possible progress in this regard. |
| **Week 10** | - Recognises, identifies and names two-dimensional shapes including circles, polygons (triangles, quadrilaterals (squares, rectangles, rhombus, trapezium, kites), pentagons, hexagons, heptagon, octagon) in terms of the number of sides up to 8-sided figures.<br>• Draws, sorts and compares physical two-dimensional shapes (listed above) according to geometrical properties including number of sides, straight and curved sides<br>• Recognises and describes natural and cultural two-dimensional shapes, and patterns in terms of geometric properties. | **Day 5:** The "Consolidation" may be utilized as a formal assessment. of learners, knowledge of shapes. |

## FIRST TERM: WEEK 1 OVERVIEW

One of the major causes of poor performance in numeracy is that learners often spend very little time on numeracy tasks. Teachers should do their utmost to use learners' time effectively, by keeping them busy on meaningful and challenging tasks all the time. These lesson plans have been carefully designed to support you to achieve that.
But, for the lesson plans to work, you need to prepare your resources, as specified in each lesson, in advance (at least the day before). Note that for most of your resources, you need to make copies of annexures that are contained in the Grade 4 term 1 lesson plan file. **You will need to access this form your grade 4 colleagues. Since most of the resources are the same for grades 4 and 5, you may collaborate in producing the resources**.

**Hours: 5** **Number of periods: 5**

**Learning Outcomes and Assessment Standards**
LO 1 AS 1, LO 5 AS 1

**Milestones:**

- Count in tens.
- Counting given unstructured collections of objects (pictures and marks) up to 300 by structuring (grouping into tens and hundreds).
- Counting out collections of a given number of objects up to 500, by forming structured collections with actual objects and/or making marks.
- Using tallies.

| | **Day 1** | **Day 2** | **Day 3** | **Day 4** | **Day 5** |
|---|---|---|---|---|---|
| **Content Focus** | Cut flard cards | Counting objects by grouping into tens and hundreds. | Tally marks and counting, using tally marks . | Counting and making grouped collections of objects | Cut number bond cards |
| **Resources** | Copies of Grade 4 term 1 Annexure B (three flard card sheets).<br>A4 paper for each learner.<br>A pair of scissors for each learner. | A collection of more than 200 counting objects for each learner, in a suitable container. | Two blank A4 sheets for each learner. | Worksheet;<br>A copy of a cutout envelope | Copies of Annexure D (the 13 sheets of number bond cards).<br>A pair of scissors for each learner.<br>A4 paper for learners.<br>Suitable containers for bond cards. |
| **Resources** | Many pairs of scissors are needed. Plan together with your Grade 4 and 5 colleagues. The lessons for the week may actually be done in any order. | | | | |

## WEEK 1: DAY 1

**Notes to the teacher:**

- Utilise the first week to set up the Resources you will need, with the help of the learners in your class. Suggestions for Resources are given in the lesson plans for week 1.
- The most critical of the Annexures mentioned here is a set of **flard cards for each learner. Make sure that you manage to produce these during the first three days of the school year**, so that each learner has a personal set of flard cards, in an envelope, from the second week onwards.
- Each learner will need their own set of flard cards to work with, to support their development of number concept throughout the year. Let learners cut out their flard cards from the copies that you provide. They can then make , and let them make envelopes from the copies you have made.A4 sheets in which to store the cards. Let some learners make two sets of flard cards, so that you have spare sets available for learners who may join school late, and to replace sets that may get lost.

**Resources:**

- Ask learners to each bring the following items to school the next day:
  - An empty box, e.g. a corn flakes or other cereal box. Learners who can do so, should bring two boxes.
  - A plastic bottle with a cap or a tin with a lid, for keeping a collection of counters.
  - More than two hundred small similar objects that can be counted, for example pebbles or beans or beads or mealie pips or small stones or short sticks or sunflower or other seeds.
  - A plastic bag (like those used in shops) or a larger box, in which the above can be kept.
- Note that these materials will be needed for lesson 3.
- Copies of the three flard card sheets (Grade 4, Term 1, Annexure B) for each learner, and second copies for half of the learners. You may make the copies on ordinary paper, but it will be much better if you can make it on thick (heavy) paper or thin cardboard.
- As many pairs of scissors as you can make available.
- You need to cut out one full set of flard cards (Grade 4, Term 1, Annexure B) before the lesson, so that you can easily show learners what their cards will look like once they have cut them out.
- One A4 sheet per learner, for wrapping the set of flard cards.
- Sets of counting cards with combinations of multiples of ten, like Annexure A, for half of the learners.

### ACTIVITIES FOR THE DAY

**PRACTICAL**

Inform learners that they will need cards to help them to learn to understand numbers better.

Hand out the two flard card sheets to each learner. Demonstrate to learners how they should cut each flard card sheet along the dotted lines, by cutting one sheet while they observe. If you have many learners in your class, you may have to do several demonstrations in different parts of the class. Learners who are still without scissors may also do the counting cards (Annexure A), writing the answers on loose sheets that you provide or in their classwork books if they already have these to work in.

Let learners who finish quickly cut a second set of flard cards, so that you have spares, and sets for learners who may join school a few days late.

Each set of Flard cards must be put inn enevelope or wrapped in paper, so that they remain separate.

Use the last fifteen minutes of the lesson to let learners (the whole class together) count in tens as far as they can, but up to at least 200. *ten, twenty, thirty, forty, fifty, . . . . . .*

## WEEK 1: DAY 2

**Notes to the teacher:**

- This lesson is about learning to count collections of objects by arranging the objects in groups of ten and hundred. The value for learners is not only refinement of their counting skills, but also the development of their understanding of the base ten structure of our number system, and hence an understanding of place value. These understandings are critically important to enable learners to make sense of and understand methods of computation.

**Resources:**

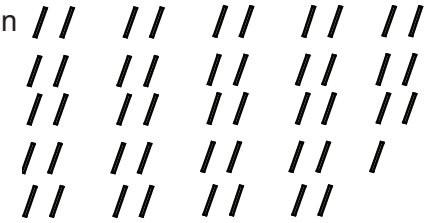
- A collection of more than 200 counting objects for each learner, in a suitable container. These are the counting objects which you asked them to bring on the first day.

### ACTIVITIES FOR THE DAY

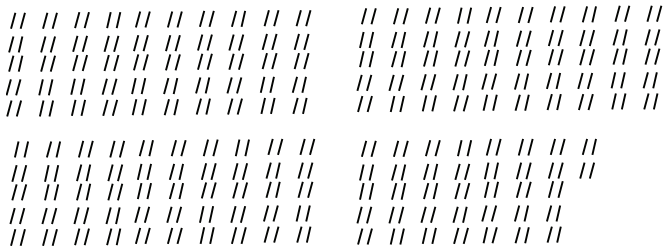
**ORAL AND MENTAL ACTIVITIES**

**Activity 1:**

Let each learner access her/his set of counting objects, and tell them that they will now count them. Explain, by demonstrating on the blackboard, how they can arrange the objects in groups of ten to make them easy to count. Once arranged like this, these objects can now be counted by first counting in tens: *ten, twenty, thirty, forty,* then continuing in ones: *forty-one, forty-two, forty-three, up to, forty-seven.*



Explain and demonstrate to learners that they can also put ten groups of ten close to each other to form a hundred, so that larger collections of objects will be even easier to count:



**Activity 2:**

Each learner now has to pack out the counting objects in groups of 10 and 100 in the same way that you have demonstrated. Move around the class and ask learners who have finished to tell you how many counters they have packed out, by stating the number of groups of hundred, the number of extra groups of 10 and the number of loose counters. For example, they may say *three hundred and seventy six* or *three hundred and seventy four* for the above example. Let each learner who finishes exchange her/his counters with another learner who has finished, so that they can have more experience of counting objects by arranging them in tens and hundreds.

Ask learners to each bring another empty box, e.g. a corn flakes or other cereal box, to school on the next day. (You will need the boxes for several purposes in later lessons.)

Use the last 5 minutes of the period to let learners count in hundreds as far as they can.

**WEEK 1: DAY 3**

**Notes to the teacher:**

- Tally marks are used as a context to practice counting and promote number concept.

**Resources:**

- Two blank A4 sheets for each learner.

**ACTIVITIES FOR THE DAY**

**ORAL, MENTAL AND CONCEPT DEVELOPMENT**

**Activity 1**

Explain and demonstrate to learners how to use tally marks to keep a record when counting. For example, you may ask each learner in the class to stand up in turn, and make a tally mark for each learner on the board while they do this:

Put two groups of five tally marks close to each other, so that the tally marks can be easily counted later by counting in tens. When you have recorded all the learners in the class, count the tally marks aloud so that all learners can observe you counting in tens and then in ones.

**Activity 2**

Now tell the class you are going to tap on the table a large number of times, and that they must make a tally mark for each tap. They may do this in their classwork books, or on loose sheets of paper. Give about one tap every second, using a suitable hard object so that all learners in the class can clearly hear each tap. Do about 40 taps.

Go round the class to check whether learners are making the tally marks correctly, with each fifth tally mark drawn horizontally across the previous four.

**Activity 3**

Tell learners you will start "tapping" again. This time make 100 and 200 taps in total. Count your taps so that you know how many you've made. Let learners count their tally marks and compare their answers. **Learners should not write their answers at this stage.** Tell them how many taps you did, and ask each learner to determine how far she/he was from the correct answer. Encourage them to perform better the next time.

**Activity 4**

Tell learners they should make their tally marks on a new page in their classwork book, or on the back of the loose sheets they have used for activities 2 and 3. Tell them that this time you will make between 300 and 400 taps. Repeat activity 3, but now give between 300 and 400 taps.

**Activity 5**

Use the last ten minutes of the lesson to allow learners (the whole class together) to count in tens as far as they can, but to at least three hundred.

## WEEK 1 : DAY 4

**Notes to the teacher:**

- In this lesson you will provide learners with further opportunities to develop their counting skills and number concept.
- Learners will once more use tally marks to keep a record while counting, and also count given tally marks.
- Only let learners express numbers in the conventional condensed notation, e.g. 300+79+5 as 375 in later lessons (week 3). If this notation is required too early, there is a huge danger that many learners will use it without understanding what it really means, i.e. without understanding the real place values of the separate digits.

**Resources:**

- A copy of the worksheet on the next page for each learner. Alternatively, you can write the next page on the board, and have learners copy it onto blank sheets that you give them.
- A copy of a cutout envelope (Grade 4, Term 1, Annexure C) for each learner. Please make an envelope yourself before the lesson so that you know how to demonstrate it to learners.

### ACTIVITIES FOR THE DAY

**CONCEPT DEVELOPMENT**

Give each learner a copy of the worksheet on the next page. Tell them that it is a record kept by a shopkeeper of customers coming into his shop each day during a certain week.

They must count the tally marks for each day. They must write the number of customers for each day in expanded notation and in words, like they did in the previous lesson.

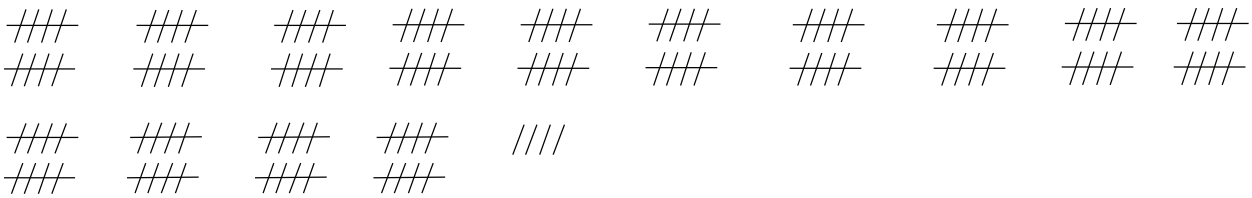
Circulate between the learners to monitor their progress. Encourage them to count in tens if they are not doing this anyway. Their written work should look like this:

| | | |
|---|---|---|
| Monday: | 100 + 40 + 4 | one hundred and forty-four |
| Tuesday: | 100 + 6 | one hundred and six |
| Wednesday: | 80 + 5 | eighty-five |
| Thursday: | 50 + 3 | fifty-three |
| Friday: | 100 + 80 + 8 | one hundred and eighty-eight |

(In a later lesson, learners will revisit this work in their classwork books, to determine the total number of customers for the week.)

Some learners may finish quite quickly. Give them copies of the cutout envelope and scissors, and ask them to cut and fold these to make envelopes.

**Monday**



**Tuesday**

~~////~~ ~~////~~ ~~////~~ ~~////~~ ~~////~~ ~~////~~ ~~////~~ ~~////~~ ~~////~~ ~~////~~
~~////~~ ~~////~~ ~~////~~ ~~////~~ ~~////~~ ~~////~~ ~~////~~ ~~////~~ ~~////~~ ~~////~~

~~////~~ /

**Wednesday**

~~////~~ ~~////~~ ~~////~~ ~~////~~ ~~////~~ ~~////~~ ~~////~~ ~~////~~ ~~////~~
~~////~~ ~~////~~ ~~////~~ ~~////~~ ~~////~~ ~~////~~ ~~////~~ ~~////~~

**Thursday**

~~////~~ ~~////~~ ~~////~~ ~~////~~ ~~////~~ ///
~~////~~ ~~////~~ ~~////~~ ~~////~~ ~~////~~

**Friday**

~~////~~ ~~////~~ ~~////~~ ~~////~~ ~~////~~ ~~////~~ ~~////~~ ~~////~~ ~~////~~ ~~////~~
~~////~~ ~~////~~ ~~////~~ ~~////~~ ~~////~~ ~~////~~ ~~////~~ ~~////~~ ~~////~~ ~~////~~

~~////~~ ~~////~~ ~~////~~ ~~////~~ ~~////~~ ~~////~~ ~~////~~ ~~////~~ ~~////~~
~~////~~ ~~////~~ ~~////~~ ~~////~~ ~~////~~ ~~////~~ ~~////~~ ~~////~~ ///

**In the last 10 minutes of the lesson:**

Ask each learner to choose a number between 200 and 300, and another number between 300 and 500, and to write each number in words, and in expanded notation, in their classwork books.

Give each learner a blank A4 sheet of paper. For homework they have to draw tally marks, neatly, on the sheet of paper, to represent one of the numbers they have chosen. Then, on the other side of the sheet, they have to represent the other number they have chosen with tally marks. They may start doing this while still in class. (You will take these sheets in during the next lesson. This will now be a resource for providing counting practice opportunities to learners.)

**WEEK 1: DAY 5**

**Notes to the teacher:**

- If you have a pair of scissors for each learner, all learners will cut bond cards (Annexure D). You need at least one set of bond cards for every four learners in your class (so they can practice bonds in groups), but preferably a set of bond cards for each learner.
- If you do not have enough pairs of scissors, some learners will make tally charts for numbers between 400 and 600.

**Resources:**

- Copies of the 13 sheets of number bond cards (Grade 4, Term 1, Annexure D).
- Scissors.
- Clean A4 sheets on which learners will make tally charts.
- For each set of bond cards that will be cut, you need a suitable container, e.g. the bottom part of a cereal box.

**ACTIVITIES FOR THE DAY**

**PRACTICAL**

Arrange learners in groups of four or three.

Give each group with scissors one set of bond card sheets and a container. They have to cut out the cards and put them in the container. Collect the containers with card sets and store them in a safe place.

In groups without scissors, or in groups that have finished cutting the bond cards, each learner should choose a different number between 400 and 600, and make a neat tally chart to represent that number. You will take these in, to use as a Resource in later lessons.

Use the last ten minutes of the lesson to let learners (the whole class together) count in tens as far as they can, but at least up to three hundred as follows:

*ten, twenty, thirty, forty, fifty, . . . . . .*

## FIRST TERM: WEEK 2 OVERVIEW

**Hours: 5** **Number of periods: 5**

**Learning Outcomes and Assessment Standards**
LO 1 AS 1, AS 3, AS 4; AS 5, AS 8
LO 3 AS 1

**Milestones:**

- Mentally add and subtract single-digit numbers
- Counting given structured collections of objects up to 1000, recording the result by writing the number name in words, by showing it with Flard cards and by writing it in expanded notation
- Investigates and compares (alone and/or as a member of a group or team) three-dimensional objects by making three-dimensional models (rectangular prisms)

| | Day 1 | Day 2 | Day 3 | Day 4 | Day 5 |
|---|---|---|---|---|---|
| **Content Focus** | Development of skill in reading text involving prose as well as diagrams and quantitative information. Practice mental addition of single digit numbers. | Learning to display numbers with flard cards and record numbers in expanded notation. | Counting grouped collections of objects, displaying each total with flard cards and writing it in expanded notation. | Make paper boxes (rectangular prisms) THIS LESSON CAN BE ON ANY DAY OF THIS WEEK. Different classes may do the lesson on different days if the schools only have enough scissors for one class. | Counting grouped collections of objects, displaying each total with flard cards and writing these in expanded notation. |
| **Resources** | A copy of Grade 4 Term 1 Annexure A (Tray and Rack sheets) for each learner. | At least four different counting worksheets, (Grade 4 Term 1 Annexure E) for each learner.<br>Flard cards (each learner should have a set).<br>Tally mark sheets (from the Week 1 Day 5 lesson). | At least four different counting worksheets, (e.g. Annexure E) for each learner.<br>Flard cards. | Scissors, preferably a pair of scissors for each learner.<br>Two copies of Annexure G for each learner | Resources E and F, as prepared for previous lessons.<br>Flard cards.<br>Scissors, sheets of A4 paper, and empty boxes (e.g. cereal boxes).<br>Copies of neat tally mark sheets. |

**WEEK 2 : DAY 1**

**Notes to the teacher:**

- This lesson provides learners with opportunities to develop basic counting, writing and reading skills.

**Resources:**

- A copy of Grade 4 Term 1 Annexure A (Tray and Rack sheets) for each learner.

**ACTIVITIES FOR THE DAY**

**Activity 1**

Hand out copies of the sheet named *Trays A*.

**Task 1**

Ask learners to find out how many apples there are in each tray. Demonstrate on the board how they should write their answers in their classwork books, for example:

There are 8 apples in tray 11.

Tell learners to write their answers by starting at Tray 1, then Tray 2 and so on up to Tray 16.

The answers are as follows:

| | | | |
|---|---|---|---|
| Tray 1: | 7 apples | Tray 2: | 8 apples |
| Tray 3: | 8 apples | Tray 4: | 7 apples |
| Tray 5: | 6 apples | Tray 6: | 10 apples |
| Tray 7: | 8 apples | Tray 8: | 9 apples |
| Tray 9: | 5 apples | Tray 10: | 7 apples |
| Tray 11: | 5 apples | Tray 12: | 4 apples |
| Tray 13: | 9 apples | Tray 14: | 6 apples |
| Tray 15: | 5 apples | Tray 16: | 3 apples |

While learners do this you may write Task 2 (see next page) on the board. (You could also make copies of these questions to hand out.)

**Task 2**

How many apples are there in each of the following two trays together?

1. Trays 3 and 5
2. Trays 4 and 10
3. Trays 2 and 12
4. Trays 8 and 14
5. Trays 16 and 15
6. Trays 13 and 11
7. Trays 9 and 10
8. Trays 6 and 12
9. Trays 1 and 7
10. Trays 2 and 11

Add ten more questions of your own.

Circulate between the desks while students work on Task 1. Learners who finish with Task 1 should start working on Task 2. Make sure learners understand the question correctly (the answer to question 1 is 14 apples).

Circulate between the desks, observe how learners find their answers, and make notes on a list of the learners' names. Use this as an opportunity to make an **assessment** of learners' basic addition skills. For each learner, note which of the following methods the learner uses:

- Produce the answers mentally by looking at the answers to Activity 1 (i.e. not looking at the printed *Trays A* sheet), without making any marks or counting on their fingers.
- Produce the answers by looking at the answers to Activity 1 (i.e. not looking at the printed *Trays A* sheet), and by making marks or counting on their fingers.
- Consult the *Trays A* sheet, and count the apples in the two trays.

**Activity 2:**

Hand out copies of the sheet named *Trays B*. Now do exactly the same as in Activity 1. Answers must be written in learners' classwork books, orderly arranged from Tray 1 to Tray 15.

Give Activity 3 for homework, even if learners have not completed activities 1 and 2.

