MATHEMATICS

Grade 4

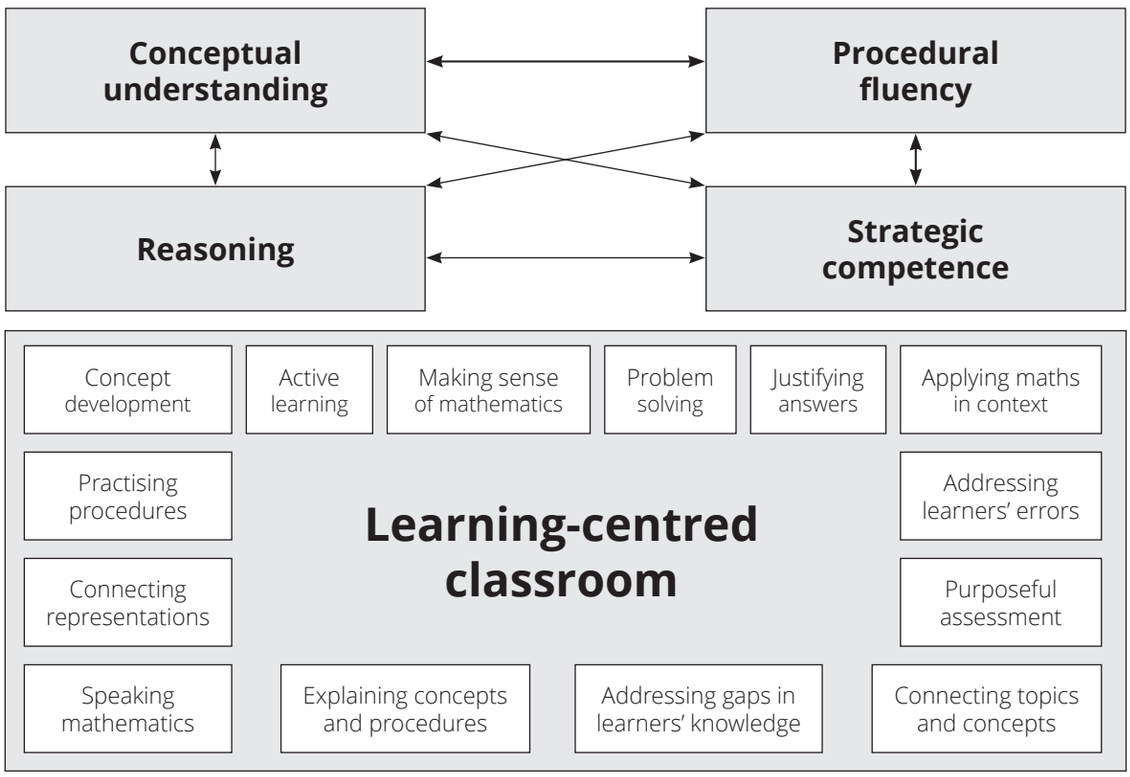
TERM 4 2020

Lesson Plans

Contents

Teaching mathematics for Understanding (TMU)

You are participating in the pilot implementation of the Mathematic Framework – which calls for *Teaching Mathematics for Understanding*. Diagrammatically the framework is represented as shown below.



The Framework proposes the steps that should be taken to bring about the transformation of mathematics teaching in South Africa. Mathematical examples of the dimensions of the framework can be found in the TMU Framework Document.

At the start of each unit, we provide examples of how the four dimensions of the framework are included in the lesson plans.

Teachers should strive to:	Brief description of what learners should do:	Explanation
- teach mathematics for conceptual understanding	**Understand**	Involves the learners' comprehension and understanding of mathematical concepts, operations, and relations
- teach so that learners develop procedural fluency	**Follow steps**	Involves developing learners' skill in carrying out procedures flexibly, accurately, efficiently, and appropriately
- develop learners' strategic competence	**Choose how to do it**	Involves the learners' ability to formulate, represent, and decide on appropriate strategies to solve mathematical problems
- develop learners' mathematical reasoning skills	**Think in mathematical ways**	Involves providing multiple and varied opportunities for learners to – the capacity for logical thought, reflection, explanation and justification

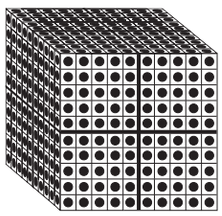
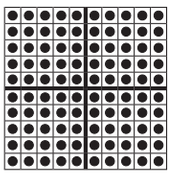
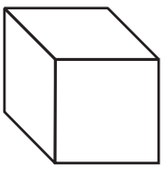
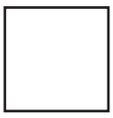
At the start of each unit, we provide examples of how the four dimensions of the framework are included in the lesson plans.

Summary of Mathematics Teaching Approaches

I. CPA (Concrete-Pictorial-Abstract) APPROACH

The Concrete-Pictorial-Abstract (CPA) approach helps learners to develop the concepts of numbers. The CPA approach uses several different representations for the concepts of numbers 1, 10, 100 and 1 000. For instance, the number '5' can be represented by 5 bottle tops (concrete objects), 5 circles (pictorial representations) and the number symbol '5' (abstract). By the time learners reach the Intermediate Phase, most should be able to work without the support of concrete objects or pictorial representations and should be working with abstract representations most of the time.

The following table shows the materials used in the TMU lesson plans. It is important to connect each representation to the other representations.

Number symbol	1 000	100	10	1
Number name	thousand	hundred	Ten	one
Base ten kit (manipulatives)				
Simplified pictorials (drawings) of the Base ten kit				

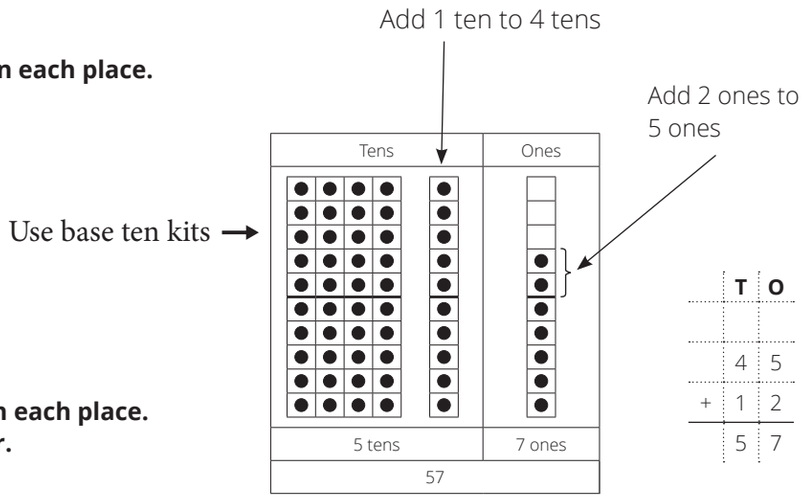
In the CPA approach, the following methods are important:

a. Column method using a base ten kit [CONCRETE OBJECTS] (Grade 2, 3, 4)

It is critical to show the connection between the place value table and the column method. In Grades 2 and 3, learners used base ten kits on a place value table.

1) 45 + 12

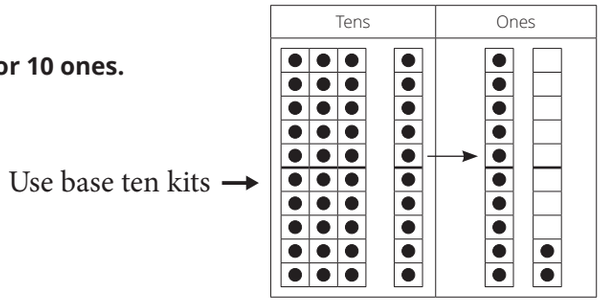
Step 1. Add bottle tops in each place.

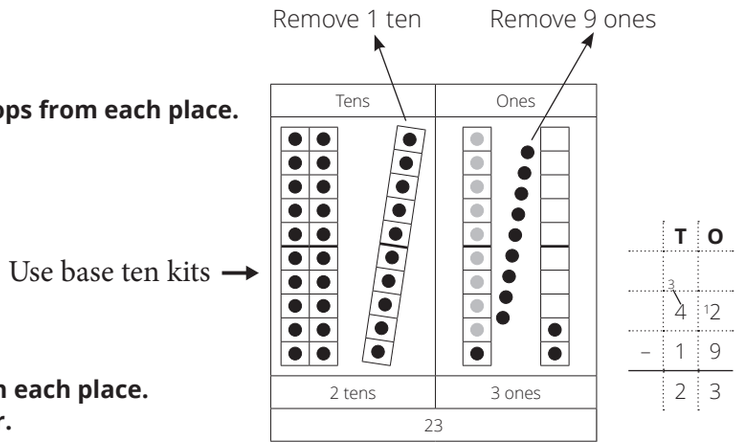


Step 2. Write numbers in each place.
Step 3. Write the answer.

2) 42 – 19

Step 1. Exchange 1 ten for 10 ones.





Step 2. Remove bottle tops from each place.

Step 3. Write numbers in each place.
Step 4. Write the answer.

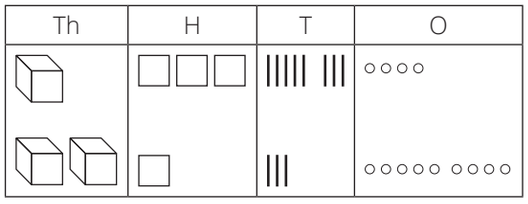
b. Column method using simplified pictorials [PICTORIAL REPRESENTATION] (Grade 3, 4)

In Grade 3, learners used simplified pictorials. Although Grade 4 learners should be working with abstract representations, you might have some learners who still need pictorial representations, particularly in the first term of Grade 4.

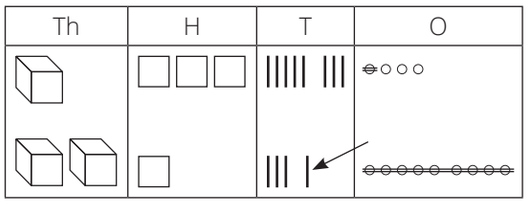
In the following diagrams, all the steps can be drawn as follows:

1) 1 384 + 2 139

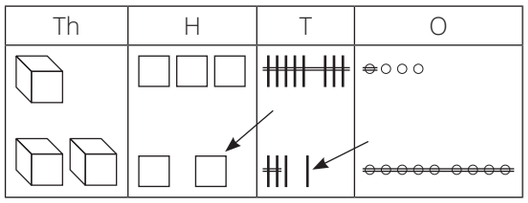
Step 1. Draw 1 384 and 2 139 vertically.



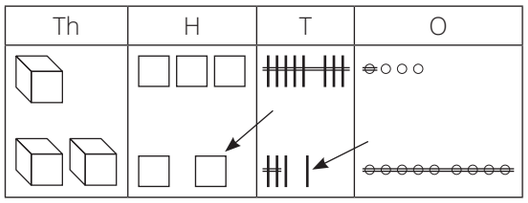
Step 2. Since 4 + 9 in the ones place exceeds 10, exchange 10 ones for 1 ten (carrying).



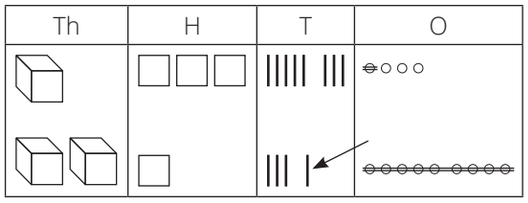
Step 3. Since 8 + 4 in the tens place exceeds 10, exchange 10 tens for 1 hundred (carrying).



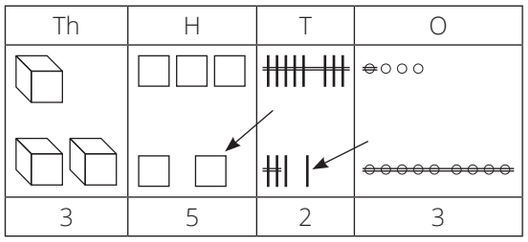
Step 4. Since 3 + 2 in the hundreds place does not exceed 10, there is no need to exchange (carry).



Step 5. Since 1 + 2 in the thousands place does not exceed 10, there it no need to exchange (carry).



Step 6. Write the answer



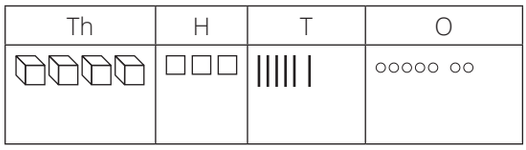
The answer is 3 523

We write this:

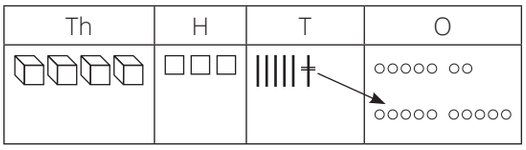
	Th	H[1]	T	U
		1	1	
	1	3	8	4
+	2	1	3	9
	3	5	2	3

2) 4 367 – 2 278

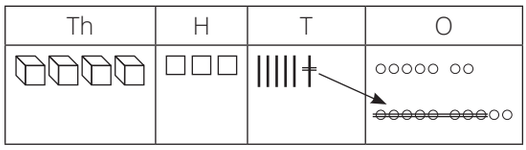
Step 1. Draw 4 367



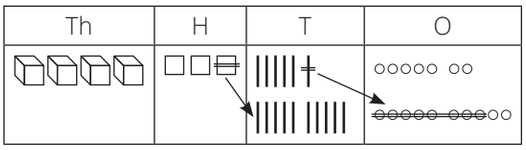
Step 2. Start in the ones place. Since we can't do 7 – 8, exchange 1 ten for 10 ones (borrowing).



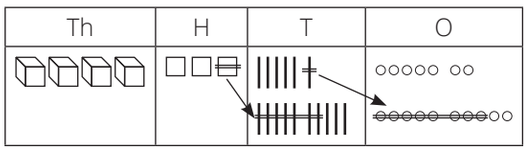
Step 3. 17 – 8 = 9 in the ones place.



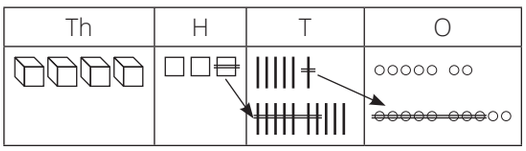
Step 4. Since we can't do 5 – 7 in the tens place, exchange 1 hundred for 10 tens (borrowing)



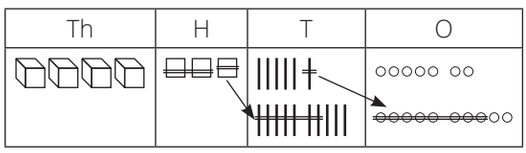
Step 5. 15 – 7 = 8 in the tens place.



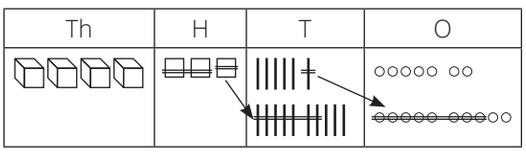
Step 6. We can do 2 – 2 in the hundreds place, so we do not need to exchange (borrow).



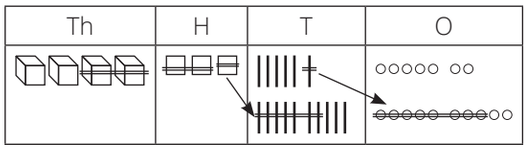
Step 7. 2 – 2 = 0 in the hundreds place.



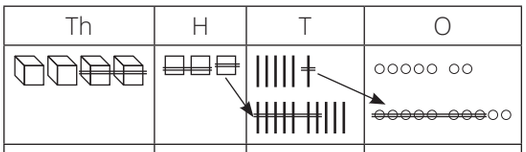
Step 8. We can do 4 – 2 in the thousands place, so we do not need to exchange (borrow).



Step 9. 4 – 2 = 2 in the thousands place.



Step 10. Write the answer



The answer is 2 089

We write this:

	Th	H	T	U
		2	1 5	1
	4	~~3~~	~~6~~	7
–	2	2	7	8
	2	0	8	9

c. Column method [ABSTRACT REPRESENTATION] (Grade 2, 3, 4)

In Grade 2, learners are shown how to write the column method using two rows. Each row shows the number place of ones and tens.

Grade 2

1) 45 + 12

	T	O	
	4	5	
+	1	2	
		7	O: 5 + 2 = 7
	5	0	T: 40 + 10 = 50
	5	7	

2) 42 – 19

	T	O	
	3	1	
	~~4~~	2	
–	1	9	
		3	O: 12 – 9 = 3
	2	0	T: 30 – 10 = 20
	2	3	

In Grade 3 and 4, learners can use one row.

Grade 3

3) 26 + 38

	H	O
	1	
	2	6
+	3	8
	6	4

4) 81 – 47

	T	O
	7	1
	~~8~~	1
–	4	7
	3	4

5) 384 + 139

	H	T	O
	1	1	
	3	8	4
+	1	3	9
	5	2	3

6) 367 – 78

	H	T	O
	2	15	1
	~~3~~	~~6~~	7
–		7	8
	2	8	9

Grade 4

7) 1 249 + 3 856

	Th	H	T	O
	1	1	1	
	1	2	4	9
+	3	8	5	6
	5	1	0	5

8) 4 321 – 2 463

	Th	H	T	O
	3	12	11	1
	~~4~~	~~3~~	~~2~~	1
–	2	4	6	3
	1	8	5	8

II. PROBLEM SOLVING

WORD PROBLEMS BY PROBLEM TYPE

- These problem types are given to guide the teacher. Learners do not need to know the names of the problem types, nor do they need to be able to identify the problem type. Learners do not need to know operation terms such us multiplier or product.

- There are different problem types for addition, subtraction, multiplication and division word problems. Since Grade 1, learners have been exposed to word problems involving a variety of problem types. It is important for you, the teacher, to be aware of the different problem types and to present these repeatedly so that learners become familiar with all of them and are able to work with all of them.

- It is important that learners learn to solve all these different types of problems. Being able to do so will help them acquire a full understanding of the meaning of all four operations.

- All problem types discussed below are addressed in the Grade 4 Lesson Plans and Learner Activity Books.

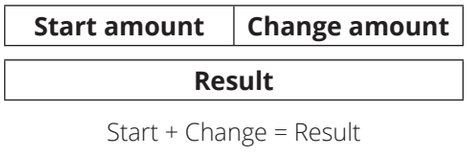
1. TYPES OF ADDITION AND SUBTRACTION WORD PROBLEM

A. COMBINE WORD PROBLEMS (OR 'ADD TO')

The change amount is added to the start amount to give the result.

There are three quantities involved in join word problems:

- the **start amount** or original amount
- a **change amount** (the amount being added or joined)
- the **result** (the total amount after the change takes place).

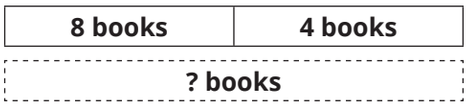


Start + Change = Result

Any of these three quantities can be the unknown in a combine problem.

a Result is the unknown

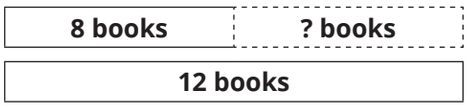
Zandile has 8 books.
Justice gave her 4 books.
How many books does Zandile have altogether?



8 + 4 = ?

b Change is the unknown

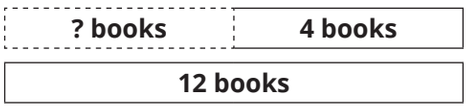
Zandile has 8 books.
Justice gave her some more books.
Now Zandile has 12 books.
How many books did Justice give her?



8 + ? = 12 or 12 – ? = 8

c) Start is the unknown

Zandile had some books.
Justice gave her 4 books.
Now Zandile has 12 books.
How many books did Zandile have to start with?



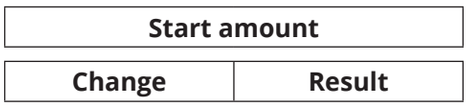
? + 4 = 12 or 12 – 4 = ?

B. CHANGE WORD PROBLEMS (OR 'TAKE FROM')

*The opposite of joining is **separating**. The change amount is subtracted from the start amount to give the result.*

There are three quantities involved:

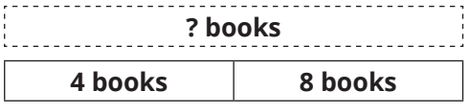
- The **start amount** or **original amount**.
- a **change amount** (the amount being removed from the original)
- the **end amount** or **result** (the total amount after the change has taken place).



Any of these three quantities can be the unknown in a change word problem.

a Start is the unknown

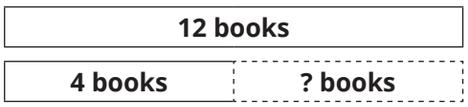
Zandile had some books.
She gave 4 books to Justice.
Zandile has 8 books left.
How many books did Zandile have to start with?



4 + 8 = ?

b Result is the unknown

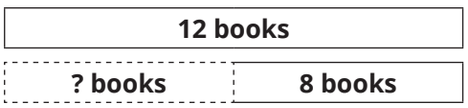
Zandile has 12 books.
She gave 4 books to Justice.
How many books does Zandile have now?



4 + ? = 12 or 12 – 4 = ?

c) Change is the unknown

Zandile has 12 books.
She gave some books to Justice.
Now she has 8 books.
How many books did she give to Justice?



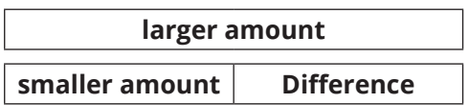
With both the Combine and the Change word problem types, the 'finding the Result' is easiest and 'finding the Start amount' is the most difficult problem type.

C. COMPARE WORD PROBLEMS

COMPARE Word Problems involve the comparison of two quantities. The third amount is the difference between the two parts.

There are three quantities involved:

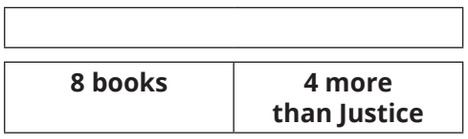
- The **larger amount**
- The **smaller amount**
- The **difference**.



Any of these three quantities can be the unknown in a compare word problem.

a Larger amount is the unknown

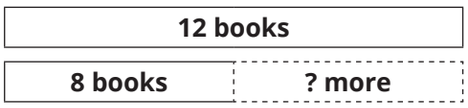
Justice has 8 books.
Zandile has 4 more books than Justice.
How many book does Zandile have?



8 + 4 = ?

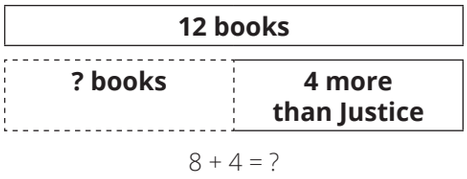
b Difference is the unknown

Zandile has 12 books.
Justice has 8 books.
How many more books does Zandile have than Justice?



8 + ? = 12 or 12 – 8 = ?

c) Smaller amount is the unknown
Zandile has 12 books.
Zandile has 4 more books than Justice.
How many books does Justice have?



With Compare word problems, the 'finding the Larger Amount' is easiest and 'finding the Smaller amount' is the most difficult.

WHEN MORE DOES NOT MEAN ADD

Learners look for verbal cues when solving word problems. "More" usually (but not always) suggests addition and "less" usually (but not always) suggests subtraction. Learners should be made aware of problems where these words suggest the opposite of what they usually do.

For example: Smangi has 14 books which is 2 more than Yvonne. How many books does Yvonne have?

Learners who can write this as 14 – 2 = ? are well on their way to understanding addition and subtraction.

2. TYPES OF MULTIPLICATION AND DIVISION WORD PROBLEM

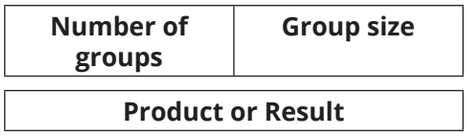
In multiplication and division problems:

- one number or *factor* counts **how many groups** or parts of equal size are involved
- the other factor tells the **size of each group** or part
- the third number in each of these two structures is the *result* or *product* and is the total of all of the parts.

A. MULTIPLICATION AND DIVISION WORD PROBLEMS

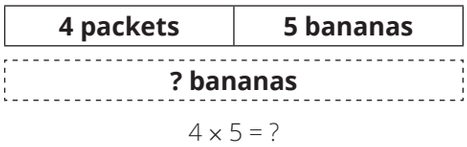
The three quantities involved are:

- The **number of groups**
- The **group size**
- The **product** or **result**



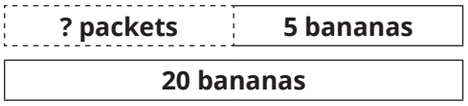
Any of these three quantities can be the unknown in a problem.

a Product or result is unknown
Patience has 4 packets of bananas.
There are 5 bananas in each packet.
How many bananas does Patience have?



b Number of groups is unknown

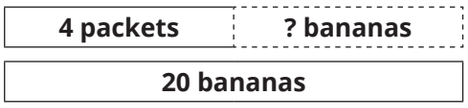
Patience has 20 bananas.
She puts them in packets with 5 bananas in each packet.
How many packets did she use?



? × 5 = 20 or 20 ÷ 5 = ?

c) Group size is unknown

Patience has 20 bananas.
She wants to share them equally among 4 packets.
How many bananas will there be in each packet?



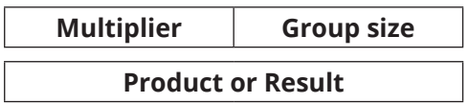
4 × ? = 20 or 20 ÷ 4 = ?

B. COMPARISON WORD PROBLEMS

Comparison problems involve the comparison of two quantities where one quantity is described in terms of how many times larger it is than the other. Larger can also mean longer, wider, taller or faster.

There are three quantities involved:

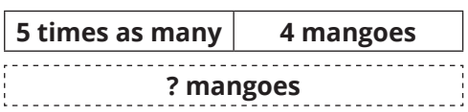
- The **multiplier** which tells you how many times bigger the product is than the set size.
- The **group size**
- The **product** or **result**.



Any of these three quantities can be the unknown in a problem.

a Product or result is unknown

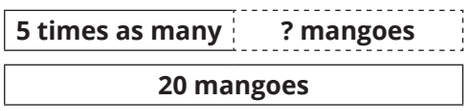
Sipho picked 4 mangoes.
Siza picked 5 times as many.
How many mangoes did Siza pick?



5 × 4 = ?

b Group size is unknown

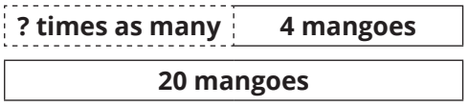
Sipho picked 20 mangoes.
He picked 5 times as many as Siza.
How many mangoes did Siza pick?



5 × ? = 20 or 20 ÷ 5 = ?

c) Multiplier is unknown

Sipho picked 20 mangoes.
Siza picked 4 mangoes.
How many times as many mangoes did Sipho pick than Siza?

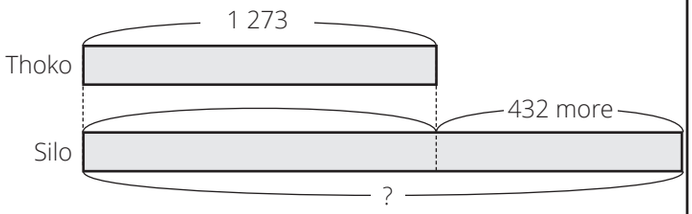


? × 4 = 20 or 20 ÷ 4 = ?

2. GENERAL PROCEDURE TO FOLLOW WHEN SOLVING WORD PROBLEMS

The hardest part of any word problem is deciding which operation to use. There can be so many details included in a word problem that the question being asked gets lost in the whole situation. Taking time to identify what is important, and what is not, is essential. Remember, if you don't know what is being asked, it will be very difficult to know if you have a reasonable answer.

Following this procedure will help the learners understand what is required of them:

<table>
<tr><th colspan="2">THE FOUR STEPS TO FOLLOW WHEN SOLVING WORD PROBLEMS</th></tr>
<tr><td>Step 1: Understand the problem
1 Write the word problem on the chalkboard
2 Read the problem.
3 Let learners read the problem until they read it fluently.
4 Underline the numbers.
5 Underline the question with a wavy line.
6 Let learners reproduce the story with manipulatives or diagrams.</td><td>For example:
Thoko has ran 1 273 metres.
Silo ran 432 metres further (more) than Thoko.
How far did Silo run?
Solution:
 
</td></tr>
<tr><td>Step 2: Devise a plan
1 Determine the operation. (+; –; ×; ÷)
2 Write a number sentence.</td><td>We have to add.
1 273 + 432 = ☐</td></tr>
<tr><td>Step 3: Carry out the plan
1 Do the calculation
2 Find the answer to the number sentence.</td><td>1 273 + 432 = 1 705
Silo ran 1 705 metres.</td></tr>
<tr><td colspan="2">Step 4: Look back
1 Compare learners' solutions.
2 Do the corrections.
3 Let learners record the work in their books.</td></tr>
</table>

Glossary of important terms used in the TMU lesson plans

The following terms are used in the TMU lesson plans for Grade 4. Some of the terms also appear in CAPS. This glossary has been prepared for Grade 4. Terms used in the TMU that expand on the CAPS repertoire are indicated.

Calculation Terms

ADDITION WITH CARRYING (TMU)

The type of addition which occurs when we need to bridge a ten, hundred, thousand, ten thousand or hundred thousand in calculations.

Examples: 197 + 4; 157 +149; and 10 984 + 19 499.

The term 'carrying' is used since the terminology is familiar to teachers.

Example: when we 'carry' 1 hundred in order to bridge the hundred, and end up with 10 hundreds, numbers are 'exchanged' to make 1 thousand.

SUBTRACTION WITH BORROWING (TMU)

The type of subtraction which occurs when the units involved in the subtraction create an *impasse* (a temporary hurdle).

Examples: 526 – 137; 423 – 397 and 10 204 – 9 429. The units do not allow for subtraction 'on their own'.

The term 'borrowing' is used since the terminology is familiar to teachers.

Example: when we 'borrow' 1 thousand, we 'exchange' it for 10 hundreds in order to overcome the *impasse* so that the subtraction can be done. We then group the 10 hundreds with the other hundreds in the question.

BASE-TEN NUMBER SYSTEM

The base-ten number system is the most commonly used number system across the world. The base-ten number system uses a base of ten which means that it involves grouping in tens.

Examples: There are 10 ones in 1 ten, 10 tens in 1 hundred, 10 hundreds in 1 thousand, 10 thousands in 1 ten thousand and 10 ten thousands in 1 hundred thousand.

Each digit in a number has a value according to its position in the number. The only digits we need to represent a number of any size are the digits 0 to 9. One focus of the TMU framework is to move from mathematics based on counting methods to methods governed by the base-ten number system.

COLUMN METHOD

The column method is a calculation technique used in addition and subtraction that helps to reinforce number concept or number sense. The column method is also known as the vertical algorithm or vertical method. This structured method consolidates learners' understanding of place value because it is structured using place value. This structuring should help learners to understand the concept of place value and to work meaningfully with numbers (rather than making tallies and counting).

EXPANDED NOTATION

Expanded notation is a representation of a number made by writing it out using place value. Expanded notation' and 'building up and breaking down of numbers' are used interchangeably in CAPS. By the end of Grade 4, learners should be able to write a number using expanded notation in order to show the place value of each of the digits in a number up to 1 000 000.

Example: 943 567 is written in expanded notation as:
943 567 = 900 000 + 40 000 + 3 000 + 500 + 60 + 7
OR 943 567 = 9 hundred thousand + 4 ten thousand + 3 thousand + 5 hundred + 6 tens + 7 ones
OR 943 567 = 9 HTh + 4 TTh + 3 Th + 5 H + 6 T + 7 O

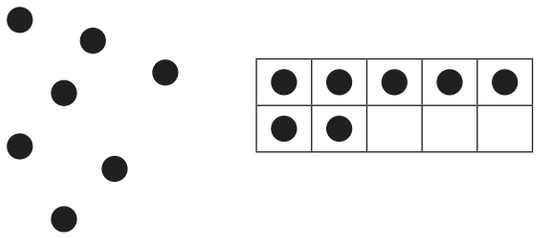
SUBITISING

Subitising is 'an instant recognition of the number of objects in a group of objects'.

This skill should have been acquired by learners in the Foundation Phase and can then be used in the Intermediate Phase.

A ten frame is a useful tool to help learners to subitise objects.

In the example below, it is easier to recognise the number of dots by putting them in a ten frame.

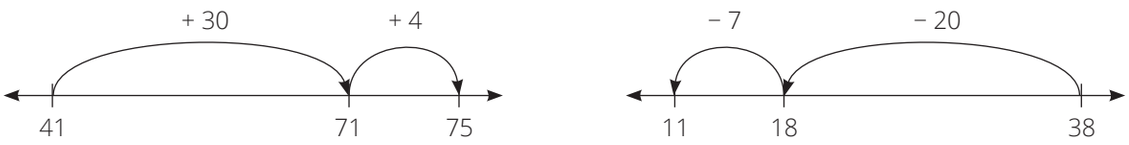


JUMPING STRATEGIES ON A NUMBER LINE

When we solve addition or subtraction with number line, we use 'jump' strategies. This strategy builds on learners' knowledge of numbers and can also help reinforce number concept or number sense.

There are many ways in which 'jumps' can be made on a number line, but efficient jumps (such as jumping to the next ten or jumping in tens, hundreds or thousands) make calculation easier.

Choosing these 'efficient jumps' develops learners' number sense.



Representation Terms

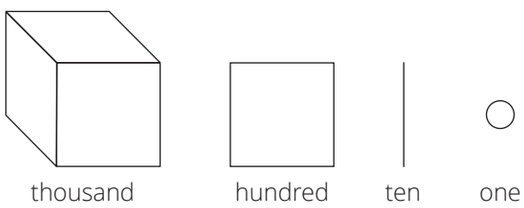
CONCRETE-PICTORIAL-ABSTRACT (CPA) APPROACH (ALSO KNOWN AS THE CRA APPROACH)

The Concrete-Pictorial-Abstract (CPA) approach helps learners develop the concepts of numbers. The CPA approach uses several different representations for the concept of the numbers 1, 10 and 100.

- **Concrete** objects are any materials that can be touched. In TMU, bottle tops are recommended as concrete objects.
- **Pictorial** representations are drawings that represent concrete objects.
- **Abstract** representations consist of number symbols such as 1, 2 and 3; and symbols such as ' + ', '–', '×', '÷'.

SIMPLIFIED PICTORIALS (OF THE TMU BASE TEN KIT WHICH IS SIMILAR TO DIENES BLOCKS)

A simplified pictorial representation of thousands, hundreds, tens and ones is used to depict numbers on paper.



By using simplified pictorials, a large amount of time can be saved writing compared to drawing, for example, tallies and circles.

Simplified pictorials are more effective than tallies.

Tallies should not be drawn beyond a maximum of 20 items and preferably for not more than ten items.

PLACE VALUE TABLE (GR 2, 3, 4)

A place value table is diagram showing a number using a display of concrete/semi-concrete objects and abstract representations (numbers and number names).

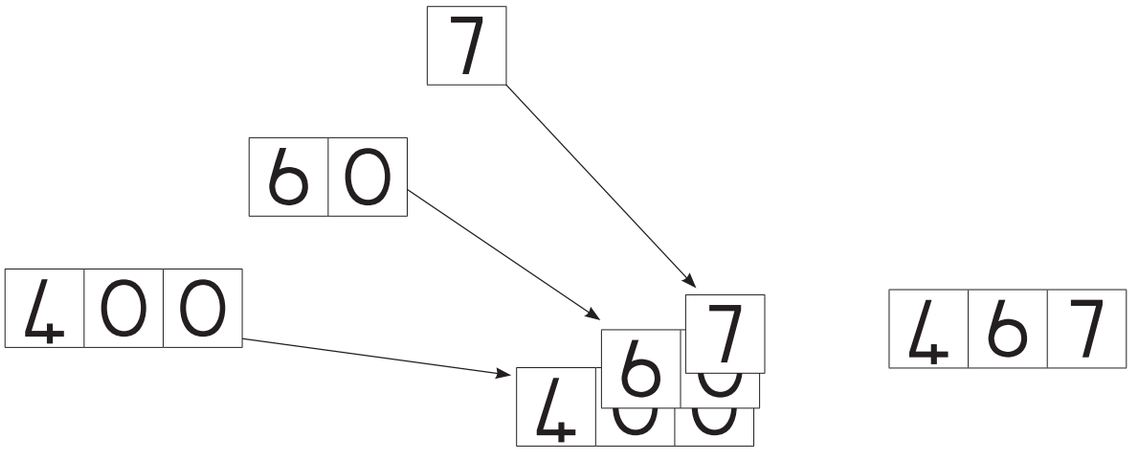
Example of the number 5 137 469 shown in a place value table:

M	HTh	TTh	Th	H	T	O
5	1	3	7	4	6	9

PLACE VALUE CARDS

Place Value Cards (also called Flard Cards) are a set of cards which learners can use to 'build' numbers. The cards for each place value are different lengths, with the highest place value being the longest card.

The diagram below shows how the number 467 is built using Place Value cards.



Place Value cards are particularly useful for building the concept of place value, as well as for expanded notation. The way in which learners use their Place Value cards also provides valuable feedback for the teacher.

For example, a learner who represents the number 467 using the ones cards only may not understand the concept of place value.

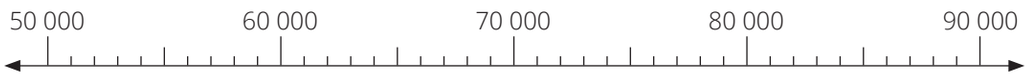
To find whether this learner understands the concept of place value, you could ask the learner to SAY the number to you or ask them to tell you what each digit in the number represents.

NUMBER LINES

A number line is a straight line divided into sections, called intervals. The numbering can start and end at any number and the size of the intervals can vary from one number line to another. The numbers on a number line increase as you move to the right.

The mid-line between the marked intervals helps the learners to avoid counting all the small intervals to read a number. If the mid-line is 5, we could find 7 by adding 2 onto 5 (5 + 2 = 7); we could find 4 by subtracting 1 from 5 (5 – 1 = 4).

In this number line, the big intervals are 10 000 and the small intervals are 1 000.



Midway between 50 000 and 60 000 is 55 000 and midway between 80 000 and 90 000 is 85 000.

ARRAY DIAGRAM (GR 2, 3, 4)

The following is the array diagram of 2 groups of 4 or 2 × 4. The order of multiplication is important when showing it in an array.

MULTIPLICATION TABLES (GR 2, 3, 4)

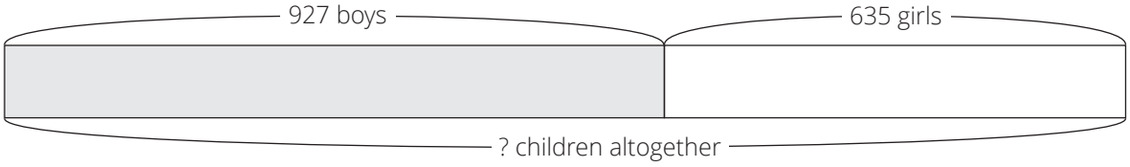
Multiplication tables show the multiples of numbers – the answers to the multiplication of several 1-digit multiplications, depending on the number of the multiplication table.

For example, the 5 times table is ❑ × 5 and will show all the multiples of 5 by the numbers 1 to 10.

Learners must memorise the multiplication tables, because once learners master the multiplication tables, they will be able to use their knowledge of multiplication to do division.

ILLUSTRATIVE DIAGRAM

A diagram representing the relationships of numbers in word problems. The following is an example of an illustrative diagram showing addition (combining).



Resources Terms

MANIPULATIVES

Manipulatives are concrete apparatus such as counters, printed tens frames, printed hundreds frames, 2-D shapes and 3D objects that can be manipulated (handled) by learners.

COUNTERS

These are any (loose) concrete objects that learners can manipulate when counting. In the TMU, bottle tops are recommended since they are freely available but other counters can also be used such as interlocking cubes (example: Unifix cubes). Teachers are expected to use concrete counters such as bottle tops on a big ten frame to help learners to develop their number concept as they learn how to count and work with numbers, starting from the number 1.

An abacus can also be used for counting. In the lesson plans, all counters are referred to as bottle tops.

TEN FRAMES (GRADE 1, TERMS 1 AND 2)

Learners in the Foundation Phase used a variety of ten frames, ten frame cards and counters (bottle tops) to support the development of concepts related to the decimal system. Ten frames are limited to ones and tens which, by Grade 4, learners should be fully conversant with.

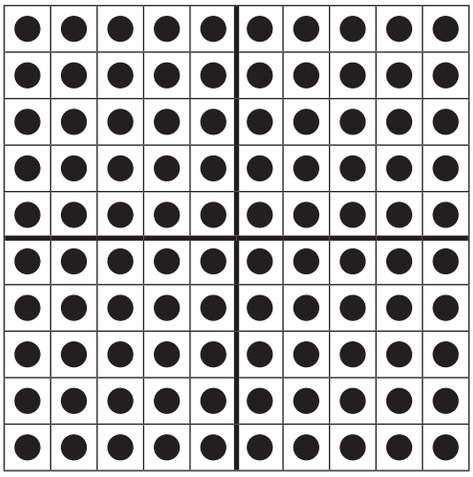
If any of your Grade 4 learners need support provided by ten frames, ask a colleague in the Foundation Phase, particularly Grade 1, for advice on the use of ten frames.

PRINTED TENS (GRADE 1, 2, 3, 4)

A printed ten is a printed version of a group of 10 ones. Call them 'ten(s)' when you use them in a lesson.

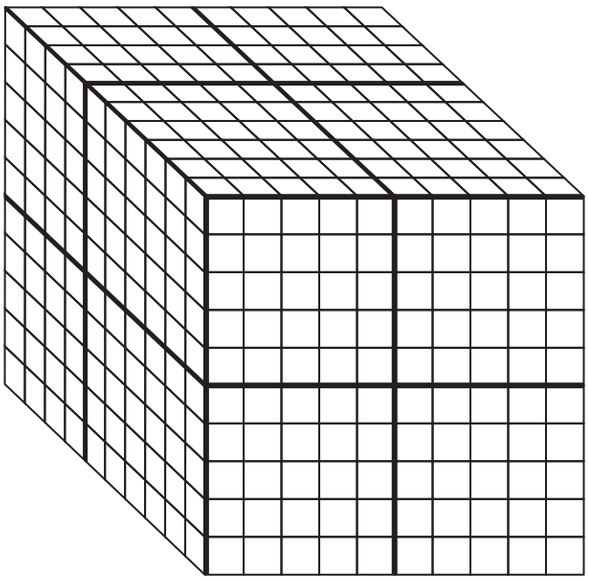
PRINTED HUNDREDS (GRADE 3, 4)

A printed hundred is a printed version of a group of 10 tens. Call them 'hundred(s)' when you use them in a lesson.



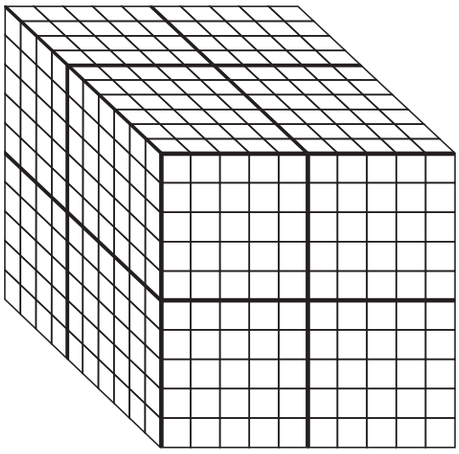
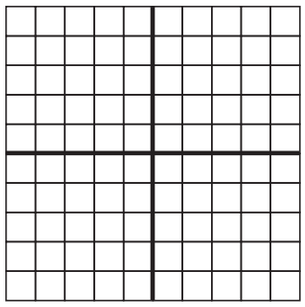
PRINTED THOUSANDS (GRADE 4)

A printed thousand is a printed version of a group of 10 hundreds. Call them 'thousand(s)' when you use them in a lesson.



BASE 10 KITS (GR 1,2,3,4)

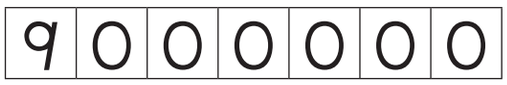
Base 10 kits are the concrete number representations used in the TMU lesson plans as 'counters' for ones, tens, hundreds and thousands. Bottle tops are used as single counters (to count ones), printed tens are used to count tens, printed hundreds are used to count hundreds and printed thousands are used to count thousands.

1 000	100	10	1
thousand	hundred	ten	one
			

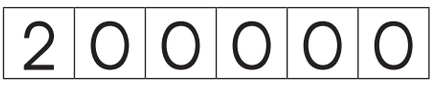
PLACE VALUE CARDS

Place Value cards are the concrete number representations used in the TMU lesson plans to build the concepts of place value and expanded notation.

Examples of Place Value cards for millions and hundred thousand.



Nine million



Two hundred thousand

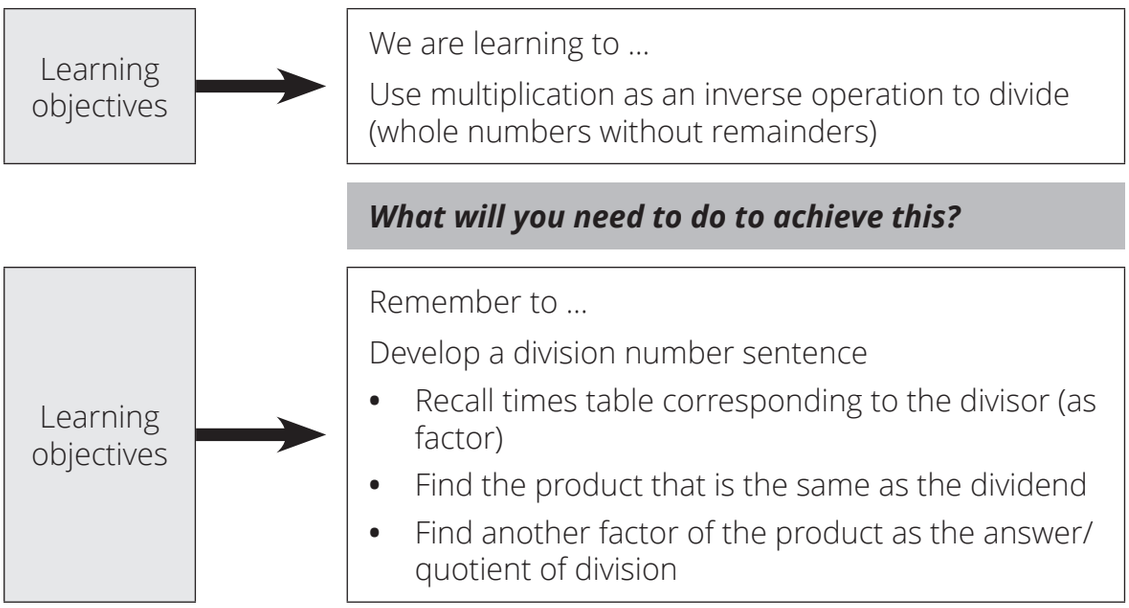
Assessment for learning

Teaching is an engagement with learners that is ongoing. The engagement should be planned so that it can lead to the achievement of learning goals in a meaningful way. As in the Foundation Phase, teaching and assessment in the Intermediate Phase should be closely aligned so that teachers draw on knowledge and skills gained through assessment to inform and enrich their classroom activities. This is ***assessment for learning***. The TMU pilot has planned assessment activities. Use these activities to find out what has been learned in your class and what you need to do to take this learning further. The planned lesson activities also provide opportunities for you to listen to your learners while you teach and to think diagnostically about learners' responses in discussions. You can then build on what you have learned through this activity to deepen the learning that takes place in your class.

The teachers' notes in the TMU lesson plans indicate daily objectives.

For example, for division:

Mathematics = Methods/Strategies



An important thing you can do as a teacher is to focus on classroom activities; in other words on discussions that make a difference to learning in the classroom.

Your task is to make sense of the TMU lesson plans so that you can strive to enact better quality teaching and learning in your classroom. Lesson plans provide useful information, but you need to make good sense of the lesson plans in order to use them well and extend their possibilities.

- The lesson plans and resources in this book are part of the Grade 4 Term 1 Teacher Toolkit for the pilot implementation of the mathematics framework. It includes a bilingual Dictionary of Mathematical Terms.

The other documents in the toolkit are:

- a Learner Activity Book (LAB) and a set of printable resources for the learners to cut out and use
- a Teacher Resource Pack which includes a set of teacher printable resources as well as printable assessment activities.

About the Lesson Plans

The lesson plans give detailed information about how to teach a CAPS-aligned lesson every day. By following the lesson plans, you will ensure that you cover the content and assessment tasks specified in the curriculum and give your learners the best possible chance of developing the knowledge and skills required for mathematics in Grade 4.

1 CURRICULUM ALIGNMENT

The lessons are sequenced according to a reorganised CAPS unit planner. The content is CAPS-aligned (all topics are covered, and the CAPS weighting has been adhered to), but it covers a slightly different sequence to the regular CAPS. Your school has been given permission by the Minister to follow this resequenced curriculum. Lessons plans show each lesson's links to the CAPS content and skills being focussed on in the lesson.

2 DBE WORKBOOKS

Pilot implementation schools have been given permission **NOT** to use the DBE workbooks. You should use the CAPS- and lesson plan-aligned Learner Activity Books (LABs) instead. The LAB has been designed to include activities from the DBE workbook wherever possible. The DBE workbook could be used for extension or additional activities if you have time and wish to do so.

3 BROAD OVERVIEW OF THE CONTENT OF THE LESSON PLANS

Each lesson plan provides a set of steps to guide you in delivering the lesson.

In addition, the lesson plans contain:

- Mental maths activities
- Whole class activities led by the teacher that will help learners to develop the concepts and skills set for the lesson
- Classwork activities
- Homework activities.

The answers for the mental maths activities and the classwork and homework activities are included in the lesson plans.

The classwork and homework activities form the content of the LAB which is provided in workbook format.

4 ASSESSMENT

Assessment opportunities are provided in the Teacher Resource Pack and are discussed in the sequence of lessons.

The programme of assessment suggested in the lesson plans complies with the CAPS.