**Activity 3:**

Hand out sheets *Rack A* and *Rack B* and let learners do the questions. Make sure learners understand the three questions on each sheet.

| | |
|---|---|
| **ASSESSMENT** | **Informal Assessment:** Activity 2 |

## WEEK 2 : DAY 2

**Notes to the teacher:**

- This is a critical lesson, where you will ensure that learners can display numbers (results of counting) correctly with flard cards, in expanded notation and writing in words.
- Learners will only express numbers in the conventional condensed notation, e.g. 300+79+5 as 375, in later lessons. If this notation is required too early, there is a huge danger that many learners will use it without understanding what it really means, i.e. without understanding the real place values of the separate digits.

**Resources:**

- At least four different counting worksheets, with pictures of objects arranged in groups of ten and hundred (like those in Grade 4 term 1 Annexure E) for each learner.
- The tally mark sheets that learners made in Week 1 Day 5 lesson. Select the correct and neatest ones.
- Each learner now has a set of 27 flard cards, of one-digit numbers, multiples of 10 and multiples of 100.
- Each learner must have a classwork book and a pencil.
- Worksheets with questions 1 to 9, or similar questions. If English is a second language for your learners, it may be best to translate the questions into their first language before you make copies.

### ACTIVITIES FOR THE DAY

### ORAL, MENTAL AND CONCEPT DEVELOPMENT

Each learner should access her/his flard cards. Ask them to put all the hundreds cards in one pile, the tens cards in another pile and the one-digit cards in a separate pile.

**NB:** *Learners must always arrange flard-cards in this way every time they are to use them, this will save them time to search for a card without any clue of where it can be found.*

Set the following tasks verbally to the whole class, one by one. Learners should do the questions individually, then compare and discuss their card displays with others.

1. Find a card that shows *four hundred*.
2. Find a card that shows *eighty*.
3. Find two cards that together show *three hundred and sixty*.
4. Find two cards that together show *three hundred and six*.
5. Find three cards that together show *three hundred and seventy-six*.
6. Find three cards that together show *seven hundred and thirty-six*.
7. Find cards that together show *six hundred and thirty-seven*.
8. Find cards that together show *six hundred and seven*.
9. Find cards that together show *six hundred and fifty-seven*.

Give each learner one counting worksheet. Distribute the four different counting worksheets, so that learners seated close to each other have different worksheets.

Tell learners that you now want them to:

- find out how many apples are shown on the worksheet;
- show the number of apples using their flard cards;
- write the numbers on their flard cards separately in their classroom books, showing with '+' signs that they belong together;
- write the total number **in words** in their books.

For example, if there are six hundred and ninety-four apples on a sheet, learners should show the cards 600, 90 and 4 and write the numbers 600, 90 and 4 in their classroom books, with '=' signs, i.e. 600 + 90 + 4 (expanded notation), as well as six hundred and ninety-four.
**Important note:** Learners need not write the numbers in condensed notation, e.g. 268; at this stage (they will do so in Week 3). When they try to do this, some may write 600904 instead of 694. It is in fact not a mistake, since this learner is simply expressing her/his understanding of the number, which is 600+90+4. You will introduce the condensed notation using flard cards in Week 3 Lesson 3.

After you have handed out the counting sheets (like those in Annexure E) and explained the task to learners, you should move around between the desks to observe what learners do and to provide some help to learners where needed.

Do not assume that all learners will be able to count the apples using multiples (group counting) Look out for those learners who are not able to do this. These will be those learners who still count the apples one by one. Suggest to them that they try and count in tens instead.

The correct answers for Annexure E are as follows:

| | | | | | |
|---|---|---|---|---|---|
| For sheet A: | 200 | | | 200 | *two hundred* |
| For sheet B: | 100 | 20 | 6 | 100 + 20 + 6 | *one hundred and twenty-six* |
| For sheet C: | 100 | 10 | 6 | 100 + 10 + 6 | *one hundred and sixteen* |
| For sheet D: | 100 | 20 | | 100 + 20 | *one hundred and twenty* |

Some learners may finish with all four counting tasks with more than 30 minutes of the lesson left. Give these learners the following tasks to work on, individually. You may set the grouping and the sharing questions at the same time, so that learners can choose which one to work on first. Request learners to do their work in writing on loose sheets, and collect these sheets at the end of the session, so that you can look at what they have done in your own time. **(Please make time to actually do this: you may find their work very interesting.)**

1. One chair costs R66 each at a shop. How many chairs can you buy with R850?
2. 850 apples have to be shared between 66 people. How many apples can each person get?

Learners who finish with sheets A to D, but are have not time left to work on the above problems, can be given tally sheets, with the instruction to count the tallies and represent the answers with flard cards, in expanded notation and in words just as they have done for sheets A to D.

| **Oral counting**<br>Use the last ten minutes of the lesson to let learners (the whole class together) count in tens as far as they can from a non–multiple of 10 or 100. For example 201; 211; 221; 231 … . . . . . | |
|---|---|
| **ASSESSMENT** | **Informal Assessment.** |

**WEEK 2 : DAY 3**

**Notes to the teacher:**

- This is a repeat of the lesson of the previous day, with different counting worksheets, e.g. Annexure F.

**Resources:**

- At least four different counting worksheets, with pictures of objects arranged in groups of ten and hundred, like those in Grade 4 Term 1 Annexure F, for each learner.

**ACTIVITIES FOR THE DAY**

**ORAL, MENTAL AND CONCEPT DEVELOPMENT**

Give each learner one of the counting worksheets: E, F, G or H, but keep Sheet I for the second half of the lesson. Distribute the four different counting worksheets, so that learners seated close to each other have different worksheets.

Put the following question to learners:
*How many apples are there in each of the boxes?*
Do not take an answer from any learner. Ask learners to discuss the question among themselves. Then put this question to them:
*How many boxes are there on one shelf (rack)?*
Allow learners to discuss this for 3 to 4 minutes, then tell them that they must now work individually to find out how many apples are shown on the worksheet. They must then:

- show the number of apples with flard cards;
- write the numbers on their flard cards separately in their classroom books, showing with '+' signs that they belong together;
- write the total number **in words** in their books.

For example, if there are six hundred and ninety-four apples on a sheet, learners should show the cards 600, 90 and 4 and write the numbers 600, 90 and 4 in their classroom books, with '+' signs i.e. 600 + 90 + 4 (expanded notation), as well as in words: *six hundred and ninety-four.*

Circulate amongst the learners. You should still not assume that all learners will be able to count the apples in multiples of ten or a hundred. Look out for learners who are not able to do this. They will be the learners who count them one by one. Try to help these learners to see that the apples are organized into group of ten apples (in each box), and to count in tens. **This is very important.** Learners who cannot count in groups of 10 and groups of 100, in other words who do not learn to quickly "see" how many apples there are in situations like those displayed on the apple sheets, are very unlikely to make any real sense of multi-digit numbers and computation with multi-digit numbers later on.
Hand out further counting sheets to learners as they finish, until all learners have done all the sheets (E, F, G and H).

The correct answers are as follows:

| | | | | | |
|---|---|---|---|---|---|
| For sheet E: | 200 | 30 | 6 | 200 + 30 + 6 | *two hundred and thirty-six* |
| For sheet F: | 400 | 30 | 1 | 400 + 30 + 1 | *four hundred and thirty-one* |
| For sheet G: | 300 | 70 | 5 | 300 + 70 + 5 | *three hundred and seventy-five* |
| For sheet H: | 800 | 40 | 7 | 800 + 40 + 7 | *eight hundred and forty-seven* |

Identify those learners who are still not able to count in groups of 10 and 100, and who do not manage to write the totals correctly (in expanded notation) for the different sheets. Write the names of these learners down, so that you can work with them separately during the next two lessons.

Stop learners when half of the lesson time is over, and there is still at least 25 minutes left.

Hand out Sheet I to all learners, and ask them to do the same as they did for Sheets E to H.

The correct answer for Sheet I is:

| | | | | | |
|---|---|---|---|---|---|
| For sheet I: | 300 | 20 | 7 | 300 + 20 + 7 | *three hundred and twenty-seven* |

Hand out clean A4 sheets. Ask learners to draw *two hundred and sixty-eight* stripes on it, arranging the stripes in the same way as on Sheet I **so that it is easy to see how many stripes there are**. Write *two hundred and sixty-eight* on the board.

Ask learners to write their names on their sheets and take it in. Use this for the purposes of continuous assessment, i.e. to get an idea of where learners are in terms of their understanding of three-digit numbers. Hopefully, learners will arrange the stripes neatly in groups of ten.

**Oral counting**

If there is time left, have the learners count on together in 5s as far as they can go

**WEEK 2 : DAY 4**

**Notes to the teacher:**

- This lesson will provide the foundation for later lessons on shapes. In this lesson you will learners how to make a 3-D box (prism), from a folded sheet of paper. You will need to practice the folding of the paper before you go into the lesson, so that you can be sure of how to demonstrate the process to your learners.
- You need to practice folding the paper before you go into the lesson, so that you can demonstrate it to the learners.

**Resources:**

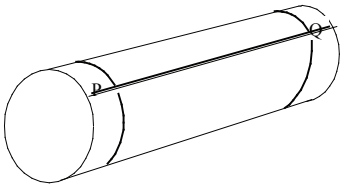
- Scissors, preferably a pair of scissors for each learner.
- Two copies of Grade 4 Term 1 Annexure G for each learner.

**ACTIVITIES FOR THE DAY**

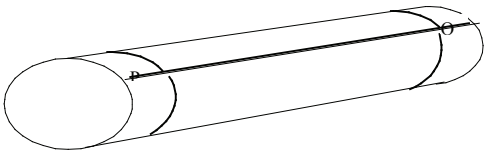
**CONCEPT DEVELOPMENT**

Give each learner a copy of sheet A, and tell them that they will each make a box with the paper. They have to write their names on the sheet, on the same side as the printed lines.

Demonstrate how to "roll" the paper into a tube, with the top edge of the sheet against the horizontal line PQ across the width.

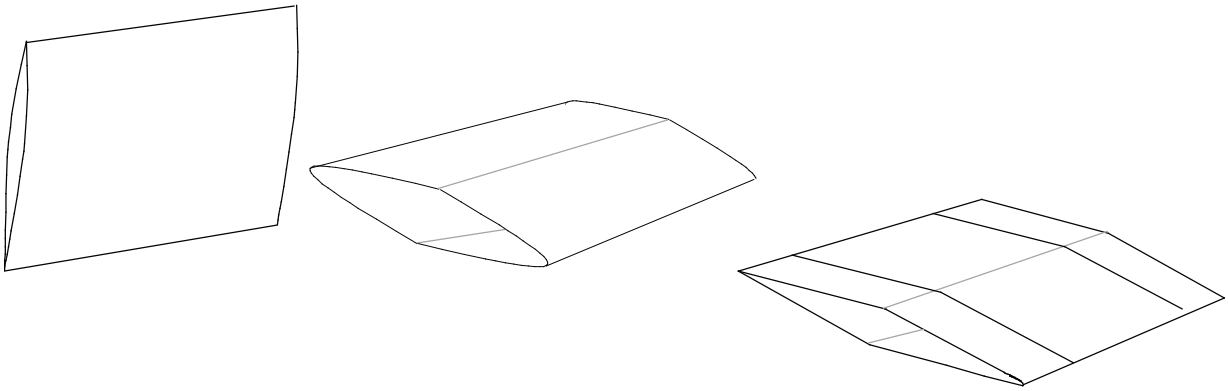



Get the learners to help each other make the tube permanent by sticking the long sides with glue, sticky tape or staples.

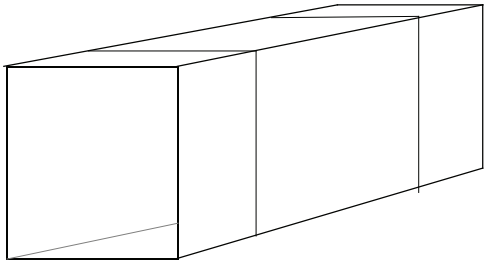



Press the tube flat and sharpen the creases.

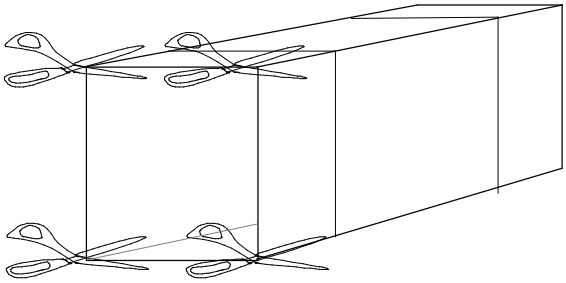
Fold it open again and press it flat to form two more creases along the length (i.e. match up the two creases already made and then press the tube flat to make new creases).



When all four long sides are properly creased, the box can be opened into shape:



To make flaps so that the box can be closed, one may cut the edges up to the printed lines:



Learners who finish quickly may make another box with Sheet B. They may also make more sturdy boxes by using cardboard from empty cereal boxes.

Keep the boxes in class for use in later lessons.

**WEEK 2: DAY 5**

**Notes to the teacher:**

- Learners who still tend to count in ones and not in groups, will spend the whole lesson counting. Spend your time with them, and try to get them to realise the benefits of counting in groups and to practice this.

**Resources:**

- The tally sheets learners made in Week 1 Day 4. Select at least 15 neat sheets beforehand, and make enough copies so that each learner will have at least five different sheets to count in class.
- Enough copies of one of the tally sheets for all learners. Refer to this as the "special" tally sheet.
- Grade 4 Term 1 Resources E and F, as prepared for previous lessons. Flard cards (one set for each learner).
- Scissors, sheets of A4 paper, and empty boxes (e.g. cereal boxes).

**ACTIVITIES FOR THE DAY**

**CONCEPT DEVELOPMENT AND ASSESSMENT**

Give each learner one tally sheet and ask them to find out how many marks there are on the sheet, then to show the total with flard cards and write the total in expanded notation.

Circulate between the learners. Identify those who do the task quickly and correctly, by counting in fives or tens, and who write the answer correctly in expanded notation. Tell these learners that they will not do more counting work today, but will make boxes instead.

After about 5 minutes, reorganise the class. Let the learners you have identified for making boxes move to one side of the class (the "boxmakers"), and the other learners (the "counters") to the other side. Give each of the "boxmakers" an empty box, a pair of scissors and a sheet of paper. Using the sheet of paper, challenge them to make a small box the same shape as the big box you have given them. Then leave them to do this while you attend to the "counters'.

Hand out copies of the special tally sheet to all learners in the counting group. Demonstrate to them how they can count the tallies in 5s and let them all do it together. Also demonstrate to them that counting can be also being done in 10s and then let them all do it together. Let them count more tally sheets individually. Circulate between learners and identify those that still count in ones. Work with them individually, trying to induce them to start counting in groups of 5s, or even better in groups of 10s. .

Continuously monitor the 'boxmakers". If they are successful in making small paper replicas of the big boxes you may now challenge them to cut cardboard from the big box and make small cardboard boxes that can actually be used as containers.

Return to the counting group and continue your efforts to ensure that all of them can now count by counting in groups of 10s. The counting sheets in Annexures E and F may work better than the tally sheets.

In the last 15 minutes, give the following task as an assessment task to all the learners in the class.

| | |
|---|---|
| Ask each learner to show a number between 300 and 400 with flard cards. They must show different numbers. Hand out a clean A4 sheet to each learner and ask them to write their name on it. They also have to write the number they have shown on their flard cards, in words, on the A4 sheets.<br><br>Now ask learners to represent this number with stripes on the other side of the A4 sheet, in such a way that it would be easy for another person to see how many stripes there are. Take the sheets in at the end of the lesson. Some learners may not have managed to finish. That is fine. | |
| **ASSESSMENT** | **Formal Assessment:** Final activity in last 15 minutes of the class |

# FIRST TERM: WEEK 3 OVERVIEW

**Hours: 5** **Number of periods: 5**

**Learning Outcomes and Assessment Standards**
LO 1, AS 1, AS 3, AS 4, AS 5, AS 6, AS 8
LO 3, AS 1

**Milestones:**
Solve different types of problems that involve addition.

- Counting given structured collections of objects, recording the result by writing the number name in words, by showing it with Flard cards and by writing it in expanded notation.
- Writing numbers up to 1 000 in the positional (condensed) notation
- Investigates and compares (alone and/or as a member of a group or team) three-dimensional objects by making three-dimensional models
- Draws, sorts and compares physical three-dimensional objects according to geometrical properties including:
  - Shape and/or number of faces

| | Day 1 | Day 2 | Day 3 | Day 4 | Day 5 |
|---|---|---|---|---|---|
| **Content Focus** | Count given collections.<br>Problems that require addition, given with pictures.<br>Learners work in expanded notation. | Problems that involve addition and subtraction. Learners work in expanded notation. | The positional notation for whole numbers.<br>Adding and subtracting numbers in expanded notation.<br>Learners work in expanded notation. | The positional notation for whole numbers | 3D objects: Identify faces of a rectangular prism |
| **Resources** | Copies of counting sheets J, K, L and M (Annexure H) for each learner.<br>Flard cards (each learner). | The copies of Annexure F (sheets E, F, G and H with apples in racks) that you have used in an earlier lesson (Week 2 day 2). Have this ready, although you may not actually use it during the lesson.<br>Flard cards (each learner).<br>Copies of Annexure I (a worksheet with questions). | Flard cards (each learner).<br>Your two sets of big flard cards for demonstrations on the board.<br>Copies of Annexure F (apple counting sheets E, F, G and H). | Copies of Resources E, F and H for each learner.<br>Flard cards (each learner's own set).<br>Annexure J<br>Annexure K | Glue or sticky tape.<br>A dark coloured chalk or koki pen.<br>Three large sheets of stiff paper.<br>A pair of scissors for each learner.<br>Four A4 sheets for each learner<br>The boxes learners made in an earlier lesson.<br>A brick, and a chalk box (or other similar box) for demonstration purposes. |

**WEEK 3 : DAY 1**

**Notes to the teacher:**

- The purpose of this lesson is to get learners to do addition by working with numbers in expanded notation.

**Resources:**

- Copies of counting sheets J, K, L and M (Grade 4 Term 1 Annexure H) for each learner.

**ACTIVITIES FOR THE DAY**

**ORAL, MENTAL AND CONCEPT DEVELOPMENT**

**Activity 1**

Hand out copies of sheets J, K, L and M to each learner, **for individual work**. Each learner has to individually find out how many apples are shown on each sheet, and represent the totals in expanded notation in his/her classwork book. Circulate through the learners and observe how they count. Specifically look out for learners who may still count one by one. Try to influence them to count in groups of ten and groups of 100.

The correct answers are as follows:

Sheet J: 200 + 20 + 6 Sheet K: 400 + 30 + 3

Sheet L: 300 + 40 + 5 Sheet M: 500 + 30 + 4

Take in the counting sheets J, K, L and M. Now ask learners to find out how many apples there are on sheets J and K together. Request that they show their answers with flard cards, then write it in expanded notation. Also tell them that you want them to show in writing the steps they took to find the total.

irculate between the learners and check what they do. If you find learners who write the numbers in condensed notation as 226 and 433, ask them to work with the numbers expressed in expanded notation. The reason why learners should preferably not work with the condensed notation now is to allow them to learn how easy it is to add numbers when they are written in expanded notation.

*Some learners may ask you for the counting sheets J and K to check their answers. It is good that they ask: give them the sheets they ask for.*

Identify learners who have finished (using methods other than the column method). Let them compare and discuss their answers in small groups (not more than 4 learners per group).

Most learners will possibly write something like this to show their thinking to find the total, but there may be variations:

200 + 400 = 600 apples 20 + 30 = 50 apples

6 + 3 = 9 apples The total is 600 + 50 + 9 apples

There may be some learners who use the column method for addition because they have been shown to do it like that in Grade 3, (although the milestones are clear that it should only be introduced late in Grade 5). Ask these learners not to use the column method now. Tell them that it is important that they learn to do it in other ways, which will make them think of the steps they take to find their answers.

**Activity 2**

When you notice that some of the discussion groups have completed their discussions, write the following additional question on the blackboard:

How many apples are there on the following two sheets together?

1. Sheets J and L
2. Sheets L and M
3. Sheets K and M
4. Sheets J and M
5. Sheets L and K

Tell learners who have finished with the first question to start working on this question, **individually**.

When all learners in the class have completed the first question, conduct a whole class discussion. Start this discussion by writing the following on the board and ask learners whether they have done it like this or differently:

| | |
|---|---|
| 200 + 400 = 600 apples | 20 + 30 = 50 apples |
| 6 + 3 = 9 apples | The total is 600 + 50 + 9 apples |

Indicate that this is a good way to do it. Also point out that this is a good way to write it up, since it shows their thinking clearly.

Ask if any learners have done it in a different way. If some learners have done it differently, ask them to describe how they did it, and try to write that up on the board. Do not write the column method on the board though because you want to discourage learners from using it at this stage.

Ask learners to continue with the other questions that you have written on the board.

Some learners may finish quite quickly. Ask them to find out how many apples there are on all four sheets together.

**WEEK 3 : DAY 2**

**Notes to the teacher:**

- This lesson provides learners with practice in doing addition and subtraction by working with numbers in expanded notation.

**Resources:**

- The copies of Grade 4 Term 1 Annexure F (sheets E, F, G and H with apples in racks) that you have used in an earlier lesson (Week 2 Day 2). Have this ready, although you may not actually use it during the lesson.
- Copies of questions 1 to 6 (see third page of lesson plan).

**ACTIVITIES FOR THE DAY**

**ORAL, MENTAL AND PROBLEM SOLVING**

**Activity 1:**

Ask learners to look up, in their classwork books, the answers they have produced for the numbers of apples on sheets E and H of Annexure E, when they did the lesson for Week 2 Day 3. Ask them to write the answers again, in expanded notation. Write the correct answers on the board and ask learners to check whether they have the correct answers:

Sheet E shows 200 + 30 + 6 apples.

Sheet H shows 400 + 40 + 7 apples.

Now ask them to find out how many apples there are on the two sheets together, showing their answers with flard cards and also writing them in expanded notation.

Circulate between the learners and observe the methods they use. If you find learners who write the numbers in condensed notation (e.g. 236 and 447) discourage it – ask them to work with the numbers in expanded notation. When you identify learners who have finished, let them discuss and compare their work in small groups (not more than 4 learners per group). Learners who finish quickly with their work and discussions may be asked to find out how many apples there are on sheets E, F, G and H together.

When all learners have finished, write the following on the board:

200 + 400 = 600 apples  30 + 40 = 70 apples

6 + 7 = 13 apples  The total is 600 + 70 + 13 apples.

Ask learners to represent this total with flard cards. They may have some difficulty.

Ask the class whether the same number can also be written like this:

600 + 80 + 3 apples

Allow some discussion between learners in small groups as they are seated, and also take some learner opinions for whole class discussion.

| |
|---|
| Ask learners to find out how many apples there are on sheets G and H together.<br>Circulate between the desks. Conclude this activity in the same way as the previous one.<br><br>Learners who finish quickly may work out the total of sheets A, B, C and D together (Annexure E, Week 2, Day 2). |
| **Activity 2:**<br>Write questions 1 to 6 (see next page) on the board, or hand out a copy to each learner.<br>Ask learners to read the questions individually.<br>Invite learners to call you to help them when they do not understand clearly.<br>Ask them to discuss the questions in small groups (no more than four) without trying to answer the questions.<br>Ask learners to produce answers to the questions, showing in writing how they found their answers.<br>Circulate and try to identify learners that have difficulty in reading the questions. Help them. |

**Learners in schools**

1. In one school there are 1000 + 300 + 60 + 5 learners.
   In another school there are 500 + 20 + 3 learners.
   How many learners are there in the two schools together?

2. In one school there are *one thousand five-hundred and thirty-two* learners.
   In another school there are *four hundred and fourty-six* learners.
   How many learners are there in the two schools together?

3. There are 900 + 10 + 4 learners in a school.
   100 + 20 + 3 new learners join the school.
   How many learners are there in the school now?

4. There are *nine hundred and sixty-three* learners in a school.
   *One hundred and twenty-four* new learners join the school.
   How many learners are there in the school now?

5. There are 1000 + 400 + 70 + 8 learners in a school.
   100 + 30 + 5 learners go away to another school.
   How many learners remain?

6. There are *one thousand seven hundred and eighty-nine l*earners in a school.
   *One hundred and fifty-three* learners go away to another school.
   How many learners remain?

**WEEK 3: DAY 3**

**Notes to the teacher:**

- In this lesson learners learn to express numbers in the conventional positional notation, by "translating" from expanded notation to the condensed notation.

**Resources:**

- Flard cards (each learner's own set).
- Your two sets of big flard cards for demonstrations on the board.
- Copies of Grade 4 Term 1 Annexure F (apple counting sheets E, F, G and H).

**ACTIVITIES FOR THE DAY**

**ORAL, MENTAL AND PROBLEM SOLVING**

**Activity 1:**

Ask learners to pack out their flard cards neatly in four stacks, while you hand out copies of counting sheet G (apples in trays and racks).

Ask learners to again show the number of apples on sheet G with flard cards, and circulate quickly through the desks to see the methods they use. Learners may show it like this:

Use your own big flard cards to also show the number like this, on the board.

Now tell the learners that you are going to move your cards around a bit. They must watch what you do carefully, and then tell you whether your cards still show the same number.

Lift the five-card off the board and put it on top of the seventy-card, like this:

Then move it a bit further down:

Ask learners whether you still show the number of apples on sheet G, but do not take answers and discussion now.

Now lift the "75" off the board and put it on top of the three-hundred card like this:

Ask learners whether you still show the number of apples on sheet G. Allow them to discuss this between themselves. Then conduct a whole class discussion. You should take the position that you are still showing the same number, *three hundred and seventy-five*. Argue that you are simply hiding the two zeros of the 300, and the zero of the 70.

During the course of the discussion you may take the three cards apart from time to time, and put them together again.
Put the “3”, “7” and “5” cards next to each other on the board like this, below the 375 is made up of the “300”, “70” and “5” cards.

| 3 | 7 | 5 |
|---|---|---|

3 7 5

Ask learners whether this display of cards also shows the number of apples on sheet G, namely *three hundred and seventy-five*. Let them discuss this between themselves for a while.

Then tell them that it certainly cannot represent the number *three hundred and seventy-five*, because three plus seven plus five is **fifteen**, not **three hundred and seventy-five**. Take the cards on the board apart again and write plus signs between them, as follows:

300 + 70 + 5 = three hundred and seventy five

3 + 7 + 5 = fifteen

Now ask learners to “make” five hundred and sixty-seven by putting flard cards on top of each other, and to hold this up so that other people can see their cards. Then ask them to keep holding their cards up, but to pull them apart so that other people can see their separate cards. Check that some learners are not holding up the “5”, the “6” and the “7” instead of the “500”, the “60” and the “7”. If there are such learners, point out that they only show 18 apples and not five hundred and sixty-seven. Repeat this with other numbers for a while, until you are satisfied that all learners make numbers correctly with flard cards.

**Activity 2:**

Write the following question on the board:

*Jeminah buys a dress for R243 and shoes for R325. How much does she have to pay?*

Also put the question to learners orally, and make sure all learners understand the question.

Ask them to find the answer by first showing the amounts with flard cards and writing them in expanded notation, so that others can see how they found their answer. Also ask them to show their final answer with flard cards that are placed on top of each other.

Circulate between the learners and ensure that they do the calculation by using expanded notation, and that they represent their answer correctly by putting the correct flard cards on top of each other.

Write more similar questions on the board, for example:

1. *Jan buys a radio for R324 and shoes for R242. How much does he have to pay?*
2. *Sipho buys chickens for R328 and roof plates for R455. How much does he have to pay?*
3. *The principal buys meat for R478 and cooldrinks for R286. How much does he have to pay?*

Circulate between learners and observe how they do the questions. It will be interesting to see how they do questions 2 and 3 because of the complications. It is possible that some learners may first produce the following answer for question 2:

300 + 400 = 700 20 + 50 = 70 8 + 5 = 13

Sipho has to pay R700 + R70 + R13.

This can easily be represented by separated flard cards:

| 700 | 70 | 10 | 3 |
|---|---|---|---|

It is problematic however, to represent it with flard cards on top of each other!

You may, once all learners have engaged with question 2 to the point where they are aware of this technical problem (some may have solved it already), put the above display on the board with your big flard cards. This will make it possible for the whole class to engage with the challenge at the same time.

Invite learners to come forward with a plan. Some learners may suggest that the “70” and “10” cards may be exchanged for an “80” card, otherwise you may suggest it yourself. In any case, put the following flard card display on the board, directly below the previous cards:

| 700 | 80 | 3 |
|---|---|---|

Now the cards can be put on top of each other, to show that the number can be written as 783.

When all learners have answered question 3 correctly, you may ask some learners to show their thinking on the board with flard cards.

**WEEK 3 : DAY 4**

**Notes to the teacher:**

- This lesson provides for consolidation of the conventional notation for writing multi-digit whole numbers.

**Resources:**

- Copies of Grade 4 Term 1 Resources E, F and H for each learner.
- Flard cards (each learner's own set).
- Grade 4 Term 1 Annexure J
- Grade 4 Term 1 Annexure K

**ACTIVITIES FOR THE DAY**

**CONCEPT DEVELOPMENT**

**Activity 1:**

Hand out the counting sheets A to M to each learner. They have to count the apples on each sheet again, and write the answer in expanded notation as well as in the normal way, like when flard cards are put on top of each other. Learners, who wish to do so, may use flard cards to sort out how to write the numbers. Circulate amongst the learners and observe how they do this.

Suggest to learners who finish quickly that they try to find out how many apples are represented on all the counting sheets together.

When all learners have counted sheets A to M, put the following display on the board, and explain to learners what it means:

| Expanded notation Long way | Cards | Condensed notation Short way |
|---|---|---|
| 300 + 40 + 7 | 3 4 7 | 347 |

**Activity 2:**

Hand out Annexure J (number writing worksheets). Learners have to do this individually and should write directly on the worksheets. Circulate and ensure that all learners understand what the tasks require of them. Take this in for marking as a formal assessment task when learners have finished.

**Activity 3:**

When learners have finished, hand out Annexure K (Adding multiples of 10). Learners have to do this individually and write the answers in their classwork books.

| **ASSESSMENT** | **Formal Assessment:** Activity 2 |
|---|---|

**WEEK 3 : DAY 5**

**Notes to the teacher:**
- This is a continuation of Week 2, Day 4

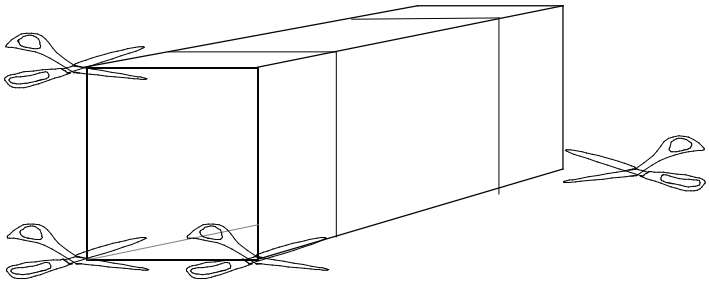
**Resources:**
- Glue or sticky tape
- A dark colored chalk or koki pen
- Three large sheets of stiff paper
- A pair of scissors for each learner
- Four A4 sheets for each learner
- The boxes learners made in an earlier lesson
- A brick, and a chalk box (or other similar box) for demonstration purposes

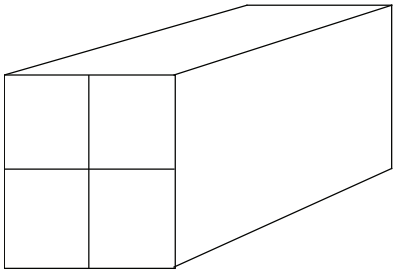
**ACTIVITIES FOR THE DAY**

**CONCEPT DEVELOPMENT**

**Activity 1:**

Give each learner one of the boxes they made during the lesson for Week 2, Day 4. If they have not done this already, show them how to close the two small ends by folding the flaps over like when you wrap a parcel. They may even glue the flaps. Assist learners who work slowly.





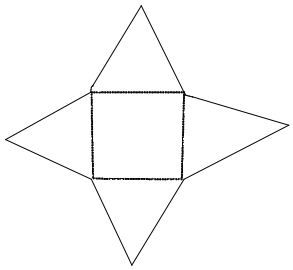
When learners have finished, show them the brick and the box you have brought to the class, and ask them to say if their closed boxes are like these objects or not. To help them to see the similarity, you may do the following:

Give each face of your brick or box a name, for example call the faces “A”, “B”, “C”, “D”, “E” and “F”, and write the names on the faces with a dark colored chalk or koki pen. Ask learners to do the same with the boxes they have made. They have to make sure that they label all the faces.

Once learners have labelled all the faces on their boxes, ask them to make a rough drawing of each face in their classwork books. They have to write the name/label of each face on its drawing.

**Activity 2:**

Make a drawing like this on the board, and ask learners to make a similar drawing on a sheet of paper, as big as the sheet of paper allows them:

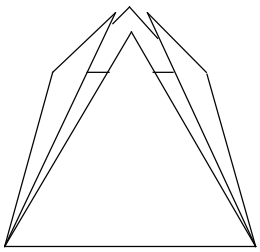


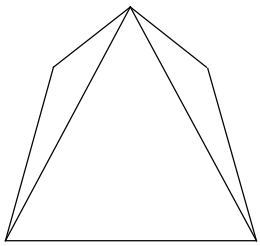
Try to make your drawing as neat as possible, with a square in the middle and four identical triangles around it, without using any instruments except a ruler.

Learners may need to make several attempts before they get reasonably good drawings.

Check that they do not make tiny drawings, but rather use the available space on the sheet of paper. Also make an example of the same drawing on your large sheet of stiff paper, so that you can demonstrate further actions to the learners.

Let learners now cut out their drawings on the solid lines, and fold up along the dotted lines so that the sharp ends meet. Also demonstrate this with your own drawing on the large sheet of stiff paper. You can stabilize the objects with sticky tape.



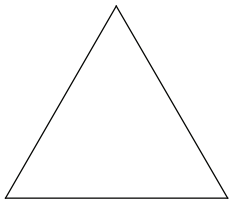


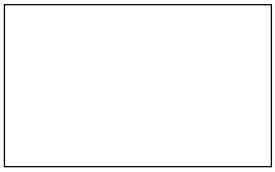
You may tell learners that such an object is called a *pyramid*, while the box they made earlier (or an ordinary brick) is called a *rectangular prism*.

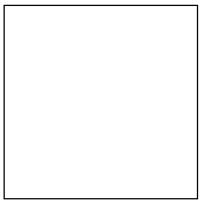
Label the faces of your big pyramid (as you did for your brick or box) and let learners do the same. Let them also draw the faces and label the drawings of the faces correspondingly.

**Activity 3:**

Make the following drawings on the board:







Tell learners that these flat shapes are called triangles, rectangles and squares respectively.

Write the following questions on the board:

1. How many faces does a rectangular prism have?
2. How many of them are exactly the same?
3. What shapes are the faces: squares, triangles or rectangles?

Ask the same questions for a pyramid and get the learners to answer them.

Learners have to do this individually as a written exercise and hand it in to you for assessment.

| ASSESSMENT | **Formal Assessment:** Activity 3 |
|---|---|

## FIRST TERM: WEEK 4 OVERVIEW

**Hours: 5** **Number of periods: 5**

**Learning Outcomes and Assessment Standards**
LO 1 AS 1, AS 4, AS 5, AS 6, AS 8, AS 9, AS 10, AS 12

**Milestones:**
- Counting in a variety of intervals
- Counting given structured collections of objects
- Know or quickly determine addition and subtraction facts
- Solve different types of problems that may involve addition and subtraction
- Extend number patterns

| | Day 1 | Day 2 | Day 3 | Day 4 | Day 5 |
|---|---|---|---|---|---|
| **Content Focus** | Practice number bonds.<br>Problems involving money, that may involve addition and subtraction. | Problems given with pictures, that may involve addition and subtraction. | Problems given in words, that may involve addition and subtraction. | Formal assessment.<br>Count in threes. | Count in a variety of intervals.<br>Extend number patterns. |
| **Resources** | Grade 4 Term 1 Annexure B (sets of number bond cards): one set for every 4 learners in the class. Each set of cards must be in a suitable container<br>A second empty container for each set of cards.<br>A watch on which you can accurately read a period of one minute.<br>A copy of Annexure L for each learner.<br>A scoring sheet (A4 or other sheet) for each group.<br>An A4 sheet for each learner. | Grade 4 Term 1 Annexure M.<br>A class list.<br>Flard cards. | Grade 4 Term 1 Annexure M.<br>The class list on which you noted learners' strategies during the previous lesson. | An assessment task like Grade 4 Term 1 Annexure N. | Chalkboard. |

## WEEK 4: DAY 1

**Notes to the teacher:**

- This lesson is devoted to learning number bonds and to working on a problem which requires more than one operation.

**Resources:**

- Grade 4 Term 1 Annexure D (Sets of number bond cards): one set for every 4 learners in the class. Each set of cards must be in a suitable container, for example a cut-down cereal box or a shoe box or a plastic bag.
- A second empty container for each set of cards.
- A watch on which you can accurately read a period of one minute.
- A copy of Annexure L for each learner.
- A scoring sheet (A4 or other sheet) for each group.
- An A4 sheet for each learner.

## ACTIVITIES FOR THE DAY

### ORAL AND MENTAL ACTIVITIES

### Activity 1: The number bond game

Arrange the class in groups of 3 or 4 learners. Each learner must have a classwork book and a pencil. In each group they have to write their names on the scoring sheet, with several lines between the names. Hand out the container with number bond cards to each group. Also hand out the second empty container to each group. Explain to the class how the game will work:

- Learners will take turns of one minute to draw cards and complete the number sentences in their classwork books. For example if the card reads 50 + 30, the learner has to write 50 + 30 = 80 in his/her classwork book, then draw a next card and continue until the 60 second period is up.
- The learner has to give answers to all the cards drawn: skipping of cards is not allowed.
- You will announce the beginning and end of each one-minute periods to the class.
- When a turn is completed, the other members of the group have to check the learner's work. The learner gets one point for every correct answer, and loses one point for every wrong answer.
- Do not put used cards for which correct answers are produced back into the container with the other cards. Put them in the second container. Only cards for which wrong answers are given are put back in the original container.
- Learners have to play in alphabetical order according to their first names.
- Learners may use the trays and racks on Annexure L to help them find the answers.

Hand out a copy of Annexure L (two pages) to each learner. Announce that there will be one trial game before the real game starts. Each player will get at least one turn of one minute in the trial game. All cards are put back into the original container after the trial game.

Use your watch to tell learners when to start the first round of the trial game. When the sixty seconds is over, call STOP. Learners now need time to mark the answers and award the points, before you say START again to set the second round in motion.

Note and record at what time you start the actual game. The game continues until all the cards have been used. Some groups will finish before others. Record the time taken from when the game started, until the last group finishes, so that you can monitor progress in future.

Within each group, the learner with most points at the end wins the game. The first group of learners who finish all the cards win the team competition. Each group should record the number of rounds they have taken to deal with all the cards, for future reference. Remember to take in the cards and the Annexure L sheets at the end.

**CONCEPT DEVELOPMENT**

**Activity 2:**

Inform learners that you will describe a situation to them and that they have to take notes because they will have to answer some questions afterwards. They have to do this and answer the question on the A4 sheets which you give them.

Describe the situation below to your learners, slowly and with repetitions, so that they have time to take notes:

*Thandeka goes to town with R598 in her purse. She first goes to the bank where she draws R800. Then she goes to a shop and buys a dress for R251. Then she goes to another shop where she buys groceries for R716.*

Pause for a full minute, so that learners can reflect on the information, before you state the following question:

*Find out how much money she has left over at the end. Do all your work on the sheet.*

Circulate between learners and urge them to write all the numbers in expanded notation before they try to do the calculations.

Write the following new question on the board while learners are working:

*Lufuno goes to town with R623 in her purse. She goes to the bank where she draws R900. Then he goes to a shop and buys a pair of trousers for R475. Then she goes to another shop where she buys groceries for R512. Find out how much money she has left over at the end.*

Circulate between the learners. Take in the sheets of learners who have finished with the first question (remember to ask them to write their names on their answer sheets). Then point them to the second question on the board. At the end of the lesson, take in all learners' work on the first question, even if they have not finished.