Photocopy the assessment activities for the learners. In the LAB, on the day that an assessment is done, there is a page provided which provides a space for learners to write corrections or do additional problems that the teacher may want them to solve after going over the written task with the class.

5 MANAGING YOUR TEACHING USING THE LESSON PLAN

The formal curriculum for Term 4 of Grade 4 is covered in a set of 35 numbered lesson plans, paced to cover a 54-day teaching term. This includes 27 fully planned lessons, 2 assessment lessons, 6 consolidation lessons and 19 revision lessons.

Each of the lessons is designed to last 60 minutes. If your school's timetable has different period lengths, you will need to adjust the amount of work done in each lesson to accommodate this. Each school should allow six hours for Mathematics each week so it should be possible to fit in all the work for the week, even if the lengths of periods are not the same as in the lesson plans.

6 SEQUENCE ADHERENCE AND PACING

Each fully planned lesson and its contents has been carefully sequenced. You should not skip any of these lessons. Should you miss a school day for any reason, rather skip a consolidation lesson near to the lesson that you are teaching. You might choose to speed up the pace of delivery to catch up a missed lesson by covering the lesson concept contents of two consecutive days in one day. To do this, you could cut out or cut back on some of the routine activities like mental mathematics or homework reflection to save time until you are back on track with the expected delivery of the plans.

7 UNIT PLAN AND OVERVIEW

Each unit is introduced with a description of the unit content. Links to the four framework dimensions are included in the introduction to the unit. The unit plan and overview gives a tabulated summary of the lessons contained in the unit. The lesson objectives and the resources required for each lesson are included in the table. There is also a column provided for you to use to keep a record of your teaching progress.

It is a good idea to reflect on your teaching. You could write about what went well, or not so well, when you taught the lessons and how you would teach the lessons again the next time. Use the space provided at the end of each unit plan and overview to record your thoughts. Some questions are provided to guide your reflection.

Reflect on the following as you prepare lessons that follow the CPA approach

Learners need to make the move from concrete to abstract, but this does not happen suddenly or in one move. Learners may need to go backwards and forwards between representations in the CPA method many times until they have fully achieved abstraction. As soon as a learner shows he/she can work abstractly, do not hold them back, allow them to work abstractly. When learners need the support of concrete/pictorial material, offer it to them again.

Preparing to teach a lesson

The lesson plans provide a detailed lesson design for you to follow. However, to deliver the lessons successfully **you must do the necessary preparation yourself**.

Before you get started, **study the Grade 4 TMU Time Allocation Per Topic**. This will give you an overview of the mathematics content you will cover during the term.

The information below outlines some key aspects of the preparation required before you teach are the lessons.

a Your lessons will not succeed if you have not prepared properly ahead of time. Where possible, prepare more than one lesson at a time. Ideally, you should prepare lessons for a whole week or unit so that you have a sound knowledge of what is to be done.

b **Prepare resources:** The resources needed for each lesson are listed in each lesson plan and in the tracker. Check what is required for each lesson ahead of time, so that you have all your resources ready for use every day (examples: bottle tops, number grids, paper cut-outs, examples of 2-D shapes and 3-D objects).

If you do not have all the necessary resources readily available, see how best you can improvise. For example get learners to collect bottle tops or small stones to be used for counting, or make your own number grids or arrays using pieces of cardboard and a marker pen.

Start collecting resources well in advance. Collect empty cool drink cans, cereal boxes, washing powder boxes and plastic bottles for use when dealing with 2-D shapes, 3-D objects and capacity. Use newspapers and magazines to cut out pictures that could be used in your teaching. If you have access to the internet, search for and print out pictures that you may need to use as illustrations in your lessons.

c **Prepare for the written classwork and homework activities:** When preparing your lessons, check the lesson activity requirements. In some instances, you will need to write information or draw some diagrams on the board for use when you do the interactive whole-class-teaching component of the lesson. Mark classwork activities immediately after the learners have finished them so that you can give useful feedback to the learners each day and become aware of any difficulties the learners are having as soon as they become apparent.

d **Prepare to teach the concepts and skills associated with the lesson topic:**
Think carefully about what you will teach your learners in the lesson:

- Be sure that you are familiar with the sequence of activities in the lesson plan.
- Prepare a short introduction to the topic so that you can explain it in simple terms to your learners.
- Prepare for the teaching of the new vocabulary and concepts before you teach – you need to be able to explain new mathematics content and skills to the learners.
- Go through the oral teaching activities provided in the lesson plans and in the Learner Activity Book (LAB).

- Make sure that you have thought about how to use the resources in the lesson effectively. This preparation needs to be done in advance, so that you do not waste time during the lesson.
- Prepare yourself to assist learners with any questions they might have during the lesson.
- Think about how you will accommodate learners with barriers to learning.

e **Lesson pace:** Think about how much time you will spend on each activity. Plan how you will manage the pace of the lesson carefully; otherwise you might not manage to cover all the lesson content. Not all learners work at the same pace. You need to determine the pace – be guided by the average learner and the recommendations in the lesson plans. Be careful not to slow down to the pace of the slowest learners as this will disadvantage the other learners.

f **Organisation of learners:** Think about how you will organise learners when they do the classwork activities. Will they work alone, in pairs or in small groups? How will you organise the pairs or groups if you choose to use them? You need to organise the learners quickly at the beginning of the lesson so that you do not waste too much time on this.

g **Inclusive education:** Consider the needs of any learners with barriers to learning in your class, and how best you can support them. The DBE has published some excellent materials to support you in working with learners with learning barriers. Two such publications are:

i Directorate Inclusive Education, Department of Basic Education (2011) *Guidelines for Responding to Learner Diversity in the Classroom Through Curriculum and Assessment Policy Statements.* Pretoria. www.education.gov.za, www.thutong.doe.gov.za/InclusiveEducation.

ii Directorate Inclusive Education, Department of Basic Education (2010) *Guidelines for Inclusive Teaching and Learning. Education White Paper 6. Special needs education: Building an inclusive education and training system.* Pretoria. www.education.gov.za, www.thutong.doe.gov.za/InclusiveEducation.

You can make the learning and teaching of mathematics more effective by remembering a few simple DOs and DON'Ts:

- **Always** teach with a SMILE
- **Always** give learners enough time to think/struggle and discover something on their own and keep quiet while they are thinking/working individually. **Do not** explain everything
- **Always** plan the lesson with enough time to let learners deepen their own thinking and be patient. **Do not** rush learners into saying/doing something by saying *'quick, quick, quick'*.
- **Always** share a variety of answers/thinking with all the learners and let them compare, think and explain which ones are OK/not OK and why. **And always** discuss important errors so that everyone can learn from them. **Do not** erase/remove incorrect answers.

- **Always** ask the learners 'why did you think so', regardless of whether their answer is correct or incorrect. **And always** assist learners to discover where and why they made mistakes. Use other learners as well to explain why something is not correct. **Do not** say *'No', 'Wrong', 'Next', 'Right', 'Yes', 'Correct',* etc. immediately after learners give you their answers.
- **DO NOT** answer or use your phone during the lesson.

Note:

The four terms in a year are not always the same length, or you might not have the planned number of teaching and learning weeks available.

You will need to adjust the pace at which you work to complete the work in the time available or make other plans to stay on track.

Grade 4 Time Allocation Per Topic

TMU: TIME ALLOCATION PER TOPIC: GRADE 4							
TERM 1		**TERM 2**		**TERM 3**		**TERM 4**	
Topic	**Time**	**Topic**	**Time**	**Topic**	**Time**	**Topic**	**Time**
Whole Numbers Counting, ordering, comparing, representing, place value (up to 1 million)	**11 h**	**2-D Shapes** Classification, investigations, drawing, tessellations, location	**13 h**	**Whole Numbers** Multiplication of 2-digit by 2-digit	**9 h**	**Decimal Fractions** Calculations with decimal fractions; solving problems; equivalent forms	**6 h**
Whole Numbers Addition and subtraction using column method up to 6-digit numbers	**12 h**	**Common Fractions** Describe and order fractions; calculations with fractions; solving problems; equivalent forms	**10 h**	**Area and Perimeter** Calculating perimeter of shapes; calculating area of squares and rectangles	**12 h**	**Time** Read time in different formats; read calendars; calculations and problem solving; conversions with time	**5 h**
Whole Numbers Approximating numbers and calculations	**10 h**	**Data Handling** Collecting and organising data; representing data; analysing, interpreting and reporting data	**15 h**	**Capacity and Volume** Estimate capacity; practically measure and record the capacity / volume; calculate the volume of solid objects	**10 h**	**Length** Estimate the length; practically measure and record length; solve problems in context; conversions	**5 h**
Numeric and Geometric Patterns and Number Sentences	**15 h**	**Whole Numbers** Multiplication of multiples of 10 up to 100 000 by 1-digit number; solve problems in context with whole numbers	**7 h**	**Whole Numbers** Division of 3- by 1-digit with/without a remainder	**12 h**	**Mass** Estimate mass; practically measure, record and compare the mass of objects; solve problems in contexts; conversions	**5 h**
				Decimal Fractions Recognise, order and place value of decimal fractions;	**4 h**	**Properties of 3-D Objects** Including position and views	**12 h**
Revision	**10 h**	Revision	**12 h**	Revision	**11 h**	Revision	**19 h**
Assessment	**2 h**	Assessment	**3 h**	Assessment	**2 h**	Assessment	**2 h**
TOTAL: 60 HOURS		**TOTAL: 60 HOURS**		**TOTAL: 60 HOURS**		**TOTAL: 54 HOURS**	

CAPS: TIME ALLOCATION PER TOPIC: GRADE 4 (page 34 in CAPS)							
TERM 1		**TERM 2**		**TERM 3**		**TERM 4**	
Topic	**Time**	**Topic**	**Time**	**Topic**	**Time**	**Topic**	**Time**
Mental Mathematics (10 minutes daily)	**8 h**	Mental Mathematics (10 minutes daily)	**7 h**	Mental Mathematics (10 minutes daily)	**8 h**	Mental Mathematics (10 minutes daily)	**7 h**
Whole Numbers: Counting, ordering, comparing and place value (3-digit numbers)	**2 h**	Whole Numbers: Counting, ordering, comparing and place value (4-digit numbers)	**1 h**	Capacity/volume	**6 h**	Whole Numbers: Counting, ordering, comparing and place value (4-digit numbers)	**1 h**
Number sentences	**3 h**	Whole Numbers: Addition and Subtraction (4-digit numbers)	**4 h**	Common Fractions	**5 h**	Whole Numbers: Addition and Subtraction (4-digit numbers)	**4 h**
Whole Numbers: Addition and Subtraction (3-digit numbers)	**8 h**	Common Fractions	**6 h**	Whole Numbers: Counting, ordering, comparing and place value (4-digit numbers)	**1 h**	Mass	**6 h**
Numeric patterns	**4 h**	Length	**7 h**	Whole Numbers: Addition and Subtraction (4-digit numbers)	**4 h**	Properties of 3D objects	**4 h**
Whole Numbers: Multiplication and Division (1-digit by 1 digit)	**4 h**	Whole Numbers: Multiplication (2-digits by 2 digits)	**6 h**	Viewing objects	**2 h**	Common Fractions	**5 h**
Time	**6 h**	Properties of 3D objects	**5 h**	Properties of 2-D shapes	**4 h**	Whole Numbers: Division (3-digit by 1 digit)	**3 h**
Data handling	**10 h**	Geometric patterns	**4 h**	Data handling	**7 h**	Perimeter, Area & Volume	**7 h**
Properties of 2-D shapes	**5 h**	Symmetry	**2 h**	Numeric patterns	**4 h**	Position and Movement	**2 h**
Whole Numbers: Multiplication and Division (2-digits by 1 digit)	**5 h**	Whole Numbers: Addition and Subtraction (4-digit numbers)	**4 h**	Whole Numbers: Addition and Subtraction (4-digit numbers)	**4 h**	Transformations	**3 h**
		Whole Numbers: Division (3-digit by 1 digit	**4 h**	Whole Numbers: Multiplication (2-digits by 2 digits)	**5 h**	Geometric patterns	**2 h**
				Number sentences	**3 h**	Whole Numbers: Addition and Subtraction (4-digit numbers)	**3 h**
				Transformations	**3 h**	Probability	**2 h**
Revision	**5 h**	Revision	**4 h**	Revision	**4 h**	Revision	**5 h**
		Assessment (all subjects)	**6 h**			Assessment (all subjects)	**6 h**
TOTAL: 60 HOURS		**TOTAL: 60 HOURS**		**TOTAL: 60 HOURS**		**TOTAL: 60 HOURS**	

Lesson Plan Outline

Each lesson plan has several components. Information about each component is discussed below. This information tells you how to use each of the components of the lesson plan and how they fit together to create a well-paced and properly scaffolded mathematics lesson each day.

Read this outline as you prepare each lesson until you are fully familiar with the general lesson plan components, pace and structure.

Teacher's notes

a Teacher's notes include information for the teacher about the **CAPS content** to be covered in the lesson and the learning objective for the lesson.

b A list of the **lesson vocabulary** is included in the teacher's notes. This list indicates the important mathematical vocabulary used in the lesson. The vocabulary, with explanations and diagrams, is also provided at the beginning of each unit and in the bilingual dictionary that is part of your TMU Toolkit. Go through the lesson vocabulary each day as you prepare for the lesson. These terms are important as they are the language of mathematics that each learner needs to learn and understand in order to build a solid foundation and understanding of this subject. It is important to explain these words to your learners and encourage learners to use them as well. If you have learners in your class who are not yet comfortable in the Language of Learning and Teaching (LoLT), try to explain the word in a language they understand. Use gestures, pictures or enlist the help of another learner who is familiar with the home language of the learner who is struggling with a language barrier.

c The **resources** that you should prepare for the day's lesson are listed. Check which resources you need in advance for each lesson so that you are ready to teach the lesson each day.

1. MENTAL MATHEMATICS (5 MINUTES)

This is the first active component of the lesson and should last only 5 minutes.

Mental mathematics can be both an **oral** or a **written** activity that consist of a set of questions which drill number facts and basic mathematical strategies that are linked to the day's lesson.

The mental mathematics activities for each day are given both in the Daily Lesson Plans and in the Learner Activity Book, but they could also be written on the board or asked orally by the teacher. The answers to the mental mathematics questions are given in the answer column in the Daily Lesson Plans.

We suggest that the learners see the answers written down so they can reflect where they made a mistake, how many they got right and how many they got wrong.

- Observe which learners struggle with mental maths activities. Make sure to spend time later to help them reach the required level of competence by offering remediation activities, which may involve using concrete or pictorial aids. Mental mathematics is not meant to be an activity using concrete material to scaffold the learning, but, if there are learners who need concrete aids to complete the mental mathematics activities, allow them to do so.
- Try to complete all of each day's mental mathematics questions, but if you find that your learners struggle to finish these in five minutes, reduce the number of questions.

2. LINK TO PREVIOUS LESSON (5 MINUTES)

This part of the lesson provides an opportunity to quickly revise the main concepts dealt with in the previous lesson. It provides an opportunity for you to informally assess learners' understanding of the concepts.

3. CORRECT HOMEWORK ACTIVITY (5 MINUTES)

Work through the homework from the previous lesson. This will provide you and the learners an opportunity to gauge the learners' knowledge and skills.

Take a minute or two to reflect on the homework with the learners. You might read out answers to all of the homework questions or get the learners to read the answers out in turn, allowing learners/peers to mark the work. Try to check the homework yourself as often as you can. If you notice a question that many learners struggled with, especially if it is important for today's lesson, you could work through it in full with the whole class. Allow learners the opportunity to write corrections as needed.

4. LESSON CONTENT – CONCEPT DEVELOPMENT. CORRECT CLASSWORK ACTIVITIES (35 MINUTES)

This is the body of the lesson. Activities on the content that you will teach with worked examples and suggested explanations are provided. These activities have been carefully sequenced and scaffolded so that they support the teaching of the concepts for that day. You should work through each of these with your class.

The Activities that the learners should do are provided in in their Learner Activity Books (LABs). They work on the Activities, either on their own, with a partner, or with their group.

Note that individual work is important. Sometimes, in group work, only one or very few learners lead the group: they do all the work and present it to the class for the group. Group work does not guarantee every learner's learning and understanding. Some of the group members may have been left behind without knowing exactly what has been has done. Learners should first work individually and then discuss what they have done with the rest of the group, based on what they have in their classwork books or worksheets.

Manage the pace of the lesson carefully; otherwise, you might not manage to cover all the lesson content. Once you have introduced the new concept, work through Activity 1 of the lesson with the whole class (or with learners in groups). Then, immediately move on to the next activity, and provide a reasonable time for the learners to complete Activity 2.

Do not wait for the last learner to finish before proceeding. If there are further activities, continue pacing yourself in this way, so that you work through all of the activities in each lesson. Occasionally a few activities are marked as optional – these need only be done if you have sufficient time.

5. HOMEWORK ACTIVITY (5 MINUTES)

Take about five minutes to tell the learners about the homework each day.

Homework consolidates the content that you have taught each day. Homework also promotes learner writing and the development of their mathematical knowledge.

As part of their homework, learners should complete classwork activities as necessary.

The daily homework activities are provided in the LAB.

6. REFLECTION AND SUMMARY OF LESSON (5 MINUTES)

Wrap up each day's lesson by focussing learners on the content covered and the concepts they should have learned.

Unit 1: Division

INTRODUCTION

This unit focuses on division, and long division in particular.

Learners practised long division in Term 3 (2-digit number ÷ 1-digit number). In Term 4 learners reinforce long division techniques by dividing 3-digit numbers by a 1 digit-number. As with all operations, solving word problems provides the context for much of the learning. Solving word problems consolidate learners' knowledge and skills of division with and without remainders. Learners deal with the relationships between the dividend, divisor, quotient and remainder (without them having to know the names of the terms). Learners are introduced to 2-digit divisors which are multiplies of 10.

In this unit, we focus on the four framework dimensions in the following ways:

Framework dimension	How the framework dimension is developed in this unit
Conceptual understanding	Use of simplified pictorial representations to understand the concept of division and a range of strategies, including the column method (vertical algorithm or long division) to solve division problems.
Procedural fluency	Learners practise the multi-step procedure of long division repeatedly. In so doing, they develop their procedural fluency.
Strategic competence	Learners solve division problems by identifying which strategy to use and also which multiplication table will help them find the answer.
Reasoning	Given that 396 ÷ 3 = 132, learners can reason that 132 × 3 is equal to 396 as follows: I know that 12 ÷ 4 = 3, means there are three 4s in 12. If so, 120 ÷ 40 = 3, because there are three 40s in 120. The answer is not 30, because there cannot be thirty 40s in 120. What you multiply 30 by 40, it will be 1 200, not 120.

In this unit, we build a **learning centred classroom** by paying attention to:

		Examples
Concept development	✓	Done in every lesson
Practising procedures	✓	Learners practise a variety of different strategies when dividing 3-digit numbers by a 1-digit number.
Problem solving	✓	Learners use division to solve problems in a variety of everyday contexts.
Connecting representations	✓	Learners connect using expanded notation to doing division using long division.
Connecting topics and concepts	✓	Link to previous lesson, correction of classwork and homework activities, as well as consolidation activities are designed to address gaps in learners' knowledge.
Addressing gaps in learners' knowledge	✓	

Mathematical vocabulary for this unit

Be sure to teach and use the following vocabulary at the appropriate place in the unit. It is a good idea to make flashcards of words and their meanings and to display these in the classroom at appropriate times.

Refer to the bilingual dictionary where necessary.

Term	Explanation / diagram
brackets ( )	Symbols that are used to create groups or indicate order of operations They tell you which part of the calculation to work out first
clue board	List of facts which can help in a calculation
divide	Method of splitting a number into equal parts or groups Find how many times one number contains another The symbol for divide is ÷
division	The operation that involves sharing or grouping
expanded notation	Breaking up a number to show the value of each digit Example: 4 329 = 4 000 + 300 + 20 + 9
long division	Method used when dividing a large number by a smaller number using columns
multiple	The result of multiplying one whole number by another whole number The product is the multiple of both numbers
remainder	Something that is left over
share (division)	To divide things equally. Sharing is the same as dividing The symbol for share is ÷

Further practice for learners

This table references other sources (including textbooks) if you need additional activities.

	Fabulous	Oxford Headstart	Oxford Successful	Platinum	Premier	Sasol Inzalo	Solutions for All	Study & Master	Viva
LB	54-56 230-231	50-52 273-279	41-43 233-235	30-32 48-49 96-99 178-181	18-26 99-113 199-200	69-70 200-208 313-317	73-74 160-167 281-287	43-52 271-274	24-25 196-198
TG	32-37 189-191	69-76 319-325	65-67 233-235	24-26 140-142	10-13 103-105	69-73 366-371	23-32 117-124 229-238	77-83 346-351	32-34 98-99

UNIT PLAN AND OVERVIEW FOR UNIT 1: Division

LP	Lesson objective Learners will be able to:	Lesson Resources Learners need classwork books, LABs, writing materials, rulers and scissors for all lessons.	Date completed
1	do simple division using expanded notation	Teacher and Learner: none	
2	use clue boards to help them solve word problems	Teacher and Learner: none	
3	use long division (the column method) to divide a three-digit number by a one-digit number	Teacher and Learner: none	
4	use long division to divide a three-digit number by a one-digit number, with or without a remainder	Teacher and Learner: none	
5	solve word problems that require the operation of division	Teacher and Learner: none	
6	practise division using the following strategies: expanded notation; clue boards; and long division	Teacher and Learner: Grade 4 textbooks (if available)	

Assessment for learning
Use the template provided at the beginning of this guide to think deeply about at least one of the lessons in this unit.

Reflection
Think about and make a note of: *What went well? What did not go well? What did the learners find difficult or easy to understand or do? What will you do to support or extend learners? Did you complete all the work set for the unit? If not, how will you get back on track?*

What will you change next time? Why?

Lesson 1: Division

Teacher's notes
This lesson is one of the fully planned lessons to be used to cover the Term 4 curriculum.
CAPS topics: Whole numbers: Division
Lesson Objective: Learners will be able to do simple division using expanded notation.
Lesson Vocabulary: brackets, expanded notation, multiple
Teacher and Learner Resources: None
Date: Week Day

1 MENTAL MATHS (5 MINUTES)

		Answer			Answer
1	14 ÷ 7 =	2	**6**	28 ÷ 7 =	4
2	35 ÷ 7 =	5	**7**	70 ÷ 7 =	10
3	49 ÷ 7 =	7	**8**	42 ÷ 7 =	6
4	7 ÷ 7 =	1	**9**	63 ÷ 7 =	9
5	21 ÷ 7 =	3	**10**	56 ÷ 7 =	8

2 LINK TO TERM 3 (5 MINUTES)

- Ask learners to do the following activity in their LAB. Mark it with them.

There are 32 apples.
Each person gets 5 apples.
How many people can get apples?

1. Underline the numbers and draw a wavy line under the question.
2. Write the number sentence: (32 ÷ 5 = ☐)
3. Do the calculation: 32 ÷ 5 = (6 remainder 2)
4. Which times table do you use to do this division? (5)
5. How do you know that there will be a remainder? (32 is not a multiple of 5)
6. What is the remainder? (2 apples)
7. What is the answer? (6) people can get 5 apples with (2 apples) left over

3 CORRECT HOMEWORK ACTIVITY

This is the first lesson in this unit. There is no homework to correct.

4 LESSON CONTENT – CONCEPT DEVELOPMENT (40 MINUTES)

In this lesson learners write 3-digit numbers in expanded notation and then do simple division. They already know how to write numbers in expanded notation, and were introduced to long division in Term 3.

- Say: **Today we are learning to calculate by first writing numbers in expanded notation.**

Activity 1: Whole class activity and learners work in pairs

- Encourage learners to discuss the calculations and share their ideas. They should write their ideas and answers in their classwork books, and then share their methods with the whole class.

- Say, as you write the number on the board: **Write 628 in expanded notation in your classwork books.**
  (Learners could answer in different ways:
  628 = 600 + 20 + 8 ***or*** 628 = 6H + 2T + 8 O ***or*** 628 = 6 hundreds + 2 tens + 8 ones)
  Let some learners share their ways to expand the number.

- Say: **We want to use expanded notation to help us divide 628 by 2.**
  Write 628 ÷ 2 = ☐ on the board.
  Say: **Discuss with your partner how you are going to do this.**
  Say: **Try your division in your classwork book.**
  (Some suggested answers:
  - When I see 628 = 600 + 20 + 8, I see that all of them are even numbers, so I can halve each number and get 300 + 10 + 4. So, the answer is 314.
  - 628 ÷ 2 = (600 ÷ 2) + (20 ÷ 2) + (8 ÷ 2) = 300 + 10 + 4 = 314.
  - 628 ÷ 2 = (6H ÷ 2) + (2T ÷ 2) + (8O ÷ 2) = 3H + 1T + 4O = 314.
  - 628 ÷ 2 = (6 hundreds ÷ 2) + (2 tens ÷ 2) + (8 ones ÷ 2) = 3 hundreds + 1 ten + 4 ones = 314.)

  Note: The important thing is that learners must realise all ideas are saying the same thing.

- Say: **We want to use expanded notation to do the calculation:** 369 ÷ 3 = ☐
  Say: **Write the example in your classwork book.**
  Say: **Write 363 in expanded notation.** (363 = 300 + 60 + 3)

Say: **Work in your classwork book. Find the answer to 363 ÷ 3 = ☐ using expanded notation.**
((369 ÷ 3) = (300 ÷ 3) + (60 ÷ 3) + (9 ÷ 3) = 100 + 20 + 3 = 123)

Activity 2: Learners work in pairs

Say: **Complete Activity 2 in your LAB.**

- Read through Activity 2 with learners. Make sure that learners understand what they should do.
- Walk around the classroom to support learners as needed.
- Before going to Question 2, correct Question 1 with the whole class.
- Work through Question **2 a** carefully with the whole class and then let them work through Question **2 b** with their partner.
- Answers provided below.

Work with your partner.

1 Calculate the following using expanded notation.

a 636 ÷ 6 = ☐
Write 636 in expanded notation: (636 = 600 + 30 + 6)
Do the division:
636 ÷ 6 = ((600 ÷ 6) + (30 ÷ 6) + (6 ÷ 6)
= 100 + 5 + 1
= 106)

b 340 ÷ 5 = ☐
Write 340 in expanded notation: (340 = 300 + 40)
Do the division:
340 ÷ 5 = ((300 ÷ 5) + (40 ÷ 5)
= 60 + 8
= 68)

c 408 ÷ 4 = ☐
Write 408 in expanded notation: 408 = (400 + 8)
Do the division:
408 ÷ 4 = (400 ÷ 4) + (8 ÷ 4)
= (100 + 2
= 102)

2 Calculate the following using expanded notation.

a 819 ÷ 4 = □
We can write 819 in expanded notation as follows: 819 = 800 + 19
Do the division:
819 = ((800 ÷ 4) + (19 ÷ 4)
= 200 + 4 remainder 3
= 204 remainder 3)

Note to the teachers: Learners must know that when you cannot divide 1 Ten by 4 without a remainder, we put together Ten's place and One's place to get 19 Ones and then divide 19 Ones by 4.

b 734 ÷ 7 = □
Write 734 in expanded notation as follows: 734 = 700 + (34)
Do the division:
734 ÷ 7 = ((700 ÷ 7) + (34 ÷ 7)
= 100 + 4 remainder 6
= 104 remainder 6)

Activity 3: Learners work on their own

Say: **Complete Activity 3 in your LAB.**

- Read through Activity 3 with learners. Make sure that learners understand what they should do.
- Walk around the classroom to support learners as needed.
- Do the correction with the whole class after each calculation and give the immediate feedback.
- Answers are given below.

Work on your own.

1. Calculate 426 ÷ 4 = □ using expanded notation
426 = (400 + 20 + 6)
426 ÷ 4 = ((400 ÷ 4) + (20 ÷ 4) + (6 ÷ 4)
= 100 + 5 + 1 remainder 2
= 106 remainder 2)

2 Calculate 255 ÷ 5 = ☐ using expanded notation

255 = (200 + 50 + 5)

255 ÷ 5 = ((200 ÷ 5) + (50 ÷ 5) + (5 ÷ 5)
= 40 + 10 + 1
= 51)

Point out to the learners that when you divide the digit in the Hundred's place, the answer is not necessarily going to be in the hundreds. In this case the answer is 40.

3 Calculate 632 ÷ 3 = ☐ using long division (the vertical method) and then using expanded notation.

a Using long division

	1	0
5	5	2
–	5	
	0	2
–		0
		2

Point out to the learners that when you cannot divide the 2 in the One's place by 5, the 2 must remain as a remainder.

b Using expanded notation

632 = (600 + 30 + 2)

632 ÷ 3 = ((600 ÷ 3) + (30 ÷ 3) + (2 ÷ 3)
= 200 + 10 remainder 2
= 210 remainder 2)

Special note to the teacher:

- Questions need to be carefully selected as expanded notation is not suitable to use for all calculations.
- In this lesson, all the digits in the Hundred's place are a multiple of their divisors. In other words, they have been selected so there is no remainder. For example, if you are asked to use expanded notation to find the answer to 255 ÷ 6 = ☐, you will get 200 ÷ 6 which gives 33 remainder 2. You then have to think about how to deal with the remainder 2 and that complicates your calculation.
- Learners are expected to realise that the expanded notation technique is useful for some cases but not for every division calculation.

5 HOMEWORK ACTIVITY (5 MINUTES)

- Explain what learners need to do for homework.
- Read the question in the LAB with learners. Make sure all the learners understand what to do.
- Answers in brackets.

Write in expanded notation and then calculate.

1 939 ÷ 3 = ☐

939 = (900 + 30 + 3)

939 ÷ 3 = ((900 ÷ 3) + (30 ÷ 3) + (9 ÷ 3)
= 300 + 10 + 3
= 313)

2 612 ÷ 3 = ☐

612 = (600 + 12)

612 ÷ 3 = (600 ÷ 3) + (12 ÷ 3)
= 200 + 4
= 204

6 REFLECTION AND SUMMARY OF LESSON (5 MINUTES)

Call the whole class to attention and summarise the key concepts of the lesson.

Say: **Today we have learnt another way of dividing numbers.**

Lesson 2: Divide and solve problems

Teacher's notes
This lesson is one of the fully planned lessons to be used to cover the Term 4 curriculum.
CAPS topics: Whole numbers: Division
Lesson Objective: Learners will be able to use clue boards to help them solve word problems.
Lesson Vocabulary: clue board, division,
Teacher and Learner Resources: None
Date: Week Day

1 MENTAL MATHS (10 MINUTES)

		Answer			Answer
1	42 ÷ 7 =	6	**6**	56 ÷ 7 =	8
2	63 ÷ 7 =	9	**7**	14 ÷ 7 =	2
3	0 ÷ 7 =	0	**8**	28 ÷ 7 =	4
4	70 ÷ 7 =	10	**9**	35 ÷ 7 =	5
5	49 ÷ 7 =	7	**10**	21 ÷ 7 =	3

2 LINK TO PREVIOUS LESSON (5 MINUTES)

- Ask learners to do the activity in their LAB.

Calculate 464 ÷ 8 = ☐ using expanded notation.

464 = 400 + (64)

464 ÷ 8 = (400 ÷ 8) + (64 ÷ 8)
= 50 + 8
= 58

- Mark the work with the learners.

3 CORRECT HOMEWORK ACTIVITY (5 MINUTES)

The answers to the Homework Activity for Lesson 1 are provided in Lesson 1.
Use this time to purposefully address gaps in learners' knowledge and to identify and address learner errors.

4 LESSON CONTENT – CONCEPT DEVELOPMENT (35 MINUTES)

In this lesson learners use division to solve word problems. They will use a clue board to support their calculations. Remind learners to use multiplication to check their calculations.

Say: **Today we are using division to solve word problems.**

Activity 1: Whole class activity and learners work in pairs

- Encourage learners to discuss the calculations and share their ideas. They should write their ideas and answers in their classwork books, and then share their methods with the whole class.

- Write the word problem on the board:
  There are 92 learners in Grade 4.
  The learners are divided into 4 teams.
  How many learners in each team?

- Read through the word problem at least three times with the learners.

- Ask: **Who will come to the board and underline the numbers and the question?**
  There are 92 learners in Grade 4.
  The learners are divided into 4 teams.
  How many learners in each team?

  Discuss whether the '4' of Grade 4 is a necessary number for this problem.
  Make sure the learners understand that the 4 of Grade 4 is the name of the grade.

- Ask: **Who will come to the board and write a number sentence to find the answer to this problem?**
  ($92 \div 4 = \square$)

- Ask: **Which times table will we use to do this long division?** (4 times table)

- Say: **Let us write useful multiplies of 4 and 10 on a *Clue Board*.**

Clue Board
$10 \times 4 = 40$
$20 \times 4 = 80$ (20 is the next multiple of 10)
$30 \times 4 = 120$ (30 is the next multiple of 10) – too big as we are dividing 92 by 4.

- Say: **Discuss with your partner. How can you use the *clue board* to solve this problem?**
  Give pairs time to discuss their strategy and to solve the problem.
  Ask selected pairs to come to the board to share their method with the rest of the class.

  (Possible answer:

  $92 \div 4 = \square$

  I know **20** $\times 4 = 80$.

  $92 - 80 = 12$

  $12 \div 4 =$ **3**

  So, $92 \div 4 = 20 + 3 = 23$)

Clue board

$10 \times 4 = 40$

$20 \times 4 = 80$

$30 \times 4 = 120$ – too big

- Say: **Use multiplication to check answer:** $(4 \times 23 = (4 \times 20) + (4 \times 3) = 80 + 12 = 92)$
- Ask: **What is the answer to the problem?** (There are 23 learners in each team.)

Activity 2: Learners work in pairs

Say: **Complete Activity 2 in your LAB.**

- Walk around the classroom to support learners as needed.
- Do the correction with the whole class each time and give the immediate feedback.
- Answers provided.

Work with a partner. Solve the following problems:

1 A car can transport 6 people.
How many cars are needed to transport 117 people?

a Underline the numbers and draw a wavy line under the question.

b Write the number sentence: $(117 \div 6 = \square)$

c Use a clue board to help you work out the answer.
(I know that $10 \times 6 = 60$.
$117 - 60 = 57$
And $57 \div 6 =$ 9 remainder 3
So, $117 \div 6 = 10 + 9$ remainder 3
$= 19$ remainder 3)

Clue board

$10 \times 6 = (60)$

($20 \times 6 = 120$ – too big as 120 is bigger than 114)

d Use multiplication to check your answer:
($6 \times 19 = (6 \times 10) + (6 \times 9) = 60 + 54 = 114$ and $114 + 3 = 117$. ✓)

e Write the answer, giving a reason for your answer.
We need (20 cars) because (we cannot leave 3 people behind, so we need 1 more car. $19 + 1 = 20$)

2 There are 8 apples in one packet.
How many packets can be made if there are 166 apples?

a Underline the numbers and draw a wavy line under the question.

b Write the number sentence: ($166 \div 8 = \square$)

c Use a clue board to help you work out the answer.
(I know $20 \times 8 = 160$.
$166 - 160 = 6$
We cannot divide 6 by 8
So, $166 \div 8 = 20$ remainder 6)

Clue board
$10 \times 8 = (80)$
$(20 \times 8 = 160$
$30 \times 8 = 240$ – too big)

d Use multiplication to check your answer.
$((20 \times 8) + 6 = 160 + 6 = 166$ ✓)

e Write the final answer.
(I cannot make a packet with only 6 apples. So 20 packets of apples can be made)

3. There are 122 sweets.
If 7 children got sweets, how many sweets did each child get?

a Underline the numbers and draw a wavy line under the question.

b Write the number sentence: ($122 \div 7 = \square$)

c Use a clue board to help you work out the answer.
(I know that $10 \times 7 = 70$.
$122 - 70 = 52$
And $52 \div 7 =$ 7 remainder 3
So, $122 \div 7 = 10 + 7$ remainder 3
$= 17$ remainder 3)

Clue board
$10 \times 7 = 70$
$(20 \times 7 = 140$ – too big)

$6 \times 7 = (42)$
$(7 \times 7 = 49$
$8 \times 7 = 56$ – too big)

d Use multiplication to check your answer.
((7 × 17) + 3 = (7 × 10) + (7 × 7) + 3
= 70 + 49 + 3
= 70 + 52
= 122 ✓)

e Write the final answer: (Each child gets 17 sweets. There are 3 sweets left over.)

Activity 3: Learners work on their own

Say: **Complete Activity 3 in your LAB.**

- Walk around the classroom to support learners as needed.
- Correct Activity 3 with learners so that they can receive immediate feedback.
- Answers are provided below.

Work on your own. Solve the following problems.

1 Nine tablespoons of sugar have a mass of 117 g.
What is the mass of one tablespoon of sugar?

a Underline the numbers and draw a wavy line under the question.

b Write the number sentence: (117 ÷ 9 = ☐)

c Use a clue board to help you find the answer.
(I know 10 × 9 = 90.
117 – 90 = 27
27 ÷ 9 = 3
So, 117 ÷ 9 = 10 + 3 = 13)

Clue board

10 × 9 = (90)

20 × 9 = (180 – too big)

d Use multiplication to check your answer:
(9 × 13 = (9 × 10) + (9 × 3) = 90 + 27 = 117 ✓)

e Write the answer: (The mass of one tablespoon of sugar is 13 g.)

2 Sizwe ran 84 km in one week.
He ran the same distance each day.
How far did he run each day?

a Underline the numbers and draw a wavy line under the question.

b Write the number sentence: (84 ÷ 7 = ☐)

c Use a clue board to help you find the answer.
(I know 10 × 7 = 70.
84 – 70 = 14
14 ÷ 7 = 2
So, 84 ÷ 7 = 10 + 2 = 12 km)

Clue board

(10 × 7 = 70

20 × 7 = 140 – too big)

d Use multiplication to check your answer:
(7 × 12 = (7 × 10) + (7 × 2) = 70 + 14 = 84 ✓)

e Write the answer: (Sizwe ran 12 km each day.)

5 HOMEWORK ACTIVITY (5 MINUTES)

- Explain what learners need to do for homework.
- Read the question in the LAB with learners. Make sure all the learners understand what to do.
- Answers are given below.

Solve the word problem.

Azwindini is selling bags of marbles.
He packs 6 marbles in each bag.
He has 156 marbles.
How many bags will he have?

1 Underline the numbers and draw a wavy line under the question.

2 Write the number sentence: (156 ÷ 6 = ☐)

3 Use a clue board to help you find the answer.
(I know 20 × 6 = 120.
156 – 120 = 36
36 ÷ 6 = 6
156 ÷ 6 = 20 + 6 = 26 bags)

Clue board

(10 × 6 = 60

20 × 6 = 120

30 × 6 = 180 – too big)

4. Use multiplication to check your answer: (26 × 6 = (20 × 6) + (6 × 6) = 120 + 36 = 156 ✓)

5. Write the answer: Azwindini will have (26 bags of marbles.)

6 REFLECTION AND SUMMARY OF LESSON (5 MINUTES)

Call the whole class to attention and summarise the key concepts of the lesson.

Say: **Today we have use division to solve word problems. We know that:**

- **we can use a clue board to help with the calculation**
- **we can use multiplication to check division.**

Lesson 3: Long division (1)

Teacher's notes
This lesson is one of the fully planned lessons to be used to cover the Term 4 curriculum.
CAPS topics: Whole numbers: Division
Lesson Objective: Learners will be able to use long division (the column method) to divide a three-digit number by a one-digit number.
Lesson Vocabulary: long division, remainder
Teacher and Learner Resources: None
Date: Week Day

1 MENTAL MATHS (5 MINUTES)

		Answer			Answer
1	16 ÷ 8 =	2	**6**	32 ÷ 8 =	4
2	40 ÷ 8 =	5	**7**	8 ÷ 8 =	1
3	24 ÷ 8 =	3	**8**	80 ÷ 8 =	10
4	48 ÷ 8 =	6	**9**	64÷ 8 =	8
5	72 ÷ 8 =	9	**10**	56 ÷ 8 =	7

2 LINK TO PREVIOUS LESSON (5 MINUTES)

- Ask learners to do the activity in the LAB.

Solve the word problem.
178 apples are packed into bags
If there are 8 bags, how many apples in each bag?

1 Underline the numbers and draw a wavy line under the question.

2 Write the number sentence: (178 ÷ 8 = ☐)

3 Use a clue board to help you do the calculation.
(I know 20 × 8 = 160.
178 – 160 = 18
18 ÷ 8 = 2 remainder 2
So, 178 ÷ 8 = 20 + 2 remainder 2
= 22 remainder 2

Clue board
10 × 8 = 80
20 × 8 = 160
30 × 8 = 240 – too big

2 × 8 = 16
3 × 8 = 24 – more than 18

4 Use multiplication to check your answer.
$(8 \times 22) + 2 = (8 \times 20) + (8 \times 2) + 2$
$= 160 + 16 + 2$
$= 178)$

5 Give the answer: (There are 22 apples in each bag)

3 CORRECT HOMEWORK ACTIVITY (5 MINUTES)

The answers to the Homework Activity for Lesson 2 are provided in Lesson 2.
Use this time to purposefully address gaps in learners' knowledge and to identify and address learner errors.

4 LESSON CONTENT – CONCEPT DEVELOPMENT (35 MINUTES)

The learners first used long division in Term 3. In this lesson learners do more long division calculations.

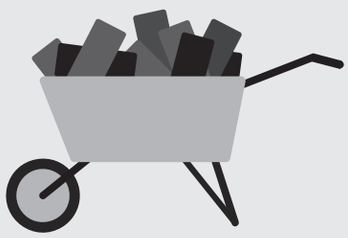
As long division is a multi-step procedure, it is important that learners are given many opportunities to practice doing long division in order to develop their procedural fluency.

- In Term 3 they practised long division of mainly 2-digit numbers divided by a 1-digit number.
- In Term 4 they practise using long division to divide 3-digit numbers by a 1-digit number using the same technique as they used when dividing 2-digit numbers a 1-digit number.
- Once they realise this, they can use long division to divide 4, 5, 6 and bigger-digit numbers without any problem.

Say: **Today we are practising long division.**

Activity 1: Whole class activity

- Tell the learners to turn to their LAB.
- Write the word problem on the board:
  834 bricks are shared equally between 3 workers.
  How many bricks will each worker get?



- Say: **Underline the number and the question in your LAB.**
  (834 bricks are shared equally between 3 workers.
  How many bricks will each worker get?)
- Say: **Write the number sentence in your LAB.** ($834 \div 3 = \square$)

- Say: **Let's use long division to find the answer to 834 ÷ 3 = ☐**
  Note: Complete this long division step by step on the board.

What you say

Step 1

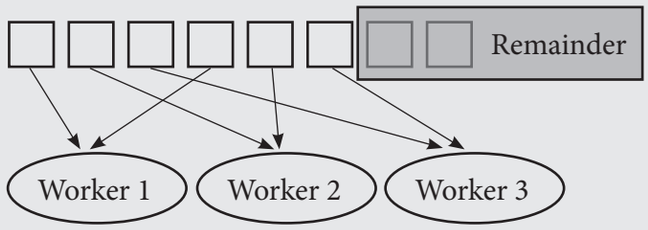
	H	T	O
3	8	3	4

- Write 834 under the thick horizontal line with the 8 in the H column, the 3 in the T column and the 4 in the O column
- Write 3 to the left of the thick vertical bar

Step 2

	H	T	O
	2		
3	8	3	4

- Start by dividing 800 bricks by 3.
  800 ÷ 3 = 2 hundreds

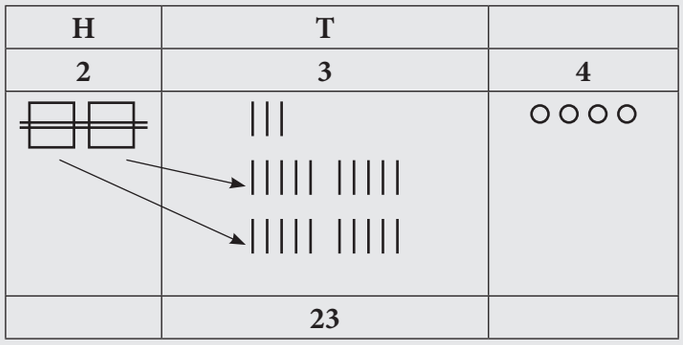


- Write **2** (Or 2 hundreds) on top of the horizontal line in the Hundred's column

Step 3

	H	T	O
	2		
3	8	3	4
–	6		
	2		

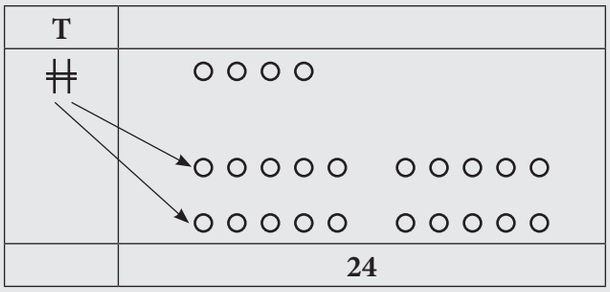
- 3 × 2 hundreds = 6 hundreds
- Write **6 hundreds** under 8 hundreds
- Subtract 6 from 8: (8 – 6) hundreds = 2 hundreds
- Draw a horizontal line and fill in the take-away sign
- Write the 2 hundreds under the 6 hundreds

		What you say
Step 4	<table><tr><td></td><td>**H**</td><td>**T**</td><td>**O**</td></tr><tr><td></td><td>2</td><td></td><td></td></tr><tr><td>3</td><td>8</td><td>3</td><td>4</td></tr><tr><td>–</td><td>6</td><td></td><td></td></tr><tr><td></td><td>2</td><td>3</td><td></td></tr></table>	• Bring down the 3 tens • Now you have 2 hundreds (or 20 tens) and 3 tens, that is 23 tens 
Step 5	<table><tr><td></td><td>**H**</td><td>**T**</td><td>**O**</td></tr><tr><td></td><td>2</td><td>7</td><td></td></tr><tr><td>3</td><td>8</td><td>3</td><td>4</td></tr><tr><td>–</td><td>6</td><td></td><td></td></tr><tr><td></td><td>2</td><td>3</td><td></td></tr></table>	• Divide 23 tens by 3. • 23 tens ÷ 3 = **7 tens**, so you write 7 above the horizontal line in the Ten's place
Step 6	<table><tr><td></td><td>**H**</td><td>**T**</td><td>**O**</td></tr><tr><td></td><td>2</td><td>7</td><td></td></tr><tr><td>3</td><td>8</td><td>3</td><td>4</td></tr><tr><td>–</td><td>6</td><td></td><td></td></tr><tr><td></td><td>2</td><td>3</td><td></td></tr><tr><td>–</td><td>2</td><td>1</td><td></td></tr><tr><td></td><td></td><td>2</td><td></td></tr></table>	• 3 × 7 tens = **21 tens**. • Write **21 tens** under the 23 tens already there • Draw a horizontal line and fill in the take-away sign • Subtract 21 from 23: (23 – 21) tens = **2 tens**. • Write **2 tens** in the Ten's column.

	What you say
Step 7	

	H	T	O
	2	7	8
3	8	3	4
–	6		
	2	3	
–	2	1	
		2	4

- Bring down the 4 ones.
- Now you have 2 tens and 4 ones
  = 20 ones + 4 ones = 24 ones



- 24 ÷ 3 = 8 ones, so you write **8 Ones** above the horizontal line in the One's place

Step 8

	H	T	O
	2	7	8
3	8	3	4
–	6		
	2	3	
–	2	1	
		2	4
–		2	4
			0

- 3 × 8 Ones = 24
- Write **24 ones** under the 24 ones already there
- Subtract 24 from 24: 24 – 24 = **0 ones**
- Write **0 ones** in the One's column
- That means **there is no remainder**

Step 9 834 ÷ 3 = 278 bricks — Each worker gets 278 bricks

- Leave this table on the board for learners' reference.

Activity 2: Whole class activity and learners work on their own

Say: **Complete Activity 2 in your LAB.**

- Work through question 1 with the learners and let them try question **2** on their own.
- Walk around the classroom to support learners as needed. You might need to support some learners with question 2, where there is a zero in the quotient, but first let them see what they can do.
- Correct and discuss answers as you go along so that learners can receive immediate feedback.
- Answers are given below.

	What you say
1 Use long division to find the answer to $384 \div 6 = \square$. Which times table must you use for this division calculation? (6) Answer: $384 \div 6 = 64$	• We cannot divide 3 H by 6. • 3 H + 8 T = 30 T + 8 T = 38 T • 38 T ÷ 6 = 6 T • Write 6 T in the T column above the line • 6 × 6 T = 36 T • 38 T – 36 T = 2 T • 2 T + 4 O = 20 O + 4 O = 24 O • 24 O ÷ 6 = 4 O • Write 4 O in the O column above the line • 6 × 4 O = 24 O • 24 O – 24 O = 0 O

	H	T	O
		6	4
6	3	8	4
–	3	6	
		2	4
–		2	4
			0

2 Use long division to find the answer to 436 ÷ 4 = □.

Which times table must you use for this division calculation? (4)

	H	T	O
	1	0	9
4	4	3	6
–	4		
		3	6
–		3	6
			0

Answer: 436 ÷ 4 = 109

What you say

- 4 H ÷ 4 = 1 H
- Write I H in the H column above the line
- 4 × 1 H = 4 H
- 4 H – 4 H = 0 H
- O H + 3 T = 3 T
- We cannot divide 3 T by 4, so we write 0 T in the T column above the line.
- 3 T + 6 O = 30 O + 6 O = 36 O
- 36 O ÷ 4 = 9 O
- Write 9 O above the line in the O column
- 4 × 9 O = 36 O
- 36 O – 36 O = 0 O
- *We write 0 to show there is no remainder.*

Activity 3: Learners work on their own

Say: **Complete Activity 3 in your LAB.**

- Walk around the classroom to support learners as needed.
- Correct and discuss answers as you go along so that learners can receive immediate feedback.
- Answers are given below.