Spend time looking at their work for question 1 carefully. You need this information about their thinking so that you can support them further with respect to the development of their problem-solving and computational skills.

## WEEK 4: DAY 2

**Notes to the teacher:**

- In the first half of the lesson learners will count and solve simple problems with respect to situations represented with pictures. In the second half of the lesson they will work further on the two problems of the previous day.

**Resources:**

- Grade 4 Term 1 Annexure M
- A class list

### ACTIVITIES FOR THE DAY

### ORAL, MENTAL AND PROBLEM SOLVING

**Activity 1:**

Hand out copies of the three sheets of Annexure M.

Ask learners to find out, for each room, how many apples are needed to fill the racks up to 600 apples in total (in the room).

Circulate between the learners and observe how they deal with the situation. There are at least three quite different strategies that learners might follow:

**A. Concretely, by counting:** They may count the "open spaces" in the racks in the room.

**B. By "filling up"**: They may count the apples on the racks in the room and then find out how much should be added to this number to get 600.

**C. Abstractly, by subtracting:** They may count the apples on the racks in the room and then subtract this number from 600, in some way or another. If there are learners who do this, you may find their methods of subtraction quite interesting.

Make notes in your class list which strategy each learner uses, so that you can compare it with the strategies they use in later lessons.

While learners are still working, rearrange them so that they are seated in small groups made up of learners who use all of the three strategies above. At some stage before learners have finished with all three pages, stop them and ask them to tell each other how they are doing the work. It will be very helpful for learners to become aware that the same task may be tackled in different ways.

Do not spend more than half of the lesson time on this activity, even if some learners do not finish all the rooms. Take in the three sheets (Annexure M) at the end.

**Activity 2:**

Let learners work in four different ways for the second half of the lesson, depending on how far they have progressed on the previous day:

If some learners did not finish solving the following problem on the previous day, write it on the board and let those learners continue to work on it (give them back their written work that they handed in at the end of the previous lesson):

*Thandeka goes to town with R598 in her purse. She first goes to the bank where she draws R800. Then she goes to a shop and buys a dress for R251. Then she goes to another shop where she buys groceries for R716.*

Other learners may have finished the above problem, but did not start with the second problem. Arrange these learners in groups of not more than four and ask them to tell each other how they thought and calculated how much money *Thandeka* has left. When they have exhausted the discussion, they may start working individually on the *Lufuno* problem.

Some learners may have done some substantial work on the second problem, but not finished it yet:

*Lufuno goes to town with R623 in her purse. She first goes to the bank where she draws R900. Then he goes to a shop and buys a pair of trousers for R475. Then she goes to another shop where she buys groceries for R512.*

*Find out how much money she has left over at the end. Do all your work on the sheet.*

Write the problem on the board again and let these learners continue to work on it individually.

For those learners who have finished the above problem, arrange them in groups of not more than four and ask them to tell each other how they thought and calculated how much money *Lufuno* had left.

## WEEK 4: DAY 3

**Notes to the teacher:**

- In this lesson, learners will have opportunities to progress from problems presented with pictures, to similar problems presented in text only.

**Resources:**

- Copies of Grade 4 Term 1 Annexure M.
- The class list on which you noted learners' strategies during the previous lesson.

### ACTIVITIES FOR THE DAY

**PROBLEM SOLVING**

**Activity 1:**

Hand out the first sheet (*Room A, Room B*) of Annexure M to each learner. Tell learners that the racks in room B have to be filled up so that there are 100 apples in each rack. These apples have to be taken from Room A. Allow learners to discuss this between themselves for one or two minutes, to check whether they understand the situation in the same way.

Tell learners that they have to find out how many apples will be left in Room A after the racks in Room B have been filled up. They have to do this individually. Circulate between learners and observe how they do it. Make brief notes of the strategies different learners use and relate it to the strategies (counting, filling up and subtraction) they have used during the previous lesson.

Put those learners who have finished together in groups of three or four. Put learners who have used quite different strategies in the same group. Ask them to tell each other how they did it.

When a group has finished talking, tell the learners to do the same for the second sheet (rooms C and D), and later the third sheet.

After about 25 minutes, write the following problem on the board:

*There are 785 apples in room G and 834 apples in the ten racks of room H. All the racks in room H have to be filled up to 100 apples each.*
*These apples have to be taken from room G. How many apples will be left in room G?*

**Activity 2:**

About halfway through the lesson, tell learners to stop working even if they have not finished with all three sheets. Ask them to now tackle the problem you have written on the board, individually. Talk through the problem with them so that limited reading ability does not hinder them from understanding the situation.

Circulate amongst the learners. Identify and support learners who may struggle to understand the situation and the question. You may point out that it is similar to the earlier questions.

Observe how learners do this question. Once more you will probably observe a variety of different strategies. Again find time to briefly note which strategies different learners use and how this may differ from the strategies they used during Activity 1.

**WEEK 4: DAY 4**

**Notes to the teacher:**
- The first part of this lesson is devoted to assessment.

**Resources:**
- An assessment task like Grade 4 Term 1 Annexure N.
- The sheets *Table B* and *Table C* from Grade 4 Term 1 Annexure R

**ACTIVITIES FOR THE DAY**

**ASSESSMENT**

**Activity 1 (40 minutes)**

Ensure that learners are seated so that they can do individual work and that they all have pencils. Tell them that they will work individually for the whole period because you want to find out how each of them think and what they can do.

Hand out the assessment task (Annexure N). Circulate between the learners and ensure that learners understand the questions. Do not allow limited reading ability to keep learners back.

**ORAL AND MENTAL ACTIVITIES**

**Activity 2**

Arrange learners in groups of no more than 4 learners per group. Hand out the banana counting sheets *Table B* and *Table C*.

Each group must now count *very softly* in threes, together: *three, six, nine, twelve, etc.* up to fifty. They may "follow" their counting on Table B if they want to.

Once they have reached 50 (actually 48), they should start again. It will go a bit better the second time. They should repeat this a few times.

Then learners should individually find out how many bananas there are on Table B.

**WEEK 4: DAY 5**

**Notes to the teacher:**

- This will be learners' first experience with number patterns (sequences) for the year.

**ACTIVITIES FOR THE DAY**

**ORAL, MENTAL AND CONCEPT DEVELOPMENT**

**Activity 1:**

Write the following numbers on the board:

18 25 32 39 46 51 58

Ask learners to write these numbers in their classwork books, and to also write what they think the next ten numbers might be. Ask learners to explain in writing why they propose these numbers and not others.

Circulate between the learners. Identify those that have finished writing their numbers and their explanations. Group them together (not more than four per group) to discuss their answers and explanations. Also ask them to each design more similar sequences (with different numbers) on their own.

When all learners have extended the initial sequence by ten more terms, and have written down an explanation, interrupt the deskwork and conduct a whole class discussion. Start by writing the extended sequence below the original sequence on the board, so that the board display looks like this (leave some space between the two rows as indicated):

18 25 32 39 46 51 58

18 25 32 39 46 51 58 65 72 79 86 93 100 107 114 121 128

Ask some learners to explain how they knew the numbers after 58 should be 65, 72 79 etc.. Some learners will explain that they have noticed that the number increase by 7 each time (or that 7 is added). Demonstrate on the blackboard how this observation can be recorded with arrows underneath the numbers:

18 25 32 39 46 51 58

+7 +7 +7 +7

18 25 32 39 46 51 58 65 72 79 86 93 100 107 114 121 128

Also demonstrate the following alternative ways of recording how a sequence works:

$18 \xrightarrow{+7} 25 \xrightarrow{+7} 32 \xrightarrow{+7} 39 \xrightarrow{+7} 46 \xrightarrow{+7} 51 \xrightarrow{+7} 58 \xrightarrow{+7} 65 \xrightarrow{+7} 72$

18 + 7 → 25 + 7 → 32 + 7 → 39 + 7 → 46 + 7 → 51 + 7 → 58 + 7 → 65 . . . . .

Learners may use any of these recording techniques when they work with sequences.

**Activity 2:**

Write the following on the board and ask learners to continue the pattern as far as they wish in writing:

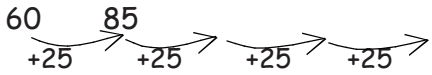
Pattern B

50 75

+25 +25 +25 +25

Write more tasks like this on the board, for learners to work on:

Pattern C




Pattern D: Start at 20 and add 5 each time

Pattern E: Start at 200 and add 15 each time

Pattern F: Start at 500 and add 40 each time

You may specify more patterns yourself.

You may also invite learners to specify patterns for themselves and then extend the patterns.

If there is time left, let learners count in 3's and 5's starting from any number between 100 and 200.

# FIRST TERM: WEEK 5 OVERVIEW

**Hours: 5** **Number of periods: 5**

**Learning Outcomes and Assessment Standards**
LO 1 AS 3, AS 5
LO 4, AS 7

**Milestones:**
- Uses the appropriate SI unit to estimate, measure, record and compare length (metre)
- Solves problems involving equal sharing and measurement, involving fractions including halves, thirds, quarters, fifths, eighths and tenths and mixed numbers involving these fractions
  - decimal notation for tenths

| | **Day 1** | **Day 2** | **Day 3** | **Day 4** | **Day 5** |
|---|---|---|---|---|---|
| **Content Focus** | Concept of fractions: eighths | Concept of fractions: tenths | Concept of fractions: thirds, quarters, etc up to ninths<br>Equivalent fractions | Concept of fractions: twentieths, fiftieths, twelfths, hundredths.<br>Equivalent fractions | Decimal notation for tenths and halves.<br>The metre as a unit of measurement. |
| **Resources** | A pair of scissors for each learner.<br>Measuring strips and objects to measure (Grade 4 Term 1 Annexure Q) | A pair of scissors for each learner.<br>Measuring strips and objects to measure (Grade 4 Term 1 Annexure Q) | A pair of scissors for each learner.<br>Measuring strips and objects to measure (Grade 4 Term 1 Annexure Q) | Measuring strips and objects to measure (Grade 4 Term 1 Annexure Q). | Metre stick.<br>Metre length of string for each learner. |

## WEEK 5: DAY 1

**Notes to the teacher:**

- Activity 1 serves to revise the idea of a fraction in the context of fair sharing. In Activity 2, learners are introduced to fractions as units of measurement.

**Resources:**

- A copy Pencil sheets A and B of Grade 4 Term 1 Annexure Q for each learner, and some spare copies.
- A pair of scissors for each learner.
- This drawing on the board:

### ACTIVITIES FOR THE DAY

### ORAL, MENTAL AND CONCEPT DEVELOPMENT

**Activity 1:**

Ask learners to solve this problem:

*Eight learners have to share two loaves of bread. How much bread should each learner get?*

If learners have difficulties, suggest that they make a rough drawing of the two loaves of bread.

Once learners are happy with the idea that each learner will get one quarter of a loaf, ask them to solve the following problem:

*Sixteen learners have to share two loaves of bread. How much bread should each learner get?*

Allow some discussion after the majority of learners have solved the problem and ensure that all learners understand why the piece each learner will get may be called *one eighth* of a loaf – it is because the loaf is divided into eight equal pieces.

**Do not use the common fraction notation $\frac{1}{4}$ or $\frac{1}{8}$ at all in this lesson or even in this term.** It is important that learners develop a proper understanding of the meaning of fractions before they are introduced to the notation, otherwise they tend to interpret the notation as just meaning two separate numbers of the same kind which is very false. Write fractions in words at this stage, for example *1 eighth*. It is also critically important that learners say the fraction names, although the “th” is quite difficult for non-English speakers!

Finally ask learners what they would call each piece if a loaf of bread is shared fairly between five learners.

**Activity 2:**

Tell the class that they will make measurements again today, not in metres as the previous day, but by using the short measuring strips on the sheets that you hand out.

Hand out a copy of Pencil Sheet A and a pair of scissors to each learner. Ask them to cut out one of the stick-rulers, including the two darkly coloured endpieces that are not part of the stick itself. The "stick" will now be their unit of measurement, like the "metre" was on the previous day. Circulate and check that they cut the rulers out correctly. Some learners may cut out just the stick without the endpieces. Correct them. They may cut out the second printed stickruler then.

Once all learners have cut out their stick-rulers, ask them to try to measure the pencils on sheet A. They have to do this individually and write down their findings. Tell learners that they may not be able to measure all the pencils accurately.

> It is very important that learners personally experience the problem of not being able to measure objects accurately, because this problem was the reason why people (the Egyptians in North Africa) originally invented fractions: as a tool for precise measurement.

Circulate between learners and ensure that they do not include the endpieces in their measurements. The drawing you have made on the board, with the pencil that is 1 STICK long, may be helpful to learners.

Learners' written reports may look something like this:

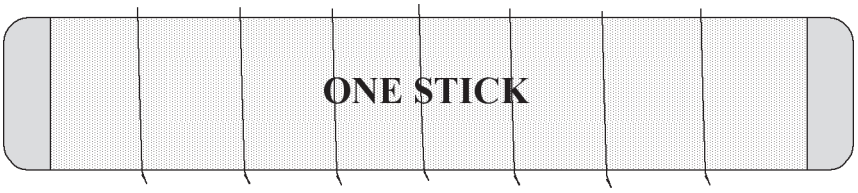
Pencil A is two STICKS long.
Pencil B is longer than 1 STICK.
Pencil C is about one and a half STICKS long.
Pencil D is about one and a half STICKS long.
Pencil E is a bit more than two STICKS long.
Pencil K is a small bit longer than one STICK.

> Some learners may say Pencil B is one and a half STICKS long. You may ask them how long Pencil C is then and point out that it is shorter than Pencil B. However, when you interact with learners now, keep in mind that the actual lengths of pencils B, C, D and E cannot be satisfactorily determined now.

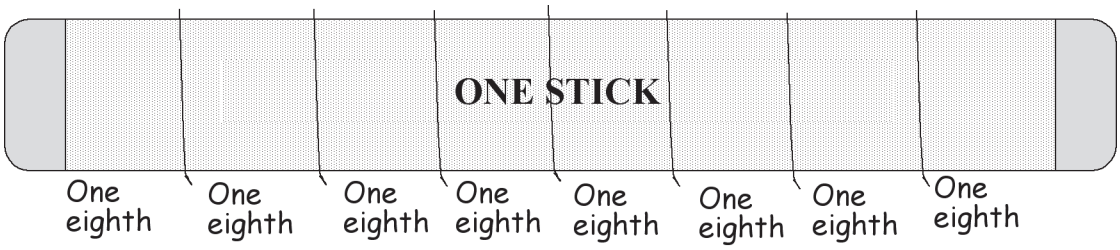
The purpose of Activity 2 is that learners should come to realise that one cannot measure all the pencils accurately. Once you are sure that all learners realise this, you may suggest that they cut out the second stick-ruler and fold it to form smaller pieces that are parts of a stick. Ask them to cut off the darker endpieces in this case. By folding the second stick-ruler in half and putting it next to the first stick-ruler, they should be able to make somewhat better measurements already.

Ask learners to fold the second stick-ruler over in half again and again (you may need to demonstrate this) and ask them how many smaller pieces are now formed.

You may wish to make marks on the drawing on the board, to support their thinking:

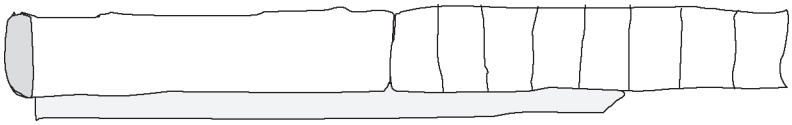


Ask learners to discuss in small groups what these smaller pieces may be called. It is extremely important that all learners have the opportunity to make sense of the idea to call the pieces "eighths", since this is at the heart of the fraction concept and some learners may previously have missed out on making the connection between the number of equal parts and the name given to the parts. Circulate between the discussion groups and listen to what they say. When all or most learners in the class are using the term "eighths", you may go to the board and write as shown below:




**Do not use the common fraction notation $\frac{1}{4}$ or $\frac{1}{8}$ at all in this lesson or even in this term.**

Ask learners to use the divided stick-ruler in combination with the original stick to try to measure the pencils better than before, starting with pencil B. They will need to put the two sticks next to each other, and you may make a rough drawing on the board to demonstrate this.



Require learners to write down their results for the different pencils, in words as demonstrated below (write it on the board):

Pencil B is STICKS long

Circulate between the learners. As soon as all of them have established the length of pencil B correctly, complete the sentence on the board:

Pencil B is one STICK and five eighths of a STICK long

It is quite important that, throughout these three lessons on fractions, you consistently check and demand that learners write their results for the different pencils out in full, correctly.

The lengths of the different rulers on sheet A are:

Pencil A: 2 STICKS

Pencil B: 1 STICK and 5 eighths of a STICK

Pencil C: 1 STICK and 4 eighths of a STICK (or one and a half STICK)

Pencil D: 1 STICK and 3 eighths of a STICK

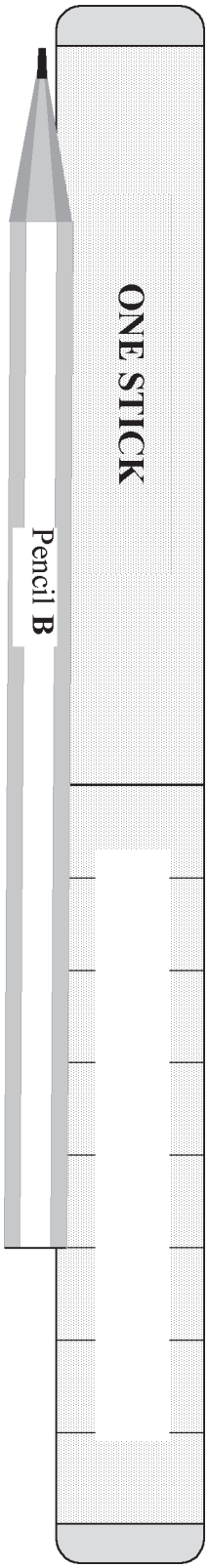
Pencil E: 1 STICK and 7 eighths of a STICK

Pencil K: 1 STICK and 1 eighth of a STICK

If there is time left, you may hand out pencil sheet B and learners may cut out the long ruler with subdivisions on one STICK. Let them use this ruler to check the measurements for pencils B, D, E, F and K.

If there is still time left, they may also start to measure the pencils on sheet B.

Learners will not be able to measure pencil L accurately with the eighths ruler. This problem provides motivation for having more subdivided rulers, with other fraction parts of a STICK



**WEEK 5: DAY 2**

**Notes to the teacher:**

- Learners will do more measurements with fractions, and learn about tenths.

**Resources:**

- Pencil sheets B, C, D and E of Grade 4 Term 1 Annexure Q.
- A pair of scissors for each learner.

**ACTIVITIES FOR THE DAY**

**CONCEPT DEVELOPMENT**

If this was not done on the previous day, hand out pencil sheet B. Let learners cut out the long ruler with subdivisions one stick. Let them use this ruler to check the measurements for pencils B, D, E, F and K.

Next, learners should measure the pencils on sheet B, and write down the measurements as described in the previous lesson plan.

Learners will not be able to measure pencil L accurately with the eighths ruler. This problem provides motivation for having more subdivided rulers, with other fraction parts of a STICK.
Tell learners that they will get another ruler on sheet C, with which they can try to measure pencil L.

Hand out pencil sheet C and let learners cut out the rulers. They must first try to measure pencil L accurately with the new ruler, then proceed to the measure all the pencils on sheet C and write down the results properly as before.
Circulate between learners. Pencil X will be a problem.

Identify learners who have written down all the measurements correctly (except pencil X of course). Hand out sheet D to these learners and ask them to continue and try to measure all the pencils on sheet D and write the answers down. A little later, also give the learners copies of sheet E and tell them they may cut out and use these rulers too.
Some learners may not get as far as sheets D and E today.

**The lengths of the pencils on sheet B are:**

Pencil F: 3 eighths of a STICK
Pencil G: 3 eighths of a STICK
Pencil H: 5 eighths of a STICK
Pencil J: 7 eighths of a STICK
Pencil L: 7 tenths of a STICK

**The lengths of the pencils on sheet C are:**

Pencil M: 4 tenths of a STICK
Pencil P: 1 and 6 tenths of a STICK
Pencil R: 6 eighths of a STICK
Pencil S: 9 tenths of a STICK
Pencil T: 1 and 9 tenths of a STICK
Pencil V: 1 and 8 tenths of a STICK
Pencil W: 1 and 7 eighths of a STICK
Pencil X: 4 sixths of a STICK

**WEEK 5: DAY 3**

**Notes to the teacher:**

- The work on fractions is continued, by learners taking measurements with fraction-rulers. Some learners may have time to become aware of equivalent fractions.

**Resources:**

- As for the previous day.

**ACTIVITIES FOR THE DAY**

**CONCEPT DEVELOPMENT AND ASSESSMENT**

**Activity 1:**

Hand out sheet D to the learners who did not get it in the previous lesson and ask them to continue to measure all the pencils on sheet D and write the answers down. A little later, also give them copies of sheet E and tell them they may cut out and use these rulers too.

Remind learners that they have to write out their results in full and write some demonstrations for pencils from sheets A and B on the board.

Learners may write the names of the fraction parts on their different rulers, so that they do not have to count the number of segments each time they use a ruler.

Pencils KK and HH will be problematic: these pencils cannot be accurately measured with the fractional parts on the given rulers.

**Activity 2:**

Identify learners who have finished and written correct answers for all the pencils on sheet D except KK and HH. Suggest to learners that they may change some of the rulers they have, to make new rulers that can be used to measure these two pencils. For pencil HH, they may try to modify the ruler with eighths and for pencil KK, they may try to modify the ruler with tenths.

**The lengths of the pencils on sheet D are:**

Pencil S: 9 tenths of a STICK
Pencil BB: 8 ninths of a STICK
Pencil J: 7 eighths of a STICK
Pencil Y: 6 sevenths of a STICK
Pencil Z: 5 sixths of a STICK
Pencil AA: 8 tenths of a STICK
Pencil R: 6 eighths of a STICK
Pencil X: 4 sixths of a STICK
Pencil DD: 5 tenths of a STICK
Pencil EE: 1 and 4 ninths of a STICK
Pencil FF: 1 and 2 sevenths of a STICK
Pencil GG: 1 and 2 tenths of a STICK
Pencil NN: 1 and 1 seventh of a STICK
Pencil JJ: 1 and 1 ninth of a STICK
Pencil KK: 1 and 7 twentieths of a STICK
Pencil LL: 5 sevenths of a STICK
Pencil MM: 7 ninths of a STICK
Pencil HH: 1 and 5 sixteenths of a STICK

**Activity 3:**

Write the following on the board, but do not try to resolve the issue in class:

Pencil G is 3 sixths of a STICK long. Pencil G is 5 tenths of a STICK long.
Pencil G is 4 eighths of a STICK long. Check whether this is all true.
How can the same pencil have different lengths?

| **ASSESSMENT** | **Formal Assessment:** Activity 1 (take in the classwork books) |
|---|---|

## WEEK 5: DAY 4

**Notes to the teacher:**

- In this lesson learners will engage with more fraction units, specifically twelfths, twentieths, fiftieths and hundredths. The concept of hundredths is a prerequisite for understanding centimeters as hundredths of a metre.

**Resources:**

- A copy of Pencil Sheet F of Annexure Q for each learner.

### ACTIVITIES FOR THE DAY

### CONCEPT DEVELOPMENT

**Activity 1**

Hand out a copy of Pencil Sheet F to each learner. Learners have to measure the pencils A1 to A5 with the rulers next to which the pencils are placed. They have to do this individually.

Note that this is quite a demanding task. It requires that learners have a good understanding of how fractions are formed when a whole is sub divided into equal parts. Circulate between learners. One way in which you can help learners without creating the risk that they simply start to parrot the information you give them, is to ask the following question, pointing to the subdivisions on the ruler:

*What part of a stick is each of these sections?*

Here are the lengths of the pencils:

Pencil A1 is one and 17 twentieths of a STICK long.

Pencil A2 is one and 41 fiftieths of a STICK long.

Pencil A3 is one and 9 twelfths of a STICK long.

Pencil A4 is one and 60 hundredths (or 6 tenths) of a STICK long.

Pencil A5 is one and 67 hundredths of a STICK long.

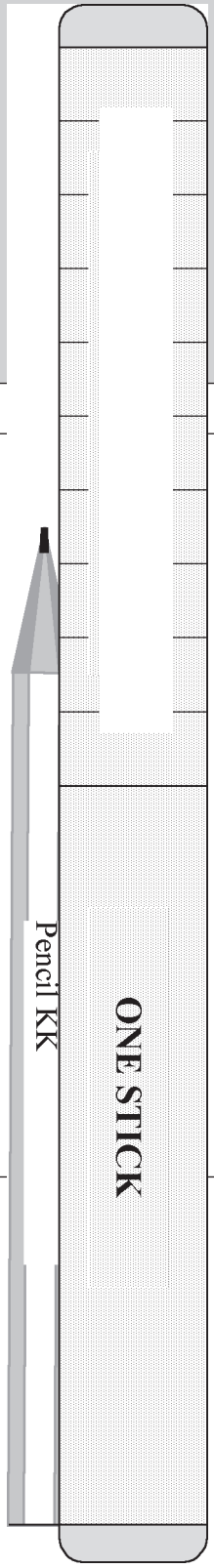
**WEEK 5: DAY 5**

**Notes to the teacher:**

- This lesson is about the metre as the standard unit of length. The activities focus on estimating and measuring lengths in metres, and then grappling with ways to deal with and name the bits over or under a whole metre measurement. This will help learners to understand the need for smaller units of measure in between metres to measure smaller lengths more accurately.

**Resources:**

- A copy of sheet G of Annexure Q for each learner.
- Metre stick
- About 20 lengths of string a metre long for learners to work with.




**ACTIVITIES FOR THE DAY**

**CONCEPT DEVELOPMENT**

**Activity 1**

Inform learners that "one tenth" is often written as 0,1, and "3 tenths" as 0,3. Inform them that this is called the *decimal notation* for fractions.

Ask them to suggest how each of the following may be expressed in the decimal notation:

2 tenths of a STICK,

5 tenths of a STICK,

1 and 9 tenths of a STICK.

Now ask learners to measure the pencils on Pencil Sheet G, and to express the lengths by using the decimal notation.

The lengths are 1,9 STICK, 1,8 STICK, 1,7 STICK etc. from left to right.

Also ask learners whether 5 tenths and one half are the same, and let them discuss this.

**INVESTIGATION**

**Activity 2**

Show the metre stick to the class and ask them whether they remember having seen it before, and what it is called. Remind them that it is called a metre.

Draw a line one metre long on the board, and demonstrate to learners that a metre is about 10 STICKS long.

Hold the attention of the class and measure the board with the metre stick.

The answer may be that it is longer than 2 metres but shorter than three metres.

Ask learners what plan one may make to be able to measure the board accurately with the metre stick.

Allow some discussion. Some learners may suggest that the metre be divided into smaller parts like was done with the STICK. Inform learners that we will do this with the metre stick later.

Hold the stick both vertically and horizontally and ask learners to imagine in their minds objects that measure either a metre up and down (length) or a metre across (width).
Ask learners to stand up and look around at the heights of different learners in the class and then in their groups and to think about which of them are about a metre tall, taller than a metre or less than a metre.
Ask several learners from each category (a metre tall, taller than a metre or less than a metre) to come to the front of the classroom. Use your metre stick to measure their heights. Learners can then review how close their estimations were and in doing so, build a mental picture of how long a metre really is.

## INVESTIGATION

**Activity 3**

Let learners work in small groups. Give each group a string one metre long.
Let learners take turns to measure their heights against the walls or the door. One of the learners holds one end of the string above the head of the learner who is being measured, while another learner pulls it down straight in line and holds the string in position. They must think up their own ways to describe the bits over or under. For example, just over a metre, a little less than a metre, almost a metre etc. Some learners may use fraction names as well like one-and-a-half and one-and-a-quarter. Learners record the heights of their group members in a table:

## FIRST TERM: WEEK 6 OVERVIEW

**Hours: 5** **Number of periods: 5**

**Learning Outcomes and Assessment Standards**
LO 1 AS 3, AS 5
LO 2 AS 1
LO 3 AS 1

**Milestones:**
- Investigate and extend number patterns.
- Mentally add and subtract multiples of 10 and 100
- Recognises, identifies and names two-dimensional shapes including:
  - Polygons (hexagons)
- Know or quickly determine multiples of single-digit numbers to at least 100 (multiplication tables).

| | **Day 1** | **Day 2** | **Day 3** | **Day 4** | **Day 5** |
|---|---|---|---|---|---|
| **Content Focus** | Number patterns | Addition and subtraction: Multiples of 10 and 100. Number patterns. | Number patterns; Addition and subtraction | Polygons: squares, rectangles, pentagons, hexagons. | Multiplication tables |
| **Resources** | Chalkboard. Grade 4 term 1 Annexure K. | Number bond cards as used previously. A copy of Annexure L for each learner. | Number bond cards as used previously. A copy of Annexure L for each learner. | Copy of a pattern with different polygons.. | Sheets with grouped objects (Annexure R). Chalkboard, worksheets. |

**Note:**
The lesson on shapes (Week 6, Day 4 can be done on any day. If there is a shortage of scissors in the school, different classes can have this lesson on different days of the week.
Note that each learner will need a large empty cereal box for this lesson.

## WEEK 6: DAY 1

**Notes to the teacher:**

- Learners will do more work on sequences, including sequences which do not have a constant difference between the terms. A major purpose of this lesson is to develop learners' abilities to communicate about numbers and mathematical relationships, and to express their thoughts in words.

**Resources:**

- Copies of Grade 4 Term 1 Annexure K.

### ACTIVITIES FOR THE DAY

### ORAL, MENTAL AND CONCEPT DEVELOPMENT

Ask learners to look up what they wrote in their classwork books for the lesson of Week 4 Day 5, and to talk about what they remember from that lesson in small groups for 3-4 minutes.

Write the following on the board and ask learners to copy and continue the patterns for at least six more numbers in each case.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Pattern A: | 25 | 26 | 28 | 31 | 35 | | | | | |
| Pattern B: | 1 | 2 | 4 | 8 | 16 | | | | | |
| Pattern C: | 32 | 33 | 35 | 39 | 47 | | | | | |
| Pattern D: | 50 | 60 | 80 | 120 | 200 | | | | | |
| Pattern E: | 50 | 70 | 60 | 80 | 70 | 90 | 80 | 100 | 90 | 110 |

Write the following instruction on the board:

**For each pattern, describe how someone can work out what the next number is.**

Circulate between learners. Identify learners that have finished extending the number patterns and point them to the instruction on the board. Explain it to them if they have reading difficulties.

Identify learners who have finished writing their stories. Arrange them in groups of three or four learners and ask them to agree on how each pattern can be described in words in one sentence. Each learner in the group should write these sentences down.

Write the following new sequences on the board:

Write the next twenty numbers in each pattern:

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Pattern G: | 15 | 26 | 39 | 54 | 71 | | |
| Pattern H: | 105 | 130 | 165 | 190 | 225 | 250 | 285 |
| Pattern I: | 2 | 5 | 11 | 20 | 32 | 47 | |
| Pattern J: | 5 | 12 | 26 | 47 | 75 | | |
| Pattern K: | 1000 | 982 | 964 | 946 | 928 | | |

Coordinate the work on the new task exactly as you coordinated the work on the first task.

If there is time left, let learners do the questions in Annexure K again.

## WEEK 6: DAY 2

**Notes to the teacher:**

- In this lesson learners will have the opportunity to consolidate their knowledge of addition and subtraction facts for multiples of ten and hundred.
- In the second half of the lesson, learners will engage with some number patterns (sequences) that behave in strange ways. This will also require them to count in various group sizes, including 7. In fact, the number patterns here just provide an interesting context for practicing addition and subtraction with small numbers.

**Resources:**

- The sets of number bond cards as used previously.
- A copy of Grade 4 Term 1 Annexure L for each learner, in case they need it for the number bond game.

### ACTIVITIES FOR THE DAY

### ORAL AND MENTAL ACTIVITIES

**Activity 1:**

Play the number bond game, as described in the lesson plan for Week 4, Day 1. This should occupy roughly the first half of the lesson. Compare the performance (speed) of the class with their performance on the previous occasions when they played this game.

### CONCEPT DEVELOPMENT

**Activity 2:**

Inform the learners that a friend of yours has designed a sequence. The first three numbers in the sequence are 12, 19 and 26. Inform the learners that later you will tell them what the next twenty numbers in your friend's sequence are. Ask them to first write the three given numbers in their classwork books and to also write what they think the **next ten** numbers could be.

Circulate and observe what learners do. It is very likely that most, if not all of them, will notice the constant difference of 7 and produce the following:

12 19 26 33 40 47 54 61 68 75 82 89 96

Allow learners to come to agreement on what the numbers could be. Then write their numbers on the board. Tell learners you will now show them the first fifteen numbers in the sequence that your friend has designed and write this on the board, directly below their numbers:

12 19 26 33 40 47 54 61 68 75 78 71 64

Ask learners to try to find out how your friend's pattern works and to write the next ten numbers in his pattern. Once they have ideas, they may share and discuss this with classmates. After about 5 minutes, ask each learner to predict the next ten numbers in your friend's pattern. Once all learners have written this down, you may write the following on the board, extending from the first part that you have written previously:

12 19 26 33 40 47 54 61 68 75 78 71 64 57 50 43 36 29 22 15 12 19

Ask whether anybody now knows the secret of your friend's number pattern. Allow some discussion. If no learner comes up with the solution, you may tell them: You friend only uses the numbers between 10 and 80 and the pattern goes up and down in steps of 7, "bouncing back" against 80 at the top and 10 at the bottom.

Ask learners to write down the first 25 numbers in your friend's pattern, if the first number is 15 instead of 12, but the step size is 7 again and the boundaries are 10 and 80 again. While they work on this, write the task below on the board. Then circulate between the learners, to ensure that they did the above task correctly, before you point them to the task on the board.

The correct answer for your friend's sequence, starting at 15 is: 15 22 29 36 43 50 57 64 71 78 75 68 61 54 47 40 33 26 19 12 15 22 29 36 43 (Note that the sequence repeats itself after bouncing off the lower boundary 10.)

This is the task you have to write on the board:

<u>Up and down patterns.</u>

Write the first 25 numbers of each of the following up and down patterns, using a step size of 8 in all cases.

Pattern A: The boundaries are 250 and 370. The first number is 255.

Pattern B: The boundaries are 350 and 462. The first number is 353.

Pattern C: The boundaries are 450 and 522. The first number is 456.

Pattern D: The boundaries are 550 and 634. The first number is 559.

Pattern E: The boundaries are 650 and 776. The first number is 657.

Pattern F: The boundaries are 649 and 775. The first number is 654.

Pattern G: The boundaries are 749 and 833. The first number is 752.

Pattern H: The boundaries are 848 and 932. The first number is 851.

Pattern I: The boundaries are 550 and 670. The first number is 558.

Pattern J: The boundaries are 653 and 773. The first number is 660.

Circulate between learners. Identify those who have finished and let them work in groups of three or four. Ask them to compare the last number of their answers for each of the patterns. If they differ on the last number, somebody has made a mistake. They have to sort out the mistakes. When they all agree on the answers, they should exchange ideas about anything interesting that they have observed while extending the patterns. They should also call you to inform you if they have observed anything that is really interesting. If some groups observe that some of the patterns start to repeat after bouncing, challenge them to find out why this happens in some cases but not in others.

**Learners who do not finish the patterns in class should do so for homework.**

**WEEK 6: DAY 3**

**Notes to the teacher:**
- In the first part of the lesson, learners will continue to work on oscillating sequences.
- In the second part of the lesson, they will practice addition and subtraction bonds by playing the game they know by now.

**Resources:**
- The sets of number bond cards as used previously.
- A copy of Grade 4 Term 1 Annexure L for each learner, in case they need it for the number bond game.

**ACTIVITIES FOR THE DAY**

**CONCEPT DEVELOPMENT**

**Activity 1:**

You need patterns A to J from yesterday on the board again. Write the last number (the 25th) in each sequence next to the specification. Ask learners to look at their answers and check whether they have the same last numbers as those you have written. If not, they should compare with a classmate to find out where they have gone wrong.

All learners now have to write the first 25 numbers in the patterns A to J, this time for a step size of 6, not eight as on the previous day.

At some stage ask learners to check whether some of the patterns start to repeat themselves at some point while others do not. Ask them to mark the patterns that repeated when the step size was eight and to check whether the same patterns repeat when the step size is six.

If time allows, learners may also make the patterns for step sizes of 5 and 9.

After about 25 minutes, write the following homework task on the board:

*Make one up-and-down pattern that repeats itself and one up-and-down pattern that does not repeat itself. Your patterns must be different from any of the patterns you did in class.*

Explain the homework to the learners, and then do Activity 2.

**ORAL AND MENTAL ACTIVITIES**

**Activity 2:**

Let learners play the number bond game, exactly as they did in the previous lesson.

**CONSOLIDATION**

**Activity 3:**

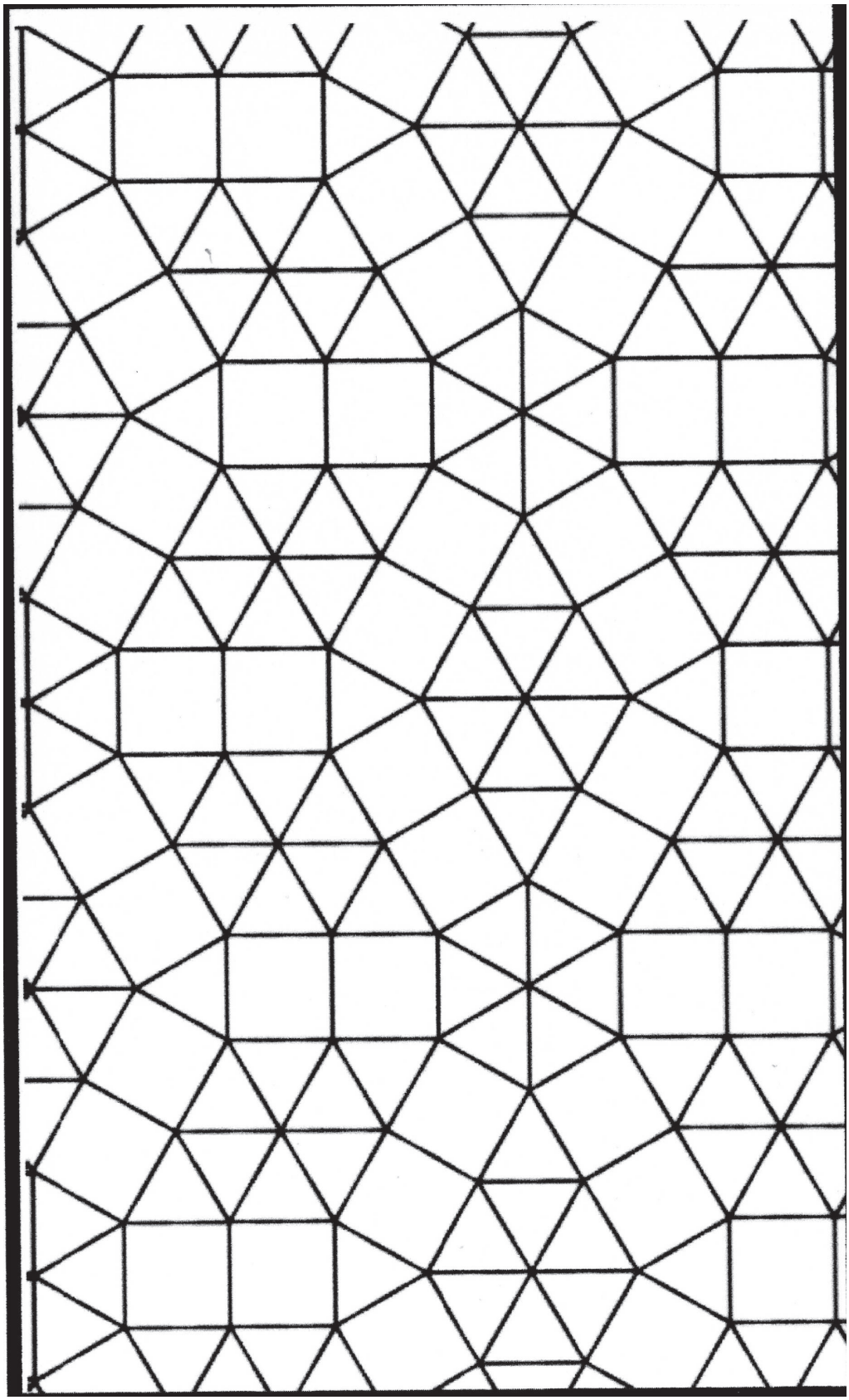
For learners who finish quickly and are now idle, write the following numbers on the board:

4 10 15 19 22

Ask learners to write these numbers in their classwork books and to write what they think the next ten numbers could be. Ask learners also to explain in writing why they think the next ten numbers should be those they indicate.