	What you say
1 Use long division to find the answer to 624 ÷ 3 = ☐. Which times table must you use for this division calculation? (3)	• 6 H ÷ 3 = 2 H • Write 2 H in the H column above the line • 3 × 2H = 6H • 6 H – 6 H = 0 H • *Remind the learners that they don't have to write the 0 here.* • O H + 2 T = 2 T • We cannot divide 2 T by 3, so we write 0 T as a place holder in the T column above the line. • 2 T + 4 O = 24 O • 24 O ÷ 3 = 8 O • Write 8 O above the line in the O column • 3 × 8 O = 24 O • 24 O – 24 O = 0 O • *We write 0 to show that there is no remainder.*

	H	T	O
	2	0	8
3	6	2	4
–	6		
		2	4
–		2	4
			0

Answer: 624 ÷ 3 = 208

	What you say
2 Use long division to find the answer to 965 ÷ 8 = ☐. Which times table must you use for this division calculation? (8)	• 9 H ÷ 8 = 1 H • Write 1 H in the H column above the line • 8 × 1 H = 8 H • 9 H – 8 H = 1 H • 1 H + 6 T = 16 T • 16 T ÷ 8 = 2 T • Write 2 T in the T column above the line • 8 × 2 T = 16 T • 16 T – 16 T = 0 T • *It is not necessary to write this 0 on the T column.* • O T + 5 O = 5 O • 5 O cannot be divided by 8. • Write 0 O above the line in the O column • 8 × 0 O = 0 O • 5 O – 0 O = 5 O

	H	T	O
	1	2	0
8	9	6	5
–	8		
	1	6	
–	1	6	
			5
–			0
			5

Answer:
965 ÷ 8 = 120 remainder 5

5 HOMEWORK ACTIVITY (5 MINUTES)

- Explain what learners need to do for homework.
- Read the question in the LAB with learners. Make sure all the learners understand what to do.
- Answers are given below.

Use long division to solve 512 ÷ 4 = ☐.

Which times table must you use for this long division calculation? (4)

	H	T	O
	1	2	8
4	5	1	2
–	4		
	1	1	
–		8	
		3	2
–		3	2
			0

Answer: 512 ÷ 4 = (128)

6 REFLECTION AND SUMMARY OF LESSON (5 MINUTES)

Call the whole class to attention and summarise the key concepts of the lesson.

Say: **Today we have practised using long division to work out the answer to a division question.**

Lesson 4: Long division (2)

Teacher's notes
This lesson is one of the fully planned lessons to be used to cover the Term 4 curriculum.
CAPS topics: Whole numbers: Division
Lesson Objective: Learners will be able to use long division to divide a three-digit number by a one-digit number, with or without a remainder.
Lesson Vocabulary: division, remainder
Teacher and Learner Resources: None
Date: Week Day

1 MENTAL MATHS (5 MINUTES)

		Answer			Answer
1	64 ÷ 8 =	8	**6**	48 ÷ 8 =	6
2	8 ÷ 8 =	1	**7**	0 ÷ 8 =	0
3	80 ÷ 8 =	10	**8**	56 ÷ 8 =	7
4	40 ÷ 8 =	5	**9**	72 ÷ 8 =	9
5	24 ÷ 8 =	3	**10**	32 ÷ 8 =	4

2 LINK TO PREVIOUS LESSON (5 MINUTES)

Ask learners to do the activity in the LAB.

Use long division to find the answer to 759 ÷ 3 = ☐.

Which tables must you use for this division calculation? (3)

	2	**5**	**3**
3	7	5	9
–	6		
	1	5	
–	1	5	
			9
–			9
			0

The answer is: 759 ÷ 3 = 253

3 CORRECT HOMEWORK ACTIVITY (5 MINUTES)

The answers to the Homework Activity for Lesson 3 are provided in Lesson 3.
Use this time to purposefully address gaps in learners' knowledge and to identify and address learner errors.

4 LESSON CONTENT – CONCEPT DEVELOPMENT (35 MINUTES)

- In this lesson learners continue to do long division. The learners do calculations in which there is a remainder in the answer. They also do calculations in which you can't divide into the digit in the largest place value. That is, where the divisor is bigger than the digit in the hundreds column when the dividend is a three-digit number.

Say: **Today we are practising more division.**

Activity 1: Whole class activity

- Tell the learners to turn to their LAB.

- Write the word problem on the board:
  255 marbles are shared equally between 6 children.
  How many marbles will each child get?

- Say: **Underline the numbers and the question in your LAB**
  (255 marbles are shared equally between 6 children.
  How many marbles will each child get?)

- Say: **Write the number sentence for this problem in your LAB:** $255 \div 6 = \square$

- Ask: **When we do the division, do you think there will be a remainder or no remainder? Give a reason for your answer.** (There is a remainder because no multiples of 6 end with '5'.)

- Say: **Let's use long division to find the answer to $255 \div 6 = \square$**
  Note: Complete this long division step by step on the board.

	H	T	O
		4	2
6	2	5	5
–	2	4	
		1	5
–		1	2
			3

The answer is
255 ÷ 6 = 42 remainder 3.

What you say

- We can't divide 2 H by 6.
- *We don't write a 0 in the H column; just leave the space blank.*
- 2 H + 5 T = 20 T + 5 T = 25 T
- 25 T ÷ 6 = 4 T
- Write 4 T above the line in the T column.
- 6 × 4 T = 24 T
- 25 T – 24 T = 1 T
- 1 T + 5 O = 10 O + 5 O = 15 O
- 15 O ÷ 6 = 2 O remainder 3
- Write 2 O above the line in the O column
- 6 × 2 O = 12 O
- 15 O – 12 O = 3 O

This means that each child gets 42 marbles. There are 3 marbles left over.

- Leave this table on the board for learners' reference.

Activity 2: Whole class activity and learners work in pairs

Say: **Complete Activity 2 in your LAB.**

- Work through question **1** with the learners and let them try from question **2** on their own.
- Walk around the classroom to support learners as needed.
- Correct and discuss answers as you go along so that learners can receive immediate feedback.
- Answers are given below.

Work with your partner.

1 Use long division to calculate $724 \div 8 = \square$.

Which times table must you use for this division calculation? (8)

	H	T	O
		9	0
8	7	2	4
-	7	2	
			4
-			0
			4

Answer: 724 ÷ 8 = 90 remainder 4

2 Use long division to calculate $329 \div 4 = \square$.

Which times table must you use for this division calculation? (4)

	H	T	O
		8	2
4	3	2	9
-	3	2	
			9
-			8
			1

Answer: 329 ÷ 4 = 82 remainder 1

3 Use long division to calculate $460 \div 5 = \square$.

Which times table must you use for this division calculation? (5)

	H	T	O
		9	2
5	4	6	0
-	4	5	
		1	0
-		1	0
			0

Answer: 460 ÷ 5 = 92

4 Use long division to calculate $623 \div 7 = \square$.

Which times table must you use for this division calculation? (7)

	H	T	O
		8	9
7	6	2	3
-	5	6	
		6	3
-		6	3
			0

Answer: 623 ÷ 7 = 89

Activity 3: Whole class activity and learners work on their own

Say: **Complete Activity 3 in your LAB.**

- Work through question **1** with the learners and let them try questions **2**, **3** and **4** on their own.
- Walk around the classroom to support learners as needed.
- Correct and discuss answers as you go along so that learners can receive immediate feedback.
- Answers are given below.

Work on your own.

1 Use long division to calculate $510 \div 6 = \square$.

Which times table must you use for this division calculation? (6)

	H	T	O
		8	5
6	5	1	0
-	4	8	
		3	0
-		3	0
			0

Answer: $510 \div 6 = 85$

2 Use long division to calculate $300 \div 4 = \square$.

Which times table must you use for this division calculation? (4)

	H	T	O
		7	5
4	3	0	0
-	2	8	
		2	0
-		2	0
			0

Answer: $300 \div 4 = 75$

3 Use long division to calculate $700 \div 8 = \square$.

Which times table must you use for this division calculation? (8)

	H	T	O
		8	7
8	7	0	0
-	6	4	
		6	0
-		5	6
			4

Answer: $700 \div 8 = 87$ remainder 4

4 Use long division to calculate $630 \div 9 = \square$.

Which times table must you use for this division calculation? (9)

	H	T	O
		7	0
9	6	3	0
-	6	3	
			0
-			0
			0

Answer: $630 \div 9 = 70$

Note to the teacher:

Learners have practised working out $630 \div 9 = \square$ mentally as they know that 63 tens $\div$ 9 = (63 $\div$ 9) tens = 7 tens = 70.

It is good to compare both techniques and confirm that the answer is the same.

5 HOMEWORK ACTIVITY (5 MINUTES)

- Explain what learners need to do for homework.
- Read the question in the LAB with learners. Make sure all the learners understand what to do.
- Answers are given below.

Use long division to solve 335 ÷ 9 = ☐.

Which times table must you use for this long division calculation? (9)

	H	T	O
		3	7
9	$^{2}\cancel{3}$	$^{1}3$	5
-	2	7	
		6	5
-		6	3
			2

Answer: 335 ÷ 9 = 37 remainder 2

6 REFLECTION AND SUMMARY OF LESSON (5 MINUTES)

Call the whole class to attention and summarise the key concepts of the lesson.

Say: **Today we have practised long division. We know that:**

- **we do not write a 0 at the beginning of an answer**
- **there might be a remainder.**

Lesson 5: Division and word problems

Teacher's notes
This lesson is one of the fully planned lessons to be used to cover the Term 4 curriculum.
CAPS topics: Whole numbers: Division
Lesson Objective: Learners will be able to solve word problems that require the operation of division.
Lesson Vocabulary: division
Teacher Resources: None
Date: Week Day

1 MENTAL MATHS (5 MINUTES)

		Answer			Answer
1	18 ÷ 9 =	2	**6**	90 ÷ 9 =	10
2	54 ÷ 9 =	6	**7**	36 ÷ 9 =	4
3	72 ÷ 9 =	8	**8**	63 ÷ 9 =	7
4	9 ÷ 9 =	1	**9**	45 ÷ 9 =	5
5	81 ÷ 9 =	9	**10**	27 ÷ 9 =	3

2 LINK TO PREVIOUS LESSON (5 MINUTES)

Ask learners to do the activity in the LAB.

Bono was asked to calculate 346 ÷ 8 = ☐. His answer was 346 ÷ 8 = 42 remainder 10

This is his calculation:

	H	T	O
	0	4	2
8	3	4	6
–	3	2	
		2	6
–		1	6
		1	0

1 Explain what is wrong with the calculation.
(Bono wrote the zero in the answer above the horizontal line. Also, his remainder was more than the number you are dividing by or the remainder of 10 is bigger than 8.)

2 Do the correct calculation here:

	H	T	O
		4	3
8	3	4	6
-	3	2	
		2	6
-		2	4
			2

3 What should the answer have been? (43 remainder 2)

3 CORRECT HOMEWORK ACTIVITY (5 MINUTES)

The answers to the Homework Activity for Lesson 4 are provided in Lesson 4.
Use this time to purposefully address gaps in learners' knowledge and to identify and address learner errors.

4 LESSON CONTENT – CONCEPT DEVELOPMENT (35 MINUTES)

In this lesson learners use the operation of division to solve word problems in context. Learners also learn to divide by multiples of 10.

Say: **Today we are using division to solve word problems.**

Activity 1: Learners work on their own

Say: **Complete Activity 1 in your LAB.**

- Read through each question with learners. Make sure that learners understand the word problem and what they are being asked to do.
- Walk around the classroom to support learners as needed.
- Correct and discuss answers as you go along so that learners can receive immediate feedback.
- Answers are given below.

Work on your own.

Find the answers and then check your answers.

1 Mother bought 4 m of dress material for R500.
How much did 1 metre cost?

a Underline the numbers and the question.

b Write the number sentence: (500 ÷ 4 = ☐)

c Do the calculation:

	H	T	O
	1	2	5
4	5	0	0
–	4		
	1	0	
-		8	
		2	0
–		2	0
			0

d Write down the answer: (1 metre costs R125)

e Check your answer

	H	T	O
	1	2	
	1	2	5
×			4
	5	0	0

2 The water truck carries 720 litres of water.
If each household gets 8 litres water, how many households can be supplied with water?

a Underline the numbers and the question.

b Write the number sentence: (720 ÷ 8 = ☐)

c Do the calculation:

	H	T	O
		9	0
8	7	2	0
–	7	2	
			0

Or 720 ÷ 8 = 72 tens ÷ 8
= (72 ÷ 8) tens
= 9 tens
= 90

d Write down the answer: (90 households can be supplied with water)

e Check your answer: (90 × 8 = 720)

Activity 2: Whole class activity and learners work in pairs

- Tell the learners to work with their partner on Activity 2 in their LAB.

1 You have R80.
How many bags of chocolate bars can you buy if one bag costs R8?

Say: **Work with your partner. Discuss an operation you can use to answer the question.** (80 ÷ 8 = 10, 10 bags)

Ask: **Who would like to come to the board to show us how you found the answer?** Listen carefully to learners' strategies. Ask questions and provide feedback as necessary.

2 You have R80.
How many bags of apples can you buy if one bag costs R10?

Say: **Work with your partner. Discuss an operation you can use to answer the question.** (80 ÷ 10 = 8, 8 bags)

Ask: **Who would like to come to the board to show us how you found the answer?** Listen carefully to learners' strategies. Ask questions and provide feedback as necessary.

Note: these two examples assist learners with the next problem.

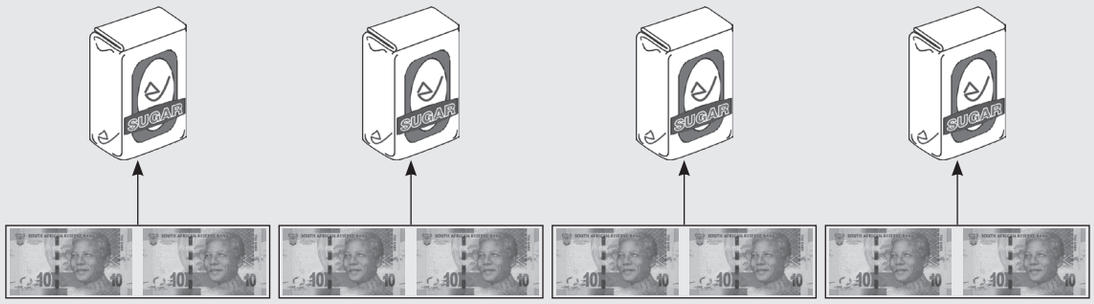
3 You have R80.

How many packets of sugar can you buy if one bag costs R20?

Say: **Work with your partner. Discuss an operation you can use to answer the question.** (80 ÷ 20 = 4, 4 packets)

Ask: **Who would like to come to the board to show us how you found the answer?** Listen carefully to learners' strategies. Ask questions and provide feedback as necessary.

Say: **Draw a diagram to show the problem.**
(Here is one possible diagram you can use:



- Use the diagram to illustrate the fact that 80 ÷ 20 and 8 ÷ 2 gives you the same answer.

Say: **We know 8 ÷ 2 = 4**
Ask: **How many R10 notes are there in R80?** (8)
Ask: **How many R10 notes do you need to buy one packet of sugar?** (2)
Ask: **Compare 80 ÷ 20 = 4 and 8 ÷ 2 = 4. What do you notice?**
(The answers are the same.)
Say: **So, we can find the answer for 80 ÷ 20 = ☐ by using 8 ÷ 2 = 4.**

Special note to the teacher: Some learners may think that if 8 ÷ 2 = 4, then 80 ÷ 20 = 40. You can assist them to correct their misconception by referring to the drawing above, and asking how many 20s are there in 80? It is 4 not 40.
Also, they can check the answer by multiplying 40 and 20: 40 × 20 = 800 not 80, so the answer of 40 is not correct.

Say: **Complete Activity 2 in your LAB.**

- Read through the questions with the learners.
- Walk around the classroom to support learners as needed.
- Correct and discuss answers as you go along so that learners can receive immediate feedback.
- Answers are given.

Work with your partner

4 You buy apples which cost R20 per bag

How many bags of apples can you buy if you have R120?

a Write the number sentence: (120 ÷ 20 = ☐)

b Do the calculation:

120	÷	20
↓		
12	÷	2

We know that 12 ÷ 2 = (6)
Then, 120 ÷ 20 = (6)

c What is the answer? I would be able to buy (6 bags of apples)

d Check your answer: (6 × 20 = 120)

5 A school skirt costs R80.

How many skirts can you buy if you have R240?

a Write the number sentence: (240 ÷ 80 = ☐)

b Do the calculation:

240	÷	80
↓		
24	÷	8

We know that 24 ÷ 8 = (3)
Then, 240 ÷ 80 = (3)

c What is the answer? (I would be able to buy 3 skirts)

d Check your answer: (3 × 80 = 240)

Activity 3: Whole class activity and learners work in pairs

- Write the number sentence on the board: 90 ÷ 40 = ☐

- Say: **Work with your partner. Discuss a strategy you can use to answer the questions.**

- Ask: **Who would like to come to the board to show us how you found the answer?**
  Listen carefully to learners' strategies. Ask questions and provide feedback as necessary.

- Write the following on the board:

90	÷	40

↓

9	÷	4

  We know that 9 ÷ 4 = 2 remainder 1
  Then, 90 ÷ 40 = 2 remainder 10

- Take particular note of how learners deal with the remainder.
  Some learners are likely to say that, when calculating 90 ÷ 40, the remainder is 1.
  Remind them that they replaced R80 with eight R10 bank notes in Activity 2.
  Let them draw R10 bank notes and make groups of R40. Then they can find that the remainder is R10.
  When we calculate 9 ÷ 4 = 2 remainder 1, the remainder 1 represents one R10 bank note.

- Let learners check their answer:
  2 × 40 + 10 = 80 + 10 = 90.
  Learners can confirm that the remainder 1 is not correct. The remainder 10 is correct.

Say: **Complete Activity 3 in your LAB.**

- Read through the questions with the learners.
- Walk around the classroom to support learners as needed.
- Correct and discuss answers as you go along so that learners can receive immediate feedback.
- Answers are given below.

1 280 ÷ 70 = ☐
Because 28 ÷ 7 = (4), we know that 280 ÷ 70 = (4)

Check your answer: (4 × 70 = 280)

2 400 ÷ 80 = ☐
Because 40 ÷ 8 = (5), we know that 400 ÷ (80) = (5)

Check your answer: (5 × 80 = 400)

3 300 ÷ 40 = ☐
Because 30 ÷ (4) = (7) remainder (2), we know that 300 ÷ 40 = (7 remainder 20)

Check your answer: (7 × 40 + 20 = 280 + 20 = 300)

4 550 ÷ 60 = ☐
Because 55 ÷ 6 = (9 remainder 1), we know that 560 ÷ 60 = (9 remainder 10)

Check your answer: (9 × 60 + 10 = 540 + 10 = 550)

5 HOMEWORK ACTIVITY (5 MINUTES)

- Explain what learners need to do for homework.
- Read the question in the LAB with learners. Make sure all the learners understand what to do.
- Answers in brackets.

Calculate.

1. 560 ÷ 70 = ☐
Because 56 ÷ 7 = (8), we know that 560 ÷ 70 = (8)

Check your answer: (8 × 70 = 560)

2. 490 ÷ 50 = 9 remainder 40 because (49 ÷ 5 = 9 remainder 4)

Check your answer: (9 × 50 = 450; 450 + 40 = 490)

6 REFLECTION AND SUMMARY OF LESSON (5 MINUTES)

Call the whole class to attention and summarise the key concepts of the lesson.

Say: **Today we have learnt to use division to solve word problems and to divide by multiples of 10.**

Lesson 6: Consolidation

Teacher's notes
This lesson allows for consolidation of the previous days' lesson content.
CAPS topics: Whole numbers: Division
Lesson Objective: Learners will practise division using the following strategies: expanded notation, clue boards and long division.
Lesson Vocabulary: division, clue card, remainder
Resources: textbooks (if available)
Date: Week Day

1 NOTES FOR THE TEACHER RELATING TO THIS WEEK'S WORK

The main topic in this unit was division. Learners used the following strategies: expanded notation; clue boards; and long division, with, and without, remainders. Learners also started dividing by 2-digit numbers which are multiples of 10.

2. POSSIBLE MISCONCEPTIONS LINKED TO THE WEEK'S WORK

- Learners make errors as a result of poor or incomplete knowledge of multiplication facts up to 10×10. It is important to make sure that the learners know these facts off by heart.
- As the procedures of expanded notation, clue boards, and long division are long and have many steps, learners often 'lose their way', leading to errors.
- The learner sees multiplication and division as separate operations. The learners do not see that multiplication and division are inverse operations and they have to use multiplication in the process of division and in order to check division.
- When learners divide 612 by 3 using long division, they may forget or be unsure about the fact that they must write 0 in Ten's place as a place holder. ($612 \div 3 = 2\mathbf{0}4$).
- With word problems, learners give the remainder even when the answer makes no sense. In other words, learners do not discard or incorporate the remainder according to the context of the word problem.

3 CORRECT HOMEWORK ACTIVITY (5 MINUTES)

The answers to the Homework Activity for Lesson 6 are provided in Lesson 6.
Use this time to purposefully address gaps in learners' knowledge and to identify and address learner errors.

4 LESSON CONTENT – CONCEPT DEVELOPMENT (45 MINUTES)

Today we are going over what we learned in this unit. We will practise using expanded notation, clue boards, and long division, with, and without, remainders.

- You could use this time for learners to complete classwork or homework activities, as necessary.
- You could use the Additional Activities from textbooks that you have or use the Consolidation Activity given.

Additional activities for consolidation

Refer to the following table. Select additional activities from the textbook/s you have. Use the answers given in the Teacher's Guide to mark the work and give feedback.

	Fabulous	Oxford Headstart	Oxford Successful	Platinum	Premier	Sasol Inzalo	Solutions for All	Study & Master	Viva
LB	54-56 230-231	50-52 273-279	41-43 233-235	30-32 48-49 96-99 178-181	18-26 99-113 199-200	69-70 200-208 313-317	73-74 160-167 281-287	43-52 271-274	24-25 196-198
TG	32-37 189-191	69-76 319-325	65-67 233-235	24-26 140-142	10-13 103-105	69-73 366-371	23-32 117-124 229-238	77-83 346-351	32-34 98-99

OR, learners could complete the Consolidation Activity in their LAB.

Consolidation Activity

1 Calculate. Use expanded notation.

a $816 \div 4 = ((800 \div 4) + (16 \div 4))$

$= (200 + 4)$

$= (204)$

b $749 \div 7 = ((700 \div 7) + (49 \div 7))$

$= (100 + 7)$

$= (107)$

2 I have 39 mangoes.
I want to put 6 mangoes in a packet.
How many packets do I need?

a. Which times table will you use to do this division? (6)

b. Write the number sentence: (39 ÷ 6 = ☐)

c. Do the calculation: (39 ÷ 6 = 6 remainder 3)

d. Write the answer: (I need 6 packets.)

e. How do you know that there will be a remainder? (39 is not a multiple of 6)

f. What is the remainder? (3 mangoes)

3 Use a clue board to solve the following problem:
A taxi can transport 9 people.
How many taxis are needed to transport 207 people?

a Write the number sentence for the problem: (207 ÷ 9 = ☐)

b Use the clue board to help you do the calculation.

(I know 20 × 9 = 180.
207 – 180 = 27
27 ÷ 9 = 3
So, 207 ÷ 9 = 20 + 3 = 23)

Clue board
10 × 9 = 90
20 × 9 = 180
30 × 9 = 270 – too big

c Give the answer: (23 taxis are needed)

d Check your answer (9 × 23 = (9 × 20) + (9 × 3) = 180 + 27 = 207)

4 Use long division to solve 627 ÷ 8 = ☐

a Which times table must you use for this long division calculation? (8)

b Do the calculation:

	H	T	O
		7	8
8	6	2	7
–	5	6	
		6	7
–		6	4
			3

c What is the answer?
(627 ÷ 8 = 78 remainder 3)

5 A printing machine prints the same number of booklets every hour.
It takes 9 hours to print 720 booklets.
How many booklets are printed in an hour?

a Write the number sentence for the problem: (720 ÷ 9 = ☐)

b Do your working out:

	H	T	O
		8	0
9	7	2	0
–	7	2	
			0
–			0
			0

Or 720 ÷ 9 = 72 tens ÷ 9
= (720 ÷ 9) tens
= 8 tens
= 80

c What is the answer? (The printing machine prints 80 booklets in an hour.)

6 Calculate:

a 120 ÷ 40 = ☐
Because 12 ÷ 4 = (3), we know that 120 ÷ 40 = (3)

b 490 ÷ 70 = ☐
Because 49 ÷ (7) = (7), we know that 490 ÷ 70 = (7)

5 REFLECTION AND SUMMARY OF LESSON

Call the whole class to attention and summarise the key concepts of the lesson.

Say: **Today we have revised different strategies for doing division: expanded notation; clue boards and long division, with and without, remainders.**

Unit 2: Time

INTRODUCTION

This unit focuses on time. This quantity forms part of Content Area: Measurement.

In this unit, we focus on the four framework dimensions in the following ways:

Framework dimension	How the dimension is developed in this unit
Conceptual understanding	Learners are given opportunities to construct their own understanding of measuring time by applying their knowledge and skills about the units of time. For example, to answer the question: *How much time has passed?* learners need to recall the system of standard units of time and create a strategy to represent the elapsed time.
Procedural fluency	Learners do a variety of tasks and solve a range of contextual problems in order to develop their procedural fluency in telling and measuring time.
Strategic competence	Learners make sensible decisions on what strategies to employ when solving problems involving time.
Reasoning	Based on the information available and the question which needs to be answered, the learners decide on an appropriate strategy for calculating elapsed time.

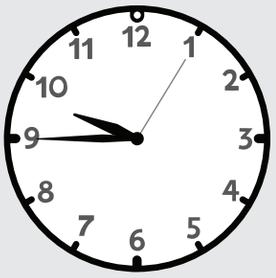
In this unit, we build a **learning centred classroom** by paying attention to:

		Examples
Concept development	✓	Done in every lesson.
Speaking mathematics	✓	Learners use terms such as analogue, digital, a.m. and p.m. in order to communicate effectively.
Connecting topics and concepts	✓	The link to previous lesson, correction of classwork and homework activities, as well as consolidation activities are designed to address gaps in learners' knowledge.
Addressing gaps in learners' knowledge	✓	
Applying maths in context	✓	Learners solve time problems in context.

Mathematical vocabulary for this unit

Be sure to teach and use the following vocabulary at the appropriate place in the unit. It is a good idea to make flashcards of words and their meanings and to display these in the classroom at appropriate times.

Refer to the bilingual dictionary where necessary.

Term	Explanation / diagram
a.m. and p.m.	'a.m.' stands for the Latin words *'ante meridiem'* which means 'before noon' 'p.m.' stands for the Latin words *'post meridiem'* which means 'after noon'
afternoon	The time between noon and evening
analogue clock	A clock with the numbers 1 to 12 around the face, a rotating short hand to show the hours, a long hands to show minutes and a thin hand to show seconds Example: The time on this analogue clock is 9:45 or quarter to 10  It is important to note the position of the minute or short hand when the learners draw hands on an analogue clock
calendar	A table showing the year broken up into months, weeks and days
clock	Device used to tell the time
convert	To change Example: You can convert 1 minute to 60 seconds
digital clock	A clock using numbers, not hands, to show the time Examples: **02:45** or **14:45**
evening	The end part of the day, towards the night. It starts at around sunset
hour half hour/ quarter hours	A unit of time equal to 60 minutes Half an hour = 30 minutes Quarter of an hour = 15 minutes
measure	To find the size or amount of something This can only be done for things that can be measured For example, you can measure the time it takes to do an activity
minute	A unit of time. 60 minutes = 1 hour
morning	The first part of the day which ends at about noon
number line	Line on which numbers can be placed, according to their value The marks on a number line must be an equal distance apart
second (time)	Unit of time shorter than one minute 60 seconds = 1 minute

Term	Explanation / diagram
time	A measurement of how long something lasts A second is a short time A century is a long time

Further practice for learners

This table references the page numbers of other sources (including textbooks) if you need additional activities.

	Fabulous	Oxford Headstart	Oxford Successful	Platinum	Premier	Sasol Inzalo	Solutions for All	Study & Master	Viva
LB	57-62	53-63	44-52	22-29	26-33	73-85	38-48	55-66	29-32
TG	38-40	76-88	67-73	18-23	14-16	78-91	33-36	86-95	21-24

UNIT PLAN AND OVERVIEW FOR UNIT 2: Time

LP	**Lesson objective** Learners will be able to:	**Lesson Resources** Learners need classwork books, LABs, writing materials, rulers and scissors for all lessons.	**Date completed**
7	describe ways time was measured long ago, read time on an analogue clock and measure time in seconds	Teacher: A clock with a second hand for the classroom, watches and cell phones (if available) A3 poster: *Analogue clock* A3 poster: *Measuring time long ago* A3 poster: *Clocks and watches today* Learner: clocks, watches and cell phones (if available)	
8	write time in 12-hour time and 24-hour time and also in a.m./p.m. format	Teacher: A clock with a second hand for the classroom, A3 poster: *Clocks and watches today* A3 poster: *Analogue time and digital time* Learner: None	
9	solve problems related to elapsed time (minutes or hours only)	Teacher: An analogue clock for the classroom A3 poster: *How long was the mathematics lesson?* Learner: Analogue clock (given at the back of the LAB) which the learners have made themselves, 1 split pin per learner (if available) – otherwise the learners can use an elastic band and small stick, or simply lay the hands of the clock on the clock face	
10	solve problems involving elapsed time in minutes, hours and days	Teacher: An analogue clock for the classroom A3 posters: *Thuto Pele timetable* A3 poster: *2021 calendar* A3 poster: *July 2021 calendar* Learner: analogue clock	
11	revise reading analogue and 24-hour digital time. They will also revise solving problems in which they calculate the amount of time passed	Teacher and Learner: Textbooks (if available)	

Assessment for learning
Use the template provided at the beginning of this guide to think deeply about at least one of the lessons in this unit.

Reflection
Think about and make a note of: *What went well? What did not go well? What did the learners find difficult or easy to understand or do? What will you do to support or extend learners? Did you complete all the work set for this unit? If not, how will you get back on track?*

What will you change next time? Why?

Lesson 7: Telling time (1)

Teacher's notes
This lesson is one of the fully planned lessons to be used to cover the Term 4 curriculum. CAPS topics: Measurement: Time Lesson Objective: Learners will know about ways that time was measured long ago, will have revised reading time on an analogue clock and will be able to measure time in seconds. Lesson Vocabulary: Analogue clock; clock; digital clock; hour; measure; minute; second; time Teacher Resources: A clock with a second hand for the classroom, watches, cellphones (if available) A3 poster: *Analogue clock* A3 posters: *Measuring time long ago* A3 poster: *Clocks and watches today* Learner Resources: clocks, watches and cell phones (if available)
Date: Week Day

1 MENTAL MATHS (5 MINUTES)

		Answer
1	How many months in a year?	12
2	Name the months that have 30 days	April, June, September, November
3	Name the months that have more than 30 days	January, March, May, July, August, October, December
4	How many days does February have?	28 days and 29 days in every four years
5	Which month is before June?	May
6	Which month is after February?	March
7	Which month is after December?	January
8	Which month is between August and October?	September
9	Which months are between March and June?	April and May
10	What do we call a year that has an extra day in February?	Leap year

2 LINK TO GRADE 3 (5 MINUTES)

- Refer the learners to the activity in the LAB.
  Say: **How much do you remember from Grade 3?**
  Say: **Complete the sentences.**

1. There are (60) minutes in an hour.
2. There are (24) hours in a day and (7) days in a week.
3. There are approximately (4) weeks in a month.
4. There are approximately (52) weeks in a year.
5. There are (12) months in a year.
6. There are (365) days in a year.
7. There are (366) days in a leap year.

3 CORRECT HOMEWORK ACTIVITY (5 MINUTES)

This is the first lesson in this unit. There is no homework to correct.

4 LESSON CONTENT – CONCEPT DEVELOPMENT (35 MINUTES)

This is the first of five lessons on Time.

In Grade 3, learners:
- described the passing of time by relating it to events in their own lives
- used calendars to calculate length of time and time passing
- read 12-hour time in hours, half hours, quarter hours and minutes on analogue and digital clocks and digital instruments that show time (example: cell phones).

In this lesson the learners find out about the history of measuring time; they revise reading time on an analogue clock and measure time in seconds.

Although the topic of Time is formally addressed in this Unit, CAPS states that the learners should read clocks and watches and tell the time regularly throughout the year. This can be done during Mental maths time, before and after break, and as the learners enter and leave the classroom.

Say: **Today we are learning about ways of measuring time long ago. We will also practice reading the time and practice measuring in seconds.**

Activity 1: Whole class activity and learners work in pairs

- Before starting the lesson, make up the analogue clock given to you as an A3 poster. You will need it for Activity 2.

- Display the A3 poster: *Measuring time long ago*
  Discuss the four different types of clocks on the poster with the learners.

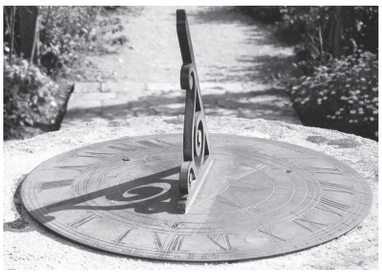
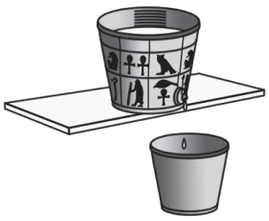
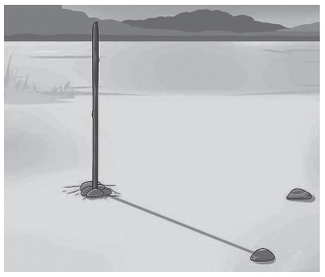
- If you are able to get a one-minute or three-minute sand clock (or egg timer) use it so that the learners can experience how long 1 minute or 3 minutes is as they watch the sand going from one side to the other. If you do not have an egg-timer, you could set the time on the stop watch feature on a cell phone.

Say: **Complete Activity 1 in your LAB.**

- Read through Activity 1 with learners. Make sure that the learners understand what they should do.
- The learners should work in pairs to discuss the different types of early clocks and to match the descriptions with the pictures.
- Walk around the classroom to support the learners as needed.
- Correct Activity 1 with the learners so that they can receive immediate feedback.
- The answers are given below.

Work with your partner

1. Look at the pictures of early clocks. Draw a line to match the picture of the clock to the description.

		**Shadow stick clock** A stick is placed in the ground. The length of the shadow changes as the Sun moves across the sky. Time is measured by the shadow as it moves on the ground.
		**Water clock** Water drips at a constant rate from one container to another through a small hole. The water level shows how many hours have passed since the bucket was filled. Time is measured in hours.
		**Sundial** The clock has a flat, round plate with a pointer that makes a shadow. As the Sun moves across the sky, the shadow moves across the numbers, showing the time.
		**Sand clock or hourglass** Sand runs from the top through a narrow opening into the bottom. It is like an egg timer which some people still use today.

2. Why can't a shadow clock be used at night?
(There is no sun and therefore no shadow to read from)

3. Predict what will happen if a water clock is used outside in the rain.
(The time will be inaccurate/ incorrect because rainwater will be added to the bucket)

Activity 2: Whole class activity and then the learners work on their own

- Display the A3 poster: *Clocks and watches today* in the classroom.

- Say: **The clocks used long ago, like the ones in Activity 1, were not accurate.**
Say: **These days we use analogue clocks or watches and digital clocks and watches.**
Discuss the different clocks on the poster with the learners.

- Ask: **What is the difference between an analogue clock and a digital clock?**
(An analogue clock has hands. A digital clock uses numbers to tell the time.)

- Say: **We are going to revise telling the time on an analogue clock.**

- Use the *analogue* clock that you made from the A3 poster for this activity.

- Ask: **Who would like to come to the board and show 4 o'clock on the clock?**
Ask: **What number is the small hand pointing to?** (4)
Ask: **What number is the big hand pointing to?** (12)
Ask: **Is this 4 in the morning or 4 in the afternoon?**
(It could be either. We don't know.)

- Ask: **Who would like to come to the board and show 8 o'clock on the clock?**
Ask: **What number is the small hand pointing to?** (8)
Ask: **What number is the big hand pointing to?** (12)
Ask: **Is this 8 in the morning or 8 in the afternoon?**
(It could be either. We don't know.)

- Ask: **Who would like to come to the board and show quarter past 8 on the clock?**
  Ask: **What number is the small hand pointing to?** (The small hand is between the 8 and the 9 but is closer to the 8.)
  Ask: **What number is the big hand pointing to?** (3)
  Say: **When it is quarter past, the big hand always points to the 3.**
  Ask: **Is this quarter past 8 in the morning or quarter past 8 in the afternoon?** (It could be either. We don't know.)

- Ask: **Who would like to come to the board and show 25 to 2 on the clock?**
  Ask: **What number is the small hand pointing to?** (The small hand is between the 1 and the 2 but is closer to the 2.)
  Ask: **What number is the big hand pointing to?** (7)
  Say: **When it is twenty-five to, the big hand always points to the 7.**
  Ask: **Is this 25 to 2 in the middle of the night or 25 to 2 after lunch?** (It could be either. We don't know.)

Say: **Complete Activity 2 in your LAB.**

- Read through Activity 2 with learners. Make sure that the learners understand what they should do.
- Walk around the classroom to support the learners as needed.
- Correct Activity 2 with the learners so that they can receive immediate feedback.
- Answers are provided below.

Work on your own.

Fill in either the missing hands on the clock or the missing time in words.

	Analogue clock	Words
1		Quarter past eleven

	Analogue clock	Words
2		(Half past four)
3		(Ten past one)
4		Twenty to nine
5		Five past 11
6		(Twenty-five to four)
7		Quarter to 7
8		(Ten to 6)

Activity 3: Whole class activity

- Display the A3 poster: *Clocks and watches today.*
  If possible, have a working analogue clock with a second hand in the classroom.

- Show the learners the analogue clock in the classroom and the three analogue clocks on the A3 poster.
  Point out that each analogue clock has three hands.
  Ask: **What does each of these hands tell us?**
  (The thin hand shows seconds; the shortest hand shows hours and the long hand shows minutes.)

- Ask: **Which hand is moving fastest?** (The thin hand)

- Ask: **How long does it take for the thin hand to move around the clock?**
  (60 seconds or 1 minute)

- Say: **When the fastest hand, which is the thin hand, moves all the way around the clock, the big hand moves forward 1 mark, or 1 minute.**

- Say: **One second is shorter than one minute.**
  Say: **There are 60 seconds in 1 minute.**
  Write **1 minute = 60 seconds** on the board.

- Say: **We can use the word 'crocodile' to help us count in seconds.**
  - **To count three seconds, we say 'one crocodile'; 'two crocodile'; three crocodile'.**
  - **To count five seconds, we say 'one crocodile'; 'two crocodile'; 'three crocodile'; 'four crocodile'; 'five crocodile'.**

- Say: **Starting now, put up your hand when you think four seconds have passed.**
  While the learners are counting to four seconds, count to four seconds yourself using the crocodile method (or the stopwatch on your phone).
  Note which the learners put up their hands at the correct time and praise them for getting the time right.

- Say: **Starting now, put up your hand when you think ten seconds is up.**
  While the learners are counting to ten seconds, count to ten seconds yourself using the crocodile method (or the stopwatch on your phone).
  Note which learners put up their hands at the correct time and praise them for getting the time right.

- Ask: **If there are 60 seconds in 1 minute, how many minutes and seconds are there in 70 seconds?**
  Allow the learners to discuss the answer with their partners.
  Ask one of the learners to come to the board to explain their answer.
  (70 seconds = 60 seconds + 10 seconds = 1 minute 10 seconds)

- Ask: **How many minutes and seconds are there in 150 seconds?**
  Allow the learners to discuss the answer with their partners.
  Ask one of the learners to come to the board to explain their answer.
  (150 seconds = 60 seconds + 60 seconds + 30 seconds
  = 2 minutes 30 seconds)

5 HOMEWORK ACTIVITY (5 MINUTES)

- Explain what the learners need to do for homework.
- Read the question in the LAB with learners. Make sure all the learners understand what to do.
- Answers are provided below.

1 How many minutes and seconds are there?
- **a** 80 seconds = (1) minute/s and (20) seconds.
- **b** 95 seconds = (1) minute/s and (35) seconds.
- **c** 120 seconds = (2) minute/s and (0) seconds.

2 How many seconds are there?
- **a** 1 minute 10 seconds = (60) seconds + 10 seconds = (70) seconds
- **b** 1 minute 50 seconds = (60) seconds + (50) seconds = (110) seconds
- **c** 3 minutes 25 seconds = (180) seconds + 25 seconds = (205) seconds

6 REFLECTION AND SUMMARY OF LESSON (5 MINUTES)

Call the whole class to attention and summarise the key concepts of the lesson.

Say: **Today we have learnt about:**
- **the history of measuring time**
- **reading the time on analogue clocks**
- **the number of seconds in a minute.**

Lesson 8: Telling Time (2)

Teacher's notes
This lesson is one of the fully planned lessons to be used to cover the Term 4 curriculum. CAPS topics: Measurement: Time Lesson Objective: Learners will be able to write time in 12-hour time and 24-hour time, and also in a.m./p.m. format. Lesson Vocabulary: a.m. and p.m.; afternoon, evening, morning Teacher Resources: An analogue clock for the classroom A3 poster: *Clocks and watches today* A3 poster: *Analogue Time and Digital Time.* Learner Resources: None
Date: Week Day

1 MENTAL MATHS (5 MINUTES)

	Question	Answer
1	How many days in a week?	7 days
2	Which days make up the weekend?	Saturday and Sunday
3	On which days of the week do you go to school?	Monday, Tuesday, Wednesday, Thursday, Friday
4	How many hours in a day?	24 hours
5	How many minutes in an hour?	60 minutes
6	How many minutes in quarter of an hour?	15 minutes
7	Which day is the day before Monday?	Sunday
8	Which day is 2 days after Monday?	Wednesday
9	Which day is 3 days after Thursday?	Sunday
10	Which day is 3 days before Thursday?	Monday

2 LINK TO PREVIOUS LESSON (5 MINUTES)

- Refer the learners to activity in LAB.
- Discuss the answers with the learners once they have completed the activity

Convert to seconds

1. 1 minute = (60) seconds
2. 2 minutes = (120) seconds
3. 4 minutes = (240) seconds
4. 1 minute 7 seconds = (67) seconds
5. 5 minutes 9 seconds = (300) seconds + 9 seconds = (309) seconds
6. 6 minutes 25 seconds = (360) seconds + 25 seconds = (385) seconds

3 CORRECT HOMEWORK ACTIVITY (5 MINUTES)

The answers to the Homework Activity for Lesson 7 are provided in Lesson 7.

Use this time to purposefully address gaps in learners' knowledge and to identify and address learner errors.

4 LESSON CONTENT – CONCEPT DEVELOPMENT (35 MINUTES)

In this, the second lesson on the topic of Time, the learners find out about reading time in 12-hour and 24-hour format on an analogue clock and a digital clock. They also practise writing time using the a.m. and p.m. format.

Note for the teacher

- 'a.m.' stands for the Latin words *'ante meridiem'* which means 'before noon'.
  'p.m.' stands for the Latin words *'post meridiem'* which means 'after noon'.
- We generally use 12 p.m. for mid-day or noon, and 12 a.m. for mid-night.
  Using digital time, we use 12:00 for mid-day and either 24:00 or 00:00 for mid-night.
- Ten past six in the morning is written 6.10 a.m. or 06:10.
  Ten past six in the evening is written 6.10 p.m. or 18:10.

Say: **Today we will practise reading time on different clocks.**

Activity 1: Whole class activity and then the learners work in pairs

- Display the two A3 posters: *Clocks and Watches Today* and *Analogue Time and Digital Time* in the classroom.

- Say: **We are going to compare times on an analogue and a digital clock.**

- Say: **Look at the poster *Clocks and Watches Today.***
  Most analogue clocks are 12-hour clocks.
  Some analogue clocks are 24-hour clocks.
  Ask: **What is the difference between a 12-hour analogue clock and a 24-hour analogue clock?**

(A 12-hour clock has the numbers 1 to 12 around the edge of the circle.
With a 24-hour clock, the numbers 13 to 24 are on the inside of the other numbers.)

- Ask: **Are digital clocks 12-hour clocks or 24-hour clocks?**
  (Some are 12-hour clocks and others are 24-hour clocks.)

- Say: **Look at the poster Analogue Time and Digital Time.**
  Ask: What is the difference between a 12-hour digital clock and a 24-hour digital clock?
  (A 12-hour digital clock shows the time from 0 to 12 and then from 1 to 12 again.
  A 24-hour digital clock shows the time from 0 to 24.)

- Move the hands of the analogue clock to show 4 o'clock.

  Ask: **Is this 4 in the morning or 4 in the afternoon?**
  (It could be either. We don't know.)

- Ask: **How do we use a 24-hour digital clock to show 4 o'clock in two different ways?**

  Say: **Work with your partner. Discuss the two ways of showing 4 o'clock on a digital clock. You can use the poster to help you.**
  Allow several the learners to provide answers.

  The learners should give the following two times:

  04:00 or **16:00**

  (The digital clock is a 24-hour clock so 04:00 is 4 o'clock in the morning and 16:00 is 4 o'clock in the afternoon. We get to 16:00 by counting on from 12 midday or 12 noon).

  On the A3 poster: *Analogue Time and Digital Time* show the counting on from 4 to get 4 + 12 = 16.)

- Say: **Notice that we use a colon (double dots or :) between the hours and the minutes. Also notice that we always have two digits for the hours and two digits for the minutes.**
  To make sure we have two digits for the hours, we don't write 4:00; we write 04:00.

- Move the hands of the analogue clock to show 8 o'clock.

  Ask: **Is this 8 in the morning or 8 in the afternoon?**
  (It could be either. We don't know.)

Say: **Work with your partner. Discuss the two ways of showing 8 o'clock on a digital clock.**
Allow several learners to provide answers.
The learners should give the following two times:

08:00 or **20:00**

Ask: **How do we get the two answers?** Allow several learners to provide answers.

(The digital clock is a 24-hour clock so 08:00 is 8 o'clock in the morning and 20:00 is 8 o'clock in the afternoon. We get to 20:00 by counting on from 12 midday or 12 noon).

Show the counting on from 8 to get 8 + 12 = 20 on the A3 poster: *Analogue Time and Digital Time.*

Say: **Remember that we use a colon between the hours and minutes with digital time. Remember also that we always have two digits to show the hours and two digits to show the minutes. So, we don't write 8:00, we write 08:00.**

Say: **Complete Activity 1 in your LAB.**

- Read through Activity 1 with learners. Make sure that learners understand what they should do.
- Walk around the classroom to support learners as needed.
- Correct Activity 1 with learners so that they can receive immediate feedback.
- Answers are provided below.

Work with your partner

1 Write the time shown on each analogue clock as a 24-hour digital time.

	Analogue clock	24-hour digital time
a	 In the morning	(06:40)
b	 In the evening	(18:40)

	Analogue clock	24-hour digital time
c	 In the morning	(11:25)
d	 In the evening	(23:25)

2 Draw hands on the analogue clock to show the given 24-hour digital time.

	Analogue clock	24-hour digital time
a	**11:10**	
b	**19:00**	
c	**13:30**	
d	**07:45**	

Activity 2: Whole class activity and then the learners work in pairs

- Display the A3 poster: *Analogue Time and Digital Time*
  Ask: **How many hours are shown on the timeline?** (24)
  Ask: **Why do you think the timeline shows 24 hours?** (There are 24 hours in a day)

- Say: **You have seen that most analogue clocks are 12-hour clocks. This means we don't know whether the time shown is before mid-day or after mid-day.**
  Say: **There is a short way of saying whether the time is before mid-day or after mid-day.**
  - **We use the letters 'a.m.' to show time from midnight up to mid-day.**
  - **We use the letters 'p.m.' to show time from mid-day up to mid-night.**

- Ask, as you point to the halfway mark on the timeline: **What is the time at the middle of the timeline?** (12:00 or 12 o'clock or mid-day or noon.)

- Ask: **How do we use a.m. or p.m. to write 10 in the morning?**
  Allow the learners to answer and then write '10 in the morning = 10 a.m.' on the board.
  Ask: **How do we use a.m. or p.m. to write 10 at night?**
  On the board write '10 at night = 10 p.m.'

- Ask: **How do we use a.m. or p.m. to write 12 mid-day?**
  Allow the learners to answer and then write '12 mid-day = 12 p.m.' on the board.
  Ask: **How do we use a.m. or p.m. to write 12 mid-night?**
  On the board write '12 mid-night = 12 a.m'.

Say: **Complete Activity 2 in your LAB.**

- Read through Activity 2 with learners. Make sure that the learners understand what they should do.
- Walk around the classroom to support the learners as needed.
- Correct Activity 2 with the learners so that they can receive immediate feedback.
- Answers provided below.

Work with your partner.

Fill in the missing times.

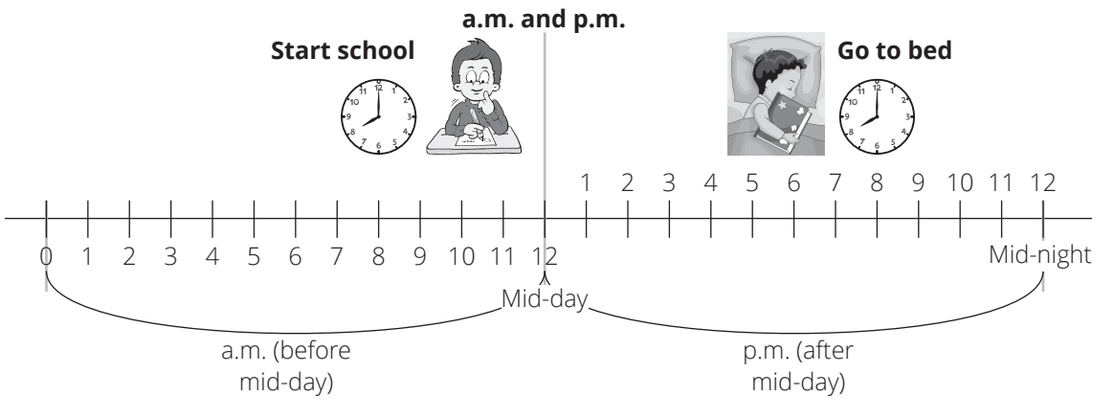
	Time in words	a.m./p.m. format	24-hour digital time
	Nine o'clock in the morning	9 a.m.	09:00
1.	Seven o'clock in the evening	(7 p.m.)	(19:00)
2.	Quarter to ten in the morning	(9.45 a.m.)	(09:45)
3.	(Twenty past two in the afternoon)	(2.20 p.m.)	14:20
4.	(Quarter past ten at night)	(10.15 p.m.)	22:15
5.	(Ten past eleven in the morning)	11.10 a.m.	(11:10)
6.	(Ten to two in the afternoon)	1.50 p.m.	(13:50)
7.	Midday	(12 p.m.)	(12:00)
8.	Midnight	(12 a.m.)	(24:00 or 00:00)

5 HOMEWORK ACTIVITY (5 MINUTES)

- Explain what the learners need to do for homework.
- Read the question in the LAB with learners. Make sure all the learners understand what to do.
- Answers are provided below.