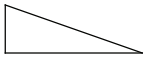
Identify those that have finished writing their numbers and their explanations. Group them together (not more than four per group) to discuss their answers and explanations.

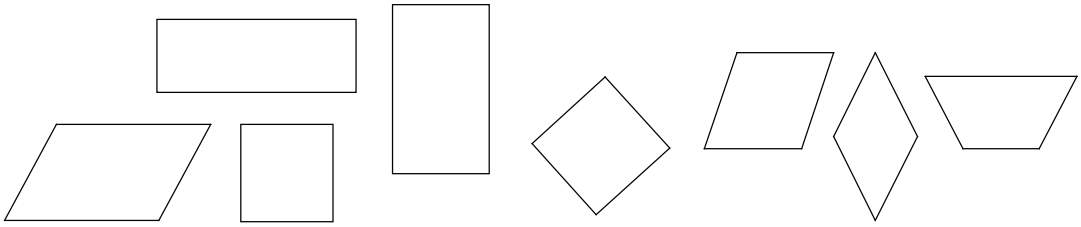
| WEEK 6: DAY 4 |
|---|
| **Notes to the teacher:**<br>• In today's lesson, we will revise shapes from Grade 4 as an introduction to focussing specifically on rectangles and squares.<br>• Make sure that the learners understand the vocabulary "side".<br><br>**Resources:**<br>• A copy of the next page for each learner. |
| **ACTIVITIES FOR THE DAY** |
| **CONCEPT DEVELOPMENT**<br>**Activity 1**<br>Give each learner a copy of the next page with the pattern. Learners can work with a partner to identify and shade in different shapes as you say them. If they have crayons, they can color the different shapes in different colours according to your instructions. Do one shape at a time; give the learners time to shade it. Let pairs of learners swap with each other after shading each shape. They can check on each other, and if there is disagreement, you can resolve it. In the pattern, learners can identify:<br>- A triangle<br>- A square<br>- A rectangle (hint: the learners will have to shade two squares together)<br>- A hexagon (hint: this is made up of six triangles)<br>You can extend this activity by asking learners to count how many of each shape they can see in the pattern.<br>You may also give learners clean sheets of paper, ensure they have rulers or other objects which can help them to draw straight lines, and ask them to make a copy of the pattern. This may be started in class and given for completion as homework. |



**Activity 2**

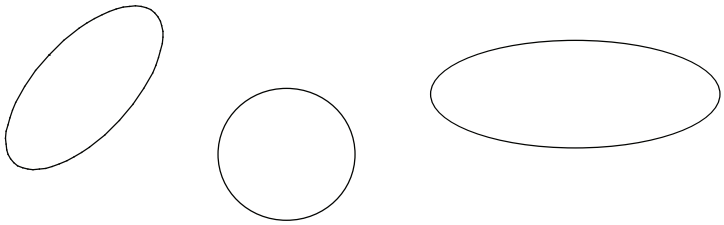
Give each pair of learners some matchsticks. Ask them to build the following shapes, one at a time. After they have built each shape, ask them questions about the shape, giving as many different learners as possible the opportunity to answer a question:

- Triangle (Examples of questions: how many sides it have? Are the three sides always the same length? Draw some triangles on the board to help the learners answer:  )
- Quadrilateral. Spend some time discussing quadrilaterals. Through questioning, ascertain from the learners that quadrilateral means a four sided shape. There are many different quadrilaterals. The learners only need to be able to name a square and a rectangle at this stage. Draw some on the board so that learners and keep repeating that a quadrilateral has four sides.



- A 5-sided figure. Ask if anybody can name it? (Pentagon)
- Hexagon (6 sides)
- Heptagon (7 sides)
- Octagon (Think of an octopus, a sea creature which has eight arms.)

Ask the learners what all the shapes that have been made in this lesson have in common. Give them a clue: something about their sides. They all have straight sides. Ask the learners if there are any shapes that they know with curved sides and let a few learners come and draw such shapes on the board:



**WEEK 6: DAY 5**

**Notes to the teacher:**
- In Activity 1, learners will learn multiplication facts.
- In Activity 2, learners will cut multiplication fact cards and play a game.

**Resources:**
- A copy of Grade 4 Term 1 Annexure R (eight sheets with bunches of bananas) for each learner
- A copy of Grade 4 Term 1 Annexure S (multiplication worksheet 1) for each learner
- A copy of Grade 4 Term 2 Annexure K (multiplication fact cards) for each learner
- Scissors

**ACTIVITIES FOR THE DAY**

**ORAL AND MENTAL ACTIVITIES**

**Activity 1**

Hand out copies of Annexure R (sheets with bananas) to each learner.

Ask learners to determine how many bananas there are on each of the sheets.

When they have finished, they should compare their answers.

Hand out copies of multiplication worksheet (Annexure S) to each learner.

Read the questions on the sheet with learners.

Learners should tackle the questions individually.

Take the sheets in.

**Activity 2**

Hand out a copy of Annexure K and a pair of scissors to each learner. Each learner should cut out the cards and put them in an envelope.

Let learners play the number bond game (as described in the lesson plan for Week 4, Day 1), with the multiplication fact cards (Annexure K).

| **ASSESSMENT** | **Formal Assessment:** Activity 1 |
|---|---|

# FIRST TERM: WEEK 7 OVERVIEW

**Hours: 5** **Number of periods: 5**

**Learning Outcomes and Assessment Standards**
LO 1 AS 3, AS 5, AS 6
LO 3, AS 1
LO 5, AS 2, AS 2, AS 4, AS 7

**Milestones:**
- Solve problems that involve addition and subtraction, involving money.
- Collects data (alone and/or as a member of a group or team) in the classroom and school environment to answer questions posed by the teacher and the class
- Recognises, identifies and names three-dimensional objects including:
  - Cubes and rectangular prisms;

| | Day 1 | Day 2 | Day 3 | Day 4 | Day 5 |
|---|---|---|---|---|---|
| **Content Focus** | Addition and subtraction, working with money | Addition and subtraction, working with money | Data collection, representation and analysis. | Data collection, representation and analysis. | Data collection, representation and analysis. |
| **Resources** | Fake bank notes (Grade 4 Term 1 Annexure O).<br>Scissors.<br>Cut-out box (Annexure P) | Fake bank notes (Annexure O). | Chalkboard. | Chalkboard. | Chalkboard. |

## WEEK 7: DAY 1

**Notes to the teacher:**

- The money notes will provide learners with another opportunity to develop understanding of how numbers are built up (place value) and what multidigit numbers mean.

**Resources:**

- Grade 4 Term 1 Annexure O (fake money notes): a copy for each learner and some spare copies.
- A pair of scissors for each learner.
- A copy of Grade 4 Term 1 Annexure P for each learner, to make a flat box container for the money notes, and some spare copies. Annexure P will work better if it is printed on stiff paper.
- Glue, for pasting the containers to make them better.

### ACTIVITIES FOR THE DAY

### ORAL, MENTAL AND CONCEPT DEVELOPMENT

**Activity 1**

Hand out copies of the four sheets with fake money notes, and a pair of scissors, to each learner. Each learner has to write his/her initials or first or second name on each of the notes before cutting, so that they can keep hold of their own money later on. Learners have to cut out the notes. While learners are busy, also hand out the copies of Annexure P. Learners who finish before others with cutting the notes, may help to make containers (using Annexure P) for the others, so that Activity 1 can get done as quickly as possible. Each learner must end up with his/her set of notes and a container.

**Activity 2**

Learners should work in pairs, or in groups of three. One learner states a four-digit amount, for example *seven hundred and seventy-two rand.* The other learner (or the other two learners) have to make up this amount of money from their notes, in four different ways, for example:

R500 + R200 + R50 + R10 + R10 + R2
R300 + R200 + R100 + R100 + R50 + R10 + R10 + R2
R400 + R100 + R200 + R60 + R10 + R2
R300 + R100 + R100 + R100 + R50 + R50 + R50 + R10 + R10 + R2

The learners should check together whether the different representations show the same amount, and that it is the amount stated by the first learner.

Each learner should then write a report of the work in his/her classwork book, indicating the numbers only (not the money to which it refers), for example as follows for the above case:

500 + 80 + 7 = 200 + 300 + 50 + 30 + 4 + 3
= 100 + 400 + 20 + 60 + 1 + 6
= 100 + 100 + 100 + 100 + 100 + 40 +10 +10 + 10 + 10 + 2 + 5

Another learner then gets the opportunity to nominate an amount.

Circulate between the learners and check as many reports as you can. Where there are mistakes, point this out to learners by saying *"This is not true, you must correct it!"* They should then interrupt what they are busy with, to first correct the work with mistakes. They should call you when they have corrected, so that you can check again.

**WEEK 7: DAY 2**

**Notes to the teacher:**
- Learners will work at problems.

**Resources:**
- The fake money notes (Grade 4 Term 1 Annexure O) for each learner.

**ACTIVITIES FOR THE DAY**

**PROBLEM SOLVING**

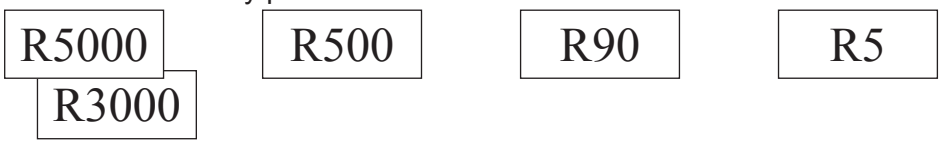
**Activity 1**

Learners have to work individually, and they may use their fake money to help them.

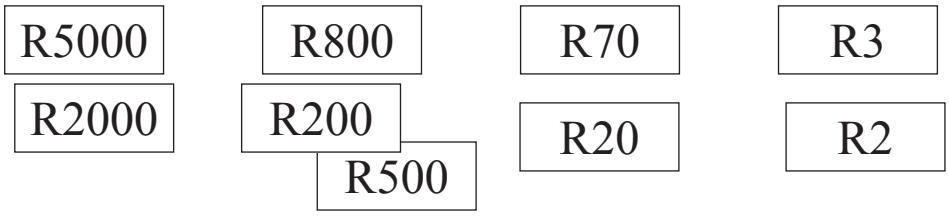
Tell the class that you have bought new bedroom suite for R8 595, but that you can pay only R5 873. Your husband (wife, mother, whichever relative you are comfortable to mention) has agreed to pay the rest. Each learner now has to work out how much your relative must contribute. Learners should make notes of the amounts you have mentioned, rather than you writing it on the board. Tell learners that they can use their fake money notes to help them, but they can also do it otherwise.

Leave the learners for at least five minutes, to ensure that they understand that they are on their own now and should tackle the problem on their own initiative. Then start circulating between them, and observe what they do. If there are learners that seem not to get started, you may suggest to them that they display the total cost of the bedroom suite with fake money notes. You may also remind them that they can do this in different ways, and that this may help them to find out how much your relative has to contribute.

Some learners may pack out the R8 595 with banknotes:




They may then reorganize the banknotes, so that they can "see" the R5 873 as part of it:




The repacking makes it easy to see that the relative should contribute R2722.

Ask learners who work like this to describe their thinking in writing. They may produce something like this:

R8 000 + R500 + R90 + R5

**R5000** + R2000 + **R800** + R200 + R500 + **R70** + R20 + **R3** + R2

So, R2000 + R700 + R20 + R2 must still be paid.

Other learners may adopt a "filling up" strategy, namely start with the R5 873 and then figure out what they must add to it to get R8 595. They may do this by working with the fake notes to support their thinking, or by working directly with the numbers, for example like this (different learners may record the same thinking differently):

R5 873 + **R27** = R5 900 R5 900 + **R100** = R6 000 R6 000 + **R2 595** = R8 595

To find the answer, this learner may add the bold parts:

R2 595 + R100 = R2 695 and R2 695 + R27 = R2 722.

Some learners may record the above thinking as follows:

R5 873 + **R27** = R5 900 + **R100** = R6 000 + **R2 595** = R8 595

While the *thinking* is mathematically 100% correct, this way of *writing* is misleading and ambiguous and should be avoided. It is not true that R5 873 + R27 (i.e. R5 900) is equal to R5 900 + R100 (i.e. R6 000). You may help learners who think and write like this enormously by suggesting that they use an arrow instead of an equal sign to represent their thinking:

R5 873 + **R27** → R5 900 + **R100** → R6 000 + **R2 595** → R8 595

A third strategy ("take away") that learners may follow is to start with the total cost (R8 595 ), and to figure out how much remains if R5 873 is taken away from it. Again learners may or may not use the fake money notes to support their thinking. This strategy may be implemented in different ways, two of which are demonstrated below:

<u>Take R5 873 away piece by piece from R8 595 ("piecemeal subtraction")</u>:

R8 595 – **R3** → R8 592 – **R70** → R8 522 – **R500** → R8 022 – R300 → R7 722 – **R5 000** → R2 722

<u>Break both the R8 595 and R5 873 down and take parts away from parts:</u>

R8 595 = R8 000 + R500 + R90 + R5

R5 873 = R5 000 + R800 + R70 + R3

To make it possible to take parts away from parts, it helps to rebuild the R8 595 as follows:

R8 595 = R7 000 + R1 500 + R90 + R5. One may then proceed as follows:

R7 000 – R5 000 = R2 000

R1 500 – R800 = R700

R90 – R70 = R20

R5 – R3 = R2, and the answer is R2 000 + R700 + R20 + R2 = R2 722.

All the above methods are mathematically quite correct. The "filling up" method is the quickest and easiest. The "break both numbers down and take parts away from parts" provides the mathematical basis of the conventional column method that was introduced by accountants in Western Europe about five centuries ago, because accountants keep their records in columns.

Identify learners that have finished, and assign them to groups of four or three learners to tell each other about their methods. As far as possible, put learners who used different strategies in the same group.

Write the following task on the board, so that groups of learners who have finished discussing their methods for the first problem, may tackle the next problem (individually). Suggest to these groups that they go to the board to read and discuss the new situation, before they return to their desks to work individually. **It is very important that learners tackle problems individually, otherwise some learners never learn.**

A farmer had 5 625 sheep. One Sunday afternoon these sheep were chased by a jackal, and by 5 O'clock that afternoon only 4 756 were found.
How many were still missing?

Identify learners that have finished with the second problem as the lesson period moves on, and again assign them to groups of four or three learners to tell each other about their methods, **and also about any changes in their strategies**. As far as possible, put learners who used different strategies in the same group.

When there is about 20 minutes of the lesson period left, demonstrate the "pack out and repack" and "filling up" strategies for the first problem on the board, with some reference to learners who have used these methods. If several learners have used other methods and there is still time left, you may also demonstrate the other methods.

## WEEK 7: DAY 3

**Notes to the teacher:**

- Over the next three days, learners will be working in groups to decide the kinds of foods they would buy from a school tuckshop. They will decide on the data they require, prepare questions and then actually go and speak to fellow learners to collect the data. They will then display the results using tallies and draw conclusions from their results. This lesson serves as revision of using tallies for counting, as well as interpreting data collected using tallies.
- They will work in groups today to pose the questions, decide a set of questions as a class and then collect data. You will need to get permission to disrupt other classes in the school in order to get their information.
- Each group of learners will ask the opinion of a different grade of learners within the school. Each group will also be broken into smaller groups so that two or three learners will go to each class in the grade.

**Resources:**

- Each learner will need their jotter and a pencil.

### ACTIVITIES FOR THE DAY

### PROBLEM SOLVING

Explain to learners that they are going to plan a menu for their school tuckshop. If the school does not have a tuckshop, tell learners that they must either imagine that their school is going to open one and they have to plan the menu, after talking to fellow learners; or if they have a food vendor near their school, they must find out from learners what they would like her to sell if they could choose a menu. Explain that the food must be healthy and that they must make sure it will be affordable and also that the relevant supplier will be able to produce the items to be sold.

Divide the class into groups with about 8 learners per group (depending on the number of learners you have – there must be 1 group to represent each grade in the school). Together the group will decide on the items (restrict it to 4 at the most) that they would like to buy at their tuckshop. Give learners time to complete this task and then ask each group to tell you their 4 items. Write the names of these items on the board and the 4 or 5 most popular items will become your main list. Learners will now draw the table in their jotters and will keep a record of their results on this table. You will need to tell each group which grade they are going to question. Divide each group into smaller groups so that only 2 or 3 learners will ask a class (instead of all 8 learners going together). Each small group must be told the exact classroom they must visit. At the time you have arranged with the other teachers in the school, learners will go and find out how many learners in their assigned class would like to buy the items on the list.

They must keep a separate record of the choice made by boys and girls in the class. They can record the numbers using individual tallies in their own jotters. They will work with these results during the next lesson. A list may look like the one on the next page: (Note: this is a sample only and each class of learners will need to make their own decision on items.)

| Item | Number of orders |
|---|---|
| Chicken soup Boys | |
| Chicken soup Girls | |
| Grilled chicken Boys | |
| Grilled chicken Girls | |
| Hamburgers Boys | |
| Hamburgers Girls | |
| Bran muffins Boys | |
| Bran muffins Girls | |

As learners ask the other learners if they would buy the items on their list, they record the positive responses using tallies. Check their books when they come back to your class, to make sure that they have actually completed the task set.

## WEEK 7: DAY 4

**Notes to the teacher:**

- Today learners will work in their groups to consolidate the information from their books onto a large chart.
- Each group will answer a set of questions related to their tallies and grade questioned.
- You will need to prepare questions to ask the learners, related to the data collected. This will help them interpret the data on their group chart in preparation for the final whole class discussion and drawing final conclusions.
- Ensure that the charts are large and clearly filled in, as the whole class will refer to these in the next lesson.

**Resources:**

- Jotters with the results of the questioning from the previous day and to record answers to questions from this lesson.
- Large sheet of paper to display final tallies for the group.
- Set of questions either written on the board or a copy for each group.

## ACTIVITIES FOR THE DAY

### PROBLEM SOLVING

Hand out the large sheets of paper to each group for them to put all their data together to see the choice made by the whole grade. Tell learners that the charts must be neat, clear and able to be seen by the whole class. Learners must copy their original table onto the large sheet of paper (making it as big as possible). The small groups of learners then report back to the rest of their group and tell them the numbers of each item chosen by each class in the grade. They must then transfer the information from their jotters onto the large chart, using tallies.

Once learners have transferred all the data from their sheets onto the large chart, they must work as a group to discuss and answer the questions you have set. Hand out the worksheets or write the questions on the board. Read these aloud with the learners following as you read, so that the learners understand what is expected of them. While learners are completing this task, you need to walk between the groups and talk to them about the questions they are answering. Ensure that they understand the questions. The questions must challenge learners to think about the results, calculate total numbers and compare results. For example (this is a sample only – you will need to add more questions of your own):

- Begin with learners adding the numbers of each section/item of the chart, i.e. boys, girls
- Then learners add the total number of learners that would buy each item

Now ask questions that challenge learners to compare the data and draw conclusions from it, e.g.

- Will more or less boys than girls buy chicken pieces and by how many?
- Do boys prefer muffins to chicken pieces? Why do you think this is?
- Why do more girls want to eat muffins than hamburgers?
- Who would buy more from the tuckshop overall? Boys or girls?
- Do you think the type of food on the list makes a difference?
- Which item would you replace and why? What would you sell in its place?

Learners will use this information in the class discussion in the next lesson.

## WEEK 7: DAY 5

**Notes to the teacher:**

- Today learners will collate their data.
- Learners calculate the total number of boys, girls and both, throughout the school, that would buy each of the items.
- Learners answer questions that lead them to conclude which items will be the most and least popular with boys, girls and both together throughout the school.
- Learners discuss why they think certain items would sell better to boys rather than girls and vice versa, why some items are generally more popular than others and with whom, etc.
- Learners will compare the items chosen by the different grades in the school.