Work with your partner

Look at the diagram showing a.m. and p.m. periods of the day and answer the questions.



1 How many hours are there in a day? (24)
2 In a day how many hours are there before mid-day (the a.m. hours)? (12)
3 In a day how many hours are there after mid-day (the p.m. hours)? (12)
4 What time does school start? Use a.m. or p.m. in your answer. (8.00 a.m.)
5 What time is bedtime? Use a.m. or p.m. in your answer. (8.00 p.m.)

6 REFLECTION AND SUMMARY OF LESSON (5 MINUTES)

Call the whole class to attention and summarise the key concepts of the lesson.

Say: **Today we have learnt about:**

- **time in 12-hour and 24-hour formats**
- **how to use a.m. and p.m. to indicate times before and after mid-day.**

Lesson 9: Time passed

Teacher's notes
This lesson is one of the fully planned lessons to be used to cover the Term 4 curriculum.
CAPS topics: Measurement: Time
Lesson Objective: Learners will be able to solve problems related to elapsed time (minutes or hours only).
Lesson Vocabulary: hour, minute, number line
Teacher Resources: An analogue clock
A3 poster: *How long was the mathematics lesson?*
Learner Resources: At the back of the LAB there is an analogue clock which the learners need to cut out and make themselves, 1 split pin per learner (if available) – otherwise the learners can use an elastic band and small stick, or simply lay the hands of the clock on the clock face
Date: Week Day

1 MENTAL MATHS (5 MINUTES)

Read the time on the analogue clock. Write the time on a 24-hour digital clock

		Answer			Answer
1	 Morning	(09:45)	**6**	 a.m.	(04:05)
2	 Night	(21:45)	**7**	 a.m.	(02:45)
3	 Evening	(18:25)	**8**	 p.m.	(14:45)

4	 Morning	(06:25)	**9**	 midnight	(24:00 or 00:00)
5	 p.m.	(16:05)	**10**	 midday	(12:00)

2 LINK TO PREVIOUS LESSON (5 MINUTES)

- Refer the learners to the activity in their LAB.
- The learners to work in pairs.

Show each 24-hour digital time on an analogue clock and in a.m./p.m. format.

	24-hour digital time	**Analogue clock**	**Write the time using a.m. or p.m.**
1	**03:26**		(3.26 a.m.)
2	**15:04**		(3.04 p.m.)

3 CORRECT HOMEWORK ACTIVITY (5 MINUTES)

The answers to the Homework Activity for Lesson 8 are provided in Lesson 8.

Use this time to purposefully address gaps in learners' knowledge and to identify and address learner errors.

4 LESSON CONTENT – CONCEPT DEVELOPMENT (35 MINUTES)

In this, the third lesson on the topic of Time, the learners solve problems involving elapsed time or time passed.

The problems in this lesson are developed in such a way that they require the learners to read analogue and digital times in order to solve the problem. This provides further opportunity to the learners for practising these skills and developing procedural fluency.

In Grade 3, the learners were able to choose from three different methods of calculating time passed. In Activity 1 these three methods are revised. Activities 2 and 3 concentrate on the use of a number line to calculate elapsed time.

Say: **Today we are learning to solve problems by working out how much time has passed.**

Activity 1: Whole class activity and the learners work in pairs

- You will need the large analogue clock you made for Lesson 7.
- Learners will each need their own analogue clock given at the back of their LAB. Learners should make their clocks before the lesson.

- You work on the board while the learners work in their LAB.
  Learners used all three methods in Grade 3, so resist the temptation to show them what to do.

Method 1 – Using an analogue clock to calculate.

1 Write this information on the board. (It is also given in the LAB)
School starts at 7.15 a.m.
School ends at 1.45 p.m.
How long are you at school?

Say: **Work with your partner. Use the clock you made to find the answer.**

Allow the learners to use their clocks to discuss a strategy and an answer which they should write in their LAB.
Ask selected learners to come to the board to show their strategy and answer.

(Learners will probably count on from 7:15 like this:

7.15 a.m. = 07:15
1.45 p.m.= 13:45

45 min (to 08:00) + 1 hour (to 09:00) + 1 hour (to 10:00) + 1 hour (to 11:00) + 1 hour (to 12:00) + 1 hour (to 13:00) + 45 min (to 13:45)
= 5 hours + (45 + 45) min
= 5 hours and 90 min
= 5 hours + 1 hour + 30 min
= 6 $\frac{1}{2}$ hours)

Method 2 – Breaking down numbers to calculate.

2 Write this information on the board. It is also given in the LAB.
Sipho takes $2\frac{1}{2}$ hours to clean the windows.
Sipho takes half that time to clean his car.
How long does it take Sipho to clean his car?

Say: **Work with your partner. Break down the numbers to find the answer.**

Allow the learners to discuss a strategy and an answer which they should write in their LAB.
Ask selected learners to come to the board to show their strategy and answer.

($2\frac{1}{2}$ hours = 2 hours + $\frac{1}{2}$ hour
= 2 hours + 30 minutes
Half of $2\frac{1}{2}$ hours = half of 2 hours + half of 30 minutes
= 1 hour + 15 minutes

Sipho takes 1 hour and 15 minutes to clean his car.)

OR

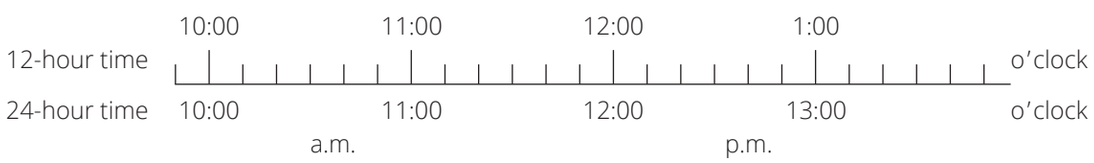
($2\frac{1}{2}$ hours = 2 hours + $\frac{1}{2}$ hour
= 120 minutes + 30 minutes
= 150 minutes
Half of 150 minutes = 75 minutes

Sipho takes 75 minutes (1 hour and 15 minutes) to clean his car.)

Method 3 – use a number line to calculate.

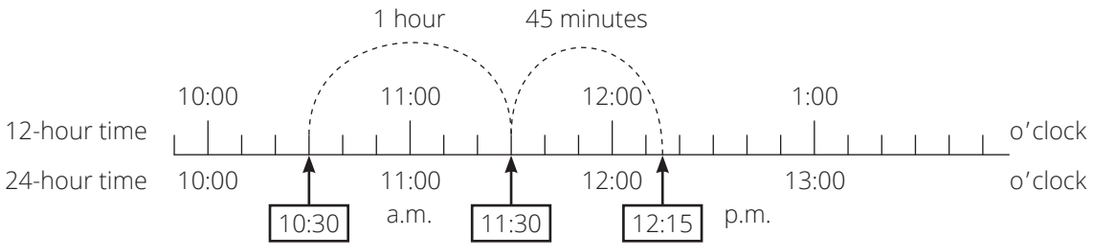
3 Write this information on the board. It is also given in the LAB.
Azwi is taking driving lessons. The lesson started at 10:30 in the morning.
The lesson is $1\frac{3}{4}$ hours long.
At what time will the lesson end?

Say: **Work with your partner. Use the given number line to find the answer.**



a How many minutes does a small interval show? (10 min)

b Mark 10:30 on the number line and count on to find the answer to the question.



c What time does the driving lesson end? It ends at (12:15)

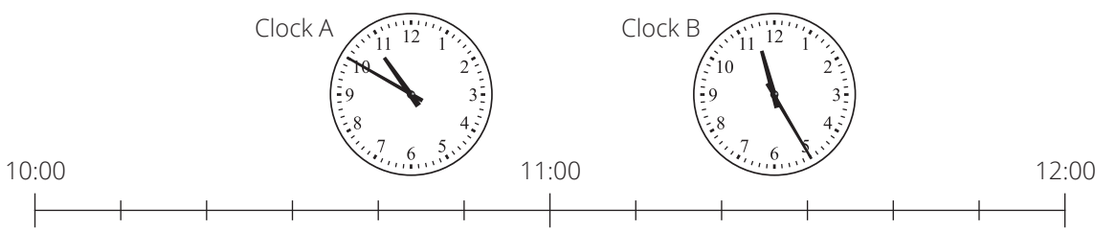
Activity 2: Learners work in pairs

Say: **Complete Activity 2 in your LAB.**

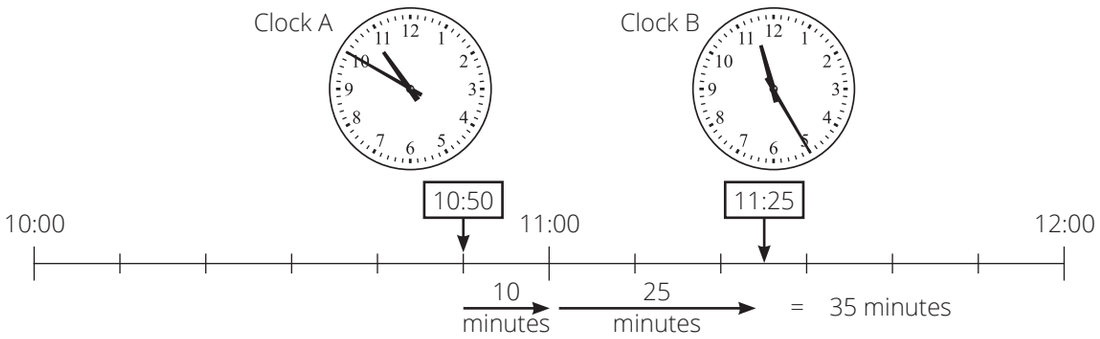
- Read through Activity 2 with the learners. Make sure that the learners understand what they should do.
- Display the A3 poster: *How long was the maths lesson?*
- Work through Question 1 in detail with learners using the poster to support the explanation. Write the answers on the board. Allow the learners time to write down their answers in the LAB.
- Allow the learners to work in pairs to answer Question 2.
- Walk around the classroom to support the learners as needed.
- Correct Activity 2 with the learners so that they can receive immediate feedback.
- Answers are provided below.

Work with your class to answer this question.
Look at the poster on the board and the clocks and number line in your LAB.

1 The mathematics lesson started at the time on Clock A and ended at the time on Clock B.
How long was the mathematics lesson?

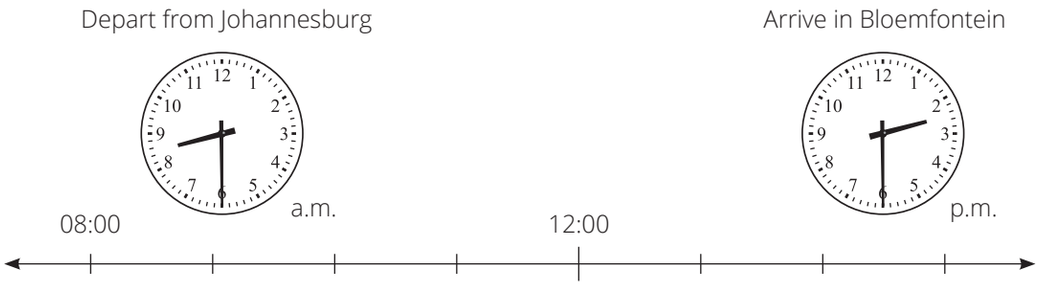


a What is the 24-hour digital time on Clock A? (10:50)
b What is the 24-hour digital time on Clock B? (11:25)
c What is the interval on the number line below the clocks? (1 mark = 10 minutes)
d Mark the times shown on Clock A and on Clock B on the number line below the clocks. (see below)
e Use the number line to count the number of minutes from the time on Clock A to the time on Clock B. (see below)
f Write the answer: The lesson was (35 minutes long).

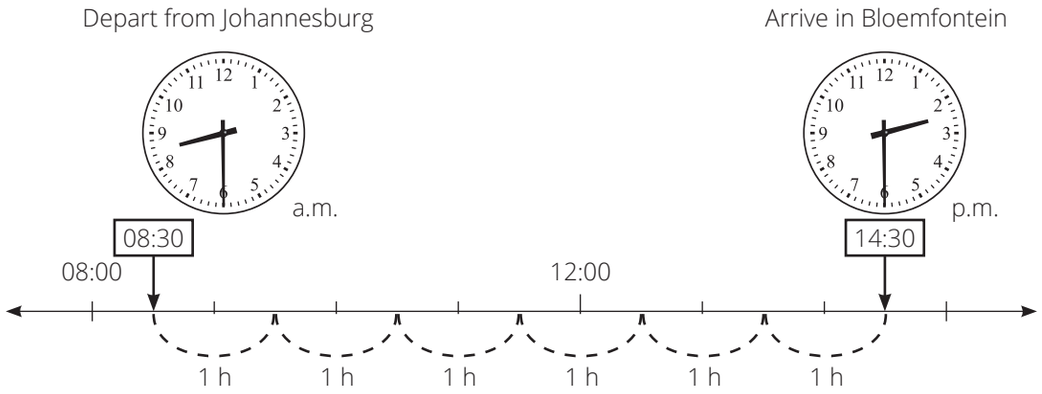


Work with your partner to answer this question:

2 Sizwe travelled by train from Johannesburg to Bloemfontein.
The clocks show the departure time (time it leaves) and arrival time.
Use the number line to answer the question: How long was the journey?



a Write the departure time in 24-hour digital time. (08:30)
b Write the arrival time in 24-hour digital time. (14:30)
c What is the interval on the number line? (1 mark = 1 hour)
d Use the number line to work out how long the journey was (see below)
e Write your answer:
Sizwe's journey lasted (6 hours / 14:30 – 08:30 = 06:00 = 6 hours)



Activity 3: Learners work on their own

Say: **Complete Activity 3 in your LAB.**

- Read through Activity 3 with learners. Make sure that the learners understand what they should do.
- Walk around the classroom to support the learners as needed.
- Correct Activity 3 with the learners so that they can receive immediate feedback.
- Answers are provided below.

Work on your own.

1 A shop is open for the following times.

Shop Opening Times	
Monday to Friday	Saturday and Sunday
Opens: 9:00 a.m.	Opens: 9:30 a.m.
Closes: 6:00 p.m.	Closes: 12:30 p.m.

a How long is the shop open on a Tuesday?

b How long is the shop open on a Sunday?

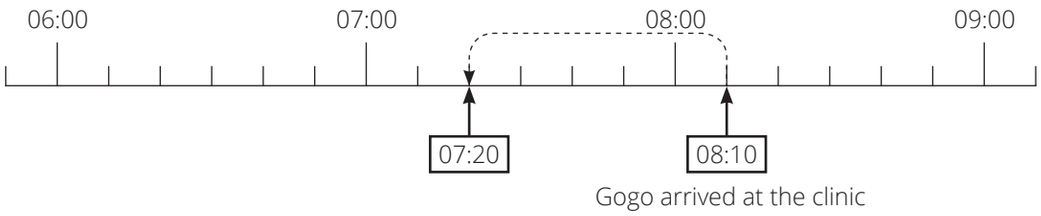
Possible answers:

- The learners could use a number line

a The shop is open for 9 hours on a Tuesday.
b The shop is open for 3 hours on a Sunday.

- The learners could subtract
  a 6:00 p.m. is 18:00, so 18.00 – 09:00 = 09:00 = 9 hours
  b 12:30 – 09:30 = 03:00 = 3 hours)

2 It takes Gogo 50 minutes to walk to the clinic. She arrived at the clinic at 08:10.



a. How many minutes are there in each small interval? (10 minutes)
b. Use the number line to work out what time Gogo leaves home.
(The learners can count backwards by 5 calibrations (or 50 minutes) to reach the answer.)
c. Write your answer as 24-hour digital time: Gogo left home at (07:20)

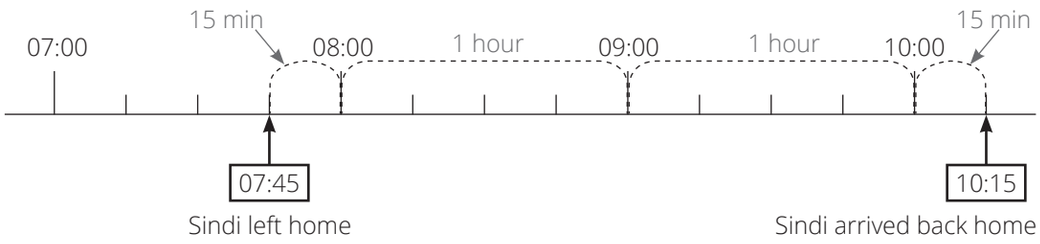
5 HOMEWORK ACTIVITY (5 MINUTES)

- Explain what the learners need to do for homework.
- Read the question in the LAB with learners. Make sure all the learners understand what to do.
- Answers are given below.

Sindi is training for a marathon.

She left home at 07:45 and arrived back home at 10:15.

How long did Sindi run for?



1. How many minutes are there in each interval? (15 minutes)

2. Use the number line to work out the answer
   (07:45 + 15 minutes = 08:00
   08:00 + 2 hours = 10:00
   10:00 + 15 minutes = 10:15.
   15 minutes + 2 hours + 15 minutes = 2 hours 30 minutes)

3. Write your answer: Sindi ran for (2 $\frac{1}{2}$ hours / 2 hour 30 minutes)

6 REFLECTION AND SUMMARY OF LESSON (5 MINUTES)

Call the whole class to attention and summarise the key concepts of the lesson.

Say: **Today we have learnt solve problems by working out how much time has passed.**

Lesson 10: How long?

Teacher's notes
This lesson is one of the fully planned lessons to be used to cover the Term 4 curriculum.
CAPS topics: Measurement: Time
Lesson Objective: Learners will be able to solve problems involving elapsed time in minutes, hours and days.
Lesson Vocabulary: calendar
Teacher Resources: Analogue clock
A3 poster: *Thuto Pele timetable*
A3 poster: *2021 calendar*
A3 poster: *July 2021 calendar*
Learner Resources: Analogue clock
Date: Week Day

1 MENTAL MATHS (5 MINUTES)

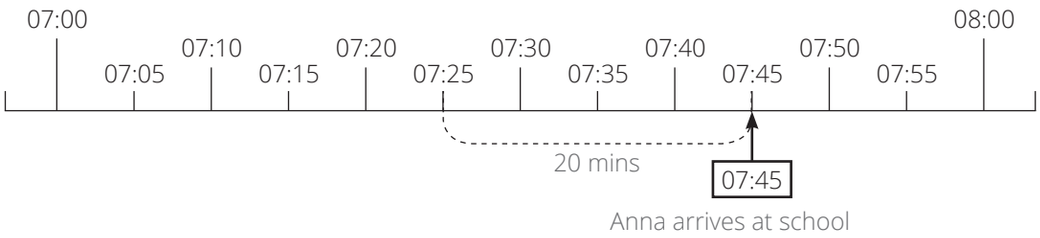
	24-hour digital time	In words	a.m. or p.m. time
1	09:23	(Twenty-three minutes past nine in the morning)	(9.23 a.m.)
2	16:40	(Twenty to five in the afternoon)	(4.40 p.m.)
3	12:00	(Twelve midday)	(12 p.m.)
4	01:15	(Quarter past one in the morning)	(1.15 a.m.)
5	20:59	(One minute to nine in the evening OR Fifty-nine minutes past eight in the evening)	(8.59 p.m.)
6	00:00	(Twelve midnight)	(12.00 a.m.)
7	13:35	(Thirty-five minutes past one in the afternoon OR Twenty-five minutes to two in the afternoon)	(1.35 p.m.)
8	22:15	(Quarter past ten at night)	(10.15 p.m.)
9	08:15	(Quarter past eight in the morning)	(8.15 a.m.)
10	14:45	(Quarter to three in the afternoon)	(2.15 p.m.)

2 LINK TO PREVIOUS LESSON (5 MINUTES)

- Refer the learners to activity in LAB.
- Allow workers to work in pairs to discuss a strategy and answer.
- Call a few the learners to the board to show their strategy and answer.

It takes 20 minutes for Anna to walk from home to school.

What time should Anna leave home if she needs to be at school by quarter to eight in the morning?



1 Write quarter to eight as 24-hour digital time. (07:45)
2 What time Anna should leave home?
(Either the learners can use the number line to work out the answer (as above)
Or they could use subtraction: 07:45 – 20 minutes = 07:25)
3. Write the answer using a.m. or p.m. time. (7.25 a.m.)

3 CORRECT HOMEWORK ACTIVITY (5 MINUTES)

The answers to the Homework Activity for Lesson 9 are provided in Lesson 9.
Use this time to purposefully address gaps in learners' knowledge and to identify and address learner errors.

4 LESSON CONTENT – CONCEPT DEVELOPMENT (35 MINUTES)

In this lesson the learners continue to solve problems involving elapsed time (time passed). Problems are designed to include answers in minutes, hours and days.

Say: **Today we will solve more time problems.**

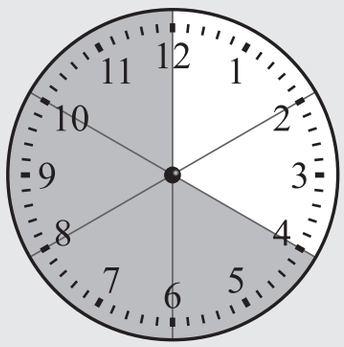
Activity 1: Whole class activity and the learners work in pairs

Say: **Complete Activity 1 in your LAB.**

- Display the poster: *Thuto Pele* timetable on the board and refer to it as you discuss the timetable.
- Start by reading through the timetable with learners.

Thuto Pele Primary School Grade 4: WEDNESDAY		
Period	**Subject**	**Start time**
1	English	08:00
2	English	08:40
3	Tswana	09:20
	Break	10:00
4	Mathematics	10:20
5	Mathematics	11:00
6	Social Sciences	11:40
	Break	12:20
7	Natural Sciences and Technology	12:50
8	Life Skills	13:30
School ends at 14:10		

- Ask: **What time does school start?** (08:00)
  Ask: **How many periods/lessons are there?** (8)
  Ask: **How many breaks are there?** (2)
  Ask: **What time does school end?** (14:10)
  Ask: **What time does the Tswana lesson start?** (09:20)
  Ask: **What time does the Tswana lesson end?** (10:00)
  Ask: **How long is the Tswana lesson?** (40 minutes)
  Ask: **Who would like to come to the board and show us how they got the answer?**
  (The learners are likely to use one of these two methods:
  - Count the minutes from 09:20 to 10:00 on analogue clock



  - Show 09:20 and 10:00 on a number line and work out the difference)

Say: **Complete Activity 1 in your LAB.**

- Read through Activity 1 with learners. Make sure that the learners understand what they should do.
- Walk around the classroom to support the learners as needed.
- Correct Activity 1 with the learners so that they can receive immediate feedback.
- Answers provided below.

Work with your partner.

Read the timetable carefully and then answer the questions.

Thuto Pele Primary School **Grade 4: WEDNESDAY**		
Period	**Subject**	**Start time**
1	English	08:00
2	English	08:40
3	Tswana	09:20
	Break	10:00
4	Mathematics	10:20
5	Mathematics	11:00
6	Social Sciences	11:40
	Break	12:20
7	Natural Sciences and Technology	12:50
8	Life Skills	13:30
School ends at 14:10		

1 How long is one period at *Thuto Pele* school? (40 minutes)

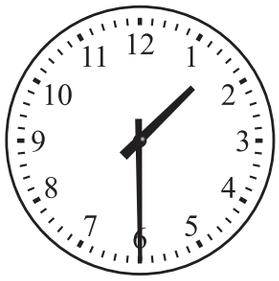
2 How many minutes of English do the Grade 4 learners have on a Wednesday?
(There are two English lessons: 40 minutes + 40 minutes = 80 minutes)

3 How many hours of Tswana do the learners have on a Wednesday?
(40 minutes = $\frac{40}{60}$ hours or $\frac{4}{6}$ hours or $\frac{2}{3}$ hours)

4 What is the length of the two breaks altogether?
(20 minutes + 30 minutes = 50 minutes)

5 How long is the school day?
Give the answer in hours and minutes.
(08:00 to 14:10 = 14:10 – 08:00 = 06:10 = 6 hours and 10 minutes)

6 Show the start time of the Life Skills lesson on this analogue clock.



Activity 2: Learners work in pairs

Say: **Complete Activity 2 in your LAB.**

- Read through Activity 2 with learners. Make sure that the learners understand what they should do.
- Display the poster: *2021 Calendar* on the board and refer to it as you discuss the questions.
- Discuss how to do Question 1 and the answer with the learners.
- Let the learners work on Questions 2, 3 and 4 with their partner.
- Walk around the classroom to support the learners as needed.
- Correct Activity 2 with the learners so that they can receive immediate feedback.
- Answers are provided below.

Work with a partner.
Use the calendar to help you answer the questions.

2021

January

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

February

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28						

March

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

April

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

May

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

June

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

July

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

August

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

September

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

October

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

November

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

December

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

1. How many days are there between 5th February to 12th February?
(The word 'between' tells us that neither 5th February nor 12th February are included. Count on the calendar. There are 6 days between these two dates.)

2. School opens on 13th January and Thato's birthday is on 17th January
How many days of school are there in the week of Thato's birthday? (3 school days)

3. How many days are there between 24th January and 5th March?
(We don't include 24th January, so we have 7 days in January.
There are 28 days in February.
We don't include 5th March, so we have 4 days in March.
Total number of days = 7 + 28 + 4 = 11 + 28 = 39)

4. How many days are there between 1st September and 7th November?
(We don't include 1st September, so we have 29 days in September.
There are 31 days in October.
We don't include 7th November, so we have 6 days in November.
Total number of days = 29 + 31 + 6 = 60 + 6 = 66)

5 HOMEWORK ACTIVITY (5 MINUTES)

- Explain what the learners need to do for homework.
- Read the question in the LAB with learners. Make sure all the learners understand what to do.
- Answers are given below.

Prudie's birthday party is on 17th July.

On Thursday 1st July she sent out invitations to her party

July 2021

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

1 How many days there are between Thursday 1st July and Prudie's birthday party. (15 days)

2 Suppose Prudie's school went on holiday on 2nd July, and the school started again on 20th July. How long was the holiday? (The holidays are 17 days long)

3 How many school days are there between 20th July and 1st August? (8 school days)

6 REFLECTION AND SUMMARY OF LESSON (5 MINUTES)

Call the whole class to attention and summarise the key concepts of the lesson.

Say: **Today we have learnt to solve time problems in which we need to work out how much time has passed.**

Lesson 11: Consolidation

Teacher's notes		
This lesson allows for consolidation of the lessons on Time.		
CAPS topics: Measurement: Time		
Lesson Objective: Learners will revise reading analogue and 24-hour digital time. They will also revise solving problems in which they calculate the amount of time passed.		
Lesson Vocabulary: analogue clock, digital clock, number line		
Resources: Textbooks (if available)		
Date:	Week	Day

1 NOTES FOR THE TEACHER RELATING TO THIS TOPIC'S WORK

The main topic in this week was Time.

2 POSSIBLE MISCONCEPTIONS LINKED TO THE UNIT'S WORK

- Time is abstract for young learners. Time cannot be seen, touched or physically experienced like other quantities such as capacity or mass.
- Learners sometimes struggle to understand minutes *past* the hour, and minutes *to* the hour. Sometimes it helps to act this out.
- In primary school mathematics, numbers are organised in groups and powers of ten. We measure time in groups of 60, 24, 7, 28, 29, 30, 31, 365 and 366.
- Learners may be confused about how to write midday and midnight in 24-hour time. By convention, midday is written 12:00 p.m., or 12:00 (in digital format) and midnight is written 12:00 a.m. or 00:00 (and sometimes 24:00).

3 CORRECT HOMEWORK ACTIVITY (5 MINUTES)

The answers to the Homework Activity for Lesson 10 are provided in Lesson 10.
Use this time to purposefully address gaps in learners' knowledge and to identify and address learner errors.

4 CLASSWORK

Today we are going over what we learned in this unit. We will practise reading analogue and 24-hour digital time. We will also revise solving problems in which we need to calculate the amount of time passed.

- You could use this time for the learners to complete classwork or homework activities as necessary.
- You could use the Additional Activities from textbooks that you have, or use the Consolidation Activity given.

Additional activities for consolidation

Refer to the following table. Select additional activities from the textbook/s you have.

Use the answers given in the Teacher's Guide to mark the work.

	Fabulous	Oxford Headstart	Oxford Successful	Platinum	Premier	Sasol Inzalo	Solutions for All	Study & Master	Viva
LB	57-62	53-63	44-52	22-29	26-33	73-85	38-48	55-66	29-32
TG	38-40	76-88	67-73	18-23	14-16	78-91	33-36	86-95	21-24

OR, learners could complete the Consolidation Activity in their LAB.

Consolidation Activity

1 Change each time to 24-hour digital format

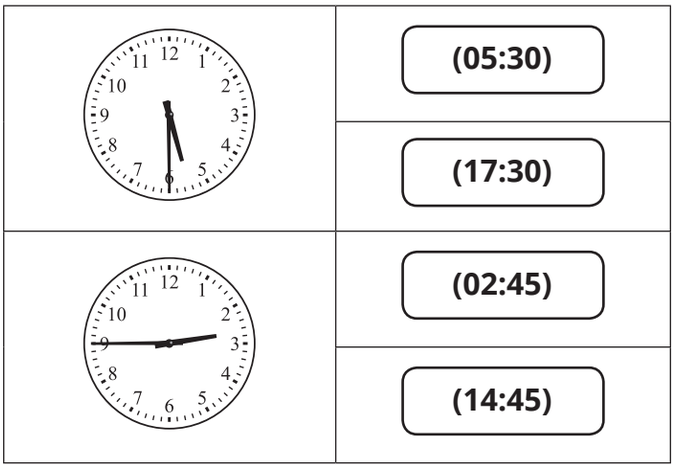
a 2:05 p.m. (14:05)

b 9:18 p.m. (21:18)

c 8:40 p.m. (20:40)

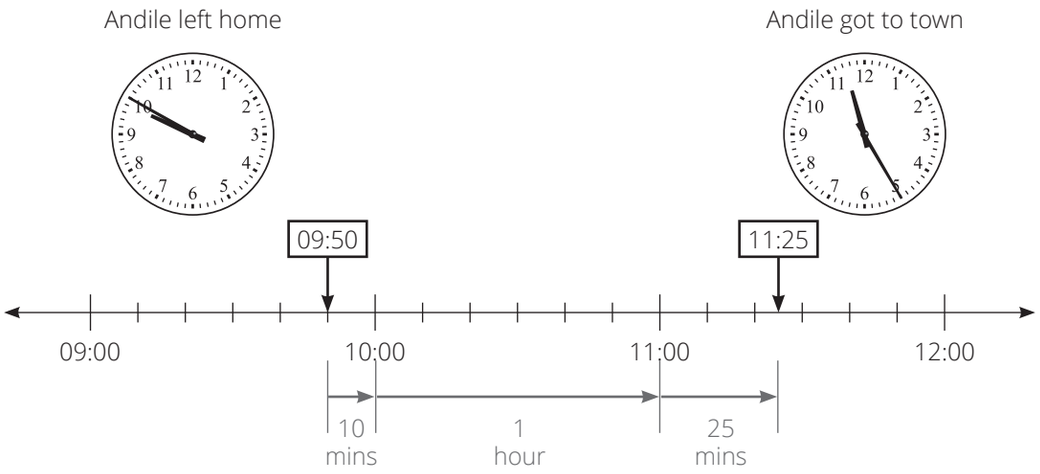
d 11:45 a.m. (11:45)

2 **a** Write the time shown on these analogue clocks in two different ways on a 24-hour digital clock.



b. Look at your answers. Why it is better to show time in 24-hour format rather than in 12-hour format?
(When using a 24-hour format there is no confusion as to whether the time is before midday or after midday.)

3 The analogue clocks show the time Andile left home and the time he got to town.
How long did it take Andile to get to town?
Write your answer in hours and minutes.



Work out your answer: (10 minutes + 1 hour + 25 minutes = 1 hour 35 minutes.)
It took Andile (1 hour 35 minutes) to get to town.

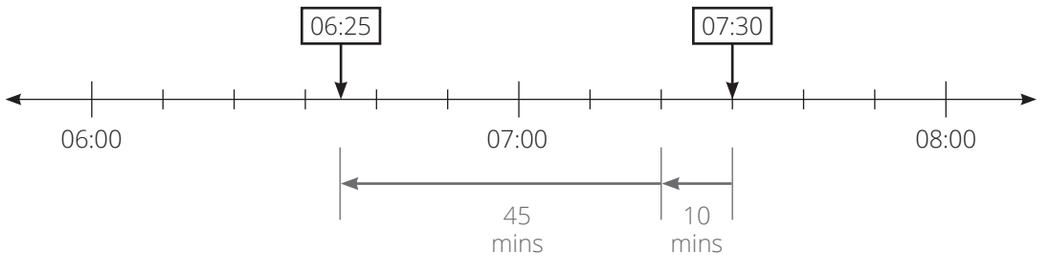
4 How much time has passed between the following times?

a 8:52 a.m. and 10:40 p.m.
(One possible solution:
08: 52 + 8 minutes = 09:00
09:00 + 1 hour = 10:00
10:00 + 40 minutes = 10:40
8 minutes + 1 hour + 40 minutes = 1 hour 48 minutes
And then add 12 hours because it is 10:40 p.m. or 22:40, so the answer is
13 hours 48 minutes.)

b 12:00 and 23:45
(One possible solution: 23:45 – 12:00 = 11:45, the answer is
11 hours and 45 minutes.)
(Another possible solution: 12:00 + 11 hours = 23:00
23:00 + 45 minutes = 23:45
11 hours + 45 minutes = 11 hours 45 minutes)

5 It takes Mavis 45 minutes to get ready for school.
It takes 10 minutes to walk to the bus stop.
The bus she must catch leaves at 07:30.
What time must Mavis get up in the morning?

Learners can choose any strategy for calculating the difference, for example a number line.



Write your answer: (Mavis must get up at 06:35)

6 Look at the calendar for December 2021.

a On the calendar, shade in the Day of Reconciliation (16th December) and Christmas Day (25th December).

December 2021						
SUN	MON	TUES	WED	THURS	FRI	SAT
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16 Day of Reconciliation	17	18
19	20	21	22	23	24	25 Christmas Day
26	27	28	29	30	31	

b How many days are there between the Day of Reconciliation and Christmas Day?

Write your answer: (There are 8 days between the Day of Reconciliation and Christmas Day)

5 REFLECTION AND SUMMARY OF LESSON (5 MINUTES)

Call the whole class to attention and summarise the key concepts of the lesson.

Say: **Today we have revised reading analogue and 24-hour digital time and have solved problems where we need to calculate the amount of time passed.**

Unit 3: Length

INTRODUCTION

This unit focuses on length. This quantity forms part of Content Area: Measurement.

In this unit, we focus on the four framework dimensions in the following ways:

Framework dimension	How the framework dimension is developed in this unit
Conceptual understanding	Learners are given opportunities to construct their own understanding of measuring length through applying the knowledge and skills about the units of length. For example, to answer the question: *What is the difference in length?*, learners need to recall the system of standard units of length, decide which units to use for calculation, and decide on a calculation strategy.
Procedural fluency	Learners do a variety of tasks and solve a range of contextual problems in order to develop their procedural fluency in working with length.
Strategic competence	Learners make sensible decisions on what strategies to employ when solving problems which involve length.
Reasoning	Based on the information available and the question which needs to be answered, learners decide on an appropriate strategy for calculating difference in length.

In this unit, we build a **learning centred classroom** by paying attention to:

		Examples
Concept development	✓	Done in every lesson
Speaking mathematics	✓	Learners use terms such length, breadth or width, and distance in order to communicate effectively.
Connecting topics and concepts	✓	Link to previous lesson, correction of classwork and homework activities, as well as consolidation activities are designed to address gaps in learners' knowledge.
Addressing gaps in learners' knowledge	✓	
Applying maths in context	✓	Learners solve length problems in context.

Mathematical vocabulary for this unit

Be sure to teach and use the following vocabulary at the appropriate place in the unit. It is a good idea to make flashcards of words and their meanings and to display these in the classroom at appropriate times.

Refer to the bilingual dictionary where necessary.

Term	Explanation / diagram
Breadth (sometimes called width)	The distance across, from side to side. When measuring length and breadth, the breadth is usually the shorter side.
centimetres (cm)	A metric unit used to measure length. A centimetre is one hundredth of a metre. There are 10 millimetres in a centimetre. 'Centi' at the start of a word usually means 'one hundredth'.
convert	To change Example: You can convert 1 cm to 10 mm
distance	Distance tells you how far apart two things are. If you measure a distance you find out how far it is from one point to another.
kilometres (km)	A metric unit of length used to measure long distances. There are 1 000 m in 1 km.
length (distance)	The measurement along a line or a curve. When you measure the length and breadth of something, the length is usually the longer distance.
line	Usually a line is used to mean a straight line. However, it can also be curved. A line goes on forever in both directions.
line segment	A part of a line that has two endpoints. It is the shortest distance between the two points. It has a length that can be measured.
longer	Greater length.
measure	To find the size or amount of something. For example, you can measure the length, mass, capacity and volume of objects.
metres (m)	A metric unit used to measure length or distance. 1 m = 1 000 mm; 1 m = 100 cm; 1 000 m = 1 km
metre stick	A ruler or measuring stick that is one metre in length.
metric units	Metric units are part of the metric system of measurement. The units are based on tens, hundreds and thousands. The metric units for length are millimetre, centimetre, metre, kilometre.
millimetre (mm)	A metric unit of length used to measure a small length or distance. There are 1 000 mm = 1 m

Term	Explanation / diagram
number line	A straight line with numbers placed at equal intervals or segments along its length. A number line can be extended infinitely in any direction and is usually represented horizontally.
perimeter	The distance all the way round a shape. Example: The perimeter of the square with sides 2 cm long = 2 cm + 2 cm + 2 cm + 2 cm or 4 × 2 cm = 8 cm
point	Position or location, usually shown by a dot.
shorter	Less length.
width	The distance across or from side to side. It is sometimes called the breadth. When measuring length and width, the width is usually the shorter distance.

Further practice for learners

This table references other sources (including textbooks) if you need additional activities.

	Fabulous	Oxford Headstart	Oxford Successful	Platinum	Premier	Sasol Inzalo	Solutions for All	Study & Master	Viva
LB	115-120	119-129	97-103	68-75	69-78	147-160	107-118	123-140	75-81
TG	79-83	149-162	101-106	56-61	34-37	161-176	80-85	174-185	43-45

UNIT PLAN AND OVERVIEW FOR UNIT 3: Length

LP	Lesson objective Learners will be able to:	Lesson Resources Learners need classwork books, LABs, writing materials, rulers and scissors for all lessons.	Date completed
12	read and measure lengths on rulers and tape measures, and convert between units of length	Teacher: Flashcards: millimetres (mm), centimetres (cm), metres (m) and kilometres (km) A3 poster: *Millimetres and centimetres* A3 poster: *Enlarged ruler showing millimetres and centimetres* A3 poster: *One metre* A3 poster: *Conversions* Learner: ruler (with cm and mm). Printed rulers are provided in the Teacher's Resource pack which need to be cut out for the learners 1 m long piece of string or wool for each group	
13	read lengths in different units and draw lines of specified length	Teacher: 1 m ruler; A3 poster: *Conversions* Learner: ruler	
14	solve problems which require the addition and subtraction of units of length	Teacher: A3 poster: *Conversions* Learner: ruler	
15	solve problems which require the multiplication and division of units of length	Teacher: A3 poster: *Conversions* Learner: ruler	
16	solve problems which require the use of the four operations and the conversion of units of length	Teacher: A3 poster: *Conversions* Learner: ruler	
17	revise and consolidate units of length by reading, measuring and drawing different lengths, by converting units of length and by solving real life problems involving length	Teacher and Learner: Textbooks (if available)	

Assessment for learning
Use the template provided at the beginning of this guide to think deeply about at least one of the lessons in this unit.

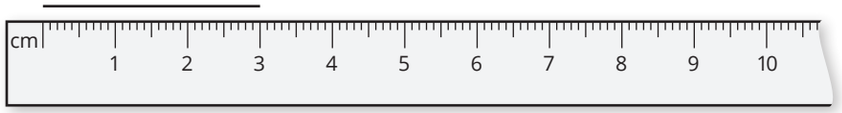
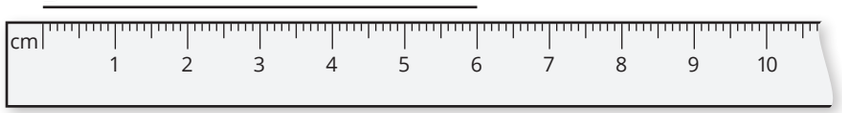
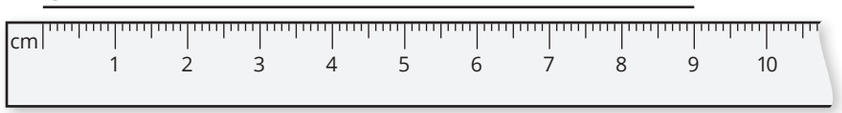
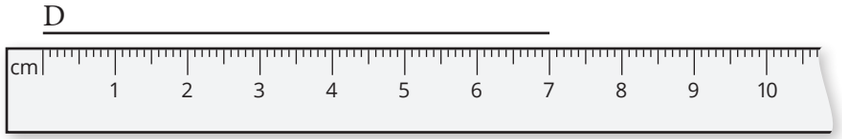
Reflection
Think about and make a note of: *What went well? What did not go well? What did the learners find difficult or easy to understand or do? What will you do to support or extend learners? Did you complete all the work set for the unit? If not, how will you get back on track?*

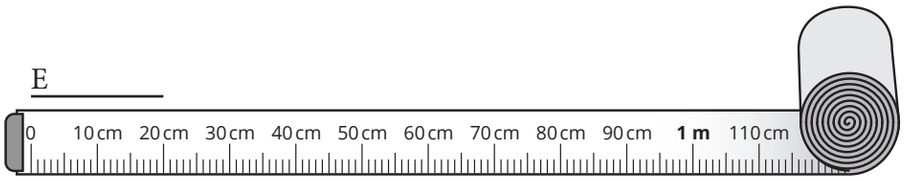
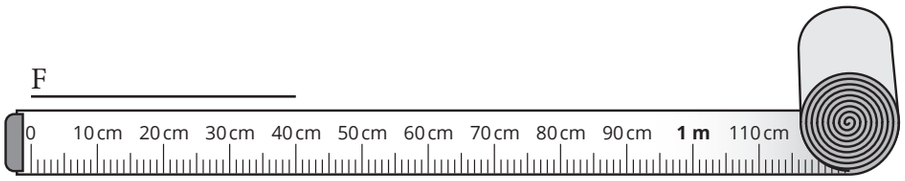
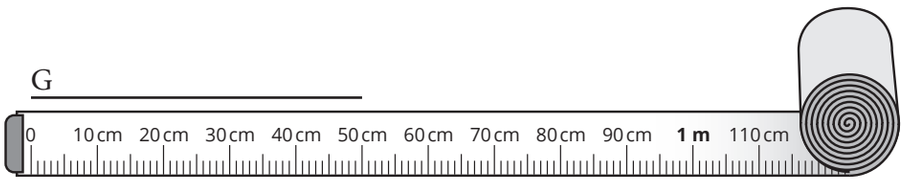
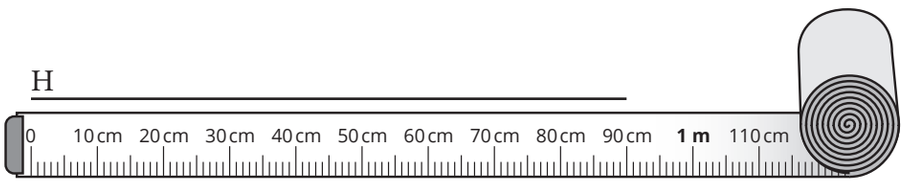
What will you change next time? Why?

Lesson 12: Units of length

Teacher's notes
This lesson is one of the fully planned lessons to be used to cover the Term 4 curriculum. CAPS topics: Measurement: Length Lesson Objective: Learners will be able to read and measure lengths on rulers and tape measures and convert between units of length. Lesson Vocabulary: centimetres (cm), distance, kilometres (km), length, metres (m), millimetres (mm) Teacher Resources: Flashcards: millimetre (mm), centimetre (cm), metre (m), kilometre (km) A3 posters: *Millimetres and centimetres* A3 poster: *Enlarged ruler showing millimetres and centimetres* A3 poster: *One metre* A3 poster: *Conversions* Learner Resources: ruler (with cm and mm). Printed rulers are provided in the Teacher's Resource pack which need to be cut out for the learners 1 m long piece of string or wool for each group
Date: Week Day

1 MENTAL MATHS (5 MINUTES)

	What is the length of each line?	Answer
1	A 	(3 cm)
2	B 	(6 cm)
3	C 	(9 cm)
4	D 	(7 cm)

5		(20 cm)
6		(40 cm)
7		(50 cm)
8		(90 cm)

2 LINK TO GRADE 3 (5 MINUTES)

- Stick up the A3 poster: *Millimetres and centimetres* and the A3 poster: *Enlarged ruler showing millimetres and centimetres.*
  Explain the posters to the learners.

- Make up the A3 poster: *One metre* and stick it up.
  Refer learners to the activity in LAB.

1 What unit of measurement would you use to measure the length of your LAB? (cm or mm)
2 What unit of measurement would you use to measure the length of your classroom? (m or cm)
3 How many millimetres are there in a centimetre? (10)

3 CORRECT HOMEWORK ACTIVITY

This is the first lesson on length. There is no homework to correct.

4 LESSON CONTENT – CONCEPT DEVELOPMENT (40 MINUTES)

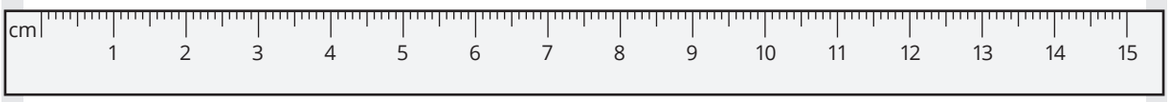
- In this lesson learners use millimetres (mm), centimetres (cm), metres (m) and kilometres (km).
- They convert between
  - millimetres (mm) and centimetres (cm)
  - centimetres (cm) and metres (m)
  - metres (m) and kilometres (km).
- Note that learners worked with cm and m in Grade 3 and mm in Grade 4 Term 3 Unit 4, but km is new in this unit. It is important that learners obtain the sense of the length of each unit.

Say: **Today we are learning to measure lengths using different units of measurement, and to convert between different units of length.**

Activity 1: Whole class activity and then learners work in pairs

- Refer the learners to the A3 poster: *Enlarged 30 cm ruler showing millimetres and centimetres.*
- Learners will need a ruler showing mm and cm (either an actual ruler or one cut out of paper – see the Teacher Resource Pack).
- In this Activity the learners revise centimetres (cm) and millimetres (mm) and then use a ruler to measure the length and breadth of a matchbox.
- Say: **Work with your partner to answer question 1.**
- Once the learners have finished Question 1, mark it with the learners. Encourage learners to share their answers with the rest of the class.
- The answers are given below.

1 Study the ruler.

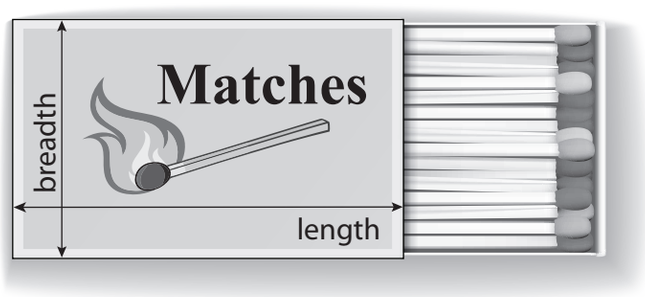


a What unit of measurement do the long marks show? (centimetres)
b What is the short way of writing this unit? (cm)
c How long is the distance between two long marks? (1 cm)
d Count on your ruler. How many small parts is 1 cm divided into? (10)

e What unit of measurement do the short marks show? (millimetres)
f What is the short way of writing this unit? (mm)
g Show your partner one thing that measures a millimetre. (Answers will vary. Examples are: thickness of fingernail, thickness of a few sheets of paper, thickness of the metal making up a paper clip)
h Show your partner one thing that measures a centimetre. (Answers will vary. Examples: width of small finger, height of eraser)

- Say: **Work with your partner on question 2.**
- Once they have finished the measuring, correct Question 2 with the learners.
- The answers are given below.

2 This is the actual size of a matchbox.



a Use your ruler to measure the length of the matchbox in centimetres and millimetres.
(5 cm and 4 mm)

Write this measurement in centimetres only using decimals. (5,4 cm)

Write this measurement in millimetres only. (54 mm)

b Use your ruler to measure the breadth of the matchbox in centimetres and millimetres.
(3 cm and 3 mm)

Write this measurement in centimetres only using decimals. (3,3 cm)

Write this measurement in millimetres only. (33 mm)

Activity 2: Whole class activity and learners work in pairs

- In Activity 2 the learners revise converting cm to mm.

- Ask: **How many millimetres in centimetre?** (10 mm)

- Say: **Work with your partner. Write in your classwork book.**
  Discuss a rule you could use to convert centimetres to millimetres.
  Use 6 cm and 8 cm as examples.