**Resources:**

- Set of questions that will lead learners to drawing conclusions from the data collected.
- Charts drawn up by each group from previous day.
- Jotters used for answering questions in previous lesson.

## ACTIVITIES FOR THE DAY

### PROBLEM SOLVING

Let one learner from each group come up to the board and display their large chart from the previous lesson. Point to each chart and direct learners attention to each chart and the grade it represents. As you point to each chart, ask learners to tell you the most popular and least popular items for that grade (do not ask the group that drew up the chart).

Learners will work in their groups and calculate the total number of boys, girls and then the total number of learners (in the whole school) that would buy each item. Remind them that they now have to work from all the charts. Learners will work in groups of four and by answering set questions, they will be able to draw conclusions from the charts. Remind them that when they answer the questions, they need to count ALL the boys in the school that would buy hamburgers etc.

- Will more or less boys than girls buy chicken pieces and by how many? Look at your answer from the lesson before. How does it differ now that you are counting the votes of the whole school? Why do you think this happened?
- Do boys prefer muffins to chicken pieces? Why do you think this is?
- Why do more girls want to eat muffins rather than hamburgers?
- Who would buy more from the tuckshop overall? Boys or girls? Compare your results from the lesson before. Is it still more/less boys? Why do you think this is so?
- Do you think the type of food on the list makes a difference when the whole school has chosen? Why do you think so?
- Which item would you replace and why? What would you sell in its place?
- Look at the number of hamburgers that were chosen by Grade 2 learners compared with Grade 7 learners? Which grade chose more hamburgers? Why do you think this is so?
- Look at all the girls' totals. Which grade would buy more chicken pieces? Why do you think it is so?

When learners have completed the task, join two or three small groups together. Let them discuss their answers, taking note of the items that they need to replace and the items they choose to replace these with.

# FIRST TERM: WEEK 8 OVERVIEW

| **Hours: 5** | **Number of Periods: 5** |
|---|---|
| **Mathematics Learning Outcomes and Assessments:**<br>**LO 4 AS 5, 6, 7,9**<br>**LO2 AS 4, 5, 9**<br>**LO1 AS 3 a, b, c; 4; 5; 6;7; 8 a, b, c, d, e;10 a, b, c, d, e; 11,** | **Milestones:**<br>• Use of appropriate measuring instruments to appropriate levels of precision: rulers, meter sticks, tape measures and trundle wheels to measure length<br>• Estimate, measure, record, compare and order 2-dimensional shapes and 3-dimensional objects using SI units with appropriate precision for<br>- Length (millimetres, centimetres, metres and kilometres )<br>• Solve problems involving selecting, calculating with and converting between appropriate SI units: millimetres, centimetres, metres and kilometres. |

| **Mental strategies:** Mental strategies are done with the whole class every day. The time should be used to develop skills and to build number sense. | | | | | |
|---|---|---|---|---|---|
| | **Day 1** | **Day 2** | **Day 3** | **Day 4** | **Day 5** |
| **Content Focus:**<br>**Measurement - Length** | Measuring - instruments and units. | Conversions between units of measurement | Estimating and fractions of metres and kilometres | Calculations and problem solving with distance and length using whole numbers | Calculations and problem solving with distance and length using whole numbers and fractions |
| **Resources** | textbook | rulers<br>textbook | meter sticks,<br>tape measures<br>trundle wheels<br>string<br>textbook | meter sticks,<br>tape measures<br>trundle wheels<br>string<br>textbook | meter sticks,<br>tape measures<br>trundle wheels<br>string<br>textbook |

**Week 8: Day 1**

**Notes to the teacher**

- Start by assessing what learners already know about measuring and revising key issues in measurement e.g. measurement of mass, length, capacity; which instruments to use in which situations; which units to use in which situations; estimating.
- Make sure learners understand what units of measurement are.

**ACTIVITIES FOR THE DAY**

**ORAL, MENTAL AND CONCEPT DEVELOPMENT**

**Activity 1**

Ask questions like as the following, and allow some small group and whole class discussion about these questions.

- How many cups will you use to fill up a litre?
- How many hand spans will you use to measure your desk?
- How many steps is it from the class to the school gate?
- How long does it take to walk one kilometer?
- What do we measure with a scale?
- What do we measure with a watch?
- What do we measure with a tape?
- What do we measure with a measuring jug?

**Activity 2**

Discuss that often we only need to have a rough idea of the size of things. Whenever we measure it is important to estimate first. In pairs, learners talk about, and then describe, how they would estimate the following using informal body measures:

- The length of the room
- The length of a piece of material
- The length of a piece of paper.

Write these heading son the board. As learners answer the questions below, fill in the answers under the correct heading.

What units of measurement are missing?

- The two towns are 117 …. apart.
- The road is 10 … wide.
- The bathroom window is 420... .. high and 370 … wide.
- Jabu is 164 … tall.
- A taxi is about 5 … long.
- The baby has a mass of 3, 45 ….
- Baby Dudu needs 2, 5 … of medicine.
- It is 28 … around your waist.
- The button-hole is 10 … high.
- A pen is about 14 … long.
- The nail is 16 … long.

- My uncle has a mass of 65 ….
- You need 500 …. of flour to make a loaf of bread.
- The bucket can hold 10 … of water

What units would you use if you wanted to measure:

- how heavy a cow is?
- the length and width of your desk?
- the size of your kitchen table if you wanted to make a table cloth?
- how much a packet of herbs or spices contains: for example cardomon or bay leaves?
- the amount of water a milk jug can hold?
- the length and width of a piece of paper?
- how much a cup can hold?
- how much water it takes to fill a bath?
- what the size of the property is that you live on?
- the size of a nail?

What instrument would you use to measure:

- your own mass?
- a piece of glass for a picture?
- the amount of milk for a cake you are making?
- flour for a recipe you are using?
- the amount of medicine to give to a young child?
- the area of your bedroom walls if you wanted to paint them?
- the distance around someone's waist if you were making her a pair of trousers?
- the distance you have travelled in a car?

**CONSOLIDATION** (5 mins)

Find exercises in your textbook that ask learners to think about the appropriate instrument and unit of measurement for measuring length, mass and capacity. Learners should answer 20 questions or more. Learners complete these exercises on their own.

**Week 8: Day 2**

**Notes to the teacher**

- The focus of this lesson is on measuring lengths and distances.
- Start by assessing whether learners know the symbols for different units of length.
- Then explain how the units of length are related.
  - Length: units of measurement.
  - Conversions between units of length

    1 km = 1 000 m
    1 m = 100 cm
    1 m = 1 000 mm
    1 cm = 10 mm.
  - Measuring in centimetres and millimeters.
- The group skills activities and the consolidation activities happen at the same time. While you are working with group 3, group 1 and group 2 will consolidate their knowledge by working through an exercise.

**Resources**

- Rulers

**ACTIVITIES FOR THE DAY**

**ORAL AND MENTAL ACTIVITY** (10 minutes)

- Learners rote count backwards and forwards in 1000s, 100s, 10s.
- Ask questions involving doubling and halving of numbers to 100.
- Ask questions where learners have to add decimal numbers e.g. 1,5 + 1,2 etc.
- Give the following instructions for learners to do:
  - Measure your book with your pencil.
  - Measure your friend with a ruler.

**CONCEPT DEVELOPMENT** (20 minutes)

- Ask learners to say how high the door is. Most doors are 2 metres high. Ask learners if they know a short way to write metres. Write on the board:
  - metres = m
- Ask learners to say how long their rulers are. Many rulers are 30 cm; some rulers are 10 cm. Ask learners if they know a short way to write centimetres. Write on the board:
  - centimetres = cm
- Ask learners how wide they think a matchstick is. It is about 1 millimetre wide. Ask learners if they know a short way to write millimetres. Write on the board:
  - millimetres = mm
- Ask learners to say how far it is from the school to someplace in the next suburb. Make sure that they give the answer in kilometres. Ask if they know the short way to write kilometres. Write on the board:
  - kilometres = km

- Check whether learners remember:
  - how many mm in a cm. They can look on their rulers to find the answer.
  - how many cm in a m. Remind learners that “centi” means 100 parts. They will know that there are 100 cents in a rand.
  - how many mm in a m. Remind learners that “milli” means 1 000 parts. Mill sounds like it is related to million, but it comes from mille which means thousand.
  - how many m in a km. Remind learners that “kilo” means 1 000.

    1 km = 1 000 m

    1 m = 1 000 mm

    1 m = 100 cm

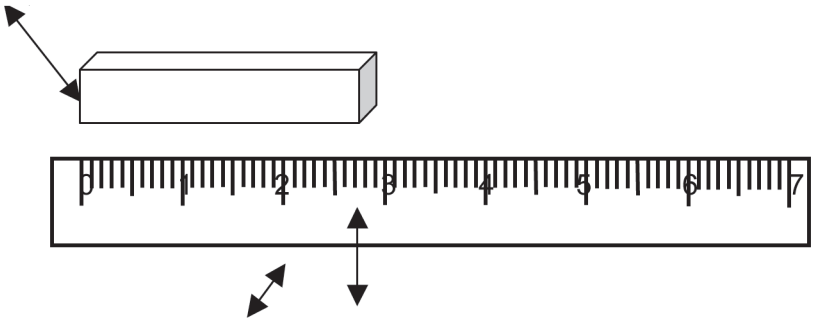
    1 cm = 10 mm
- Do some conversion calculations and one or two problems with the whole class.

**CONCEPT DEVELOPMENT** (30 minutes)

Work with the weakest group of learners in the class. Check that they can measure lines and small objects using a ruler. They need to know:

- to put the end of the line or object against zero on their rulers
- how to read the number of centimetres
- how to count the number of little lines showing millimetres
- how to give the answer either in centimetres and millimetres or millimetres.

Place object against zero mark.




**2 cm + 7 mm** **or 20 + 7 mm** **or 27 mm**

While you are work with Group 3, Group 1 and Group 2 should do practical measuring of objects, lines and drawings on their own. They should also draw lines and objects to given measurements. Find exercises like this in your textbook for them to do.

| Week 8: Day 3 |
|---|
| **ACTIVITIES FOR THE DAY** |

**ORAL AND MENTAL ACTIVITY** (10 minutes)

Ask the following type of questions. Make it fun for the learners, such as putting them in teams and giving points for the first team to answer.

- How many 25s will you find in 100?
- How many 250s will you find in a 1000?
- 500 ml is ___ litres etc.
- 1,5 kg = ___ grams etc.

**CONCEPT DEVELOPMENT (**15 minutes)

Revise the relationships between metres and kilometres. 1000 m = _____km. Then ask learners to work with parts of kilometers. They should record their answers. e.g.

1. 500 m + 500 m = _____m = _____ km
2. 2 x 500 m = _____ km
3. $\frac{1}{2}$ km = _____ m
4. 250 m + 250 m + 250 m + 250 m + =_____m = _____ km
5. 4 x 250 m = _____ km
6. $\frac{1}{4}$ km = _____ m

Revise the relationships between centimetres and metres. 100 cm = _____m. Then ask learners to work with parts of metres e.g.

1. 500 cm + 500 cm = _____cm = _____ m
2. 2 x 500 cm = _____ m
3. $\frac{1}{2}$ m = _____ cm
4. 250 cm + 250 cm + 250 cm + 250 cm + =_____cm = _____ m
5. 4 x 250 cm = _____ m
6. $\frac{1}{4}$ m = _____ cm

Revise the relationships between centimetres, millimetres and metres.

1 000mm = 100 cm = _____m.

1. 3 m = _____cm = _____mm
2. 1 $\frac{1}{2}$ m = _____ cm = _____ mm
3. $\frac{1}{4}$ m = _____ cm = _____ mm
4. 250 cm = ____ m

**INVESTIGATION** (15 mins)

- Find an exercise in your textbook that deals with conversions between units of distance and length. Groups 1 and 3 will work on their own doing these exercises while you work with Group 2 on estimating and measuring in metres. Do activities in which learners need to measure distances longer than 1 metre and also longer than 5 metres.

- Learners need to estimate in metres first. Help them to find ways of estimating 1m. For many adults the distance from their nose to the index finger of an outstretched arm is 1m. This is not the case for most Grade 5 learners. Let learners use a metre of string to find where on their bodies they can mark off 1 metre.
- Explain that the height of a door is usually 2m and the height of many windows is 1m. Knowing an object of 1 m length or height helps you to use this to estimate other lengths in metres.
- Remember that you need to know how long:
  a metre is before you can estimate in metres
  a centimetre is before you can estimate in centimeters
  a millimetre is before you can estimate in millimeters.

Ask learners to estimate long distances e.g.

- the width of the classroom,
- the length of the classroom,
- a recent long jump record (Khotso Mokoena jumped 8 m and 24 cm in the last Olympic games),
- the length of the passage or field,
- the width of the road outside the school,
- the length of the school car park,
- the distance around a field or flower bed.

Ask learners to measure at least two of these distances. Insist that learners give and record their answers using units.

- With builders tapes learners must not only read off the number at the end of the distance, they also need to know how many metres they have unrolled the tape. For example, the distance may be 4 m and 78 cm, but at the end of the object / distance the tape may only show the number 78. Insist that learners estimate first and write down their estimation. It is not enough to approximate the answer afterward e.g. round 78 up to 80.
- Let learners practice doing long jumps and measuring their jumps. Record and keep the distances learners jump. These can be used for data handling.

**Week 8: Day 4**

**Notes to the teacher**

- In this lesson learners will focus on:
  - Calculating and solving problems with distance and length.
  - Estimating and measuring lengths in metres.
- The group skills activities and the consolidation activities happen at the same time. While you are working with group 3, group 1 and group 2 will consolidate their knowledge by working through an exercise.

**Resources**

Pieces of string in 1 metre lengths
Builders tapes over 2 metre long,
Metre sticks,
Trundle wheels.

**ACTIVITIES FOR THE DAY**

**ORAL AND MENTAL ACTIVITY** (10 minutes)

Do oral and mental activities every day at the start of the lesson. Some ideas are:

- Rounding off e.g. 7.2kg to the nearest kg etc.
- Rounding off e.g. 0,6 mm to the nearest cm etc.
- 2 half liters give you ___ liters etc.

**CONCEPT DEVELOPMENT** (20 minutes)

- Do some calculations the involve lengths and distances. Use Term 1's number range to guide your choice of numbers. Examples should involve all four operations, but with whole numbers only.
- Do some problem solving with lengths and distances.

**GROUP LESSON ACTIVITIES** (30 minutes)

- Work with Group 3 doing the measuring of lengths done with Group 2 on Day 3.

- Find an exercise in your textbook that deals with calculations and problem solving of distances and lengths. Groups 1 and 2 work on their own doing these exercises. These calculations and problems should include all four operations.

**Week 8: Day 5**

**Notes to the teacher**

- In this lesson learners will focus on:
- Calculating and solving problems with distance and length
- Estimating and measuring lengths in metres
- The group skills activities and the consolidation activities happen at the same time. While you are working with group 3, group 1 and group 2 will consolidate their knowledge by working through an exercise.

**Resources**

Pieces of string in 1 metre lengths
Builders tapes over 2 metre long,
Metre sticks,
Trundle wheels.

**ACTIVITIES FOR THE DAY**

**ORAL AND MENTAL ACTIVITY**(10 minutes)

- Let each group choose a number between 50 and 75 and write as many facts about the number as possible in 3 minutes e.g. 60 : 30+30; 20+40; 75-15 etc. After 3 minutes groups swap their papers and check the answers. The group with the most correct facts is declared the winner.

**CONCEPT DEVELOPMENT** (20 minutes)

- Do some calculations the involve lengths and distances. Use the number range of Term 1 to guide your choice of numbers. Examples should involve all four operations. These calculations and problems should include whole numbers and fractions.
- Do some problem solving with lengths and distances.

**GROUP SKILLS AND CONCEPT ACTIVITIES** (30 minutes)

- Work with Group 1 doing the measuring of lengths done with Group 2 on the Day 3.
- Find an exercise in your textbook that deals with calculations and problems solving of distances and lengths. Group 2 and Group 3 work on their own doing these exercises. Set more challenging questions than the exercise for Groups 2 and Group 3.

## FIRST TERM: WEEK 9 OVERVIEW

**Hours: 5** **Number of periods: 5**

**Learning Outcomes and Assessment Standards**
LO 1 AS 3, AS 5, AS 6, AS 8, AS 12

**Milestones:**
- Counting in a variety of intervals
- Know or quickly determine multiples of single-digit numbers to at least 100 (multiplication tables
- Know or quickly determine multiples of 10, 20, 30, 40, 50, 60, 70, 80, 90, 100 up to at least 1 000
- Solve problems that involve repeated addition
- Solve problems that involve grouping and sharing.

| | Day 1 | Day 2 | Day 3 | Day 4 | Day 5 |
|---|---|---|---|---|---|
| **Content Focus** | Counting in different units (threes, fours etc.). Repeated addition (multiplication) problems | Counting in groups, mental addition and repeated addition. Repeated addition (multiplication) problems. | Repeated addition (multiplication) problems. | Grouping and sharing problems. | Grouping and sharing problems. |
| **Resources** | Worksheets with questions (Grade 4 term 1 Annexure S). | Problems set by teacher. | Problems set by teacher. | Problems set by teacher. | Problems set by teacher. |

**WEEK 9: DAY 1**

**Notes to the teacher:**

- This lesson is about the concept of multiplication as repeated addition, and the development of multiplication skills.

**Resources:**

- Grade 4 Term 1 Annexure S (copies for each learner).
- Grade 4 Term 1 Annexure R, in case some learners need it to make sense of the activities for the day.

**ACTIVITIES FOR THE DAY**

**ORAL, MENTAL AND CONCEPT DEVELOPMENT**

**Activity 1**

Arrange learners in groups of no more than four learners per group.

The learners in each group should count together, *very softly*, in threes to at least 100, and each learner should write the numbers down.

In each group, they should repeat this by counting in fours, fives, sixes, sevens, eights, nines and tens, to at least 100 each time, and each learner should write the sequence down individually.

**Activity 2**

Learners should now work individually. They should do multiplication worksheet 2 from Annexure S, or similar questions.

Suggest to learners that they may use the counting patterns they have formed in Activity 1 or count again, to help them to find the answers.

**Activity 3**

Arrange learners in groups of no more than four learners per group again.

The learners in each group should count together, *very softly*, in tens to at least 100, and each learner should write the numbers down.

In each group, they should also count in twenties to at least 200, in thirties to at least 300, in forties to at least 500 etc to counting in nineties to at least 900, and each learner should write each sequence down individually.

**Activity 4**

Learners should work individually again. They should do multiplication worksheet 3 from Annexure S, or similar questions.

**WEEK 9: DAY 2**

**Notes to the teacher:**

- .Learners work on multiplication problems

**ACTIVITIES FOR THE DAY**

**PROBLEM SOLVING**

**Activity 1**

Ask learners where they think the goods sold by retail shops come from. Discuss the delivery of stocks to retail shops. Different providers will deliver different kinds of goods to the shop.

Describe this problem to learners, and ask learners to take notes while you describe it.

Circulate between learners while you talk, and check that they take notes.

Repeat where necessary.

Situation 1

Early one morning, a fruit supplier delivers 20 bunches of 4 bananas each to shop.
Later in the day the supplier delivers 8 bunches more, again with 4 bananas in each bunch.

When you are satisfied that all learners have taken notes so that they have all the information about the situation, ask learners to find out how many bananas were delivered, in total, to the shop on that day. They should do this individually.

At this point the teacher may want to repeat the story because some learners may want to check if the notes they have taken are (information they have is) sufficient to enable them to find solution to the problem.

Situation 2

Early one morning, a fruit supplier delivers 30 bunches of 8 bananas each to shop.
Later in the day the supplier delivers 7 bunches more, again with 8 bananas in each bunch.
How many bananas are delivered to the shop in total?

Also write situation 2 on the board now, so that learners who work quickly do not get bored.

Circulate and observe how learners do Situation 1. It is just fine if they do it in several steps, for example as shown below, and if they use the counting patterns they have produced on the previous day at present.