- Allow selected learners to come to the board to show their answers.

6 cm = 60 mm

8 cm = 80 mm

A possible answer:
We multiply the number of cm by 10 to convert cm to mm.
This is because there are 10 mm in 1 cm
6 cm = 6 × 10 mm = 60 mm
8 cm = 8 × 10 mm = 80 mm

- Ask: **How can we write 1 mm in cm?** (0,1)
  Why? (Because 1 cm is divided into 10 equal parts and we know one part is 1 mm. So 1 mm is $\frac{1}{10}$ cm and we have learnt that $\frac{1}{10}$ = 0,1.)

- Say: **Work with your partner.**
  Discuss a rule you could use to convert millimetres to centimetres.
  Use 3 mm and 5 mm as examples.

- Allow selected learners to come to the board to show their answers.

3 mm = 0,3 cm

5 mm = 0,5 cm

A possible answer:
We divide the number of mm by 10 to convert mm to cm.
This is because there are 0,1 cm in 1 mm
3 mm = $\frac{3}{10}$ cm = 0,3 cm
5 mm = $\frac{5}{10}$ cm = 0,5 cm

Say: **Complete Activity 2 in your LAB.**

- In Activity 2 the learners practise converting from mm to cm and from cm to mm.
- Read through Activity 2 with learners. Make sure that learners understand what they should do.
- Walk around the classroom to support learners as needed.
- Learners should work in pairs to discuss the conversions.

- Correct Activity 2 with learners so that they can receive immediate feedback.
- Answers are given below.

Work with your partner.

1 **a** Write all the measurements in millimetres.

18 mm = (18) mm

$1\frac{1}{2}$ cm = (15) mm

1 cm = (10) mm

$\frac{1}{2}$ cm = (5) mm

11 mm = (11) mm

b Write the measurements from shortest to longest.

(5 mm; 10 mm; 11 mm; 15 mm; 18 mm)

2 Complete the following

a 9 cm = (90) mm

b 100 mm = (10) cm

c 300 mm = (30) cm

d 125 cm = (1 250) mm

e 618 cm = (6 180) mm

f 4 750 mm = (475) cm

g 8 mm = (0,8) cm

h 6,5 cm = (65) mm

Remember:

1 cm = 10 mm

1 mm = 0,1 cm

Activity 3: The learners work in groups of 4 and finally learners work on their own

- In Activity 3 the learners measure in metres (m) and are introduced to kilometres (km).
- You will need a 1 m ruler (either an actual metre rule or the one provided in the Teacher's Resource Pack and prepared before the lesson).
- Each group of 4 learners will need either a 1 m ruler or a 1 m length of string or wool (prepared before the lesson).

- Display the flashcards showing 'millimetre (mm)', 'centimetre (cm)', 'metres (m)' and 'kilometres (km)'.

- Beforehand decide how many groups you are going to have and think of different things in the classroom that the groups can measure.
  Examples are the length of the classroom; the width of classroom; the width of the classroom door; the height of the cupboard in the classroom; the length of the chalkboard in the classroom; the height of the classroom wall; the length of the playground; the distance from the classroom door to the school gate.

- Stick up the metre ruler that you have made from the Teacher's Resource Pack.

- Say: **We are now going to measuring in metres.**
  Ask: **How many centimetres are there in a metre?** (100 cm = 1 m)
  Say: **Work in your group. Measure the length given to your group. Write the answer in your classwork book.** (Assign groups different lengths to measure.
  Allow learners to tell the class their measurements in metres.
  These measurements will be approximate, for example: a metre and a bit.)

- Ask: **Would you be able to use your piece of string to measure the length, or *distance*, from school to home?** (No)
  Say: **Explain why you would not measure the distance from school to home in metres.**
  (It is too far/ the unit is too small for the measurement/ the numbers would be too big)

- Say: **We use a different unit, called a *kilometre* to measure longer lengths, or distances.**
  Point to the 'kilometre' flashcard.
  Say: **There are 1 000 metres in a kilometre.**
  Display the A3 poster: *Conversions.*

Say: **Complete Activity 3 in your LAB.**

- Read through Activity 3 with learners. Make sure that learners understand what they should do.
- Walk around the classroom to support learners as needed.
- Remind learners that they can refer to the poster: *Conversions* if necessary.
- Correct Activity 3 with learners so that they can receive immediate feedback.
- Answers are given below.

Work on your own.

1 Do the following conversions.

a 400 cm = (4) m

b 3 m = (300) cm

c 146 cm = (1,46) m

d 10 cm = (0,1) m

e 7 cm = (0,07) m

f 0,8 m = (80) cm

g 2,9 m = (290) cm

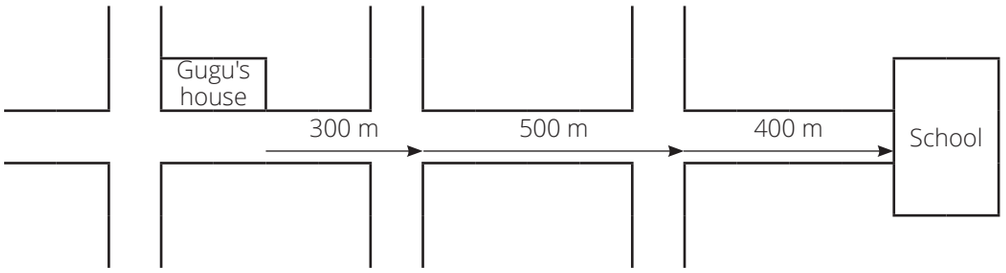
h $\frac{1}{2}$ m = (50) cm

Remember:

1 m = 100 cm

1 cm = $\frac{1}{100}$ m = 0,01 m

2 This map shows Gugu's house and the school.



a. What is the distance, in metres, from Gugu's house to school?
Distance = (300) m + (500) m + (400) m = (1 200) m

b. Write the distance from Gugu's house to school in km and m.
Distance = (1 000 m + 200 m = 1 km and 200 m)

Remember:

1 000 m = 1 km

c. Write the distance from Gugu's house to school in km.
(Distance = 1,2 km)

d. The distance between Gugu's house and the village is 3,5 km.
How many metres is this? (3 500 m)

3 Complete:

a 4 km = (4 000) m

b 5 000 m = (5) km

c 7 300 m = (7) km (300) m

d 3 km 600 m = (3 600) m

e 8 km 200 m = (8,2) km

f 1,9 km = (1) km (900) m = (1 900) m

5 HOMEWORK ACTIVITY (5 MINUTES)

- Explain what learners need to do for homework.
- Read the question in the LAB with learners. Make sure all the learners understand what to do.
- Answers are given below.

Complete:

1 10 mm = (1) cm

2 13 cm = (130) mm

3 100 cm = (1) m

4 1,6 m = (160) cm

5 1 000 m = (1) km

6 2,4 km = (2 400) m

6 REFLECTION AND SUMMARY OF LESSON (5 MINUTES)

Call the whole class to attention and summarise the key concepts of the lesson.

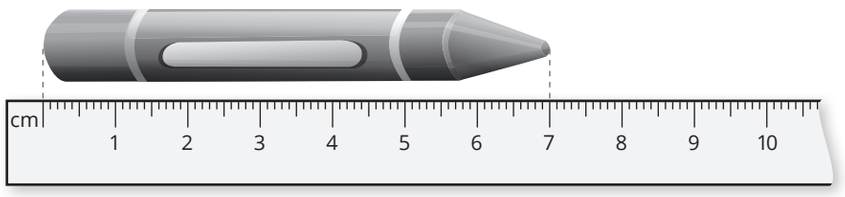
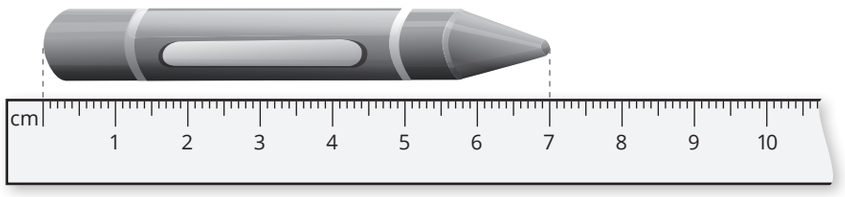
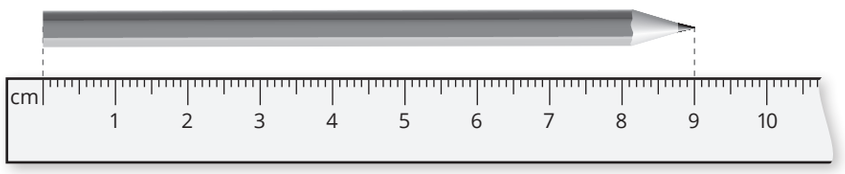
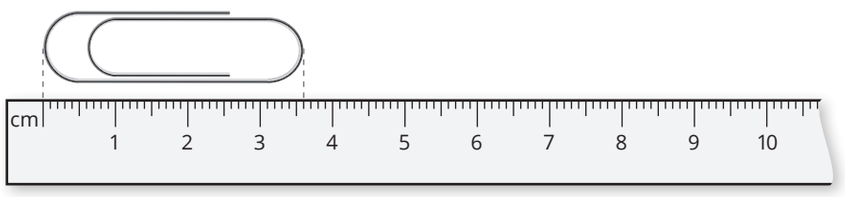
Say: **Today we have learnt to:**

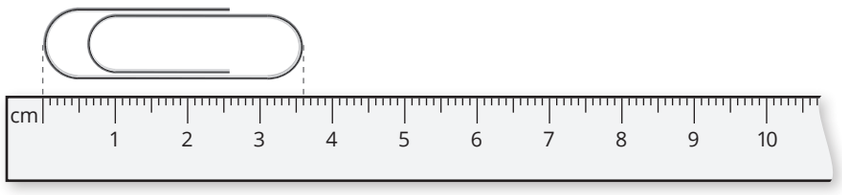
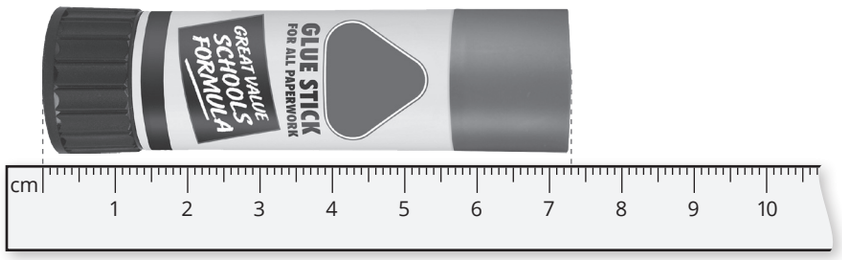
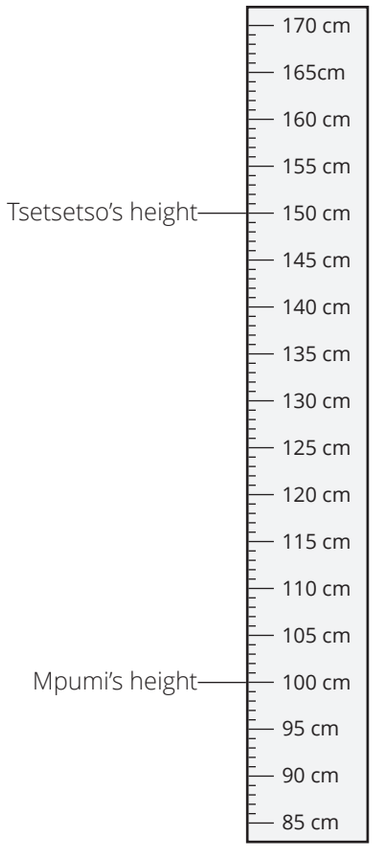
- **measure lengths using different units of measurement**
- **convert between different units of length.**

Lesson 13: Measuring and drawing line segments

Teacher's notes
This lesson is one of the fully planned lessons to be used to cover the Term 4 curriculum. CAPS topics: Measurement: Length Lesson Objective: Learners will be able to read lengths in different units and draw line segments of specified length. Lesson Vocabulary: centimetre, line, line segment, measure, metre, millimetre, point Teacher Resources: 1 metre ruler; A3 poster: *Conversions* Learner Resources: ruler
Date: Week Day

1 MENTAL MATHS (10 MINUTES)

	What is the length of each line?	Answer
1		(7) cm
2		(70) mm
3		(9) cm
4		(3,6) cm

5		(36) mm
6		(7,3) cm
7		
a	Mpumi's height	(1) m
b	Tsetsetso's height	(1,5) m

2 LINK TO PREVIOUS LESSON (5 MINUTES)

- If you have not done so already, stick up the A3 poster: *Conversions*.
- Refer learners to the activity in the LAB.

- Remind learners to refer to the *Conversions* poster displayed in the classroom.

Do the following conversions:
1 130 mm = (13) cm
2 20 cm = (200) mm
3 500 cm = (5) m
4 2 m 30 cm = (230) cm
5 2 000 m = (2) km
6 4,8 km = (4 800) m

3 CORRECT HOMEWORK ACTIVITY (5 MINUTES)

The answers to the Homework Activity for Lesson 12 are provided in Lesson 12.
Use this time to purposefully address gaps in learners' knowledge and to identify and address learner errors.

4 LESSON CONTENT – CONCEPT DEVELOPMENT (35 MINUTES)

- Learners start by measuring straight lines.
- Many learners make mistakes when measuring the length of a straight lines. For instance, they start measuring at the end of the ruler, not at 0. If uncorrected, these errors will translate into errors when they have to draw straight lines of specified lengths (line segments). The teacher needs to monitor the learners' work in order to correct these errors.
- The activities also provide opportunities for learners to practise converting mm to cm and cm to mm.

Say: **Today we are learning to measure and draw straight lines.**

Activity 1: Learners work in pairs

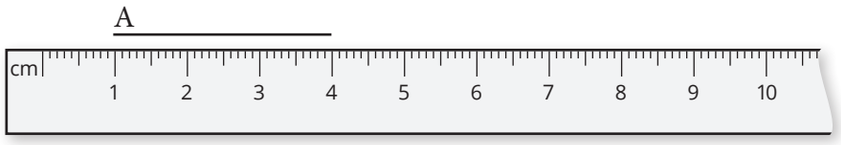
- In Activity 1 the learners engage with lines that are not always measured correctly.

Say: **Complete Activity 1 in your LAB.**

- Read through Activity 1 with learners. Make sure that learners understand what they should do.
- Walk around the classroom to support learners as needed.
- Correct Activity 1 with learners so that they can receive immediate feedback.
- The answers are given below.

Work with your partner.

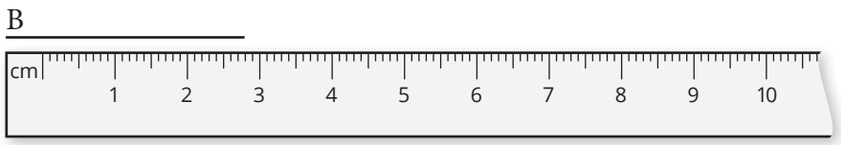
1 Sibu measured the length of Line A:



a Sibu says Line A is 4 cm long. Is Sibu correct? (No)

b If 4 cm is wrong, give the correct answer and explain to Sibu what he did wrong.
(Line A is 3 cm long. Sibu did not notice that the line starts at 1, not 0.
The length of Line A is 4 – 1 = 3 cm)

2 Lungile measured the length of Line B like this:

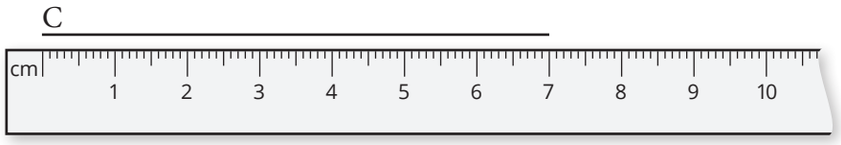


a Lungile says Line B is 2,8 cm long. Is she correct? (No)

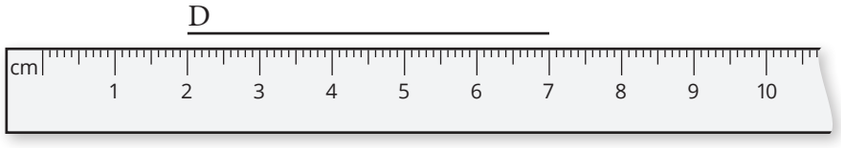
b Explain your answer.
(Line B is approximately 3 cm long. Note that Line B does not start at 0, it starts at the left end of the ruler)

c Describe how you would measure the length of Line B accurately.
(Place the 0 of ruler at the left end of the line B and read the measurement.)

3 What is the length of line C? (7 cm or 70 mm)

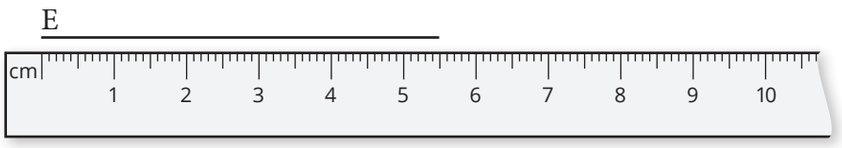


4 What is the length of Line D in centimetres? (5 cm)



Explain how you found the answer. (7 cm – 2 cm = 5 cm)

5 What is the length of Line E in centimetres? (5,5 cm or 5 $\frac{1}{2}$ cm or 5,5 cm)



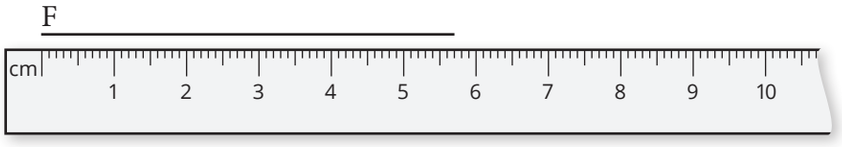
What is the length of Line E in millimetres? (55 mm)

6 What is the length of Line F

a in centimetres and millimetres? (5 cm and 7 mm)

b in millimetres? (57 mm)

c in centimetres? (5,7 cm)



Activity 2: Whole class activity and learners work on their own

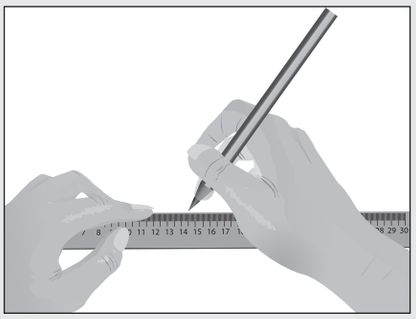
- In Activity 2 learners draw lines of given lengths.

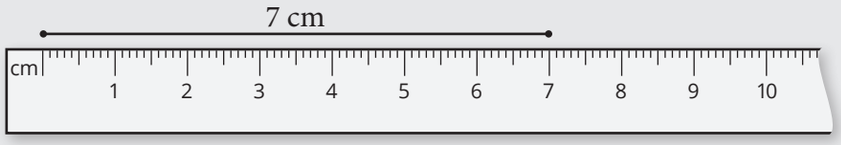
- Learners will need a ruler showing centimetres and millimetres.
  You will need a metre stick in order to draw a 70 cm line on the board.

- Say:
  I am going to draw a line that is 70 cm long so that you can see what I am doing.
  I put my ruler on the board.
  I draw a dot at 0.
  I draw another dot at 70 cm.
  I join the 2 dots with a straight line.
  I write 70 cm above the line.

- Say: **Work in your classwork book. Use your ruler to draw a line that is 7 cm long.**
  Note: the instruction must be given step by step at a pace to suit the learners.

- **Put your ruler on the paper.**
- **Draw a dot at 0 on your ruler as a starting point.**
- **Hold your ruler in place.**
- **On your ruler measure 7 cm from the dot and mark it with another dot.**
- **Join 2 dots with a straight line.**
- **Write '7 cm' above the line.**





Say: **Complete Activity 2 in your LAB.**

- Read through Activity 3 with learners. Make sure that learners understand what they should do.
- Walk around the classroom to support learners as needed.
- Peer assessment: Get learners to swap work and measure each other's work to check for accuracy.

Work on your own

1 Use your ruler.
Measure and draw each of the following straight lines.
Label each line with its length.

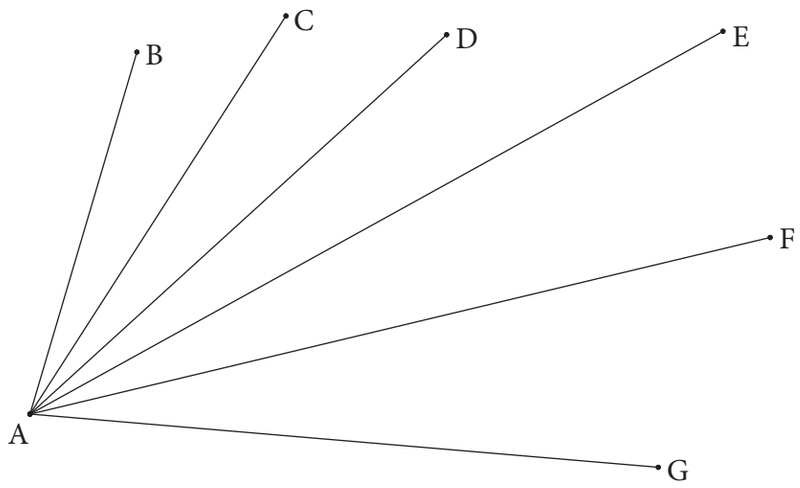
a Line A: 10 cm.

10 cm

b Line B: 13 cm and 6 mm long.

13,6 cm / 13 cm and 6 mm / 136 mm

2 a Use your ruler.
Draw a straight line from dot A to each other dot.
This means that you should draw 6 straight lines altogether.



b Which line is the longest? (AE)
How long is it? (Approximately 11 cm)

5 HOMEWORK ACTIVITY (5 MINUTES)

- Explain what learners need to do for homework.
- Read the question in the LAB with learners. Make sure all the learners understand what to do.
- Answers are given below.

1. Use your ruler. Measure the length of Line A.

Line A

Line A is (6) cm long

Line A is (60) mm long

2. Use your ruler.

Draw a straight line that is 9 cm long.

Label it Line B.

Line B

6 REFLECTION AND SUMMARY OF LESSON (5 MINUTES)

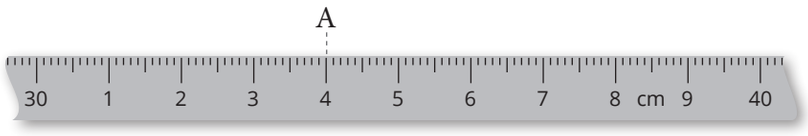
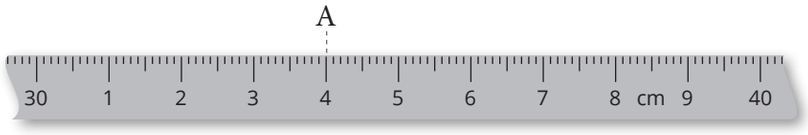
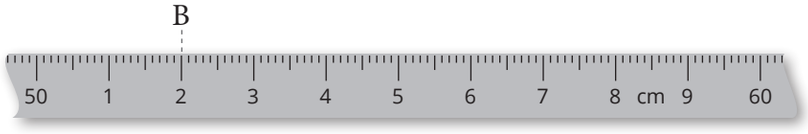
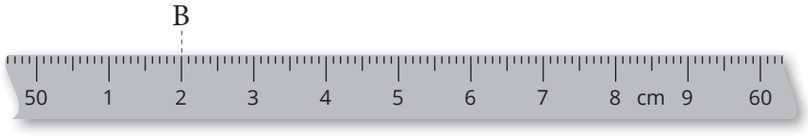
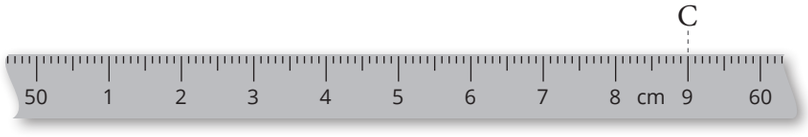
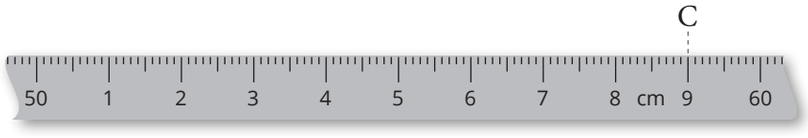
Call the whole class to attention and summarise the key concepts of the lesson.

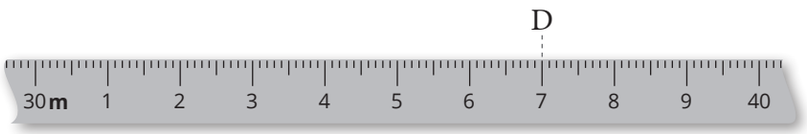
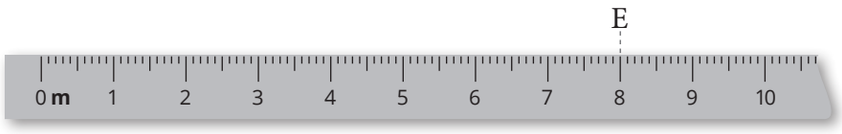
Say: **Today we have learnt to measure and draw straight lines.**

Lesson 14: Solving problems involving length (1)

Teacher's notes
This lesson is one of the fully planned lessons to be used to cover the Term 4 curriculum.
CAPS topics: Measurement: Length
Lesson Objective: Learners will be able to solve problems which require the addition and subtraction of units of length.
Lesson Vocabulary: centimetre, decimal place, length, metre, millimetre
Teacher Resources: A3 poster: *Conversions*
Learner Resources: ruler
Date: Week Day

1 MENTAL MATHS (5 MINUTES)

	What length is measured on each ruler?	Answer
1		(34) cm
2		(340) mm
3		(52) cm
4		(520) mm
5		(59) cm
6		(590) mm

7		(37) m
8		(8) m

2 LINK TO PREVIOUS LESSON (5 MINUTES)

- Refer learners to the activity in the LAB.
- Learners can swap with a partner and check each other's straight lines.

Use your ruler. Draw a straight line that is 8 cm and 4 mm long.

3 CORRECT HOMEWORK ACTIVITY (5 MINUTES)

The answers to the Homework Activity for Lesson 13 are provided in Lesson 13.
Use this time to purposefully address gaps in learners' knowledge and to identify and address learner errors.

4 LESSON CONTENT – CONCEPT DEVELOPMENT (35 MINUTES)

Learners solve problems which require the following prior knowledge:
- units of measurement of length (mm, cm, m, km)
- converting between mm, cm and m
- addition and subtraction including addition and subtraction of decimal fractions

Say: **Today we are learning to solve problems which involve length.**

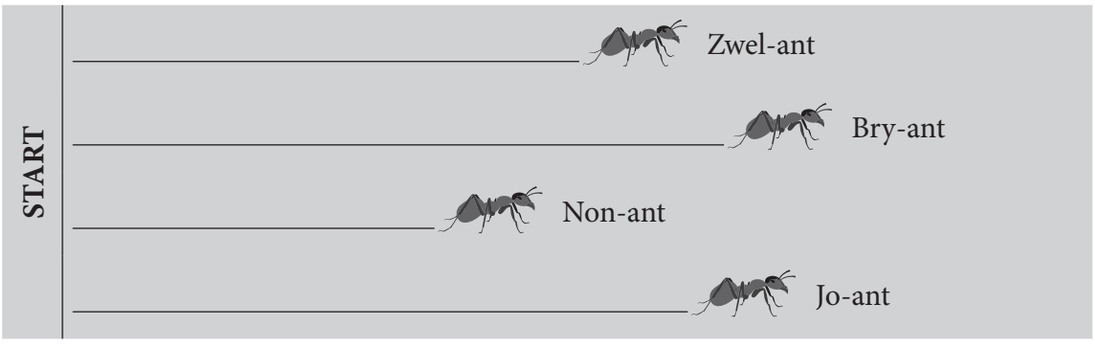
Activity 1: Whole class activity and learners work in pairs

- In Activity 1 the learners measure distances in mm and cm and then add and subtract these measurements.

STEP 1:

- Refer the learners to the following diagram in their LAB.

Four ants are running in a 100 mm race.

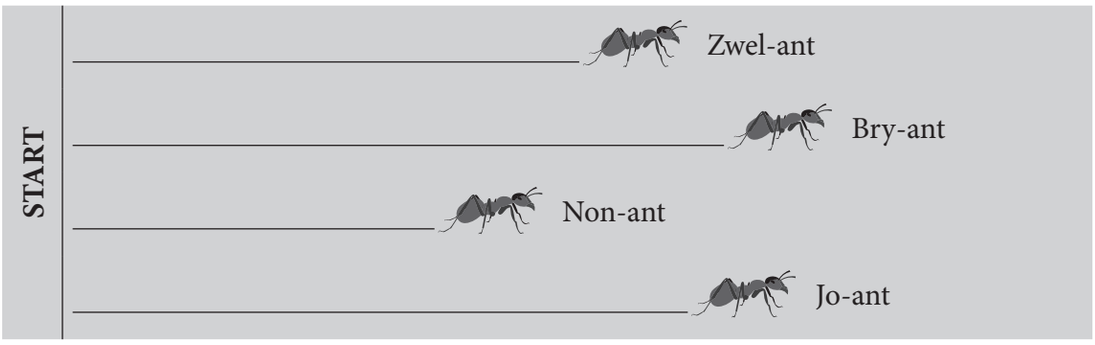


- Ask following questions:
  - **How long is the race in cm?** (10 cm)
  - **Who is winning the race?** (Bry-ant)
  - **Who is coming last?** (Non-ant)

STEP 2:

- Say: **Work with your partner to answer questions 1 and 2 in your LAB.** Check learners' measurements before they do the calculations based on the measurements.

Four ants are running in a 100 mm race.
So far, they have reached the place you see in the diagram.



1 Measure the distance that each runner reached and give the answer in mm.

a How far has Zwe-lant run? Give your answer in cm. (7 cm)
b How far has Bry-ant run? Give your answer in mm. (90 mm)
c How far has Non-ant run? Give your answer in cm. (5 cm)
d How far has Jo-ant run? Give your answer in mm. (85 mm)

2 Complete the table:

Name of the ant	Distance run in cm	Distance run in mm
Zwel-ant	(7 cm)	(70 mm)
Bry-ant	(9 cm)	(90 mm)
Non-ant	(5 cm)	(50 mm)
Jo-ant	(8,5 cm)	(85 mm)

- Discuss the answers with the learners and make sure that they correct any answers they got wrong.

STEP 3:

- Say: **Work with your partner to answer questions 3 to 7 in your LAB.**
  The answers are given below.

3 How much further does Bry-ant need to run to finish the race?
(100 mm – 90 mm = 10 mm or 10 cm – 9 cm = 1 cm)

4 How much further has Bry-ant run than Non-ant?
(90 mm – 50 mm = 40 mm or 9 cm – 5 cm = 4 cm)

5 How far have Zwe-lant and Non-ant run altogether?
(70 mm + 50 mm = 120 mm or 7 cm + 5 cm = 12 cm)

6 How much further must Jo-ant run to finish the race?
Give your answer in both mm and cm.
(100 mm – 85 mm = 15 mm = 1,5 cm)

7 How much further has Jo-ant run than Non-ant?
Give your answer in both mm and in cm.
(85 mm – 50 mm = 35 mm = 3,5 cm)

Activity 2: Learners work in pairs

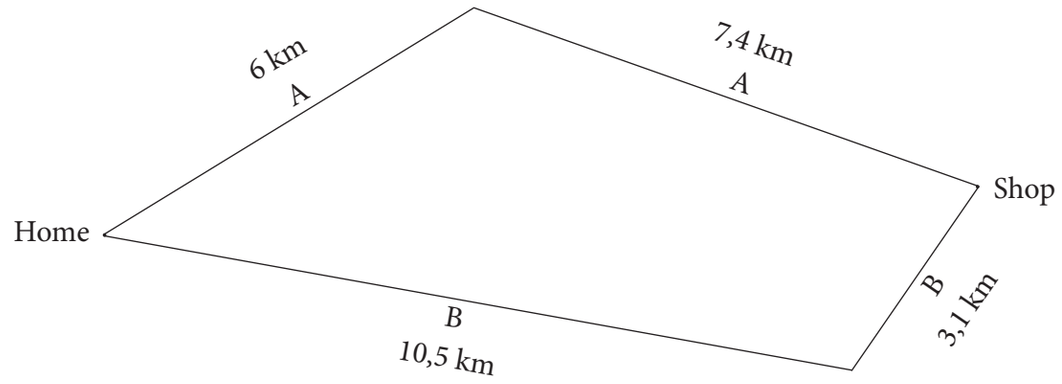
- In Activity 2 the learners add and subtract distances given on a diagram in kilometres and then do calculations in metres.

Say: **Complete Activity 2 in your LAB.**

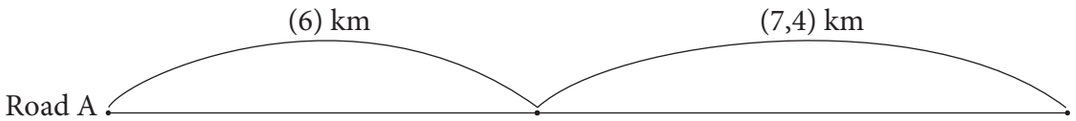
- Read through Activity 2 with learners. Make sure that learners understand what they should do.
- Walk around the classroom to support learners as needed.
- Remind learners that they can refer to the poster: *Conversions* if necessary.
- Correct Activity 2 with learners so that they can receive immediate feedback.
- The answers are given below.

Work with your partner

1 Sindi could go to the shops in two different ways, Road A and Road B.

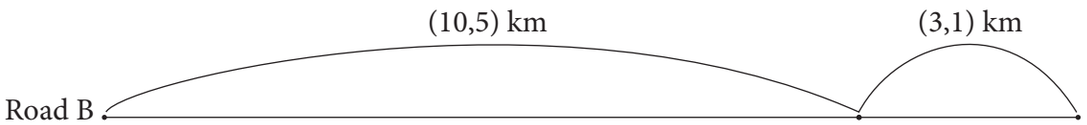


a Calculate the distance in kilometres between home and the shop using Road A.



Distance using Road A = (6) km + (7,4) km = (13,4) km

b Calculate the distance in kilometres between home and the shop using Road B.

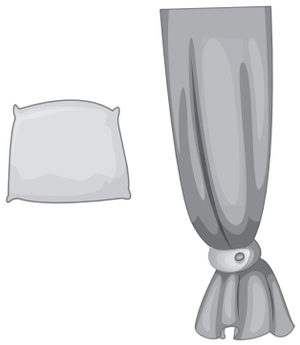


Distance using Road B = (10,5) km + (3,1) km = (13,6) km

c. What is the difference in distance between Road A and Road B?
Give your answer in km: (13,6 km – 13,4 km = 0,2 km)
Give your answer in m: (200 m)

d. Which road do you recommend Sindi to choose? Give a reason for your answer.
(Road B. It is shorter.
Note learners might give other answers – for example based on different road conditions. Listen carefully to their answers and reasons.)

2 Mother is making curtains and cushions.
She needs 13,8 m of material for the curtains.
She needs 6,7 m for the cushions.



a How much material does mother need to make one curtain and one cushion?
(13,8 + 6,7 = 20,5 m)

b At the shop, material is sold by the metre.
How many metres of material must mother buy? (21 m)

5 HOMEWORK ACTIVITY (5 MINUTES)

- Explain what learners need to do for homework.
- Read the question in the LAB with learners. Make sure all the learners understand what to do.
- Answers are given below.

Calculate: write the answer in three ways as mm, cm and mm and mm.

	Answer is mm	**Answer in cm and mm**	**Answer in cm only**
1	4 cm 5 mm + 7 mm = (45 mm + 7 mm = 52 mm)	(5 cm 2 mm)	(5,2 cm)
2	3 cm 8 mm + 49 mm = (38 mm + 49 mm = 87 mm)	(8 cm 7 mm)	(8,7 cm)
3	5,1 cm – 5 mm = (51 mm – 5 mm = 46 mm)	(4 cm 6 mm)	(4,6 cm)
4	6 cm 2 mm – 2 cm 1 mm = (62 mm – 21 mm = 41 mm)	(4 cm 1 mm)	(4,1 cm)

6 REFLECTION AND SUMMARY OF LESSON (5 MINUTES)

Call the whole class to attention and summarise the key concepts of the lesson.

Say: **Today we have learnt to solve problems which involve length.**

We know how to:

- **work with different units of measurement of length (mm, cm, m, km)**
- **convert between mm and cm**
- **add and subtract lengths**
- **add and subtract lengths which are written as decimal fractions.**

Lesson 15: Solving problems involving length (2)

Teacher's notes
This lesson is one of the fully planned lessons to be used to cover the Term 4 curriculum.
CAPS topics: Measurement: Length
Lesson Objective: Learners will be able to solve problems which require the multiplication and division of units of length.
Lesson Vocabulary: centimetre, length, longer, metre, millimetre, shorter, unit of length, width
Teacher Resources: A3 poster: *Conversions*
Learner Resources: ruler
Date: Week Day

1 MENTAL MATHS (5 MINUTES)

Remember that 1 cm = 10 mm

Write in mm		Answer	Write in cm		Answer
1	3 cm =	30 mm	**6**	10 mm =	1 cm
2	10 cm =	100 mm	**7**	60 mm =	6 cm
3	40 cm =	400 mm	**8**	500 mm =	50 cm
4	0,6 cm =	6 mm	**9**	5 mm =	0,5 / $\frac{1}{2}$ cm
5	35 cm =	350 mm	**10**	18 mm =	1,8 cm

2 LINK TO PREVIOUS LESSON (5 MINUTES)

- Refer learners to the activity in the LAB.

Draw a circle around the correct word in each sentence:

1. If 1 m = 100 cm, it means that 1 m is 100 times shorter/(longer) than 1 cm.

2. If 1 cm = 10 mm, it means that 1 mm is 10 times (shorter)/ longer than 1 cm.

3 CORRECT HOMEWORK ACTIVITY (5 MINUTES)

The answers to the Homework Activity for Lesson 14 are provided in Lesson 14.
Use this time to purposefully address gaps in learners' knowledge and to identify and address learner errors.

4 LESSON CONTENT – CONCEPT DEVELOPMENT (35 MINUTES)

- Learners solve real life problems which require the following prior knowledge:
  - units of measurement of length (mm, cm, m)
  - converting between mm, cm and m
  - multiplication and division.

Say: **Today we are learning to solve problems which involve length.**

Activity 1: Whole class activity and learners work in pairs

Say: **Complete Activity 1 in your LAB.**

- In Activity 1 the learners use multiplication, addition, division and subtraction to solve a fencing problem.

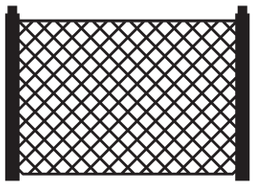
- Work on Question 1 of the Activity 1 with the learners. They work on Question 2 with their partners.
- Remind learners that they can refer to the poster: *Conversions* if necessary.
- Walk around the classroom to support learners as needed.
- The answers are given below.

STEP 1:

- Read through the problem three times with learners. Make sure that learners understand the question.
- Refer to the diagram of the fence and make sure that the learners understand what is mean by 'a piece of fence'
- Once the learners have answered Question 1, discuss the answers with the learners. Encourage them to explain the strategy they used to find the answer to question 1 **c**.

Mulalo wants to build a fence along the front of her stand.
She buys:

- 6 pieces of fence that are 5 m long.
- 2 pieces of fence that are 4 m 50 cm long
- 10 pieces of fence that are 2,1 m long.



1 What will the total length of the fence be if she joins all the pieces together? Write the answer in metres.

a Convert all the measurements to metres.
(Two of the measurements are already in metres so the only conversion necessary is 4 m 50 cm = 4,5 m)

b Complete the table which can help you find the answer.

Number of pieces of fence	Length of the fence	Total length of fence for each
6	5 m	(6 × 5 m = 30 m)
2	4,5 m	(2 × 4,5 m = 9 m) OR (2 × 4,5 m = (2 × 4) + (2 × 0,5) = 8 + 1 = 9 m)
10	2,1 m	(10 × 2,1 m = 21 m)

c Work out the total length of fence that Mulalo has.

Total length = 30 + 9 + 21 = 30 + 30 = 60 m

30

d Write your answer (Mulalo has 60 m fencing)

STEP 2:

- Say: **Work with your partner to answer Question 2.**
- Once the learners have finished working on Question 2, call selected learners to the board to show the class how they answered the question.

2. Mulalo needs 62,3 m of fence. Does she have enough fence?
If she needs more fence, how much will she need?

Write a number sentence: (62,3 – 60 = ☐)

Do the calculation: (62,3 – 60 = 2,3 m)

Write your answer. (No, she will not have enough fence. She needs another 2,3 m of fence).

Activity 2: Learners work in pairs

Say: **Complete Activity 2 in your LAB.**

- In Activity 2 the learners use multiplication and division to work out the answers to a question about a building and a question about making serviettes.
- For learners who have no knowledge of what a *skyscraper* is, explain that a skyscraper is a very tall building, in this case with 90 floors. The tallest building in South Africa is 55 floors high (The Leonardo in Sandton, Johannesburg).

- For learners who have no knowledge of what a *serviette* is, explain that it is a square of cloth or paper that you use to protect your clothes or to wipe your hands and mouth when you are eating.

- Read through the activity with the learners. Make sure that learners understand the language and what they should do.
- Walk around the classroom to support learners as needed.
- Remind learners that they can refer to the poster: *Conversions* if necessary.
- Correct Activity 2 with learners so that they can receive immediate feedback.
- The answers are given below.

1 A skyscraper has 90 floors.
Each floor is 350 cm high.
How high is the building?
Give your answer in metres.

A skyscraper is a very tall building

a Underline the numbers and the question.
A skyscraper has 90 floors.
Each floor is 350 cm high.
How high is the building?

b Write a number sentence for the problem and work out the answer.

One solution:

Number sentence: (90 × 350 cm = ☐)

			4		
			3	5	0
×				9	0
	3	1	5	0	0

(90 × 350 cm = 31 500 cm = 315 m)

A second solution:

Number sentence: (90 × 3,5 m = ☐)

90 = 9 × 10, so 90 × 3,5 m = 9 × 10 × 3,5 m = 9 × 35 m = 315 m

35 m

			4	
			3	5
×				9
		3	1	5

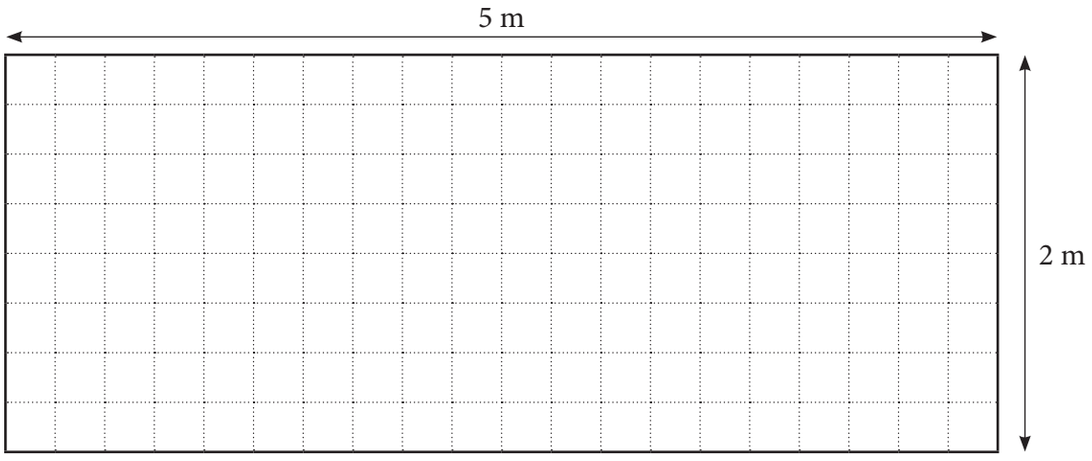
c Write your answer: (The skyscraper is 315 metres high)

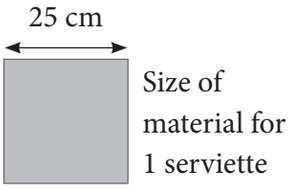
2 Mama Phatu bought 5 m of material with a width of 2 m.
She wants to make square serviettes with side length of 25 cm.
How many serviettes will she be able to make from that material?

a Underline the numbers and the question.

Mama Phatu bought 5 m of material with a width on 2 m.
She wants to make serviettes with squares with side length of 25 cm.
How many serviettes will she be able to make?

b Write the measurements on the material and the serviette on the sketches provided.





Size of material for 1 serviette

c Write all the measurements in centimetres.
(5 m = 500 cm
2 m = 200 cm)

d Mama Phatu first works out how many serviettes can fit along the 5 m length of the material.
Show how she can do this calculation.
(One solution: Number of serviettes = 500 ÷ 25 = 20 serviettes)

e Mama Phatu then measures how many serviettes can fit along the 2 m breadth of the material. Show how she can do that.
(One solution: Number of serviettes = 200 ÷ 25 = 8 serviettes)

f Mama Phatu then multiplies the two numbers together to work out how many serviettes can be cut from the material.
Show how she can do that.
(Number of serviettes = 20 × 8 = 160 serviettes)

g Write your answer:
Mama Phatu can make (160) serviettes out of the material.

5 HOMEWORK ACTIVITY (5 MINUTES)

- Explain what learners need to do for homework.
- Read the question in the LAB with learners. Make sure all the learners understand what to do.
- Answers are given below.

How many 30 cm pieces of rope can Ephraim cut from a 1,5 m piece of rope?

Answer each question to find out the answer.

1. Convert 1,5 m to cm: 1,5 m = (150 cm)

2. Write a number sentence for the problem: (150 ÷ 30 = ☐)

3. Do the working out: (I know 15 ÷ 3 = 5, so 150 ÷ 30 = 5)

4. Write the answer: (He can cut 5 pieces of rope.)

6 REFLECTION AND SUMMARY OF LESSON (5 MINUTES)

Call the whole class to attention and summarise the key concepts of the lesson.
Say: **Today we have learnt to solve real life problems involving length.**

We know how to:

- **work with units of measurement of length (mm, cm, m,)**
- **convert between different units of measurement**
- **multiply and divide to solve length problems.**

Lesson 16: Solving problems involving length (3)

Teacher's notes
This lesson is one of the fully planned lessons to be used to cover the Term 4 curriculum.
CAPS topics: Measurement: Length
Lesson Objective: Learners will be able to solve problems which require the use of the four operations and the conversion of units of length.
Lesson Vocabulary: convert, length, perimeter
Teacher Resources: A3 poster: *Conversions*
Learner Resources: Ruler
Date: Week Day

1 MENTAL MATHS (5 MINUTES)

Remember: 1 m = 100 cm

		Answer			Answer
1	500 cm = _____ m	5 m	**6**	$2\frac{1}{2}$ m = _____ cm	250 cm
2	6 300 cm = _____ m	63 m	**7**	4 cm = _____ m	0,04 m
3	63 cm = _____ mm	630 mm	**8**	19 m = _____ cm	1 900 cm
4	4 500 cm = _____ m	45 m	**9**	6,4 m = _____ cm	640 cm
5	13 cm = _____ m	0,13 m	**10**	2,1 cm = _____ mm	21 mm

2 LINK TO PREVIOUS LESSON (5 MINUTES)

- Refer learners to the activity in the LAB.

Four girls took part in a relay race at an athletics meeting.
The total length of the race was 816 m, and each girl ran the same distance.
How far did each girl run?

1 Write the number sentence for the problem.
(816 m ÷ 4 = ☐ m)

2 Calculate the answer

	2	0	4
4	8	1	6
-	8		
		1	6
	-	1	6
			0

3 Write your answer: (Each girl ran 204 m)

3 CORRECT HOMEWORK ACTIVITY (5 MINUTES)

The answers to the Homework Activity for Lesson 15 are provided in Lesson 15.
Use this time to purposefully address gaps in learners' knowledge and to identify and address learner errors.

4 LESSON CONTENT – CONCEPT DEVELOPMENT (35 MINUTES)

Learners solve real life problems which require the following prior knowledge:
- units of measurement of length (mm, cm, m, km)
- converting between different units of length, including m and km
- addition, subtraction, multiplication and division
- working with decimals in the context of length.

Say: **Today we are learning to solve problems which involve length.**

Activity 1: Whole class activity and learners work in pairs

- Display the poster: *Conversions* in the classroom.
- Ask: **How many metres are there in one kilometre?** (1 000)
- Say: **Work in your classwork book. Discuss with your partner and write the answers.**

1 2 km = (2 000) m
2 30 km = (30 000) m
3 0,5 km = (500) m
4 2 000 m = (2) km
5 250 m = ($\frac{1}{4}$ or 0,25) km

- Call selected learners to the board to show the class how they answered the questions.

Say: **Complete Activity 1 in your LAB.**

- In Activity 1 the learners answer questions about the different routes that Ben can take to school.

- Read through the activity with the learners. Make sure that learners understand what they should do.
- Walk around the classroom to support learners as needed.
- Remind learners that they can refer to the poster: *Conversions* if necessary.
- Check learners' conversions (Question 1. a.) before they answer the rest of the questions.
- Correct Activity 1 with learners so that they can receive immediate feedback.
- Answers are given below.

Ben has four different ways (routes) that he can take to school:

Distances for each route
Route A: 1,25 km
Route B: 1,5 km
Route C: 900 m
Route D: 1 150 m

1 Write all distances in the same unit.
Think carefully about which unit is the most suitable.

(Convert all distances to metres. In this example it is best to convert to the smaller unit so as to avoid dealing with decimals.
A: 1,25 km = 1 250 m
B: 1,5 km = 1 500 m
C: 900 m = 900 m
D: 1 150 m = 1 150 m)

2 What is the difference in length between Route A and Route B?
Give your answer in metres.

(Difference in length = 1 500 m – 1 250 m
= 250 m)

3 What is the difference in length between Route C and Route D?

(Difference in length = 1 150 m – 900 m
= 250 m)

4 On Wednesday Ben took Route A when he walked to school.
He took Route D when he walked home from school.
How far did Ben walk altogether on Wednesday?
Give your answer in kilometres.

(Total distance walked = 1 250 m + 1 150 m
= 2 400 m
= 2,4 km)

5 How far did Ben walk if he took Route C to and from school every day for a week?
Give your answer in kilometres.

Write a number sentence:
(5 × 2 × 900 m = □; he took the route twice a day for 5 days)

Calculate the answer: (5 × 2 × 900 = 10 × 900
= 9 000 m
= 9 km)

Why do you think Ben chose Route C rather than any of the other routes?

(Route C is the shortest route)

Activity 2: Learners work in pairs

Say: **Complete Activity 2 in your LAB.**

- In Activity 2 the learners calculate the amount of ribbon needed by Sasah, as well as the cost of buying the ribbon and the change she would receive from a R100 note.

- Read through the activity with the learners. Make sure that learners understand what they should do.
- Walk around the classroom to support learners as needed.
- Remind learners that they can refer to the poster: *Conversions* if necessary.
- Correct and discuss Activity 2 with learners so that they can receive immediate feedback.
- The answers are given below.

Sasah uses ribbon to decorate presents of exactly the same size.
She uses 80 cm of ribbon per present.

1 Write the length of ribbon in metres.
80 cm = (0,8 m or $\frac{8}{10}$ m)

2 How many metres of ribbon will Sasah need to wrap 3 presents?
Write the number sentence and then answer the question in metres and centimetres.
Number sentence: (3 × 80 cm = ☐ cm)
Find the answer: (3 × 80 cm = 240 cm = 2 m and 40 cm)

3 How many presents can Sasah decorate if she has 6 m of ribbon?
Write the number sentence and answer the question.
Write 6 m in cm: 6 m = (600 cm)
Write the number sentence: (600 ÷ 80 = ☐)
Find the answer: (I know 60 ÷ 8 = 7 remainder 5
So 600 cm ÷ 80 cm = 7 presents and remainder 50 cm)
Sasah can decorate (7) presents

4 Sasah needs to decorate 12 presents with ribbon.
The ribbon is sold in 5 m rolls.

a How much ribbon will she need? Give the answer in metres.
(For 12 presents Sasah needs 12 × 80 cm = 960 cm = 9,6 m)

b How many rolls of ribbon must Sasah buy?
(Ribbon is sold in 5 m rolls.
2 rolls is 2 × 5 m = 10 m.)
Sasah needs to buy (2) rolls of ribbon

c The ribbon costs R36 per roll.
How much will Sasah have to pay?
(2 × R36 = R72)
Sasah will have to pay (R72)

d How much change would Sasah get if she pays with a R100 note?

(100 – 72 = 28)
Sasah should get (R28) change

UNIT 3

5 HOMEWORK ACTIVITY (5 MINUTES)

- Explain what learners need to do for homework.
- Read the question in the LAB with learners. Make sure all the learners understand what to do.
- Answers are given below.

Mr. Jabu needs to put a new fence around his vegetable garden.

The perimeter of the vegetable garden is 7,85 m.

He has a roll of fence that is 4 $\frac{1}{2}$ m long.

How much more fence does Mr Jabu need to buy?

The shop sells fence by the metre.

1 Write each measurement in centimetres.

(7,85 m = 785 cm

4 $\frac{1}{2}$ m = 450 cm)

2 Do the calculation:

(785 cm – 450 cm = 335 cm)

3 Give the answer in metres: Mr. Jabu needs to buy (4 m) of fence.

6 REFLECTION AND SUMMARY OF LESSON (5 MINUTES)

Call the whole class to attention and summarise the key concepts of the lesson.

Say: **Today we have learnt to solve real life problems involving length.**

We know how to:

- **work with different units of measurement of length (mm, cm, m, km)**
- **convert between different units of length, including working with decimal fractions and common fractions**
- **add, subtract, multiply divide to solve length problems**
- **work with decimals in the context of length.**

Lesson 17: Consolidation

Teacher's notes		
This lesson allows for consolidation of the lessons on length.		
CAPS topics: Measurement: Length		
Lesson Objective: Learners will revise and consolidate units of length by reading, measuring and drawing different lengths, by converting units of length and by solving real life problems involving length.		
Lesson Vocabulary: centimetre, convert, kilometre, length, measure, metre, millimetre,		
Resources: Grade 4 Learners' Books and Teacher's Guides (if available)		
Date:	Week	Day

1 NOTES FOR THE TEACHER RELATING TO THIS WEEK'S WORK

The main topic was the measurement of length.

2 POSSIBLE MISCONCEPTIONS LINKED TO THE OPERATION OF DIVISION

- Learners think that they should measure or read length from the end of the ruler. This is only true if one end of the object aligns with zero on the ruler.
- Learners might think that mm, cm, m and km are the only units of length. While learners do not need to know any other units of length at this stage, you should tell them that there are other units of length, particularly Imperial measures of length such as inches, feet and miles.
- When using tape measures, learners sometimes assume that the measurement is the number on the tape measure at the end of the distance. For example, if the width of the office is 4 m 95 cm, they might record the width as 95 cm, forgetting to take account of the metre measure as well as the 95 cm.

3 CORRECT HOMEWORK ACTIVITY (5 MINUTES)

The answers to the Homework Activity for Lesson 16 are provided in Lesson 16.
Use this time to purposefully address gaps in learners' knowledge and to identify and address learner errors.

4 CLASSWORK

Say: **Today we are going over what we learned this week. We will practise working with length.**

- You could use this time for learners to complete classwork or homework activities, as necessary.
- You could use the Additional Activities from textbooks that you have or use the Consolidation Activity given.

Additional activities for consolidation

Refer to the following table. Select additional activities from the textbook/s you have. Use the answers given in the Teacher's Guide to mark the work..

	Fabulous	Oxford Headstart	Oxford Successful	Platinum	Premier	Sasol Inzalo	Solutions for All	Study & Master	Viva
LB	115-120	119-129	97-103	68-75	69-78	147-160	107-118	123-140	75-81
TG	79-83	149-162	101-106	56-61	34-37	161-176	80-85	174-185	43-45

OR, learners could complete the Consolidation Activity in their LAB.

Consolidation Activity

1 Complete the sentences:

a There are (1 000) m in 1 km. So (1) km = 1 000 m.

b There are (100) cm in 1 m. So 1 m = (100) cm, and 1 cm = (0,01) m

c There are (10) mm in 1 cm. So 1 cm = (10) mm, and 1 mm = (0,1) cm

2 Convert

a 45 cm = (450) mm

b 1 250 m = (1,25) km

c 1 m 25 cm = (125) cm

d $2\frac{1}{2}$ km = (2 500) m

3 Use a ruler. Draw and label the following lines:

a Line A = 12,8 cm

(Line A or A)

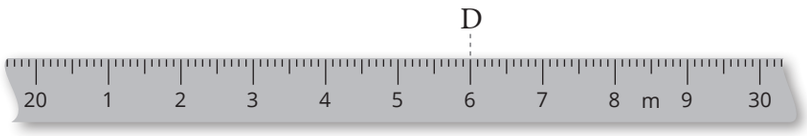
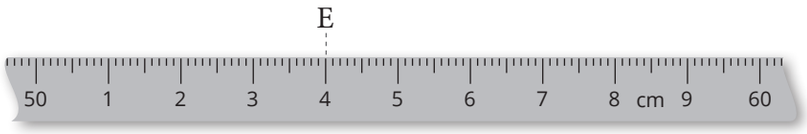
b Line B = 87 mm

(Line B or B)

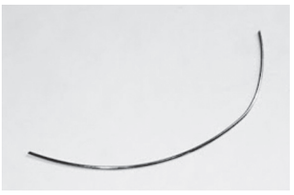
4 Use a ruler. Measure the length of each line.

		Answer
A		(70) mm (7) cm
B		(48) mm (4,8) cm
C		(93) mm (9,3) cm

5 Read and write the measurements shown on these two rulers:

		Answer
a		(26 m)
b		(54 cm)

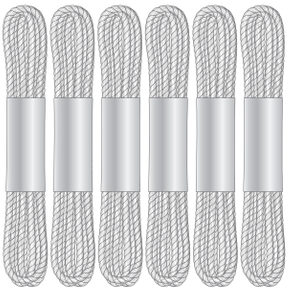
6 Eddie has a 1 m piece of wire.
He cuts 73 cm off the piece of wire.
How much wire is left?



Do your working out here: (100 cm – 73 cm = 27 cm)

Write the answer: Eddie has (27 cm) wire left

7 Jethro bought 6 pieces of rope.
Each piece of rope was 15 m long.
How much rope did Jethro buy altogether?



Do your working out here:
(6 × 15 = 90 m
Or 6 × 15 = (6 × 10) + (6 × 5)
= 60 + 30
= 90)

Jethro bought (90 m) of rope

UNIT 3

8 Hloni used two pieces of ribbon to decorate a room.
One piece of ribbon is 1 524 mm long.
The other piece of ribbon is 123,4 cm long.

a Write the two measurements using the same units.

The two pieces of ribbon are (1 524 mm or 152,4 cm) and (123,4 cm or 1 234 mm) long

b How long are the two pieces together?

Do your working out here:

(1 524 mm + 1 234 mm = 2 758 mm OR 152,4 cm + 123,4 cm = 275,8 cm)

	1	5	2	4
+	1	2	3	4
	2	7	5	8

	1	5	2	,	4
+	1	2	3	,	4
	2	7	5	,	8

The two pieces together are (2758 mm or 275,8 cm) long.

c What is the difference in length of the 2 pieces of the ribbon?

Do your working out here:

(1 524 mm - 1 234 mm = 290 mm OR 152,4 cm - 123,4 cm = 29 cm)

	1	$^{4}\cancel{5}$	$^{1}2$	4
–	1	2	3	4
		2	9	0

	1	$^{4}\cancel{5}$	$^{1}2$	,	4
+	1	2	3	,	4
		2	9	,	0

The longer piece of ribbon is (290 mm or 29 cm) longer than the shorter piece.

9 Zami makes bracelets.
Each bracelet has 12 beads and each bead is 15 mm wide.

a What is the length of the bracelet? Give your answer in cm.

(12 × 15 mm = 180 mm OR 12 × 15 = (12 × 10) + (12 × 5)
= 120 + 60
= 180 mm)

The bracelet is (18 cm) long

b Zami wants to make a bracelet that is 27 cm long.

How much longer is the second bracelet than the first bracelet?
(27 cm – 18 cm = 9 cm)

How many more beads will Zami need for the longer bracelet?
(Zami needs 12 beads for 18 cm so will need 6 beads for the 9 cm difference in length.)

So Zami will need (6) more beads for this longer bracelet.

5 REFLECTION AND SUMMARY OF LESSON

Call the whole class to attention and summarise the key concepts of the lesson.

Say: **Today we have revised length.**

We can:

- **work with different units of length**
- **read, measure and draw different lengths**
- **convert units of length**
- **solve real life problems involving length.**

Unit 4: Mass

INTRODUCTION

This unit focuses on the measurement of mass.

By Grade 4, learners should have an understanding of the property they are measuring.

In the previous grades they have used non-standard units and standard units (grams and kilograms) to measure the mass of objects. They have ordered objects on the basis of mass and have used the terms heavier and lighter to compare objects in terms of mass.

The conversion of units of mass is new in Grade 4.

In this unit, we focus on the four framework dimensions in the following ways:

Framework dimension	How the framework dimension is developed in this unit
Conceptual understanding	In the problem solving activities, learners are given opportunities to link their knowledge of operational procedures to solving problems involving mass.
Procedural fluency	Learners do a variety of tasks and solve a range of contextual problems in order to develop their procedural fluency in the four operations.
Strategic competence	Learners make sensible decisions on what strategies to use when solving problems involving mass.
Reasoning	Based on the information available and the question which needs to be answered, learners discuss their mathematical ideas and decide which strategy to use when solving different mass problems.

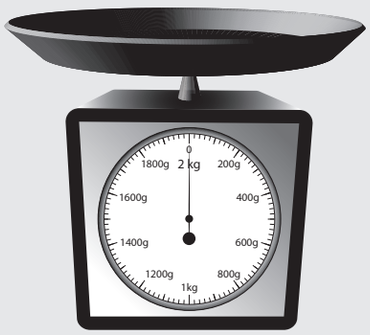
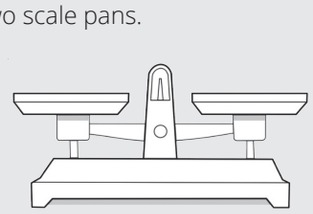
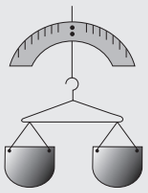
In this unit, we build a **learning centred classroom** by paying attention to:

		Examples
Concept development	✓	Done in every lesson.
Speaking mathematics	✓	Learners use terms such as mass, kilogram and gram in order to communicate effectively.
Addressing gaps in learners' knowledge	✓	Link to previous lesson, correction of classwork and homework activities, as well as consolidation activities are designed to address gaps in learners' knowledge.
Addressing learners' errors	✓	When some learners make errors, other learners explain the reason why their answers are not correct. Teachers give opportunities to everyone to express their reasoning by comparing both correct and incorrect answers. Incorrect answers are not erased as they can be used to deepen learners' understanding.
Applying maths in context	✓	Learners solve mass problems in context.

Mathematical vocabulary for this unit

Be sure to teach and use the following vocabulary at the appropriate place in the unit. It is a good idea to make flashcards of words and their meanings and to display these in the classroom at appropriate times.

Refer to the bilingual dictionary where necessary.

Term	Explanation / diagram
analogue scale	Measuring scale that has a face which is marked so that you can read a measurement. A hand marks the mass on the face of the scale. Learners must know that the small marks/calibrations tell them $\frac{1}{10}$ kg = 100 g. Example: This scale used to measure mass in kilograms and grams. 
approximate	A measure that is near enough to the exact answer.
backwards	In reverse of the usual way; back to the starting point. Example: When you count backwards in whole numbers, the numbers get smaller: 10, 9, 8, 7, …
balance scale	Scale which is used to measure mass by allowing the comparison of masses in two scale pans. Examples:  
calculate	Find the answer. Work out the solution.
compare	To look for similarities or differences. Example: You can compare the masses of objects using words like heavier than and lighter than.
digital scale	Scale in which measurement is shown in numbers rather than on a dial. 

Term	Explanation / diagram
estimate	An "educated guess" not just a wild guess; judge the amount without measurement or calculation. Example: We can estimate the mass of objects.
forwards	Going towards the front; moving away from the starting point. Example: When you count forwards in whole numbers the numbers get bigger.
gram	Metric unit of measurement of mass. The abbreviation for gram is g. The mass of 1 g is the same everywhere in the world. One gram is very light. 1 000 grams = 1 kilogram and 1 gram = $\frac{1}{1000}$ kg 1 millilitre of water has a mass of almost exactly 1 gram.
heavy, heavier, heaviest	Objects which have a great mass are heavy. The heaviest object (of a group of objects) is the one with the greatest mass. Example: The car is heavy, the taxi is heavier, the truck is the heaviest
kilogram	Standard metric unit of mass. The abbreviation for kilogram is kg. The mass of 1 kg is the same everywhere in the world. 1 litre of water has a mass of almost exactly 1 kilogram. 'Kilo' at the beginning of the word means '1 000'.
light, lighter, lightest	Objects which have a small mass are light. The lightest object (of a group of objects) is the one with the smallest mass. Example: The pen is light, the button is lighter, and the feather is the lightest.
mass	The amount of matter that an object is made up of. Example: A chicken has a greater mass than a biscuit.
measure	To find the size or amount of something. This can only be done for things that can be measured. Example: You can measure the mass of a table.
measurement	The measure of the size of something. You can get measurements of lots of different things. Example: The measurement of the mass of a 9-year old child is about 28 kg.
order	To sort; to put things in order of size. Example: You can sort objects according to their mass.

Term	Explanation / diagram
scale or graduated markings	Little lines or markings at fixed intervals that define the relation between the units being used.
scale	The measuring tool used for determining the mass of an object is also called a scale.  Example: The markings (or scale) calibrations on this bathroom scale show kilograms.
standard unit	The formal unit of measurement; units that are agreed by everyone. Example: The kilogram is the standard unit of measurement of mass.

Further practice for learners

This table references other sources (including textbooks) if you need additional activities. Note: These references are for the **Grade 6** Learner and Teacher materials.

	Fabulous	Oxford Headstart	Oxford Successful	Platinum	Premier	Sasol Inzalo	Solutions for All	Study & Master	Viva
LB	220-224	257-262	216-221	160-165	184-191	297-305	254-262	254-258	177-182
TG	181-183	302-309	177-181	127-132	96-99	345-354	212-217	343-351	90-92

UNIT PLAN AND OVERVIEW FOR UNIT 4: Mass

LP	Lesson objective Learners will be able to:	Lesson Resources Learners need classwork books, LABs, writing materials, rulers and scissors for all lessons.	Date completed
18	estimate the mass of items in grams, and use different measuring scales to measure mass in grams	Teacher Resources: Bathroom scale and kitchen scale (analogue and / or digital as available) A3 poster: *Some instruments for measuring mass* Learner Resources: None	
19	convert units of mass and know that there are 1 000 g in 1 kg	Teacher Resources: Bathroom scale and kitchen scale (analogue and/ or digital as available) A3 poster: *Grams and kilograms* Learner Resources: None	
20	solve mass problems which involve the operations of addition and subtraction	Teacher Resources: A3 poster: *Grams and kilograms* Learner Resources: None	
21	solve mass problems which involve the operations of multiplication and division	Teacher Resources: A3 poster: *Grams and kilograms* Learner Resources: None	
22	revise and consolidate mass	Teacher and Learner Resources: Textbooks (if available)	

Assessment for learning
Use the template provided at the beginning of this guide to think deeply about at least one of the lessons in this unit.

Reflection
Think about and make a note of: *What went well? What did not go well? What did the learners find difficult or easy to understand or do? What will you do to support or extend learners? Did you complete all the work set for the unit? If not, how will you get back on track?*

What will you change next time? Why?

Lesson 18: Measuring mass in grams

Teacher's notes
This lesson is one of the fully planned lessons to be used to cover the Term 4 curriculum. CAPS topics: Measurement: Mass Lesson Objective: Learners will be able to estimate the mass of items in grams and use different measuring scales to measure mass in grams. Lesson Vocabulary: graduated markings (or scale), grams, interval, mass, scale Teacher Resources: bathroom scale and kitchen scale (analogue and / or digital as available); A3 poster: *Some instruments for measuring mass* Learner Resources: None
Date: Week Day

1 MENTAL MATHS (5 MINUTES)

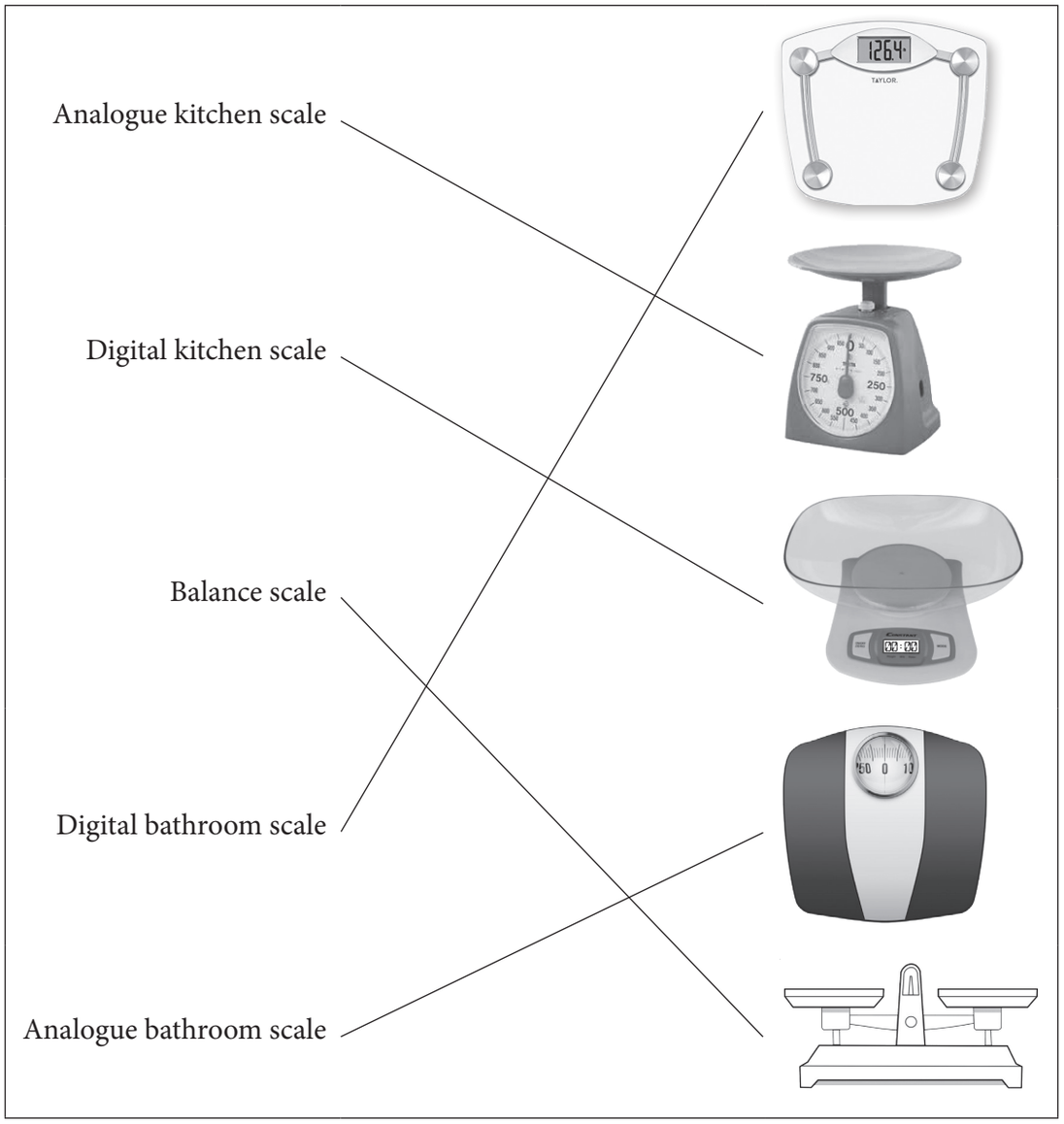
Draw a line to match the item with the estimate of its mass

Item			Estimated mass
1	 R2		35 g
2	 Packet of biscuits		500 g
3	 Small packet of chips		1 000 g
4	 Butter		6g
5	 Big Bag of mealie meal		200 g

2 LINK TO GRADE 3 (5 MINUTES)

- Refer learners to the activity in the LAB.

Match the name of the scale with the drawing.



3 CORRECT HOMEWORK ACTIVITY

This is the first lesson in this unit. There is no homework to correct.

4 LESSON CONTENT – CONCEPT DEVELOPMENT (40 MINUTES)

This is the first of five lessons on mass.

In Grade 3
- learners worked with kilograms and grams
- they learned that there are 1 000 g in a kg but did not convert between kilograms and grams
- they read mass on numbered lines of a scale only.

What is new in Grade 4:
- reading mass off scales where not all the lines are numbered, with 2, 4, 5 and 10 marks equally spaced between numbered lines
- converting between grams and kilograms
- working with masses with up to 2 decimal places.

In this lesson, learners read the mass, in grams, of items placed on a kitchen scale.

Say: **Today we are learning to read the mass (in grams) off different scales.**

Activity 1: Learners work in pairs

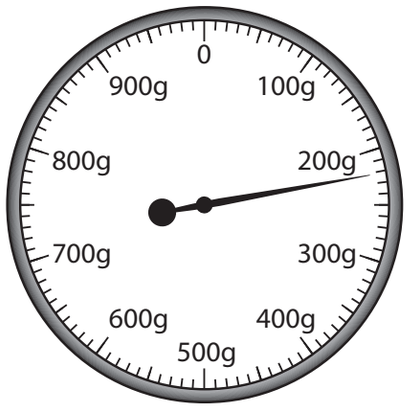
Say: **Complete Activity 1 in your LAB.**

- Read through Activity 1 with learners. Make sure that learners understand what they should do.
- Walk around the classroom to support learners as needed.
- Correct Activity 1 with learners so that they can receive immediate feedback.
- Answers are given below.

Work with your partner.

Look at the analogue kitchen scale.

The kitchen scale has a circular number line.



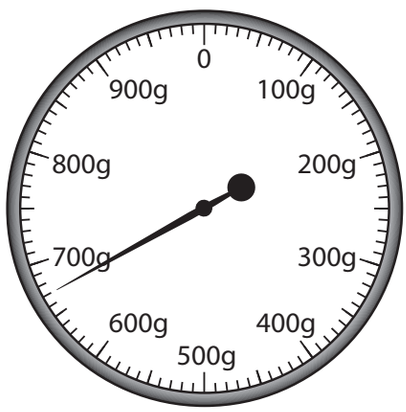
1 Discuss how you would work out how many grams are represented by each small line between 0 and 100 g. Write down how you worked this out.

(100 g is divided into 10 equal parts, or intervals. 100 g ÷ 10 = 10 g)

Answer: Each small line represents (10 g)

2 What is the mass shown on the kitchen scale? (220 g)

3 Use an arrow to show a mass of 670 g on the kitchen scale.



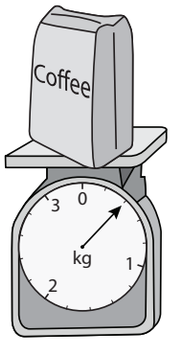
Activity 2: Learners work in pairs

Say: **Complete Activity 2 in your LAB.**

- Read through Activity 2 with learners. Make sure that learners understand what they should do.
- Walk around the classroom to support learners as needed.
- Correct Activity 2 with learners so that they can receive immediate feedback.
- Answers are provided below.

Work with your partner
Read the mass of each object off the kitchen scales.

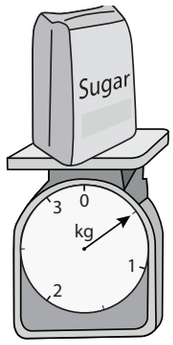
1



a How many grams are represented by each interval? (200 g)

b What is the mass of the coffee? (400 g)

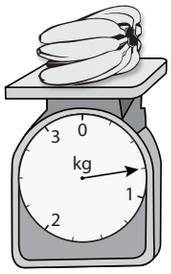
2



a How many grams are represented by each interval? (500 g)

b What is the mass of the sugar? (500 g)

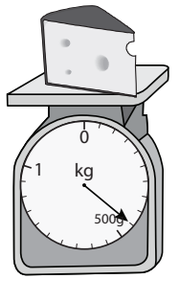
3



a How many grams are represented by each interval? (250 g)

b What is the mass of the bananas? (750 g)

4



a How many grams are represented by each interval? (50 g)

b What is the mass of the cheese? (450 g)

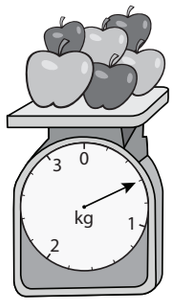
Activity 3: Learners work on their own

Say: **Complete Activity 3 in your LAB.**

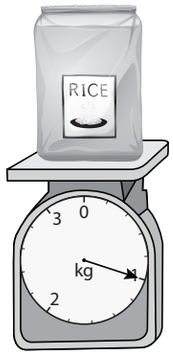
- Read through Activity 3 with learners. Make sure that learners understand what they should do.
- Walk around the classroom to support learners as needed.
- Correct Activity 3 with learners so that they can receive immediate feedback.
- Answers are provided below.

Work on your own.
Draw an arrow to show the mass on each kitchen scale.

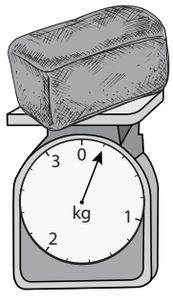
1 The apples have a mass of 600 g



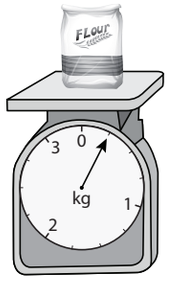
2 The rice has a mass of 1 000 g



3 The bread has a mass of 200 g



4 The flour has a mass of 250 g



5 HOMEWORK ACTIVITY (5 MINUTES)

- Explain what learners need to do for homework.
- Read the question in the LAB with learners. Make sure all the learners understand what to do.
- Answers are provided below.

Give the mass shown on each kitchen scale.

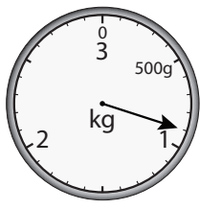
Scale 1

Answer: (500 g)

Scale 2

Answer: (100 g)

Scale 3



Answer: (900 g)

6 REFLECTION AND SUMMARY OF LESSON (5 MINUTES)

Call the whole class to attention and summarise the key concepts of the lesson.

Say: **Today we have learnt to use a kitchen scale to read the mass of objects in grams.**

Lesson 19: Grams and kilograms

Teacher's notes
This lesson is one of the fully planned lessons to be used to cover the Term 4 curriculum. CAPS topics: Measurement: Mass Lesson Objective: Learners will know that there are 1 000 g in a kg and will be able to convert units of mass. Lesson Vocabulary: gram (g), kilogram (kg), mass Teacher Resources: Bathroom scale and kitchen scale (analogue and / or digital as available) A3 poster: *Grams and kilograms* Learner Resources: None
Date: Week Day

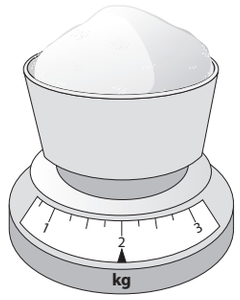
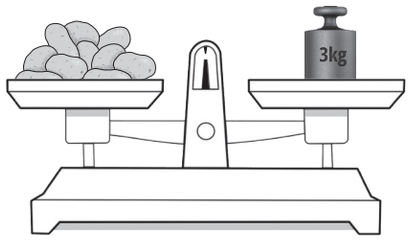
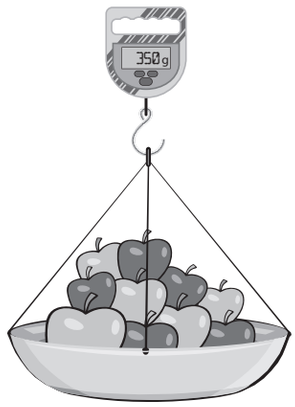
1 MENTAL MATHS (5 MINUTES)

Draw a line to match the object with the closest estimate of its mass.

		Answer
1	The mass of a small dog	3 grams
		3 kilograms
		30 grams
		30 kilograms
2	The mass of a pencil	6 grams
		6 kilograms
		60 grams
		60 kilograms
3	The mass of a fridge	14 grams
		14 kilograms
		140 grams
		140 kilograms
4	The mass of a teacher's table	15 grams
		15 kilograms
		150 grams
		150 kilograms
5	The mass of a cow	700 kilograms
		7 grams
		70 kilograms
		700 grams

2 LINK TO PREVIOUS LESSON (5 MINUTES)

- Refer learners to the activity in the LAB.

1 What is the mass of the sugar being measured? (2 kg)	
2 What is the mass of the potatoes being measured? (3 kg)	
3 What is the mass of the apples being measured? (350 g)	

3 CORRECT HOMEWORK ACTIVITY (5 MINUTES)

The answers to the Homework Activity for Lesson 18 are provided in Lesson 18.
Use this time to purposefully address gaps in learners' knowledge and to identify and address learner errors.

4 LESSON CONTENT – CONCEPT DEVELOPMENT (35 MINUTES)

Learners use measuring instruments to find the mass of objects in kilograms. They also convert between grams and kilograms.

Say: **Today we will be working out how many grams there are in a kg and will learn how to convert units of mass.**

Activity 1: Learners work in pairs

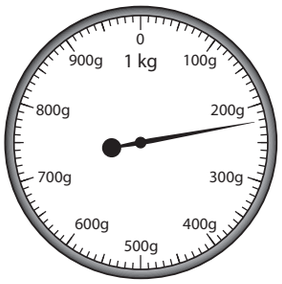
- You will need: A3 poster: *Grams and kilograms*

Say: **Complete Activity 1 in your LAB.**

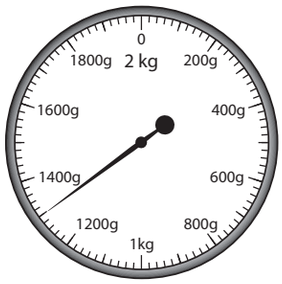
- Read through Activity 1 with the learners.
- Allow the learners to work with their partner on the Activity.
- Walk around the classroom to support learners as needed.
- Correct Activity 1 with learners so that they can receive immediate feedback.
- Suggested answers are given below.

Work with your partner.

Look at the two scales below. Discuss how you can use the information on the scales to work out how many grams there are in a kilogram.



A



B

1 Write down how you worked out how many grams there are in a kilogram.

(Look at the small lines and the matching labels.

From scale A we can see that the numbers go up in 100 g steps. The next label after 900 g would be 1 000 g, which is labelled 1 kg, so we know that there are 1 000 g in 1 kg.

From scale B we can see that the numbers go up in 200 g steps. The next label after 800 g would be 1 000 g, which is labelled as 1 kg, so we know that there are 1 000 g in 1 kg.)

2 Complete this clue card:

1 kg = (1 000) g

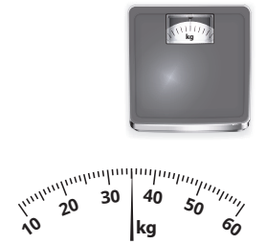
Activity 2: Learners work on their own

Say: **Complete Activity 2 in your LAB.**

- Read through Activity 2 with learners. Make sure that learners understand what they should do.
- Walk around the classroom to support learners as needed.
- Correct Activity 2 with learners so that they can receive immediate feedback.
- Answers are provided below.

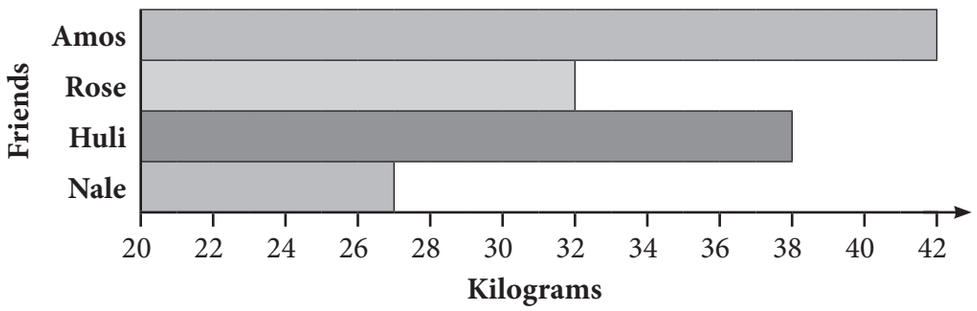
Work on your own.

1 Bongi measured her mass.



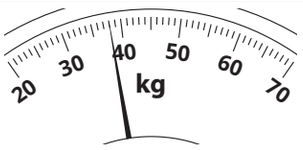
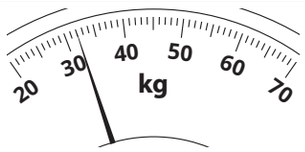
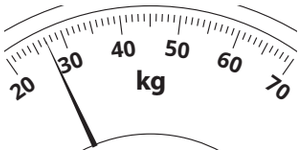
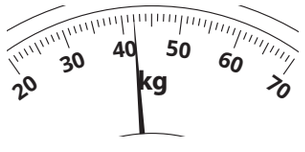
- **a** What measuring instrument did she use? (a bathroom scale)
- **b** How many intervals are there between 10 kg and 20 kg? (10)
- **c** What does each interval represent? (1 kg)
- **d** What is Bongi's mass? (35 kg)

2 Four friends draw a bar graph of their masses:



Read the masses shown on the graph.

Write the mass next of the scale showing the measurement and the name of the person who has that mass.

A  Person: (Huli) Mass: (38 kg)	B  Person: (Rose) Mass: (32 kg)
C  Person: (Nale) Mass: (27 kg)	D  Person: (Amos) Mass: (42 kg)

Activity 3: Learners work on their own

Say: **Complete Activity 3 in your LAB.**

- Display the poster: *Grams and kilograms* in the classroom. Refer learners to the poster.
- Read through Activity 3 with learners. Make sure that learners understand what they should do.
- Do Question **1 a** with learners.
- Walk around the classroom to support learners as needed.
- Correct Activity 3 with learners so that they can receive immediate feedback.
- Answers are provided below.

Work on your own
You may use the conversion table to help you.
The thick line shows the position of the decimal comma.

1 Write each mass in grams only.

Example: 1 kg and 300 g = 1 300 g			**kg**			**g**
a 3 kg = (3 000 g)			3	0	0	0
b 6 kg and 500 g = (6 500 g)			6	5	0	0
c 2 kg and 50 g = (2 050 g)			2	0	5	0
d 1 kg and 5 g = (1 005 g)			1	0	0	5
e 11 kg and 327 g = (11 327 g)		1	1	3	2	7

2 Write each mass in kilograms and grams.

Example: 5 200 g = 5 kg and 200 g			**kg**			**g**
a 2 000 g = (2 kg)			2	0	0	0
b 1 500 g = (1 kg and 500 g)			1	5	0	0
c 8 200 g = (8 kg and 200 g)			8	2	0	0
d 15 000 g = (15 kg)		1	5	0	0	0
e 470 000 g = (470 kg)	4	7	0	0	0	0

3 Convert each mass.

Example: 3 300 g = 3,3 kg			**kg**			**g**
a 2 500 g = (2,5) kg			2	5	0	0
b 7 200 g = (7,2) kg			7	2	0	0
c 1,6 kg = (1 600) g			1	6	0	0
d 0,4 kg = (400) g			0	4	0	0
e 10 kg = (10 000) g		1	0	0	0	0
f 900 g = (0,9) kg			0	9	0	0

5 HOMEWORK ACTIVITY (5 MINUTES)

- Explain what learners need to do for homework.
- Do Question 1 with learners.
- Read the question in the LAB with learners. Make sure all the learners understand what to do.
- Answers are provided below.

Write each mass in kilograms.

1 4 000 g = (4 kg)
2 2 000 g = (2 kg)
3 6 000 g = (6 kg)
4 10 000 g = (10 kg)

6 REFLECTION AND SUMMARY OF LESSON (5 MINUTES)

Call the whole class to attention and summarise the key concepts of the lesson.

Say: **Today we have learnt about one kilogram and how to work out how many grams there are in a kilogram.**

Lesson 20: Solving mass problems (1)

Teacher's notes		
This lesson is one of the fully planned lessons to be used to cover the Term 4 curriculum. CAPS topics: Measurement: Mass Lesson Objective: Learners will be able to solve mass problems which involve the operations of addition and subtraction. Lesson Vocabulary: gram, kilogram, mass, Teacher Resources: A3 poster: *Grams and kilograms* Learner Resources: None		
Date:	Week	Day

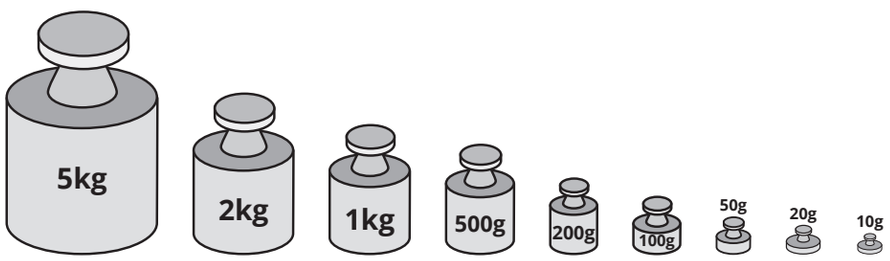
1 MENTAL MATHS (5 MINUTES)

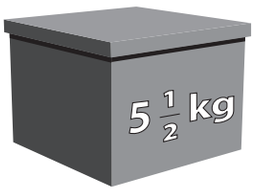
	Question	Answer
1	Convert 1,5 kg to g	1 500 g
2	Convert 2,8 kg to g	2 800 g
3	Convert 10 kg to g	10 000 g
4	Convert 3,2 kg to g	3 200 g
5	Convert 0,6 kg to g	600 g
6	Convert 1000 g to kg	1 kg
7	Convert 800 g to kg	0,8 kg
8	Convert 1 200 g to kg	1,2 kg
9	Convert 2 500 g to kg	2,5 kg
10	Convert 400 g to kg	0,4 kg

2 LINK TO PREVIOUS LESSON (5 MINUTES)

- Refer learners to the activity in the LAB.

Tshidi wants to find out how many of the smaller mass pieces would add up to the mass of the box, the packet and the book.
She wants to use as few smaller mass pieces as possible.



a	Box 	Mass pieces with the same mass as the box = (5 kg + 500 g) (Other answers are possible such as 2 kg + 2 kg + 500 g OR 1 kg + 1 kg + 1 kg + 1 kg + 1 kg + 100 g + 100 g + 100 g + 100 g + 100 g)
b	Packet 	Mass pieces with the same mass as the packet = (500 g + 200 g + 100 g + 20 g) (Other answers are possible)
c	Book 	Mass pieces with the same mass as the book = (2 kg + 20 g + 20 g) (Other answers are possible)

UNIT 4

3 CORRECT HOMEWORK ACTIVITY (5 MINUTES)

The answers to the Homework Activity for Lesson 19 are provided in Lesson 19.
Use this time to purposefully address gaps in learners' knowledge and to identify and address learner errors.

4 LESSON CONTENT – CONCEPT DEVELOPMENT (35 MINUTES)

Learners solve mass problems which require addition and subtraction. Problems are designed to include whole numbers, mass stated in whole numbers and decimal fractions and the conversion of units of mass.

Say: **Today we are learning to solve problems involving mass.**

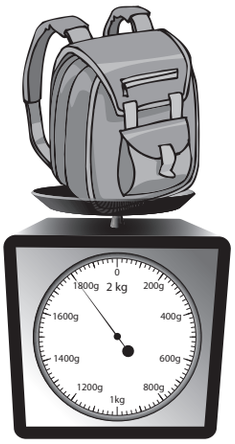
Activity 1: Learners work in pairs

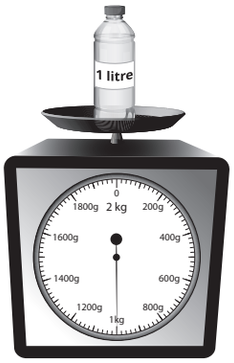
Say: **Complete Activity 1 in your LAB.**

- Read through Activity 1 with learners. Make sure that learners understand what they are being asked to do. Do not tell learners how to do the Activity, rather let them discuss the questions and work out their own strategies.
- Walk around the classroom to support learners as needed.
- Correct Activity 1 with learners so that they can receive immediate feedback.

Work with your partner

1 Look at the two scales.
Calculate the mass of the backpack with the bottle of water inside.





a What is the mass of the backpack? (1 800 g or 1,8 kg)

b What is the mass of the bottle of water? (1 kg)

c What is the mass of the backpack with the bottle of water inside?
(1 800 g + 1 kg = 1 kg 800 g + 1 kg = 2 kg 800 g OR 1,8 kg + 1 kg = 2,8 kg)

d Write the answer in kilograms: The mass of the bag and the water is (2,8 kg)

2 An empty bowl is put on a kitchen scale. Its mass is recorded and then fruit was put into the bowl. The mass of the bowl when it is empty is 175 g.
What is the mass of the fruit in the bowl?

a Write the number sentence:
(347 g – 175 g = ☐ g)

b Do the calculation.

	$^{2}\not{3}$	$^{1}4$	7
–	1	7	5
	1	7	2

c Write the answer: (The mass of the fruit is 172 g)

Activity 2: Learners work in pairs

Say: **Complete Activity 2 in your LAB.**

- Read through Activity 2 with learners. Make sure that learners understand what they should do.
- Walk around the classroom to support learners as needed.
- Correct Activity 2 with learners so that they can receive immediate feedback.
- Answers are provided below.

Work with your partner.

1 **a** Gogo needs 2,8 kg of flour to bake bread.
She has 1,2 kg of white flour and 500 g brown flour.
How much more flour does Gogo need?

Write 500 g in kg: (500 g = 0,5 kg)

Amount of flour that Gogo has = (1,2 kg + 0,5 kg = 1,7 kg)

Amount of flour that Gogo still needs = (2,8 kg – 1,7 kg = 1,1 kg)

Answer: Gogo still needs (1,1) kg flour

b The flour is sold in 500 g packets.
How many packets of flour must Gogo buy?

Write the answer to **a** in grams: (1,1 kg = 1 100 g)

Answer: (If Gogo buys 2 packets of flour, she gets 1 000 g which is not enough flour.
If Gogo buys 3 packets of flour she gets 1 500 g which is more than she needs.
Gogo must buy 3 packets of flour and will have 400 g flour left over.)

2 Kedimo has a mass of 38 kg 600 g.
He is going to travel on an aeroplane.
His hand luggage (the luggage he can take on the aeroplane) must have a mass of 7 kg or less.
He held his hand luggage in his hand and stood on a bathroom scale.
The reading on the scale was 46 kg 200 g.

a Find the mass of the hand luggage.

Convert the measurements to grams
(38 kg 600 g = 38 000 g + 600 g = 38 600 g
46 kg 200 g = 46 000 g + 200 g = 46 200 g

Number sentence that describes the problem: (46 200 g – 38 600 g = ☐)
Do the calculation:

	3	15			
	~~4~~	~~6~~	$^{1}2$	0	0
–	3	8	6	0	0
		7	6	0	0

Give the answer: The mass of the hand luggage was (7 600 g)

b Should Kedimo take some things out of his hand luggage? Give a reason for your answer.

The hand luggage is 7 600 g and he is only allowed 7 kg = 7 000 g.

He should take some things out of his hand luggage as it is too heavy.

c If you answered yes to question **b** what mass should he take out of his hand luggage?

Mass he must take out (7 600 g – 7 000 g = 600 g)

Give the answer: (Kedimo must take 600 g = 0,6 kg out of his hand luggage)

Activity 3: Learners work on their own

Say: **Complete Activity 3 in your LAB.**

- Read through Activity 3 with learners. Make sure that learners understand what they should do.
- Walk around the classroom to support learners as needed.
- Correct Activity 3 with learners so that they can receive immediate feedback.
- Answers are provided below.

Work on your own

Calculate the following and write your answers in kilograms.

1 3 kg 250 g + 18,5 kg

Write the two masses in grams:

(3 kg 250 g = 3 000 g + 250 g = 3 250 g)

(18,5 kg = 18 000g + 500g = 18 500 g)

	1				
		3	2	5	0
+	1	8	5	0	0
	2	1	7	5	0

Answer:
(21 750 g = 21 kg 750 g = 21,75 kg)

2 232 kg 350 g + 214 kg 900 g

Write the two masses in grams:

(232 kg 350 g = 232 000 g + 350 g
= 232 350 g)

(214 kg 900 g = 241 000g + 900g
= 241 900 g)

			1			
	2	3	2	3	5	0
+	2	1	4	9	0	0
	4	4	7	2	5	0

Answer:
(447 250 g = 447 kg 250 g = 447,25 kg

3 45 kg 360 g – 7,5 kg

Write the two masses in grams:

(45 kg 360 g = 45 000 g + 360 g
= 45 360 g)

(7,5 kg = 7 000g + 500g = 7 500 g)

		14			
	$^{3}\cancel{4}$	$\cancel{5}$	$^{1}3$	6	0
-		7	5	0	0
	3	7	8	6	0

Answer: (37 kg 860 g = 37,86 kg)

4 16,5 kg – 9 kg 200 g

Write the two masses in grams:

(16,5 kg = 16 000 g + 500 g = 16 500 g)

(9 kg 200 g = 9 000g + 200g = 9 200 g)

	$^{0}\cancel{1}$	$^{1}6$	5	0	0
-		9	2	0	0
		7	3	0	0

Answer: (7 kg 300 g = 7,3 kg)

UNIT 4

5 HOMEWORK ACTIVITY (5 MINUTES)

- Explain what learners need to do for homework.
- Read the question in the LAB with learners. Make sure all the learners understand what to do.
- Answers are provided below.

Calculate 2 kg 250 g + 1,75 kg and write the answer in kilograms

Write the two masses in grams:

(2 kg 250 g = 2 000 g + 250 g = 2 250 g)

(1,75 g = 1 kg + 750 g = 1 000 g + 750 g = 1 750 g)

	1	1		
	2	2	5	0
+	1	7	5	0
	4	0	0	0

Answer: (4 000 g = 4 kg)

Calculate 6 kg 350 g – 2,6 kg and write the answer in kilograms.

Write the two masses in grams:

(6 kg 350 g = 6 000 g + 350 g = 6 350 g)

(2,6 kg = 2 kg + 600 g = 2 000 g + 600 g = 2 600 g)

	$^{5}\cancel{6}$	$^{1}3$	5	0
–	2	6	0	0
	3	7	5	0

Answer: (3 750 g = 3 kg 750 g = 3,75 kg)

6 REFLECTION AND SUMMARY OF LESSON (5 MINUTES)

Call the whole class to attention and summarise the key concepts of the lesson.

Say: **Today we have learnt how to solve mass problems where we needed to add or subtract to find the answer and where we need to convert units of mass before we add or subtract so that we work with the same units.**

Lesson 21: Solving mass problems (2)

Teacher's notes
This lesson is one of the fully planned lessons to be used to cover the Term 4 curriculum.
CAPS topics: Measurement: Mass
Lesson Objective: Learners will be able to solve mass problems which involve the operations of multiplication and division.
Lesson Vocabulary: approximate, gram, kilogram, mass,
Teacher Resources: A3 poster: *Grams and kilograms*
Learner Resources: None
Date: Week Day

1 MENTAL MATHS (5 MINUTES)

Question		Answer	Question		Answer
Convert to grams:			**Convert to kilograms and grams**		
1	2 kg	2 000 g	**6**	3 500 g	3 kg 500 g
2	4,2 kg	4 200 g	**7**	9 999 g	9 kg 999 g
3	10 kg	10 000 g	**8**	28 700 g	28 kg 700 g
4	$1\frac{1}{2}$ kg	1 500 g	**9**	6,2 kg	6 kg 200 g
5	51,3 kg	51 300 g	**10**	74,1 kg	74 kg 100 g

2 LINK TO PREVIOUS LESSON (5 MINUTES)

- Refer learners to the activity in the LAB.