20 bunches of 4 bananas each is 80 bananas
8 bunches of 4 bananas each is 32 bananas
80 + 32 = 112 bananas

**Note that learners are not at all supposed to do column multiplication at this stage. Multiplication in columns is only to be introduced in Grade 6.**

Give another similar problems during the course of the lesson, for example:

Situation 3

Early one morning, a fruit supplier delivers 70 bunches of 6 bananas each to shop.
Later in the day the supplier delivers 4 bunches more, again with 6 bananas in each bunch.
How many bananas are delivered to the shop in total?

In the above problems, learners were strongly led to do multiplication in two steps, for example to calculate 74×6 by calculating 70×6 and 4×6, and then adding the two results.

Give the following problem. Hopefully, learners will now decide for themselves to split the problem into two parts.

Situation 4

Early one morning, a fruit supplier delivers 57 bunches of 6 bananas each to shop.
How many bananas is this in total?

At some stage during the lesson, write a solution on the board, expressed verbally like this:

20 bunches of 4 bananas each is 80 bananas
8 bunches of 4 bananas each is 32 bananas
80 + 32 = 112 bananas

Show learners that this work can be more briefly written up by using the multiplication sign:

20 × 4 = 80 and 8 × 4 = 32.  80 + 32 = 112.

At a later stage, preferably only in the next lesson, you may suggest that they write more formally:

28 × 4 = 20 × 4 + 8 × 4 = 80 + 32 = 112.

**WEEK 9: DAY 3**

**Notes to the teacher:**
- Learners do more multiplication problems

**ACTIVITIES FOR THE DAY**

**PROBLEM SOLVING**

Give a variety of multiplication problems in context, like those in the previous lesson.

Monitor the learners, and help slower learners to make sense of the situations and to use counting in groups (like in the lesson for Week 9 Day 1) where necessary in cases where they cannot recall multiplication facts.

You may also give some problems that require several operations, for example:

Situation 1
Early one morning, a fruit supplier delivers 134 bunches of 12 bananas each to various shops in town. Later in the day the supplier delivers 107 bunches more, again with 12 bananas in each bunch.
How many bananas are delivered to the shops in total?
Situation 2
Early one morning, a fruit supplier delivers 156 bunches of 12 bananas each to shop.
Later in the morning the supplier delivers 87 bunches more, with 12 bananas in each bunch.
In the afternoon, the supplier delivers another 18 bunches, with 12 bananas in each bunch.
How many bananas are delivered to the shop in total?

**WEEK 9: DAY 4**

**Notes to the teacher:**

- In this lesson learners will work on problems involving grouping and sharing. While you may realize that these problems can be solved by doing division, learners will not realize it. Do not tell them that the problems can be solved by doing division. They will be able to solve the problems, by using addition and repeated addition. They can learn later in the year that problems like these can be solved by doing division.

**ACTIVITIES FOR THE DAY**

**PROBLEM SOLVING**

Have a discussion with the class about different ways in which people can travel. People may for example walk, use a bicycle, go by car or taxi, or by bus or train or they may fly or travel with a ship. Make the discussion more specific about different ways in which the learners in their school may travel to another school some distance away.

Ask the following question, write it on the board, and ask learners to work on it individually:

Situation 1

874 learners have to travel to another school. The bus service has many buses. They are willing to let 45 learners travel in one bus. How many buses should be hired, so that all the learners can go?

Leave learners alone for a while to work on the problem individually, but do check that they engage individually and not in pairs or small groups.

In the meantime, also write situations 1 and 2 on the board. Learners may work on these situations after they have resolved Situation 1 satisfactorily.

Circulate between learners and identify learners who may not quite understand the situations and questions. Ask them to tell you how they understand the questions. In this way they may actually develop a better understanding. **Do not try to help learners find out what to do**, **because that may cause them to stop thinking!** Limit your interaction with learners to help them to understand the contexts in which the questions are situated.

Observe and try to understand the methods that learners use.

Situation 2

874 learners have to travel to another school. The bus service has 15 large buses, that are all exactly the same. The principal decides that the learners should be evenly spread over the 15 buses. How many learners should travel in each bus?

Situation 3

874 learners have to travel to another school. Only taxis are available. One taxi can take only 17 learners. How many taxis are needed, if all the learners have to travel at the same time?

**WEEK 9: DAY 5**

**Notes to the teacher:**

- In Activity 1, Learners will work on two problems. While you may realize that these problems can be solved by doing division, learners will not realize it. Do not tell them that the problems can be solved by doing division. They will be able to solve the problems, by using addition and repeated addition. They can learn later in the year that problems like these can be solved by doing division.
- In Activity 2, learners will make up and down patterns again, like in the lesson for Week 6, days 2 and 3.

**DAILY ACTIVITIES**

**PROBLEM SOLVING**

**Activity 1**

Write the following two problems on the board. Talk the situations through with the learners, with a view to ensure that they all understand the contexts and the questions. Tell them they may work in any way they like, but they have to work individually.

Each learner may also decide which question to start with. Disengage from the learners after you have set the questions, so that they realize they need to work on their own.

1. A question about chairs:
   Chairs cost R64 each at a shop.
   How many chairs can you buy with R800?
2. A question about apples:
   800 apples have to be shared between 64 people.
   How many apples should each person get?

Some learners may do these questions very quickly. Write the following additional questions on the board right away, so that these learners will have work to do:

3. Chickens cost R42 each at a shop. How many chickens can you buy with R880?
4. R880 must be fairly shared between42 people. How much money should each person get?
5. Big chickens cost R55 each at a shop. How many chickens can you buy with R950?
6. R950must be fairly shared between 55 people. How much money should each person get?

Circulate between learners and identify learners who may not quite understand the questions. Ask them to tell you how they understand the questions. In this way they may actually develop a better understanding. **Do not try to help learners find out what to do**, **because that may cause them to stop thinking!** Limit your interaction with learners to help them to understand the contexts in which the questions are situated.

Observe and try to understand the methods that learners use.

# FIRST TERM: WEEK 10 OVERVIEW

| **Hours: 5** | **Number of Periods: 5** |
|---|---|
| **Mathematics Learning Outcomes and Assessments:**<br>**LO 3 and LO 5** | **Milestones:**<br>Recognise, visualize and name 2-dimensional shapes and 3-dimensional objects<br>Ask simple questions about own school and family environment and identifies appropriate data sources in order to address issues in that environment<br>Organise and record data using tallies and tables.<br>Use simple data collection sheets that involves counting objects in order to collect data<br>. |

| | **Day 1** | **Day 2** | **Day 3** | **Day 4** | **Day 5** |
|---|---|---|---|---|---|
| **Content Focus** | Collect data in class and represent the data in tables. | Collect data in class and represent the data with tally sheets. | Investigate properties of 2-D shapes. | Make 3-D objects from paper. | Investigate surfaces of various objects. |
| **Resources** | | | | Empty boxes, scissors, glue, sheets of paper. | Variety of 3-D objects. |

## WEEK 10: Day 1

**Notes to the teacher:**

- In today's lesson, learners will count items in the classroom or the school environment and record this in a tally table.
- Counting objects is done for a reason. For example, retail outlets (shops) count the stock on their shelves regularly. This is not only for financial reasons, but also so that the stock controller can interpret the stock count. By comparing two successive stock counts, he can see that a brand of toothpaste is not selling well, and therefore he will not order that brand for a while. He can see which items are low, and order those. Thus, the data collecting, representing and interpretation of the findings are three components of the process which cannot be done in isolation from one another.
- In today's lesson, learners will be divided into small groups to count items in the classroom. Make this a meaningful, realistic exercise by creating a purpose for counting the objects, e.g. the school principal wants to know how many pencils are in each classroom.

**Resources:** Chalkboard, workbooks. Prepared paper with lists of objects to be counted (this will depend on what you have available in the classroom.)

### ACTIVITIES FOR THE DAY

### CONCEPT DEVELOPMENT

- Tell the learners that the school principal needs to order items for the school shop. He has asked the learners to help him as he is too busy to go round to each classroom. Divide your learners into groups of 3-4 learners and give each group a piece of paper which tells them what they must count, for example:

Stationery - Please count how many of the following are in the classroom:
HB (writing) pencils
Erasers
Sharpeners
rulers

Some other suggestions, depending on your facilities. Make sure there are four or five items with something in common on each list:
Chalk (different colours);
School clothing (shoes socks, shirts, shorts)
Furniture (desks, chairs, cupboards)

- Give the learners in their groups a few minutes to discuss how they feel it would be best to count these items to make sure they have counted accurately. They must also design a sheet on which they can record their totals. Afterwards, listen to their suggestions. Some groups might think it would be easiest if each group came to the front of the class in turn and asked learners by a show of hands how many items they have. If they are counting furniture, it might be easiest for each learner in the group to count a different item of furniture. Some groups might suggest that they go round to each learner in turn and write what they have on a class list for example:

| Name | Pencil | Eraser | Sharpener | Ruler |
|---|---|---|---|---|
| Mary | 2 | 1 | 1 | 1 |
| Thabo | 1 | 0 | 1 | 1 |
| Joshua | 1 | 1 | 1 | 1 |

- Decide how it would work best for you in the classroom, and then give the learners enough time to count what they need to count. *Tip: If any groups want to come to the class to count by a show of hands, it would make sense to let them do this before all the groups walk around the class counting other objects.*
- Settle the learners into their groups. Ask each group to total up the numbers of each object that they counted and write this information on a neat table in their workbooks. Draw an example on the board:

| Pencils | Erasers | Sharpeners | Rulers |
|---|---|---|---|
| 48 | 37 | 31 | 45 |

- Let the learners give feedback about their counts. Ask each group in turn questions such as:
  - Did every learner have only one pencil?
  - Which colour chalk was there the most of?
  - If there are 36 learners in the class, are there enough chairs for everyone?
  - If the school principal wants each learner in the class to have 2 pencils, how many more pencils does he need to order for this class?
  - If there were 48 shoes in the classroom today, how many pairs is that?

Ask learner to beach bring some empty boxes, like cereal boxes, to school on the next day. You will need this in the lesson for day 4.

## WEEK 10: Day 2

**Notes to the teacher:**

- The focus of today's lesson is on recording data, obtained from posing a simple question, on a tally table.
- As with all data collection, there has to be interpretation of the data. Therefore, after completing a tally chart, learners must answer questions about the data.

### ACTIVITIES FOR THE DAY

### PROBLEM SOLVING

- Tell the learners that a new shop is opening and wants to know what kind of bread most people in the area prefer, so that the shop owner can make sure he stocks the most popular kind of bread. Write the following question on the chalkboard.

  What kind of bread does your family eat?

- Ask a few learners randomly to answer the question. They might need guidance as to what is meant by "What kind of bread". Lead them to come up with white bread, brown bread, whole wheat bread. See if there are any learners whose families do not eat bread.
- With input from the learners, draw a table on the board with the types of the breads.

| Kinds of bread | Tally | Number of children |
|---|---|---|
| White | | |
| Brown | | |
| Whole wheat | | |
| None | | |

- Learners can come to the board one at a time and show which breads they eat at home by recording this information using the tally method. If any families eat, for example, brown and white bread, ask the learners to choose the one they think their family eats most often. Note that every child draws one stroke and the fifth child draws a stroke horizontally through the four vertical strokes. When all the learners have recorded what type of bread their family eats, total the tallies by counting in fives and counting on in ones to include the "unbundled" stokes. Let learners take turns to count the tallies. As a learner gives the total, ask a few other learners if they agree with the total that was obtained. The completed tally table will look something like this.

| Kinds of bread | Tally | Number of children |
|---|---|---|
| White | 𝍸 𝍸 //// | 14 |
| Brown | 𝍸 //// // | 12 |
| Whole wheat | //// / | 6 |
| None | / | 1 |

- Erase the totals. Ask the learners to copy the tally table and fill in the totals in their workbooks.
  Once Learners have completed the tallying then ask them to copy and complete the table in their class work books and to fill in the third column.
- Give learners the following questions, based on the table, to answer in their Maths Class Work book:
  1. What is the most popular kind of bread?
  2. What is the least popular kind of bread?
  3. Why do you think that most families eat this type of bread?
  4. How many children are there in the Grade 5 Class altogether?
- Give the learners problems to solve, based on the survey about bread. You can write the problems on the board if you are unable to make a worksheet. Examples of problems you can give the learners:
  - If each family in this class buys one loaf of bread a day, how many loaves of bread will the shop sell in a week (7 days)?
  - White bread costs R7 a loaf. The shop sold 15 loaves. How much money did the shop receive?
  - At the start of the day, there were 54 loaves of bred in the shop. By lunchtime, half had been sold. How many loaves were still in the shop?

## WEEK 10: DAY 3

**Notes to the teacher:**

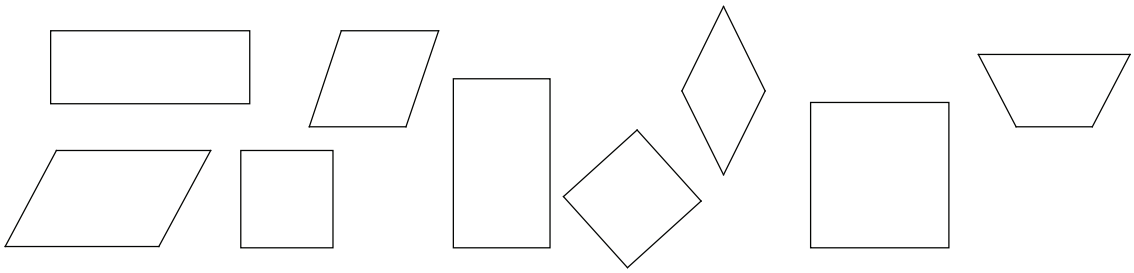
- In today's lesson, we will continue investigating two-dimensional shapes, specifically squares and rectangles which are part of a group of four-sided figures called quadrilaterals.
- Although it is difficult not to notice that squares and rectangles have corners which are right angles, this is not the focus of the lesson The learners need to focus on similarities and differences between squares and rectangles in terms of the number and length of their sides.

**Resources:** Square or square dotted grid paper for learners, scissors, glue, chalkboard, textbooks.

### ACTIVITIES FOR THE DAY

**CONCEPT DEVELOPMENT** (20 minutes)

- Draw a number of four-sided shapes on the board.



- Ask learners what all these shapes have in common. (they all have four straight sides)
- See which learners remember, from the previous lesson, what we call the group of shapes with four sides. Quadrilaterals.
- Give the learners examples of other words that start with "quad-". Some that you could tell them are: quadruped (an animal with 4 feet); quadruplets (4 babies born at the same time) quad bike (bike with 4 wheels). All these words have to do with 4.
  *Tip: This is not essential for the learners to know; it might help them remember the word quadrilateral.*
- Tell the learners that there are many different animals in the world. Ask the learners to give you a few examples. If you were to group animals according to the number of legs they have, we could list many animals. Ask the learners to name some four-legged animals. Now explain that among four-legged animals, we can make other groups. For example, animals that have horns. Ask the learners to name some animals that have horns.
- Now refer to the drawings of shapes on the board. Ask the learners if they can see any shapes that could be grouped together in their own special group? Let the learners come and point to the shapes that they think can be grouped together and explain why they think they can be grouped together. Lead them to decide that squares and rectangles can be grouped together, because they are similar. Ask the learners what the most noticeable thing about these two shapes is: their corners are "square".
- Ask the learners if they can see anything else in the classroom which has "square" corners like the rectangle and square. Some things they might notice include a piece of paper, the chalkboard, the door, the window, where the floor and wall meet, and their desks.

- Some learners might know that where two sides (lines) join like this, it is called a *right angle*.
  *Tip: you can mention this, but the concept of two lines meeting and right angles being formed will be dealt with later in the year. The focus of the difference and similarities between squares and rectangles, at this stage, is on the length and number of sides.*

• In groups, let the learners discuss and write down (on a piece of scrap paper);
  - What is the same about squares and rectangles?
  - What differences are there between squares and rectangles?
  - After a few minutes, let several learners from different group report back to the class what they concluded.
  - Write a conclusion on the board: Squares and rectangles both have four straight sides. The sides of the square are the same length. A rectangle has two long sides opposite each other and two short sides opposite each other.

Opposite = two things or people facing each other across a distance. For example, houses can be on opposite sides of the street. Make sure learners understand the word "opposite". Choose learners to come to the front of the class and stand opposite each other.

## WEEK 10: Day 4

**Notes to the teacher:**

- The focus of the next three lessons is on recognising three-dimensional objects, starting with revision of Grade 4 work and leading to focussing on the differences between rectangular prisms and cubes.
- The learners will be introduced to the vocabulary *face*. A cube has six faces. They are all square.
- In this lesson, we will revise the names of objects from Grade 4 and build cubes and rectangular prisms.
- It is important that the learners:
  - Touch and observe 3-D objects and models in their school and home environments;
  - Gradually move away from working with concrete objects and recreate the objects and relationships in their minds.
- It is important that learners understand that we cannot actually create a 3-D object on paper by drawing. Rather we use certain conventions to show three dimensions on paper. For example, we use these kinds of drawings to show 3-D objects:

**Resources:**

- The empty boxes that learners brought to class earlier in the week.
- Sheets of paper and glue.
- Scissors, preferably for each learner.
- A stapler

### ACTIVITIES FOR THE DAY

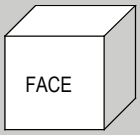
**CONCEPT DEVELOPMENT**

- Hold a cube-shaped object (e.g. a chalk box or die) for the class to see. Ask the learners if they know what the name of an object like this is
- Give each learner a sheet of paper, and let them roll it into a cylinder. Glue or staple their cylinders to make them stable.
- Let each learner take an empty box and a sheet of paper, and make an object like the box (but smaller) from the piece of paper.
- Divide the class into two teams. Use the objects that you have (or, if you cannot find enough objects, draw them on the board). Ask each team in turn questions such as:
  - This is a board eraser. What is the mathematical name of an object like this? (rectangular prism)
  - Show another rectangular prism in the classroom.
  - What do we call this cold drink can?
  - Give me an example of another cylinder.
  - What is the mathematical name for ball?

**WEEK 10: Day 5**

**Notes to the teacher:**

- In today's lesson, learners will use the rectangular prisms and cubes that they built in the previous lesson to compare them by the number and shape of faces that they have.
- A face is the surface of an object. Cubes and rectangular prisms both have 6 faces.

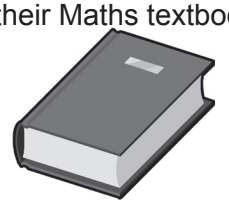



**Resources:**

**ACTIVITIES FOR THE DAY**

**CONCEPT DEVELOPMENT**

- Ask learners in turn to show you:
  - The surface of a desk;
  - The surface of the door;
  - The surface of their Maths textbook. Ask them how many surfaces their Maths textbook has. It has 6.

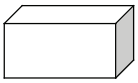
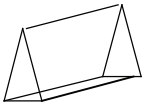


- Tell the learners that in Maths, when we talk of objects, we call the surface of the object the ***face.*** Ask learners in turn to go to different objects which are rectangular prisms and show the class all the faces of each object. In the classroom, rectangular prisms include bricks, the chalkboard eraser, books, boxes, and the door. Try to find as many examples as you can to give as many learners as possible the opportunity to use the word face, and identify the faces of different rectangular prisms.
- Ask the learners to take out the rectangular prisms and cubes that they made in the previous lesson. Ask a few learners in turn to tell you, using the word "face" the differences between the cubes and rectangular prisms.
- Draw a table such as the one below on the board, and let different learners fill it in to look like this:

| Object | Total number of faces | Number of square faces | Number of rectangular faces |
|---|---|---|---|
| Rectangular prism | 6 | 2 | 4 |
| Cube | 6 | 6 | 0 |

**Consolidation** (25 minutes)

- Have 3D objects available for learners who might need to handle them to fill in a table such as the one below. The learners can copy the table off the board if you cannot photocopy it. You might find a similar exercise in the textbook. Do not expect them to be able to draw the 3D shapes accurately if they copy from the board:

| Picture of object | Name of object | Total number of faces | Number of faces that are: | | | Example of this shaped object found in the environment |
|---|---|---|---|---|---|---|
| | | | Square | Rectangular | Triangles | |
|  | | | | | | |
| | | | | | | |
| | Triangular based pyramid | | | | | |
|  | | | | | | |
| | Square based pyramid | | | | | |