1 Calculate 4 kg 6 g + 6,5 kg
Write the answer in kg and g.

Convert both amounts to grams:

(4 kg 6 g = 4 000 g + 6 g = 4 006 g)

(6,5 kg = 6 000g + 500g = 6 500 g)

	1				
		4	0	0	6
+		6	5	0	0
	1	0	5	0	6

Answer: (10 506 g = 10 kg 506 g)

2 Calculate 14 kg 350 g - 11 kg 800 g
Write the answer in kg and g.

Convert both amounts to grams:

(14 kg 350 g = 14 000 g + 350 g = 14 350 g)

(11 kg 800 g= 11 000g + 800g = 11 800 g)

	1	$^{3}\not{4}$	$^{1}3$	5	0
–	1	1	8	0	0
		2	5	5	0

Answer: (2 550 g = 2 kg 550 g)

3 CORRECT HOMEWORK ACTIVITY (5 MINUTES)

The answers to the Homework Activity for Lesson 20 are provided in Lesson 20.
Use this time to purposefully address gaps in learners' knowledge and to identify and address learner errors.

4 LESSON CONTENT – CONCEPT DEVELOPMENT (35 MINUTES)

Learners solve mass problems which require multiplication and division. Problems are designed to include whole numbers, mass stated in whole numbers and decimal fractions and the conversion of units of mass.

Say: **Today we are learning to solve problems involving mass.**

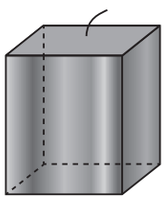
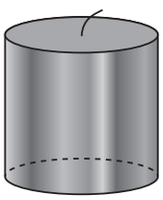
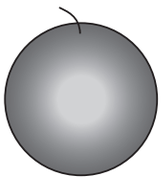
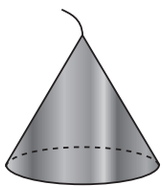
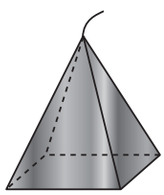
Activity 1: Learners work in pairs

Say: **Complete Activity 1 in your LAB.**

- Read through Activity 1 with learners. Make sure that learners understand what they should do.
- Walk around the classroom to support learners as needed.
- Learners should work in pairs to discuss the problems and strategies they will use to solve the problems.
- Correct Activity 1 with learners so that they can receive immediate feedback.

Work with your partner

Fathima makes and sells these candles:

Candle A	Candle B	Candle C	Candle D	Candle E
				
Mass: 600 g	Mass: 500 g	Mass: 350 g	Mass: 250 g	Mass: 200 g

1 Which candle has half the mass of Candle B?

Half of 500 g = 500 ÷ 2 = 250 g

The mass of Candle (D) is half the mass of Candle B.
(It is fine if learners are able to calculate this mentally and do not show any calculation)

2 How many Candle Bs can Fathima make from 3 kg of wax?

(Possible strategies:
3 kg = 3 000 g
3 000 ÷ 500
= 30 ÷ 5
= 6

OR
500 g makes one of Candle B
1 000 g (= 1 kg) makes two of Candle B
3 000 g makes (3 × 2) = 6 of Candle B)

Answer: Fathima can make (6) of Candle B.

3 The wax is sold in 1 kg packets.
Fathima has an order for 20 of Candle C.
How many kilograms of wax must she buy?

Write the number sentence: (20 × 350 g = ☐ g)

(Possible strategy:
20 × 350 g = (10 × 2) × 350 g = 10 × (2 × 350 g) = 10 × 700 g = 7 000 g = 7 kg)

Answer: (Fathima must buy 7 packets of wax)

Activity 2: Learners work in pairs

Say: **Complete Activity 2 in your LAB.**

- Read through Activity 2 with learners. Make sure that learners understand what they should do.
- Walk around the classroom to support learners as needed.
- Correct Activity 2 with learners so that they can receive immediate feedback.
- Answers are provided below.

Work with your partner
250 g flour is needed to make 20 biscuits

1 How much flour will Hendrik need to make 100 biscuits?

(100 biscuits = (20 + 20 + 20 + 20 + 20) biscuits)
(Or 100 biscuits ÷ 20 biscuits = 5)
(Or 100 biscuits = 5 × 20 biscuits)
(Or Hendrik will need 5 times more flour.)

Flour needed (5 × 250 g = 1 250 g)

2 Flour is sold in 1 kg packets.
How many packets of will Hendrik need to buy to make 100 biscuits?

(Hendrik needs 1 250 g flour = 1,25 kg of flour)

Hendrik needs to buy: (2 packets of flour)

3 How much flour will Hendrik need to make 50 biscuits?

(Hendrik needs 1 250 g flour to make 100 biscuits.
For 50 biscuits he needs 1 250 g ÷ 2 flour

1 250 ÷ 2 = (1 000 ÷ 2) + (200 ÷ 2) + (50 ÷ 2)
= 500 + 100 + 25
= 625)

Hendrik needs (625 g flour) to make 50 biscuits

4 Hendrik has 1,5 kg of flour. How many biscuits can he make?

(1,5 kg flour = 6 × 250 g)
(Or 1 500 g ÷ 250 g = 150 g ÷ 25 g = 6)
(Or 1 500 g = (250 + 250 + 250 + 250 + 250 + 250) g)
(Or, with 1,5 g flour he can make 6 batches of biscuits)

Hendrik can make (6 × 20 biscuits = 120 biscuits)

(Or 250 g flour can make 20 biscuits
500 g flour can make 40 biscuits
1 kg flour can make 80 biscuits
1,5 g can make 120 biscuits)

Activity 3: Learners work on their own

Say: **Complete Activity 3 in your LAB.**

- Read through Activity 3 with learners. Make sure that learners understand what they should do.
- Walk around the classroom to support learners as needed.
- Correct Activity 3 with learners so that they can receive immediate feedback.
- Answers are given below.

Work on your own

1 The mass of one large building brick is 4 kg.
What is the mass of 25 bricks?

The mass of 25 bricks = (25 × 4 kg = 100 kg)

2 A box of matches has a mass of 8 g.
A packet of matches is made from 10 boxes of matches.

Box of matches

a What is the mass of one packet of matches?
Mass of a packet of matches = (10 × 8 g = 80 g)

b How many packets of matches have a mass of 1,6 kg?
Write 1,6 kg in grams: (1,6 kg = 1 600 g)
Number of packets of matches = (1 600 g ÷ 80 g
= 160 g ÷ 8 g
= 20)

Packet of matches

5 HOMEWORK ACTIVITY (5 MINUTES)

- Explain what learners need to do for homework.
- Read the question in the LAB with learners. Make sure all the learners understand what to do.
- Answers are provided.

1 The mass of a bar of soap is 227 g.

What is the mass of 6 bars of soap?

Give the answer in kilograms and grams.

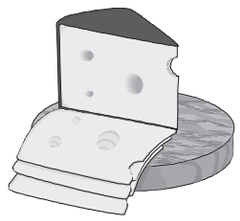
Write the number sentence: (6 × 227 = ☐)

Do the calculation:

		1	4	
		2	2	7
×				6
	1	3	6	2

Answer: The mass of 6 bars of soap is (1 362 g or 1 kg 362 g)

2 The local shop sells 200 g cheese for R15.



a What is the cost of 1 kg cheese?

1 kg = 1 000 g
= 5 × 200 g

The cost of 1 kg cheese = 5 × R15
= R75

	2	
	1	5
×		5
	7	5

b What is the cost of 3 kg cheese?

The cost of 3 kg cheese = 3 × R75
= R225

		1	
		7	5
×			3
	2	2	5

6 REFLECTION AND SUMMARY OF LESSON (5 MINUTES)

Call the whole class to attention and summarise the key concepts of the lesson.

Say: **Today we have learnt to solve mass problems where we have to multiply and divide and where we have to convert units of mass.**

Lesson 22: Consolidation

Teacher's notes		
This lesson allows for consolidation of the unit on mass.		
CAPS topics: Measurement: Mass		
Lesson Objective: Learners will revise and consolidate mass.		
Lesson Vocabulary: gram, kilogram, mass		
Resources: Textbooks (if available)		
Date:	Week	Day

1 NOTES FOR THE TEACHER RELATING TO THIS UNIT'S WORK

The main topic in this unit was mass. Learners concerted units of mass, used measuring instruments to read and measure mass, and used the four operations to solve mass problems.

2. POSSIBLE MISCONCEPTIONS LINKED TO THE WEEK'S WORK

- Learners do not read a scale at eye level.
- Learners often assume that all measuring instruments have 10 unnumbered intervals between numbered intervals.

3 CORRECT HOMEWORK ACTIVITY (5 MINUTES)

The answers to the Homework Activity for Lesson 21 are provided in Lesson 21.
Use this time to purposefully address gaps in learners' knowledge and to identify and address learner errors.

4 CLASSWORK

- You could use this time for learners to complete classwork or homework activities as necessary.
- You could use the Additional Activities from textbooks that you have or use the Consolidation Activity given.

Additional activities for consolidation

Refer to the following table. Select additional activities from the textbook/s you have. Use the answers given in the Teacher's Guide to mark the work.

	Fabulous	Oxford Headstart	Oxford Successful	Platinum	Premier	Sasol Inzalo	Solutions for All	Study & Master	Viva
LB	220-224	257-262	216-221	160-165	184-191	297-305	254-262	254-258	177-182
TG	181-183	302-309	177-181	127-132	96-99	345-354	212-217	343-351	90-92

OR, learners could complete the Consolidation Activity in their LAB.

Consolidation Activity

1 Fill in the missing units:

a The mass of an egg is 55 (g)

b The mass of a child is 32 (kg)

2 **a** How many grams in 1 kg? (1 000)

b How many grams in 4,5 kg? (4 500)

3 Draw a circle around the correct answer.

a The mass of a drawing pin is about:

2 kg (2 g) 200 g

b The mass of the man is about:

(75 kg) 75 g 750 g

4 Mpho bought the following items:

- 2 kg potatoes
- 1 000 g mince
- $1\frac{1}{2}$ kg sugar
- 2 litre bottle of water

1 litre bottle of water has a mass of about 1 kg.

What is the total mass of the items she has to carry?

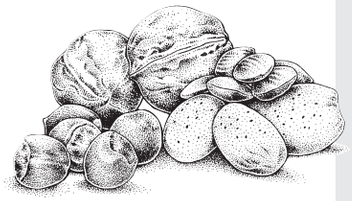
(1 000 g = 1 kg and $1\frac{1}{2}$ kg = 1,5 kg

2 kg + 1 kg + 1,5 kg + 2 kg = 6,5 kg

Answer: (6,5 kg or 6 500 g or $6\frac{1}{2}$ kg)

5 Azwi needs 1 kg of nuts.

She has 250 g cashew nuts, 0,5 kg peanuts and 100 g walnuts.
How many grams of almond nuts must she buy?



Answer:

(Mass of the nuts that Azwi has = 250 g + 0,5 kg + 100 g
= 250 g + 500 g + 100 g
= 850 g)

	2	5	0
	5	0	0
+	1	0	0
	8	5	0

(Mass of almond nuts that Azwi must buy
= 1 kg – 850 g
= 1 000 g – 850 g
= 150 g)

	0	9		
	~~1~~	^{1}~~0~~	^{1}0	0
–		8	5	0
		1	5	0

Answer: Azwi must buy (150 g) almond nuts

6 A tin of coffee has a mass of 375 g.
A box of tea has a mass of 250 g.
How many boxes of tea will have the same mass as 8 tins of coffee?

Answer:

(The mass of 8 tins of coffee = 8 × 375 g
= 3 000 g)

		6	4	
		3	7	5
×				8
	3	0	0	0

(1 000 ÷ 250 = 4.

So, 4 boxes of tea have a mass of 1 000 g or 1 kg

And 3 × 4 boxes of tea = 12 boxes of tea have a mass of 3 000 g)

(12) boxes of tea will have the same mass as 8 tins of coffee

UNIT 4

Unit 5: Properties of 3-D objects

INTRODUCTION

This unit focuses on the properties of 3-D objects. Throughout this unit learners are referred to 3-D objects in concrete form. While these objects are available commercially, it is not necessary to purchase them. You (and your learners) should collect as many 3-D objects in the form of boxes, balls, canisters and tins as you can. Start collecting now!

In this unit, we focus on the four framework dimensions in the following ways:

Framework dimension	How the framework dimension is developed in this unit
Conceptual understanding	In the construction activities, the learners are given opportunities to develop their knowledge and understanding of 2-D shapes and 3-D objects.
Procedural fluency	Learners practise the steps to follow when drawing rectangular prisms and cubes.
Strategic competence	Learners make sensible decisions on which 2-D shapes to use when building specific 3-D objects.
Reasoning	Based on the information available, learners discuss their mathematical ideas to decide how to classify 3-D objects.

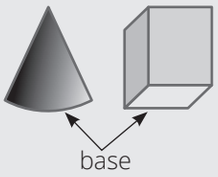
In this unit, we build a **learning centred classroom** by paying attention to:

		Examples
Concept development	✓	The key concepts of 3-D objects are addressed in the unit.
Speaking mathematics	✓	Learners are encouraged to use the vocabulary of 2-D shapes and 3-D objects when they speak about what they are thinking and doing. Learners use terms such edge, face and vertex in order to communicate the properties of 3-D objects effectively.
Practising procedures	✓	Learners follow the steps to draw rectangular prisms and a cubes.
Justifying answers	✓	Learners justify their choice of the 2-D shapes required to build a specific 3-D object by referring to the properties of the 3-D object.
Addressing gaps in learners' knowledge	✓	This unit provides many opportunities to address errors and gaps in learners' knowledge around 2-D shapes and 3-D objects. The activities are designed to support learners as they make connections between 2-D shapes and 3-D objects.
Addressing learners' errors		

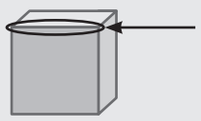
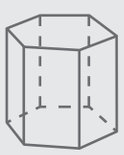
Mathematical vocabulary for this unit

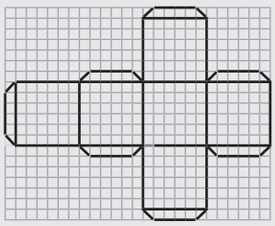
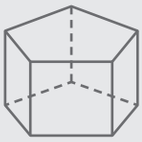
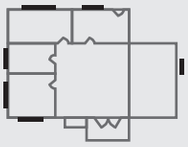
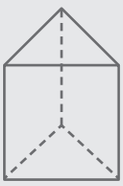
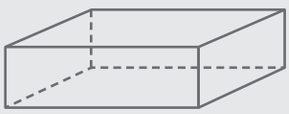
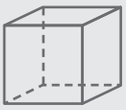
Be sure to teach and use the following vocabulary at the appropriate place in the unit. It is a good idea to make flashcards of words and their meanings and to display these in the classroom at appropriate times.

Refer to the bilingual dictionary where necessary.

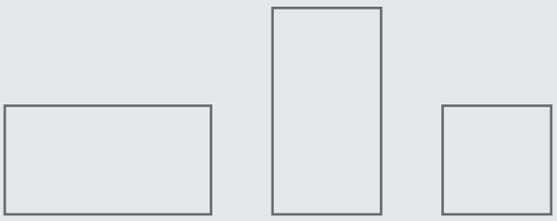
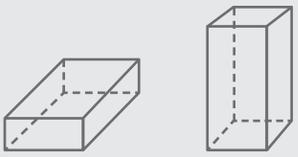
Term	Explanation / diagram
2-D shape	2-D is short for two-dimensional. Two-dimensional shapes are flat shapes They have length and breadth (width) but no thickness (height) 
3-D objects	3-D is short for three-dimensional. Three-dimensional shapes have length, breadth and height. 
apex	In a pyramid or a cone, the apex (or vertex) is the point at the "top" (opposite the base) 
base	The base of a 3-D object is the part on which the object usually stands. 
circle	2-D shape that is completely round 
classify	To divide into groups or types so that things with similar physical characteristics are in the same group.

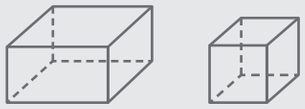
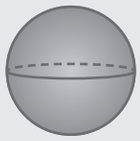
UNIT 5

Term	Explanation / diagram
cone	3-D object with a circular base and a curved surface that tapers to a point called a vertex or apex. 
cube	A prism in which all the faces are square. 
cylinder	3-D object with two flat circular faces and one curved surface. 
dimension	A measurement of size such as length, width, height.
edge	A straight line formed where two faces of a 3-D object meet.  A cube has 12 edges.
face	The flat surfaces of a 3-D object.  A triangular prism has 5 faces.
hexagon	Closed 2-D shape with six straight sides. 
hexagonal prism	A prism with a hexagonal base. It has 8 faces, 18 edges, and 12 vertices. 

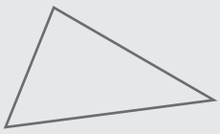
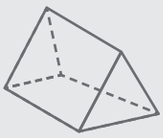
Term	Explanation / diagram
net	A 2-D shape that can be folded to make a 3-D object A net of a cube: 
pentagon	Closed 2-D shape with five straight sides 
pentagonal prism	A prism with a base that is a pentagon. It has 7 faces, 15 edges, and 10 vertices. 
plan (or plan view or top view)	When an object is looked down on from above, what can be seen is the plan or plan view or top view. A plan (or plan view or top view) of a house: 
polygon	Closed 2-D shape made of straight lines. Triangles, rectangles and hexagon are all polygons. A circle is not a polygon.
prism	3-D object with matching ends that are polygons and side faces that are rectangles (or squares which are special rectangles). Prisms are named after the shape of the base.  Triangular Prism  Rectangular Prism  Cube

UNIT 5

Term	Explanation / diagram
property	Facts which are always true about a set of numbers or geometrical shapes. Examples of properties are the number of edges of 3-D objects, the lengths of the sides of 2-D shapes and the sizes of angles
pyramid	3-D object formed by joining the edges of a polygon to a point to form sloping triangular faces.  A square pyramid
quadrilateral	Any closed 2-D shape with four straight sides. The sides do not need to be the same length.  A square, a rectangle and a trapezium are all quadrilaterals.
rectangle	A quadrilateral that has four straight sides and four right angles. The opposite sides of a rectangle are equal. A square is a special type of rectangle. 
rectangular prism	A 3-D object whose six faces are rectangles (or squares, which are special rectangles). 
regular hexagon	Hexagon in which the six straight sides are all the same length and the six angles are the same size. Example: 

Term	Explanation / diagram
regular pentagon	Pentagon in which the five straight sides are all the same length and the five angles are the same size. Example: 
side	Straight or curved line that makes up a triangle, quadrilateral, circle or other 2-D shape
sketch	A drawing that shows the full shape of a 3-D object A sketch of a rectangular prism and a cube: 
sphere	3-D object that is perfectly round The mathematical name for a ball 
square	A closed 2-D shape with four straight sides of equal length and four corners that are right angles 
square-based pyramid	A pyramid with a square base. The side faces are all triangles and they meet at the apex or vertex. 
straight	Without curves This is a straight line: _____
surface	The face of a shape. It has length and breadth but no thickness.

UNIT 5

Term	Explanation / diagram
triangle	A closed 2-D shape with three straight sides 
triangular prism	A prism with triangular ends. The end can be any type of triangle. 
triangular pyramid	A pyramid with a triangular base 
vertex (plural: vertices)	In a pyramid or a cone, the vertex (or apex) is the point at the "top" (opposite the base). 

Further practice for learners

This table references other sources (including textbooks) if you need additional activities.

	Fabulous	Oxford Headstart	Oxford Successful	Platinum	Premier	Sasol Inzalo	Solutions for All	Study & Master	Viva
LB	124-128	137-142	111-114	76-79	84-88	173-180	128-136	149-154	89-93
	225-226	263-266	222-226	166-171	192-194	306-309	263-270	259-263	184-188
	173-174	208-209	162-164	124-127	138-141	250-254	194-196	206-208	133-134
TG	87-90	172-177	112-116	62-65	40-42	191-203	95-98	197-203	49-51
	184-186	309-314	181-184	133-137	100-101	352-354	218-222	352-354	93-95
	136-137	246-248	145-146	99-100	70-71	283-288	157-159	277-281	71-72

UNIT PLAN AND OVERVIEW

The unit builds on learners' knowledge of 3-D objects. The 3-D objects studied in Grade 3 included spheres (ball shapes), prisms (box shapes), cylinders, pyramids and cones.

In Grade 3 learners described, sorted and compared 3-D objects in terms of flat or curved surfaces, and the 2-D shapes that make up the faces of 3-D objects.

What is new in Grade 4 is that learners focus on rectangular prisms, cubes (a special type of rectangular prism), other types of prisms, pyramids, cylinders, cones and spheres. In Grade 4, learners describe, sort and compare 3-D objects in terms of number and shape of faces, number of vertices and number of edges.

There is a lot of practical work in this unit. Start collecting the resources required well in advance.

If necessary, arrange with other Grade 4 teachers at the school to share resources.

UNIT 5: Properties of 3-D objects

LP	**Lesson objective** Learners will be able to:	**Lesson Resources** Learners need classwork books, LABs, writing materials, rulers and scissors for all lessons.	**Date completed**
23	describe 3-D objects (rectangular prisms or cubes) according to the number, shape and size of faces	Teacher Resources: Variety of boxes which are rectangular prisms or cubes A3 poster: *2-D shapes and 3-D objects* A3 poster: *Rectangular prisms and cubes* Learner Resources: A box which is a rectangular prism and a box which is a cube for each group of 4 learners; scrap paper or sheets of newspaper	
24	make a rectangular prism and a cube from cut-out polygons and understand what a net is.	Teacher Resources: dice (if available), A3 poster: *How to build a cube from a net* Learner Resources: the polygons for rectangular prisms and cubes traced in Lesson 23, glue, sticking tape, nets of cubes and cuboids from the back of the LAB	

LP	**Lesson objective** Learners will be able to:	**Lesson Resources** Learners need classwork books, LABs, writing materials, rulers and scissors for all lessons.	**Date completed**
25	use straws and putty (like Prestik) to build a rectangular prism and a cube	Teacher Resources: Cubes and rectangular prisms collected by the teacher; packets of 3 different coloured straws. Learner Resources: Each pair will need: pieces of plastic straws cut to size, reusable putty such as Bostik Prestik Alternative resource suggestions: If straws are not available use matchsticks, toothpicks or small straight sticks. If reusable putty is not available use clay, modelling clay or plasticine	
26	draw sketches of a rectangular prism and a cube	Teacher Resources: three copies of the A3 poster: *Grid paper*, marker pen Learner Resources: sharp pencil, ruler	
27	revise and consolidate the properties of 3-D objects	Teacher and Learner Resources: Grade 4 textbooks, if available	
28	classify prisms, cylinders and spheres	A3 poster: *Spheres* A3 poster: *Some 3-D objects* A3 poster: *Faces, vertices and edges* Flashcards of the following words: 3-D objects, rectangular prism, cube, sphere, triangular prism, hexagonal prism, base, quadrilateral, polygon) Learner Resources: Variety of prisms, cylinders and spheres collected by the teacher and learners	
29	make different prisms using cut out polygons	Teacher Resources: Different prisms that you and the learners have collected A3 poster: *Prisms are named according to the shape of the base* A3 poster: *2-D shapes and 3-D objects* Learner Resources: sticking tape; two pages of 2-D shapes from the back of the LAB	

LP	Lesson objective Learners will be able to:	Lesson Resources Learners need classwork books, LABs, writing materials, rulers and scissors for all lessons.	Date completed
30	make prisms and cylinders using cut out polygons and circles.	Prisms and cylinders collected by teacher and the learners. Learner Resources: polygons and circles from the back of LAB, ruler, sticking tape	
31	describe the properties of a pyramid and a cone and use 2-D shapes to make pyramids and cones	Teacher Resources: Pyramids and cones collected or built up by the teacher, or pictures of pyramids and cones A3 poster: *Pyramids and cones* Learner Resources: Polygons, circles and sectors needed to make pyramids and cones from the back of the LAB, sticking tape	
32	match different views of everyday objects; and identify objects from different views	Teacher and Learner Resources: everyday objects such as teapots, mugs, cups and milk jugs	
33	revise and consolidate the properties of prisms, cylinders, cones and pyramids; the matching of different views of everyday objects; and the identification of objects from different views	Teacher and Learner Resources: Grade 4 textbooks, if available	

Assessment for learning
Use the template provided at the beginning of this guide to think deeply about at least one of the lessons in this unit.

Reflection
Think about and make a note of: *What went well? What did not go well? What did the learners find difficult or easy to understand or do? What will you do to support or extend learners? Did you complete all the work set for the unit? If not, how will you get back on track?*

What will you change next time? Why?

Lesson 23: Rectangular prisms and cubes

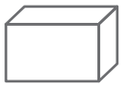
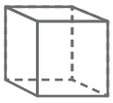
Teacher's notes
This lesson is one of the fully planned lessons to be used to cover the Term 4 curriculum. CAPS topics: Shape and space: Properties of 3-D objects Lesson Objective: Learners will be able to describe 3-D objects (rectangular prisms or cubes) according to the number, shape and size of faces. Lesson Vocabulary: 3-D object, cube, face, rectangular prism, vertex/vertices Teacher Resources: A3 poster: *2-D shapes and 3-D objects;* A3 poster: *Rectangular prisms and cubes.* Learner Resources: 2 empty boxes for each group of 4 learners (one rectangular prism and one cube); scrap paper or sheets of newspaper *A note on the boxes:* *For a class of 32 learners you need 8 rectangular prisms (cereal boxes, tissue boxes, washing powder boxes) and 8 cubes (chalk boxes, some tissue boxes etc.).* *Ask learners to help with collecting the prisms and start collecting well in advance.* *Do not collect very big boxes as learners need to trace around the boxes.*
Date: Week Day

1 MENTAL MATHS (5 MINUTES)

Round off to the nearest cm		**Answer**
1	9,4 cm	9 cm
2	4,8 cm	5 cm
3	6,2 cm	6 cm
4	5,5 cm	6 cm
Round off to the nearest litre		
5	16,9 ℓ	17 ℓ
6	198,6 ℓ	199 ℓ
7	23,1 ℓ	23 ℓ
Round off to the nearest kg		
8	132,4 kg	132 kg
9	19,3 kg	19 kg
10	19,7 kg	20 kg

2 LINK TO GRADE 3 (5 MINUTES)

- Refer learners to the activity in the LAB.
- Discuss and mark the work with learners.

3-D object	Name of 3-D object	Can it roll?	Can it slide?
	(cylinder)	(yes)	(yes)
	(prism)	(no)	(yes)
	(cube)	(no)	(yes)
	(cone)	(yes)	(yes)

3 CORRECT HOMEWORK ACTIVITY

This is the first lesson in this unit. There is no homework to correct.

4 LESSON CONTENT – CONCEPT DEVELOPMENT (40 MINUTES)

- This is the first in a series of nine lessons and two consolidation lessons on 3-D objects.

- In this lesson, learners investigate the properties of rectangular prisms and cubes (which they called boxes in the Foundation Phase) by tracing the faces of these two 3-D objects.

Notes for the teacher on rectangular prisms and cubes:

i. Rectangular prisms and cubes are both 3-D (three-dimensional) objects.
ii. A rectangular prism is a 3-D object which has six faces that are rectangles and/or squares.
iii. A cube is a rectangular prism which has six square identical faces.
iv. A square is a special type of rectangle.
v. A cube is a special type of rectangular prism.

Say: **Today we are learning about the properties of rectangular prisms and cubes.**

Activity 1: Learners work in pairs

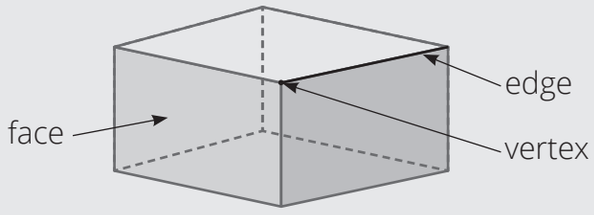
- Stick up the A3 poster: *2-D shapes and 3-D objects.*

- Each pair of learners will need an empty box (either a cube or a rectangular prism).

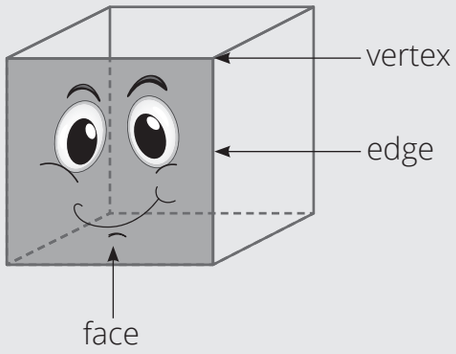
- Say: **Look at the box I have given you.**
  We call this a 3-D object because it has three dimensions: length, breadth and height.

- Say: **Move your hand over a *face* of the 3-D object.**
  How many faces does your 3-D object have? (6 faces)
  (To make sure that they count all the faces, learners can stick a small ball of Prestik or draw a cross on each face as they count it.)

(NOTE: These diagrams are given in the LAB for the learners to refer to.)



- Say: **Point to a *vertex*.**
  We use the word vertex when we talk about one corner. We use the word *vertices* when we talk about more than one corner.
  How many *vertices* does your 3-D object have? (8 vertices)
  (To make sure they count all the vertices, learners can stick a small ball of Prestik on each vertex.)



- Say: **Run your finger along an *edge* of your 3-D object.**
  How many *edges* does your 3-D object have? (12 edges)
  (To make sure they count all the edges, learners can stick a small ball of Prestik on each edge.)

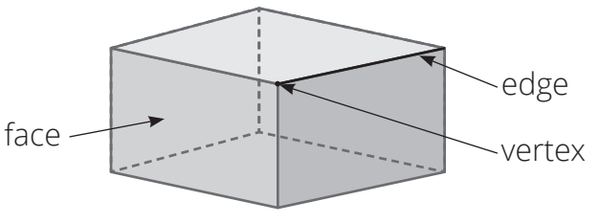
- Point to the 2-D shapes and then the 3-D objects on the A3 poster and make sure the learners know the difference between the two.

Say: **Complete Activity 1 in your LAB. Use your 3-D objects to help you.**

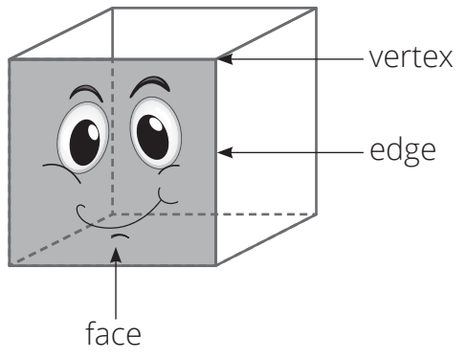
- Read through Activity 1 with learners. Make sure that learners understand what they should do.
- Walk around the classroom to support learners as needed.
- Correct Activity 1 with learners so that they can receive immediate feedback.

- Answers are given below.

Work with your partner to answer the following questions.



Rectangular Prism



Square Prism or Cube

1 How many vertices do each of these 3-D shapes have? (8 vertices)

2 How many faces do each of these 3-D shapes have? (6 faces)

3 How many edges do each of these 3-D shapes have? (12 edges)

UNIT 5

Activity 2: Learners work in a group of 4 and then work in pairs

- The learners need two empty boxes per group of 4: one must be a cube and the other must be a rectangular prism. (These are the same boxes as the ones used in Activity 1.) Each pair needs one of the boxes for question 1 and the other box for question 2.

- Stick up the A3 poster: *Rectangular Prisms and Cubes.*
  Use the poster to remind the learners of the difference between a rectangular prism and a cube (or square prism).

Say: **Complete Activity 2 in your LAB.**

- Read through Activity 2 with learners. Make sure that learners understand what they should do.
- Walk around the classroom to support learners as needed.
- Make sure that learners swap boxes correctly.
- Correct Activity 2 with learners so that they can receive immediate feedback.
- Answers are provided below.
- Tell learners to keep their traced polygons for use in next lesson.

Work with your partner

1 • Use the first box your teacher has given you.
- Work on the scrap paper your teacher has given you.
- Trace each face of the box on a piece of paper to find out how many faces of the same shape your box has.

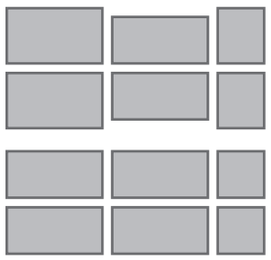
SOLUTION:

The learners should end up with one of the following:

If the box is a *cube*, the learners should discover that:

- the box has 6 faces
- each face has the same shape which is a square.

If the box is a *rectangular prism*, the learners should discover that each box has 6 faces that are either squares or rectangles.



- Some rectangular prisms have three pairs of different identical rectangles as faces.
- Other rectangular prisms have 2 faces the same shape and size and four faces that are another shape and size (often 2 identical square faces and 4 identical rectangular faces).

2 • Swap boxes with the other pair in your group.

- Work on the scrap paper your teacher gave you.
- Trace each face of the box on a piece of paper to find out how many faces of the same shape your new box has.

SOLUTIONS: See the solutions to **1**.

Activity 3: Learners work in groups of 4

- Each group of 4 will need the cube and the rectangular prism they used in Activity 3.

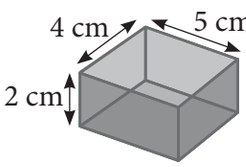
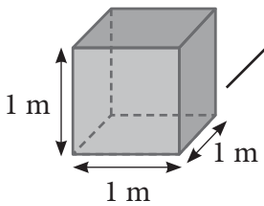
Say: **Complete Activity 3 in your LAB.**

- Read through Activity 3 with learners. Make sure that learners understand what they should do.
- Walk around the classroom to support learners as needed.
- Correct Activity 3 with learners so that they can receive immediate feedback.
- Answers are provided below.

Work in a group of 4

Look carefully at the poster and the 2 boxes your teacher gave you.

Complete the table by drawing a line to match the prism with the description.

Prism	Description
	Rectangular prism with 3 pairs of different rectangular faces. Each pair of rectangular faces is the same size and shape.
	Cube with 6 faces that are identical squares
	Rectangular prism with two square faces that are the same size and 4 rectangular faces that are the same size.

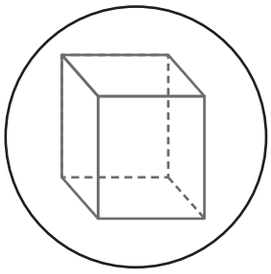
UNIT 5

5 HOMEWORK ACTIVITY (5 MINUTES)

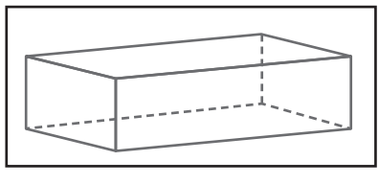
- Explain what learners need to do for homework.
- Read the question in the LAB with learners. Make sure all the learners understand what to do.
- Answers are provided below.

Draw a rectangle around each rectangular prism and a circle around each cube.

1



2



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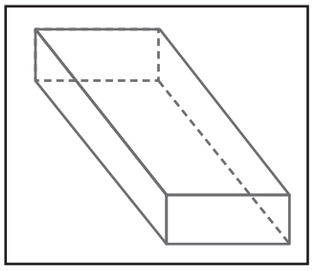

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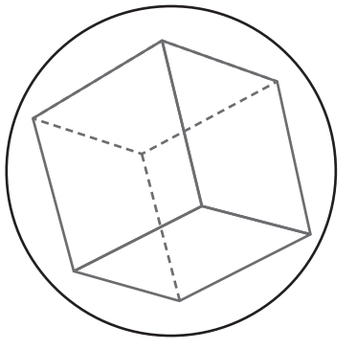

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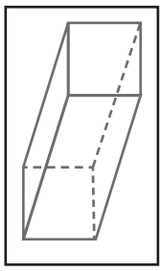
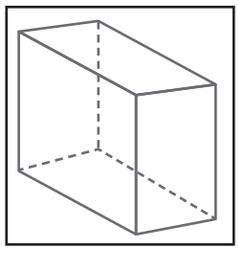


6



6 REFLECTION AND SUMMARY OF LESSON (5 MINUTES)

Call the whole class to attention and summarise the key concepts of the lesson.

Say: **Today we have learnt about the properties of rectangular prisms and cubes.**

Lesson 24: Make rectangular prisms and cubes (1)

Teacher's notes
This lesson is one of the fully planned lessons to be used to cover the Term 4 curriculum. CAPS topics: Shape and space: Properties of 3-D objects Lesson Objective: Learners will be able to make a rectangular prism and a cube from cut-out polygons and understand what a net is. Lesson Vocabulary: net, polygon, rectangular prism, vertex/vertices Teacher Resources: dice (if available), A3 poster: *How to build a cube from a net* Learner Resources: The polygons for rectangular prisms and cubes that the learners traced in Activity 3 in Lesson 23, scissors, glue, sticking tape, nets of cubes and rectangular prisms from the back of the LAB.
Date: Week Day

1 MENTAL MATHS (5 MINUTES)

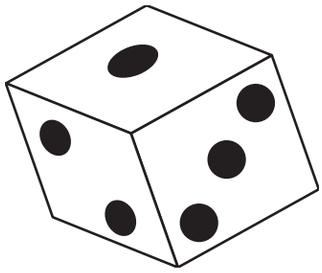
Convert to litres		Answer
1	1 000 mℓ	1 ℓ
2	500 mℓ	0,5 ℓ or $\frac{1}{2}$ ℓ
3	250 mℓ	0,25 ℓ or $\frac{1}{4}$ ℓ
4	15 ℓ and 600 mℓ	15,6 ℓ
5	13 ℓ and 40 mℓ	13,04 ℓ
Convert to millilitres		
6	3 ℓ	3 000 mℓ
7	$\frac{1}{4}$ ℓ	250 mℓ
8	2 ℓ 110 mℓ	2 110 mℓ
9	6 ℓ 500 mℓ	6 500 mℓ
10	6 ℓ 60 mℓ	6 060 mℓ

2 LINK TO PREVIOUS LESSON (5 MINUTES)

- Refer learners to the activity in the LAB.
- Mark the work with learners once they have finished the activity.

A dice is a special rectangular prism because all the faces are squares of exactly the same size.

1 Give another name for a special rectangular prism which has faces that are squares of exactly the same size. (cube)
2 What is the shape of each face of a dice? (square)
3 How many faces does a dice have? (6)
4 How many edges does a dice have? (12)
5 How many vertices does a dice have? (8)



3 CORRECT HOMEWORK ACTIVITY (5 MINUTES)

The answers to the Homework Activity for Lesson 23 are provided in Lesson 23.
Use this time to purposefully address gaps in learners' knowledge and to identify and address learner errors.

4 LESSON CONTENT – CONCEPT DEVELOPMENT (35 MINUTES)

- In this lesson, learners use cut out polygons and nets to make a rectangular prism or a cube.
  - This practical activity will contribute to the development of their knowledge of the properties of rectangular prisms and cubes.
  - It provides the learners with the opportunity to investigate the following properties of rectangular prisms and cubes: number of faces, edges and vertices; shape and size of faces; and length of edges.

- These properties will be consolidated in Lesson 25.

Say: **Today we are learning to use cut out polygons and nets to make a rectangular prism and a cube.**

Activity 1: Learners work in pairs

- Stick up the A3 poster: *How to build a cube from a net* in the classroom

- Each pair of learners will need the polygons they traced in Lesson 23, a ruler, pair of scissors, sticky tape

Say: **Complete Activity 1 in your LAB.**

- Read through Activity 1 with learners. Make sure that learners understand what they should do.
- Make sure that each pair of learners has the resources they need

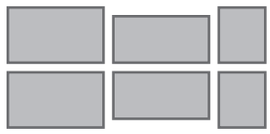
- Walk around the classroom to support learners as needed.
- There are no answers as this is a practical activity.
- Learners should store their rectangular prisms safely in the classroom as they will use them in the next lesson.

Work with your partner

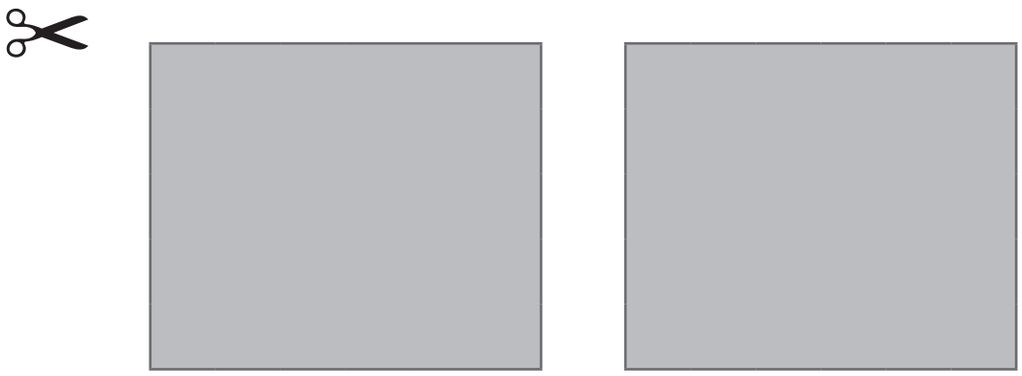
Build a rectangular prism by following the following steps:

1 Use the faces of a rectangular prism you traced in Lesson 23.

OR



2 Carefully cut out each face.

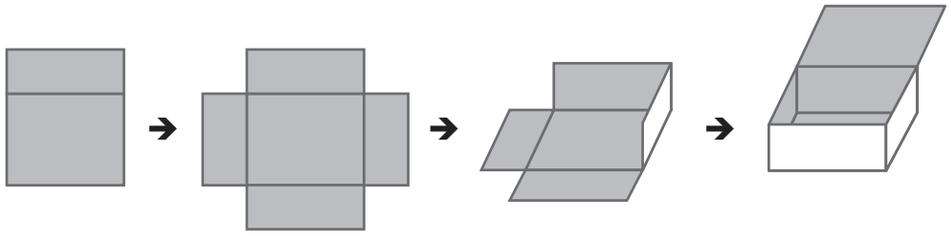


3 Make the box by taping the faces together.

SOLUTION:

This is a practical activity

- Allow the learners to use trial and error to make their box.
- Check that learners' rectangular prisms look something like the following:

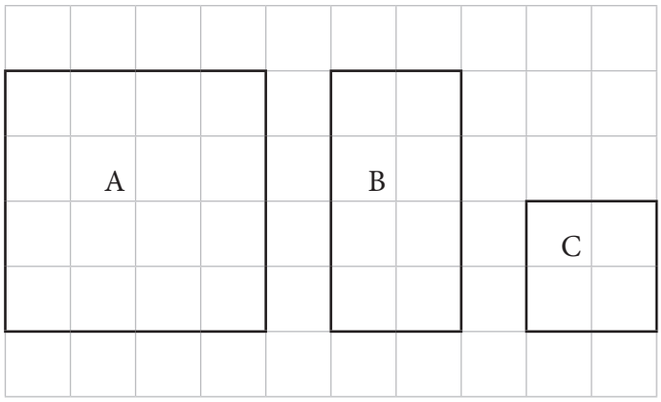


Activity 2: Learners work on their own

- Explain to the learners what they need to do.
- Read the question in the LAB with learners. Make sure all the learners understand what to do.
- Answers are provided below.

Work on your own.

Look at the three 2-D shapes shown:



Name the 3-D object that you would build if you used:

1 two of shape A and four of shape B (rectangular prism)
2 four of shape B and two of shape C (rectangular prism)
3 six of shape C. (cube)

Activity 3: Learners work in pairs

- Each pair of learners will need an empty box that is a rectangular prism or a cube.

- Say, as you hold up an empty box:
  - **This box, which is a 3-D object was made from a flat sheet of cardboard.**
  - **Carefully open up and flatten out your box so that you can see the 2-D shape that was used to build the 3-D shape.**
  - **The flat sheet must be in one piece.**

- Say, as you point to the piece of cardboard: **The 2-D shape that we use to make a 3-D object is called a *net*.**

- Refer the learners to the A3 poster: *How to build a cube from a net.*

5 HOMEWORK ACTIVITY (5 MINUTES)

- Say: **It is easier to build a 3-D object from a net than from separate polygons.**

- Say: **For homework you are going to build a cube and a rectangular prism from nets.**

- Make sure that learners understand what they should do.
- Tell learners that they can find the net of a cube and a rectangular prism at the back of their LAB.
- No answers are provided as this is a practical activity.
- Learners should bring their objects safely to the school as they will use them in the next lesson.

Build the cube and the rectangular prism from the two nets given in Lesson 24 at the back of the LAB..

6 REFLECTION AND SUMMARY OF LESSON (5 MINUTES)

Call the whole class to attention and summarise the key concepts of the lesson.

Say: **Today we have learnt to use cut out polygons to make a rectangular prism and a cube.**
We know that rectangular prisms and cubes and their nets have 6 faces.

Lesson 25: Make rectangular prisms and cubes (2)

Teacher's notes
This lesson is one of the fully planned lessons to be used to cover the Term 4 curriculum.
CAPS topics: Shape and space: Properties of 3-D objects
Lesson Objective: Learners will be able to use straws and Prestik to build a rectangular prism and a cube.
Lesson Vocabulary: cube, rectangular prism, 3-D object, 2-D shape, vertex/vertices
Teacher Resources: Cubes and rectangular prisms collected by the teacher (some prisms with all faces rectangles and other with squares and rectangles as faces), packets of three different coloured straws (enough for all pairs of learners)
Learner Resources: Each pair will need enough pieces of plastic straw to build models, reusable putty such as Bostik Prestik, pairs of scissors
Alternative resource suggestions: If straws are not available use matchsticks, toothpicks, or small straight sticks. If the reusable putty is not available use clay, modelling clay, or plasticine.
Date: Week Day

1 MENTAL MATHS (5 MINUTES)

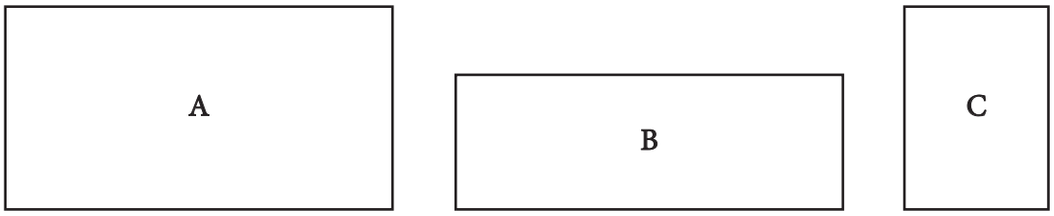
	Convert	Answer
1	5 cm = _____ mm	50 mm
2	20 cm = _____ mm	200 mm
3	460 mm = _____ cm	46 cm
4	500 cm = _____ m	5 m
5	9 m = _____ cm	900 cm
6	2,5 m = _____ cm	250 cm
7	31 m = _____ cm	3 100 cm
8	650 cm = _____ m	6,5 m
9	68 mm = _____ cm	6,8 cm
10	1,4 cm = _____ mm	14 mm

2 LINK TO PREVIOUS LESSON (5 MINUTES)

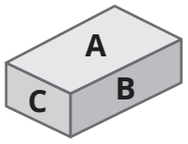
- Refer learners to the activity in the LAB.
- Mark the work with learners.

Work with your partner

Thloriso has two cut-outs of each rectangle:



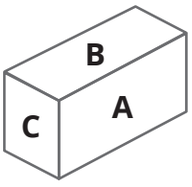
He sticks the cut-outs together and ends up with rectangular prism 1.



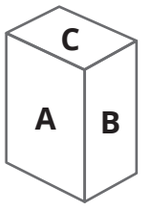
Rectangular prism 1

He then used the cut-outs to make two more rectangular prisms.

On each of these rectangular prisms, write down which cut-out was used for each of the faces shown.



Rectangular prism 2



Rectangular prism 3

UNIT 5

3 CORRECT HOMEWORK ACTIVITY (5 MINUTES)

- For homework in Lesson 24 the learners were asked to build a cube and a rectangular prism from two given nets.
- Learners are expected to bring their 3-D objects to class and show them to their partner. If the learners didn't bring the objects, tell them to bring them the next day.

4 LESSON CONTENT – CONCEPT DEVELOPMENT (35 MINUTES)

- In this lesson learners make models of a rectangular prism and a cube. This practical activity will contribute to the development of their knowledge of the properties of rectangular prisms and cubes.

- The importance of a model is that it is a representation of something. Learners need to understand that the straws represent the edges of the 3-D object and the balls of Bostik Prestik represent the vertices.
- Model building provides the learners with the opportunity to investigate the following properties of rectangular prisms and cubes: number of faces, edges, and vertices; the shape and size of faces; and the length of edges.

Say: **Today we are learning to use straws and Bostik Prestik to make a cube and a rectangular prism. We will also revise the properties of rectangular prisms and cubes.**

Activity 1: Learners work in pairs

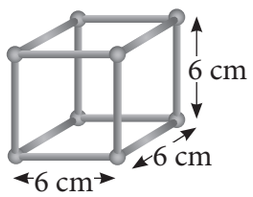
- For this activity each pair of learners will need 6 pieces of a plastic straw, reusable putty such as Bostik Prestik and a pair of scissors. Most plastic straws are at least 20 cm, so you can cut three × 6 cm pieces from one straw.

Say: **Complete Activity 1 in your LAB.**

- Read through Activity 1 with learners. Make sure that learners understand what they should do.
- Give each pair of learners the resources they need.
- Walk around the classroom to support learners as needed. Ensure that learners use the resources economically.
- Check learners' models so that they can receive immediate feedback.

Work with your partner.
You need 6 pieces of plastic straw that are 6 cm long and some balls of putty.
You also need the cube you made in the last lesson.

1 Use the straws and Bostik Prestik to build a cube with pieces of straw.
The completed cube should look like this:



2 Summarise what you used to build your cube by completing this table:

	Answer
Length of each piece of straw	(6 cm)
Number of pieces of straw needed	(12)
Number of balls of Bostik Prestik needed	(8)

3 Use the model of this cube and the cube you made in the last lesson to complete the table.

Properties of a cube			
Number of edges	Number of vertices	Number of faces	Shape of faces
(12)	(8)	(6)	(square)

4 Complete each sentence by circling the correct word:

a In my model, the straws represent the (edges) / faces / vertices of the cube.

b In my model, the balls of Bostik Prestik represent the edges / faces / (vertices) of the cube.

Activity 2: Learners work in pairs

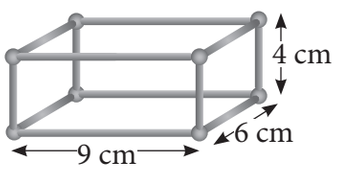
- Each pair of learners will need four straws that are 9 cm long, four straws that are 6 cm long and four straws that are 4 cm long. If possible, try to have a different colour for each length, e.g. the 9 cm pieces could be transparent, the 6 cm pieces could be black, and the 4 cm pieces could be blue.
- They will also need reusable putty such as Bostik Prestik.

Say: **Complete Activity 2 in your LAB.**

- Read through Activity 2 with learners. Make sure that learners understand what they should do.
- Give each pair of learners the resources they need. Prepare enough pieces of each length for the class. Learners must use 'trial and error' to build up a rectangular prism.
- Walk around the classroom to support learners as needed.
- Check learners' models so that they can receive immediate feedback.
- *Note: teachers must show rectangular-based prism and a square-based rectangular prism as rectangular prisms to learners. Learners must distinguish a cube and a square-based rectangular prism.*

Work with your partner.
You need 12 pieces of plastic straw (four that are 9 cm long; four that are 6 cm long and four that are 4 cm long) and some balls of putty.
You also need the rectangular prism that you made in the last lesson.

1 Use the straws and Bostik Prestik to build a rectangular prism that looks like this:



UNIT 5

2 Summarise what you used to build your rectangular prism by completing this table:

	Answer
Number of pieces of straw needed	4 × (9) cm; 4 × (6) cm; 4 × (4) cm
Number of balls of Bostik Prestik needed	(8)

3 Use the model of this rectangular prism and the rectangular prism you made in the last lesson to complete the table.

Properties of this rectangular prism			
Number of edges	Number of vertices	Number of faces	Shape of faces
(12)	(8)	(6)	(rectangles)

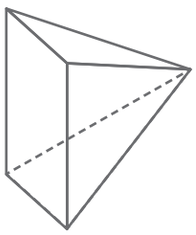
4 Compare the properties of a cube and a rectangular prism.

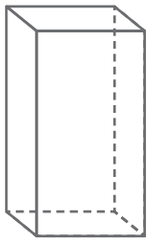
	Properties			
	Number of edges	**Number of vertices**	**Number of faces**	**Shape of faces**
A cube	(12)	(8)	(6)	(square)
A rectangular prism	(12)	(8)	(6)	(rectangles or sometimes rectangles and squares)

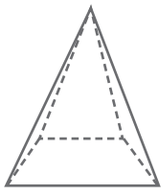
5 HOMEWORK ACTIVITY (5 MINUTES)

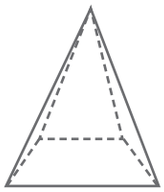
- Explain what learners need to do for homework.
- Read the question in the LAB with learners. Make sure all the learners understand what to do.
- Answers are provided below.

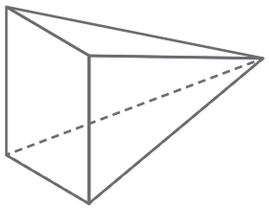
Which drawings below show a rectangular prism? (2, 6, 7, 8)

1 

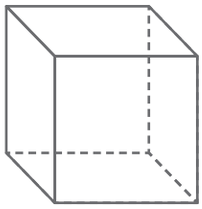
2 

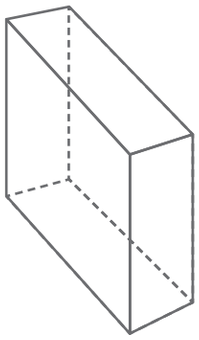
3 

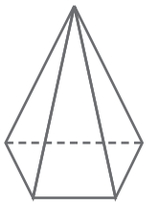
4 

5 

6 

7 

8 

9 

6 REFLECTION AND SUMMARY OF LESSON (5 MINUTES)

Call the whole class to attention and summarise the key concepts of the lesson.

Say: **Today we have learnt to use straws and Bostik Prestik to make a rectangular prism or a cube.**

We know that:

- **rectangular prisms and cubes have 12 edges**
- **rectangular prisms and cubes have 8 vertices**
- **all the faces in a cube are squares**
- **the faces in a rectangular prism can be squares or rectangles.**

Lesson 26: Draw a rectangular prism and a cube

Teacher's notes		
This lesson is one of the fully planned lessons to be used to cover the Term 4 curriculum.		
CAPS topics: Shape and space: Properties of 3-D objects		
Lesson Objective: Learners will be able to draw sketches of a rectangular prism and a cube.		
Lesson Vocabulary: cube, rectangular prism, sketch, vertex/vertices		
Teacher Resources: 3 copies of the A3 poster: *Grid paper* and a marker pen		
Learner Resources: sharp pencil, ruler		
Date:	Week	Day

1 MENTAL MATHS (5 MINUTES)

	Convert	Answer
1	3 kg = _____ g	3 000 g
2	20 kg = _____ g	20 000 g
3	4,5kg = _____ g	4 500 g
4	0,8 kg = _____ g	800 g
5	2 $\frac{3}{4}$ kg = _____ kg and _____ g	2 kg and 750 g
6	1 000 g = _____ kg	1 kg
7	16 000 g = _____ kg	16 kg
8	4 700 g = _____ kg and _____ g	4 kg and 700 g
9	8 500 g = _____kg	8,5 kg or 8 $\frac{1}{2}$ kg
10	250 g = _____ kg	0,25 kg or $\frac{1}{4}$ kg

2 LINK TO PREVIOUS LESSON (5 MINUTES)

- Refer learners to the activity in the LAB.
- Mark the work with learners.

Work on your own

State whether the following are true or false.
If false, re-write the sentence to make it true.

1 A cube is a special type of rectangular prism. (True)
2 All rectangular prisms have 12 flat faces.
(False. All rectangular prisms have 6 flat faces.)
3 Rectangular prisms have more edges than cubes have.
(False. Rectangular prisms and cubes have the same number of edges.)

3 CORRECT HOMEWORK ACTIVITY (5 MINUTES)

The answers to the Homework Activity for Lesson 25 are provided in Lesson 25.

Use this time to purposefully address gaps in learners' knowledge and to identify and address learner errors.

4 LESSON CONTENT – CONCEPT DEVELOPMENT (35 MINUTES)

- In this lesson, learners draw sketches of rectangular prisms and cubes on grid paper. This will help them to consolidate the properties of these 3-D objects.

- It is important to remember the following when drawing a sketch:
  - a sketch is a drawing that shows the full shape of a 3-D object
  - the foreground lines should be solid lines
  - the 'background' lines which are drawn to show the three-dimensional nature of the object should be dotted lines.

Say: **Today we are learning to sketch rectangular prisms and cubes on grid paper.**

Activity 1: Learners work in pairs

- You need: A3 poster: *Grid paper* and a marker pen

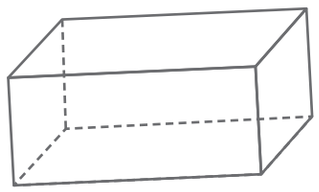
- Say: **A figure which shows the full shape of an object is called a *sketch*.**

Say: **Complete Activity 1 in your LAB.**

- Work through the activity, step-by-step with learners.
  As you read each step, draw it on the grid paper on the board and then get learners to draw it on the grid paper in their LAB.
  Note: if you are not confident with drawing the sketches, you need to practise drawing sketches on your own grid paper as preparation for the lesson.
- Walk around the classroom to support learners as needed.
- Correct Activity 1 with learners so that they can receive immediate feedback.

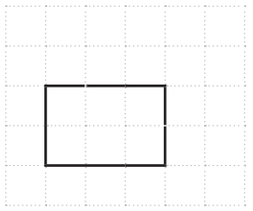
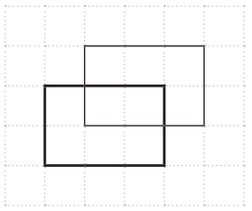
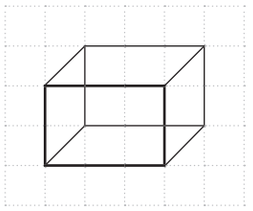
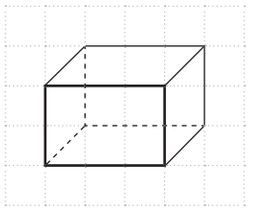
Work on your own

Put your own rectangular prism in front of you to look at.

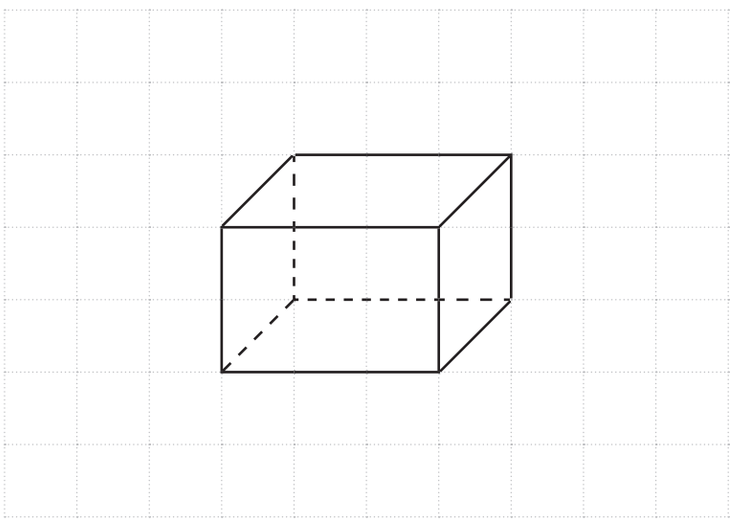


Follow the steps to draw a sketch of a rectangular prism on the grid below. The front face is 3 cm by 2 cm.

Work with a sharp pencil. Draw light lines because you need to change some of them to dotted lines later.

Step 1	Step 2	Step 3	Step 4
Draw the front face	Draw the back face the same size as the front face. Place it slightly to the right (or left) of the front face	Join the matching vertices of the two faces	Use dotted lines to show the faces that can't be seen
			

Draw your rectangular prism here:



(Check that the solid lines and dotted lines are correct.)

Activity 2: Learners work on their own

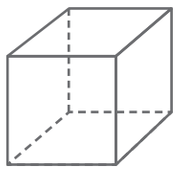
- You will need the A3 poster: *Grid paper* and a marker pen.

Say: **Complete Activity 2 in your LAB.**

- Read through Activity 2 with learners. Make sure that learners understand what they should do.
- Allow learners time to complete the activity. Walk around the classroom to support learners as needed.
- Correct Activity 2 with learners so that they can receive immediate feedback.
- Answers are provided below.

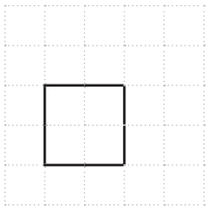
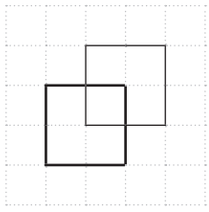
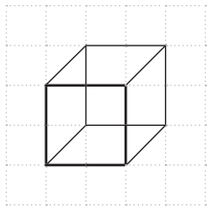
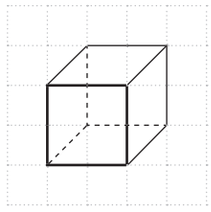
Work on your own

Put your own cube in front of you to look at.

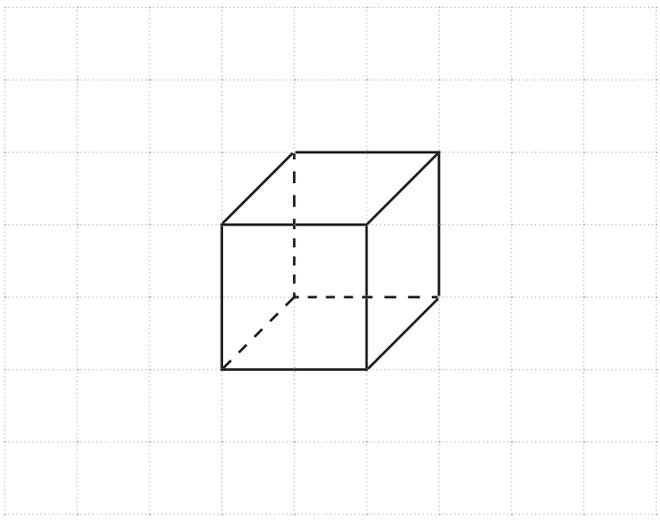


Follow the steps to draw a sketch of a cube on the grid paper below. The front face is 2 cm by 2 cm.

Work with a sharp pencil. Draw light lines because you need to change some of them to dotted lines later.

Step 1	Step 2	Step 3	Step 4
Draw the front face	Draw the back face the same size as the front face. Place it slightly to the right (or left) of the front face	Join the matching vertices of the two faces	Use dotted lines to show the faces that can't be seen
			

Draw your rectangular prism here:



(Check that the solid lines and dotted lines are correct.)

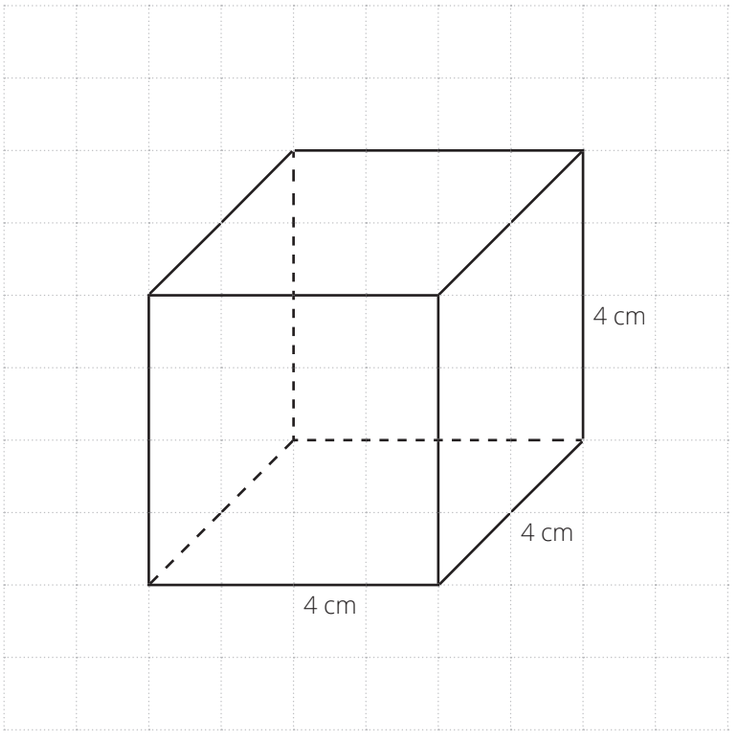
5 HOMEWORK ACTIVITY (5 MINUTES)

- Explain what learners need to do for homework.
- Read the question in the LAB with learners. Make sure all the learners understand what to do.
- The answer is provided below.

Work on the grid paper.

Draw a cube that is 4 cm × 4 cm × 4 cm.

Write the measurement on the diagram.



(Check that the solid lines and dotted lines are correct, and that the edge lengths are shown.)

6 REFLECTION AND SUMMARY OF LESSON (5 MINUTES)

Call the whole class to attention and summarise the key concepts of the lesson.

Say: **Today we have learnt to sketch rectangular prisms and cubes.**

We know that:

- **a sketch is a drawing that shows the full shape of a 3-D object**
- **the solid lines in a sketch show the edges that are visible**
- **the dotted lines in a sketch show the 'background' edges.**

Lesson 27: Consolidation

Teacher's notes		
This lesson allows for consolidation of the properties of rectangular prisms and cubes.		
CAPS topics: Shape and space: Properties of 3-D objects		
Lesson Objective: Learners will revise and consolidate the properties of 3-D objects.		
Lesson Vocabulary: cube, edge, face, rectangular prism, sketch, vertex/vertices,		
Resources: Grade 4 Learner's Books and Teacher's Guides (if available)		
Date:	Week	Day

1 NOTES FOR THE TEACHER RELATING TO THIS UNIT'S WORK

So far in this unit, we have focussed on the properties of rectangular prisms and cubes.

2 POSSIBLE MISCONCEPTIONS LINKED TO THE UNIT'S WORK

Some learners struggle to distinguish between three-dimensional objects and the two-dimensional shapes that make up its faces. An effective way of addressing this is to use concrete objects. All real objects are three dimensional.

3 CORRECT HOMEWORK ACTIVITY (5 MINUTES)

The answers to the Homework Activity for Lesson 26 are provided in Lesson 26.
Use this time to purposefully address gaps in learners' knowledge and to identify and address learner errors.

4 CLASSWORK

- You could use this time for learners to complete classwork or homework activities, as necessary.
- You could use the Additional Activities from textbooks that you have or use the Consolidation Activity given.

Additional activities for consolidation
Refer to the following table. Select additional activities from the textbook/s you have.

Use the answers given in the Teacher's Guide to mark the work and provide feedback.

	Fabulous	Oxford Headstart	Oxford Successful	Platinum	Premier	Sasol Inzalo	Solutions for All	Study & Master	Viva
LB	124-128	137-142	111-114	76-79	84-88	173-180	128-136	149-154	89-93
	225-226	263-266	222-226	166-171	192-194	306-309	263-270	259-263	184-188
	173-174	208-209	162-164	124-127	138-141	250-254	194-196	206-208	133-134
TG	87-90	172-177	112-116	62-65	40-42	191-203	95-98	197-203	49-51
	184-186	309-314	181-184	133-137	100-101	352-354	218-222	352-354	93-95
	136-137	246-248	145-146	99-100	70-71	283-288	157-159	277-281	71-72

OR, learners could complete the Consolidation Activity in their LAB.

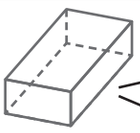
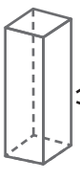
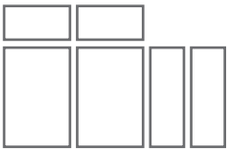
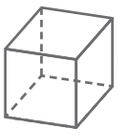
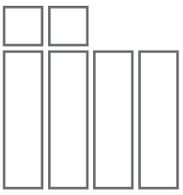
Consolidation Activity

1 Complete these two sentences:

a A 3-D object with faces that are rectangles or rectangles and squares is called a (rectangular prism).

b A 3-D object with faces that are all squares is called a (cube).

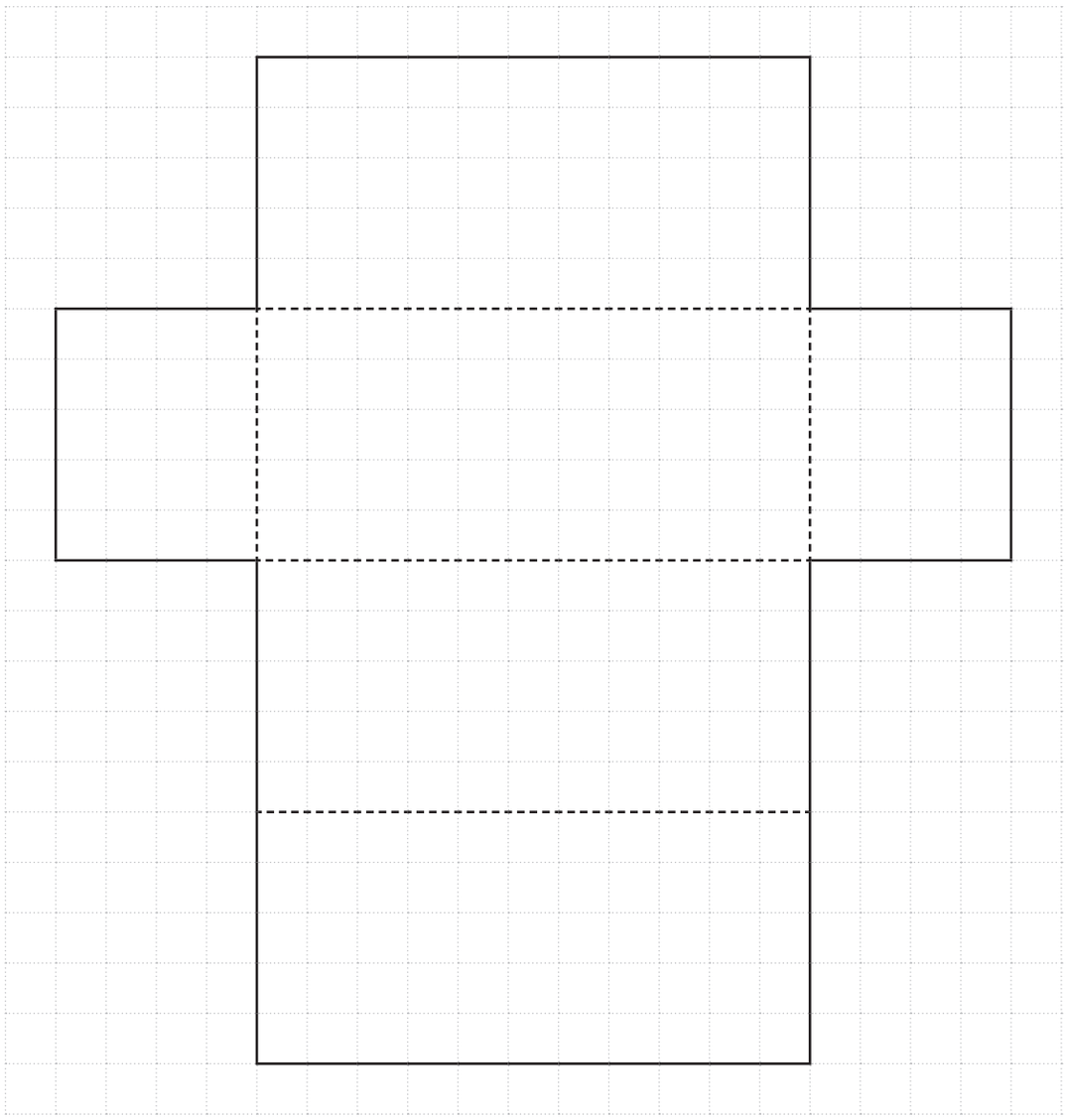
2 Match the 3-D object with the correct name and the correct drawing of the polygons which can be used to make the 3-D object.

3-D object	Name	Polygons which make the 3-D object
	rectangular prism	
	cube	
		

3 Complete the table:

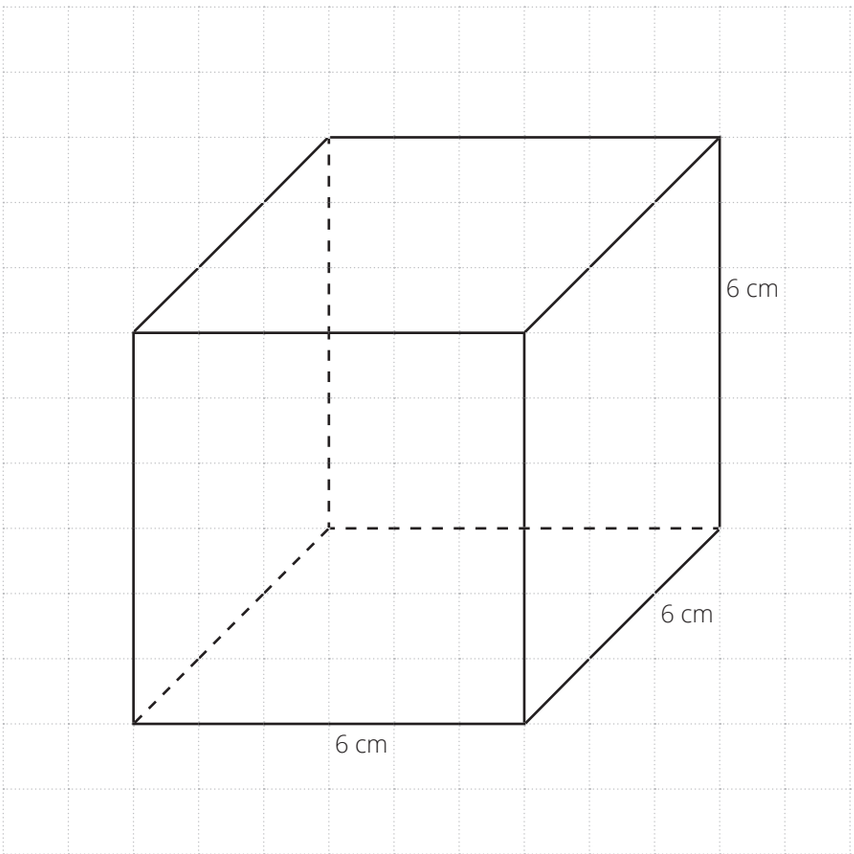
	Number of faces	Number of edges	Number of vertices
Rectangular prism	(6)	(12)	(8)
Cube	(6)	(12)	(8)

4 Name the 3-D object that can be made from this net.



(Rectangular prism)

5 Finish this sketch of a cube that is 6 cm by 6 cm by 6 cm.
Write the measurements on the sketch of the cube.



Lesson 28: Prisms, cylinders and spheres

Teacher's notes
This lesson is one of the fully planned lessons to be used to cover the Term 4 curriculum.
CAPS topics: Shape and space: Properties of 3-D objects
Lesson Objective: Learners will be able to classify prisms, cylinders and spheres.
Lesson Vocabulary: base; classify, cylinder, face, prism, sphere
Teacher Resources: A3 poster: *Spheres*; A3 poster: *Some 3-D objects*, A3 poster: *Faces, vertices and edges*; Flashcards (3-D objects, rectangular prism, cube, cylinder, sphere, triangular prism, hexagonal prism, base, quadrilateral, polygon)
Learner Resources: Variety of prisms, cylinders and spheres collected by the teacher and the learners.
Date: Week Day

1 MENTAL MATHS (5 MINUTES)

What am I?		**Answer**
1	I am a polygon with three straight sides	triangle
2	I am a quadrilateral with sides of the same length and four right angles	square
3	I am a closed 2-D shape with five straight sides	pentagon
4	I am a polygon with six straight sides	hexagon
5	I am a polygon with five straight sides of equal length and 5 equal angles	regular pentagon

2 LINK TO PREVIOUS LESSON (5 MINUTES)

- Refer learners to the activity in the LAB.
- Allow learners to come to the board to explain their answer to the rest of the class.
- Encourage other learners in the class to comment on the explanations and ask questions as necessary.

Norlan says that a cube is a special type of rectangular prism.

1 Do you agree? (Norlan is correct)

2 Give a reason for your answer.
(A cube is a rectangular prism in which all six faces are squares.)

3 CORRECT HOMEWORK ACTIVITY (5 MINUTES)

The previous lesson was a consolidation lesson. There is no homework to correct.

4 LESSON CONTENT – CONCEPT DEVELOPMENT (35 MINUTES)

- In this lesson, learners classify some 3-D objects, namely prisms, cylinders and spheres. The activities are designed to increase learners' knowledge of the properties of 3-D objects.

- The main concepts dealt with in this lesson:
  - Cylinder
    i. The top and bottom surfaces of a cylinder are called the base and the top face.
    ii. The base and the top face of a cylinder are circles and must be the same size and shape.
    iii. The surface of a cylinder is curved. This curved surface is made from a rectangle.
  - Prisms
    i. The top and bottom surfaces of a prism are called the base and the top face and must be the same size and shape.
    ii. The base and top face of a prism can have any number of sides, depending on the type of prism.
    iii. A prism is named according to the shape of its base.
    iv. The side faces of a prism are all rectangles (or squares which are special rectangles).

- Note: The learners should already know the term *sphere*.

- Set up a display of the 3-D objects collected by you and the learners in the classroom. Stick up the flashcards in the classroom.

Say: **Today we are learning to classify 3-D objects**

Activity 1: Whole class activity and then the learners work in pairs

- Stick the A3 poster: *Spheres* up in the classroom

- Ask: **What is a sphere?** (A sphere is a ball shape. It is a 3-D object.)

- Say: **Give me examples of spheres.** (Tennis ball, beach ball, football, and many others)

- Ask: **What is the difference between a sphere and a circle?**
  (A sphere is a 3-D object while a circle is a 2-D shape.)

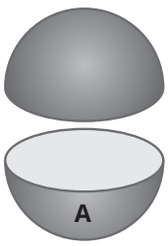
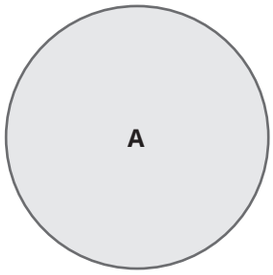
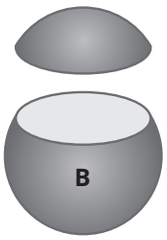
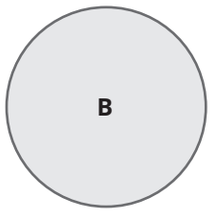
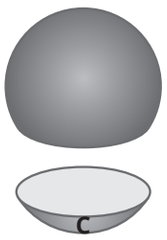
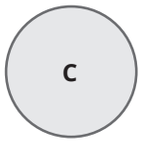
Say: **Complete Activity 1 in your LAB.**

- Read through Activity 1 with learners. Make sure that learners understand what they should do.

- Do the **A** activity in Question 1 with the learners. (They should draw a large circle.)
- Allow learners to work in pairs to complete the activity.
- Walk around the classroom to support learners as needed.
- Correct Activity 1 with learners so that they can receive immediate feedback.

Work with your partner

1 Tshepo cut through a sphere in different positions.
He then dipped the flat faces of the part of the sphere marked by a letter and then stamped on paper with them.
Draw the shape of Tshepo's stamp each time.

	Draw the shape you would see:
Cutting the sphere in half: 	
Cutting the sphere a quarter of the way down: 	
Cutting the sphere an eighth of the way up: 	

2 Which stamp made the largest circle? (A)

3 Is the following statement true or false?
The circle on the cut face of a sphere is largest when you cut the sphere in half. (True)

4 Complete the sentences:
A sphere is a 3-D object which looks like a ball when viewed from any angle. When cut straight across you always see a (circle).

5 Draw a circle around the correct answer. A sphere is a 3-D object which can slide / (roll).

Activity 2: Learners work on their own

- Stick up the A3 poster: *Some 3-D Objects* in the classroom.

Say: **Complete Activity 2 in your LAB.**

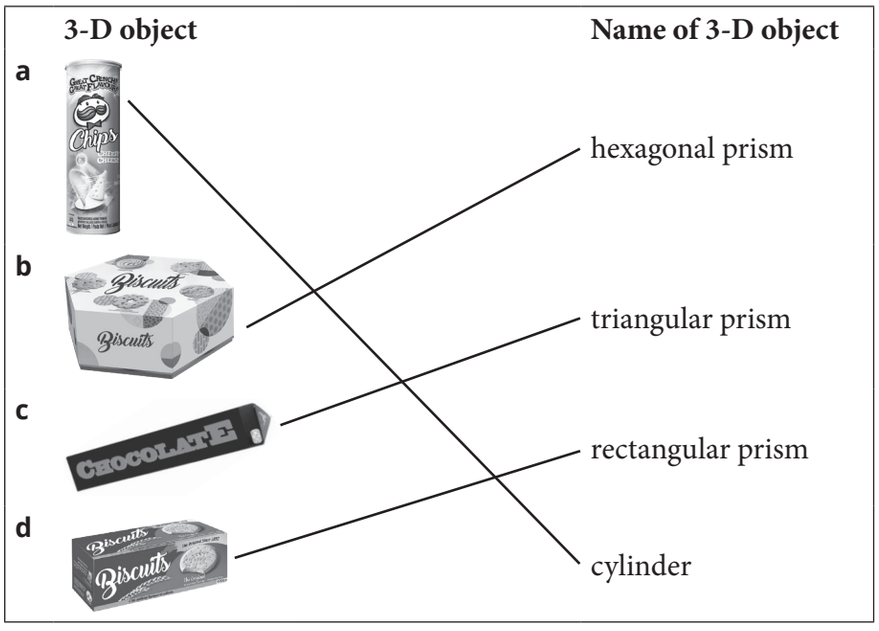
- Read through Activity 2 with learners. Make sure that learners understand what they should do.
- Walk around the classroom to support learners as needed.
- Ask selected learners to explain their answer to Question 1 to the rest of the class. Discuss answers with the class. Use the A3 poster and the concrete aids to support the discussions.
- Correct Activity 2 with learners so that they can receive immediate feedback.
- Answers are provided below.

Work on your own,

1 **a** Separate the 3-D objects in question **2** into two groups.
Group 1: **a**
Group 2: **b**, **c**, **d** and **e**

b Explain why you grouped, or classified, the 3-D objects as you did.
Possible answers:
i All the faces of **b**, **c**, **d** and **e** are flat, while **a** has a curved surface
ii The base and top face of **b**, **c**, **d** and **e** are polygons, while the base and top face of **a** are circles.

2 Match the 3-D object with its name.



UNIT 5

Activity 3: Whole class activity and then learners work in pairs

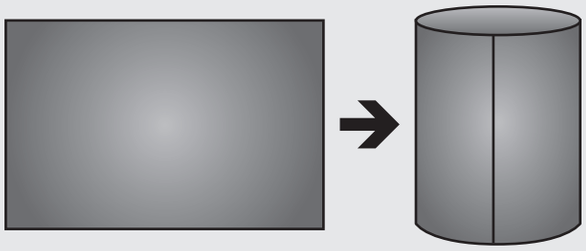
- Stick up the A3 poster: *Faces, Edges and Vertices* in the classroom.

- Say: **Let's find out more about cylinders and prisms.**

- Say: **A cylinder is a 3-D shape shaped like a roller or a tin can.**

- Ask: **What do you know about the flat faces of a cylinder?**
  (There are two flat faces that are circles. Both circles are the same size.)

- Take a piece of paper and curve it round so that it looks like the curved face of the cylinder.



  Ask: **What shape do we end up with when we cut and open out the curved surface of a cylinder?**
  (We end up with a rectangle).

- Say: **We know that a cylinder has two flat faces that are identical circles and one curved surface that opens up to give a rectangle.**
  Point out the parts of the cylinder on the A3 poster: *Some 3-D Objects.*

- Say: **Prisms are named according to the shape of its base.**
  Point out the prisms on the A3 poster: *Some 3-D Objects.*

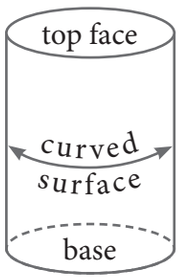
- Say: **The upper and lower surfaces of a prism and a cylinder are called the *base* and the *top face*.**

Say: **Complete Activity 3 in your LAB.**

- Read through Activity 3 with learners. Make sure that learners understand what they should do.
- Walk around the classroom to support learners as needed.
- Correct Activity 3 with learners so that they can receive immediate feedback.
- Answers are provided below.

Work with your partner

1 **a** Label the base, the top face and the curved surface of this cylinder.

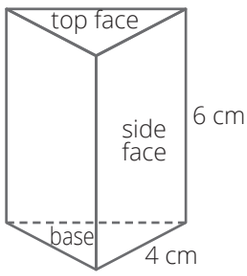


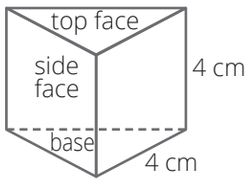
b Look at the base and top face of the cylinder.
Write down two correct statements about these two faces.
(The base and top face of the cylinder are both circles
The two faces are both the same size.)

c How many **curved surfaces** does this cylinder have? (1)

d What is the shape of the polygon that makes the curved surface of this cylinder? (Rectangle or rectangular)

2 **a** Label the base, top face and side face of these two prisms.





b. Look at the base and the top face of the prisms.
Write down two correct statements about the two faces of these prisms.
(The base and top face are both triangles.
The base and top face are the same size and shape as each other.)

c How many side faces does each prism have? (Three)

d What is the shape of the side faces of these prisms? (Rectangles or squares)

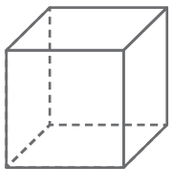
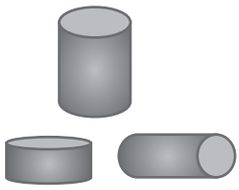
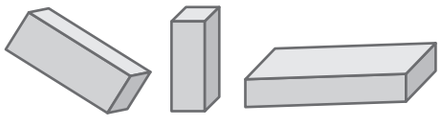
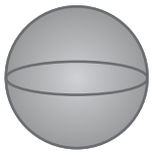
e Remember that prisms are named according to the shape of the base. Name these two prisms. (Triangular prisms)

UNIT 5

5 HOMEWORK ACTIVITY (5 MINUTES)

- Explain what learners need to do for homework.
- Read the question in the LAB with learners. Make sure all the learners understand what to do.
- Answers are provided below.

Complete the table:

3-D object		Number of curved surfaces	Number of flat surfaces	Shape of flat faces
cube		(0)	(6)	(square)
cylinders		(1)	(2)	(circular/ circle)
rectangular prisms		(0)	(6)	(rectangle/ square)
sphere		(1)	(0)	(no flat faces)

6 REFLECTION AND SUMMARY OF LESSON (5 MINUTES)

Call the whole class to attention and summarise the key concepts of the lesson.

Say: **Today we have learnt about prisms and cylinders.**

We know that, in a cylinder:

- **The top and bottom surfaces of a cylinders are called the base and the top face.**
- **The base and top face of a cylinder are circles and must be the same size and shape.**
- **If the curved surface of a cylinder is cut from face to face, we get a rectangle.**

We know that, in a prism:

- **The top and bottom surfaces of a prism are called the base and the top face.**
- **The base and top face of a prism must be the same size and shape.**
- **A prism is named according to the shape of its base.**
- **The side faces of a prism are all rectangles or squares.**

Lesson 29: Making prisms from polygons

Teacher's notes
This lesson is one of the fully planned lessons to be used to cover the Term 4 curriculum.
CAPS topics: Shape and space: Properties of 3-D objects
Lesson Objective: Learners will be able to make different prisms using cut out polygons.
Lesson Vocabulary: circle, cube, dimension, hexagonal prism, pentagonal prism, prism, regular hexagon, regular pentagon, triangular prism
Teacher Resources: Different prisms that you and the learners have collected.
A3 poster: *Prisms are named according to the shape of the base*
A3 poster: *2-D shapes and 3-D objects*
Learner Resources: Two pages of 2-D shapes for Lesson 29 from the back of the LAB; pairs of scissors, sticking tape
Date: Week Day

1 MENTAL MATHS (5 MINUTES)

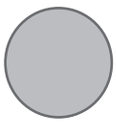
	What am I?	Answer
1	I am a 2-D shape with one curved side.	circle
2	I am a polygon with 6 sides of equal length and 6 equal angles.	regular hexagon
3	I am a 2-D shape with 5 sides of different lengths.	pentagon
4	I am a polygon with 4 sides.	quadrilateral
5	I am a 2-D shape with 2 pairs of opposite sides equal in length and 4 right angles.	rectangle

2 LINK TO PREVIOUS LESSON (5 MINUTES)

- Refer learners to the activity in the LAB.
- Discuss and mark the work with learners.

Francina cut straight through the following 3-D objects: a square-based rectangular prism, a cube, a cylinder and a sphere.

She then used each cut surface as a stamp. The stamps made these shapes.
Which cut 3-D object made the stamps?



This stamp could have been made using the cut surface of the (cylinder) or the (sphere).

This stamp could have been made using the cut surface of the (cube) or the (square-based rectangular prism).

3 CORRECT HOMEWORK ACTIVITY (5 MINUTES)

The answers to the Homework Activity for Lesson 28 are provided in Lesson 28.
Use this time to purposefully address gaps in learners' knowledge and to identify and address learner errors.

4 LESSON CONTENT – CONCEPT DEVELOPMENT (35 MINUTES)

In this lesson, learners use cut out 2-D shapes to make a triangular prism, a pentagonal prism and a hexagonal prism. These activities will reinforce the following concepts:

- the faces or surfaces of prisms are 2-D shapes/polygons
- prisms are named according to the shape of the base
- the side faces of a prism are rectangles
- the number of side faces in a prism is the same as the number of sides in the base.

Say: **Today we are learning to make prisms using cut out polygons.**

Activity 1: Learners work in pairs

- Refer to the A3 poster: *2-D shapes and 3-D objects* and the concrete objects collected. If you don't have sufficient concrete objects, use the A3 poster: *2-D shapes and 3-D objects* to revise the difference between 2-D shapes and 3-D objects.

- Say: **Look at the diagrams of the 2-D shapes on the poster.**
  2-D objects have two dimensions. Name the dimensions. (Length and breadth)

- Stick up the A3 poster: *Prisms are named according to the shape of the base.*

- Ask, as you point to the diagram of the rectangular prism on the poster:
  How do we know that this diagram shows a 3-D object?
  (The dotted lines indicate that the object is not flat)

- Ask: **What is the difference between a 2-D shape and a 3-D object?**
  (A 3-D object is not flat; it has height; it has three dimensions)

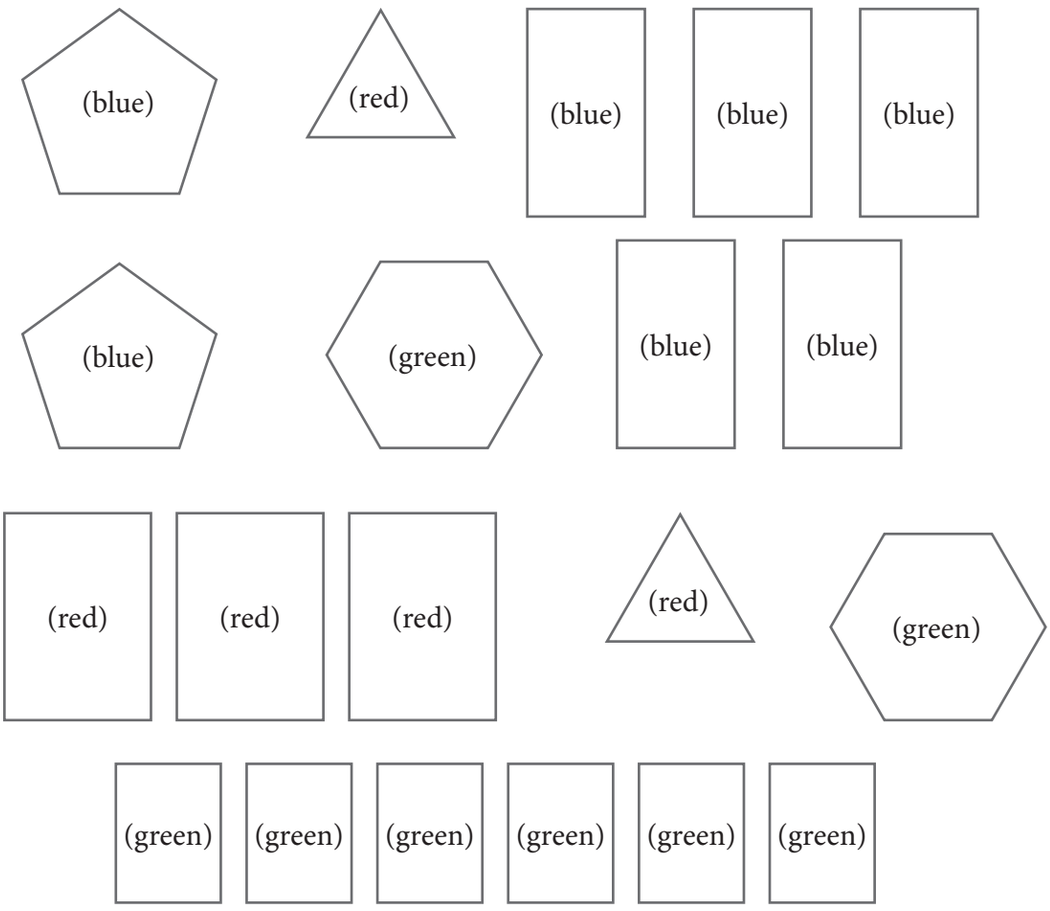
Say: **Complete Activity 1 in your LAB.**

- Read through Activity 1 with learners. Make sure that learners understand what they should do.
- Remind learners that a regular pentagon has five sides of equal length, and that a regular hexagon has six sides of equal length.
- Walk around the classroom to support learners as needed.
- Correct Activity 1 with learners so that they can receive immediate feedback.

Work with your partner

Look at the 2-D shapes below.

1. Colour all the 2-D shapes you will need to make a triangular prism (a prism with a base that is a triangle) in ***red***.
2. Colour all the 2-D shapes you will need to make a prism with a base that is a regular pentagon in ***blue***.
3. Colour all the 2-D shapes you will need to make a prism with a base that is a regular hexagon in ***green***.



Activity 2: Learners work on their own

- Learners will need: a ruler, sticking tape, scissors and the two pages of 2-D shapes for Lesson 29 at the back of the LAB.

Say: **Complete Activity 2 in your LAB.**

- Read through Activity 2 with learners. Make sure that learners understand what they should do.

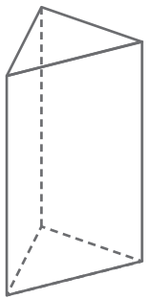
- Tell learners to refer to Activity 1 as they decide which 2-D shapes to use
- Correct Activity 2 with learners so that they can receive immediate feedback.
- Answers are provided below.

Work on your own.

Cut out the 2-D shapes at the back of the LAB and use them to make 3-D objects. If you need to, refer to your answers in Activity 1.

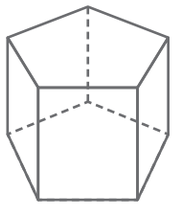
1 Name the 2-D shapes that you need to make a triangular prism: (3 rectangles and 2 triangles)

Cut out the 2-D shapes and stick them together to make a triangular prism.



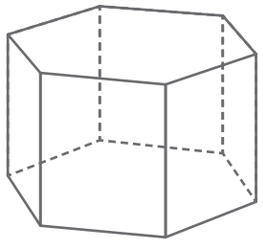
2 Name the 2-D shapes that you need to make a prim with a base that is a regular pentagon:
(2 pentagons and 5 rectangles)

Cut out the 2-D shapes and stick them together.



3 Name the 2-D shapes that you need to make a prism with a base that is a regular hexagon:
(2 hexagons and 5 rectangles)

Cut out the 2-D shapes and stick them together.

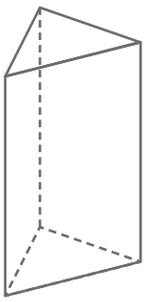
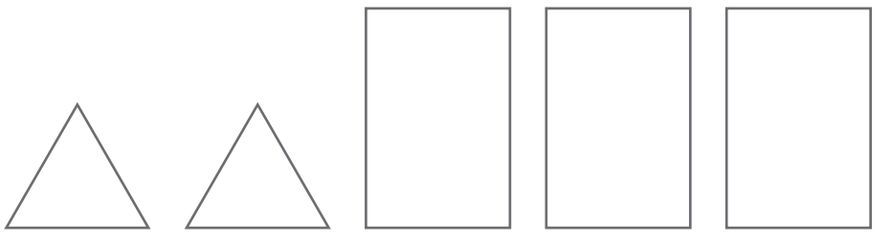
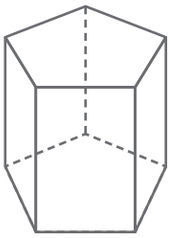
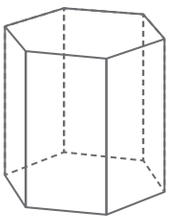


4 Display the 3-D objects you have made in your classroom.

5 HOMEWORK ACTIVITY (5 MINUTES)

- Explain what learners need to do for homework.
- Read the question in the LAB with learners. Make sure all the learners understand what to do.
- Answers are provided below.

Draw the 2-D shapes that make up each prism.

Prism	2-D shapes that make up the prism
	
	
	

6 REFLECTION AND SUMMARY OF LESSON (5 MINUTES)

Call the whole class to attention and summarise the key concepts of the lesson.

Say: **Today we have learnt to make prisms from cut-out 2-D shapes.**

We know that:

- **the faces or surfaces of prisms are 2-D shapes**
- **prisms are named according to the shape of the base**
- **the side faces of a prism are rectangles (or squares)**
- **the number of side faces in a prism is the same as the number of sides in the base.**

Lesson 30: Make prisms and cylinders

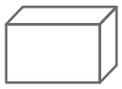
Teacher's notes
This lesson is one of the fully planned lessons to be used to cover the Term 4 curriculum.
CAPS topics: Shape and space: Properties of 3-D objects
Lesson Objective: Learners will be able to make prisms and cylinders using cut out polygons and circles.
Lesson Vocabulary: circle, cylinder, polygon, prism,
Teacher Resources: Prisms and cylinders collected by teacher
Learner Resources: Two pages of polygons and circles from the back of LAB. scissors, ruler, sticking tape.
Date: Week Day

1 MENTAL MATHS (5 MINUTES)

Convert		Answer
1	I have two flat faces which are circles and one curved surface	cylinder
2	I have six square faces	cube
3	I have two faces which are triangles and three faces which are rectangles	triangular prism; prism with a base that is a triangle
4	I have a base which is a hexagon, a top face which is a hexagon and six side faces which are rectangles	hexagonal prism; prism with a base that is a hexagon

2 LINK TO PREVIOUS LESSON (5 MINUTES)

- Refer learners to the activity in the LAB.
- Discuss and mark the work with learners.

3-D object	Name of 3-D object	Draw the shapes that make up the object
	(cylinder)	
	(rectangular prism)	
	(cube)	

3 CORRECT HOMEWORK ACTIVITY (5 MINUTES)

The answers to the Homework Activity for Lesson 29 are provided in Lesson 29.
Use this time to purposefully address gaps in learners' knowledge and to identify and address learner errors.

4 LESSON CONTENT – CONCEPT DEVELOPMENT (35 MINUTES)

In this lesson, learners use cut out polygons and circles to make two prisms and a cylinder:
- Prism A with a rectangle or square as a base
- Prism B with a trapezium as a base
- A cylinder.

NOTE: Learners do not need to know the term trapezium.

Say: **Today we are learning to make prisms and cylinders.**

Activity 1: Learners work in pairs and then learners work on their own

- Learners will need the polygons and circles from the Resource Pack at the back of the LAB.

Say: **Complete Activity 1 in your LAB.**

- Read through Activity 1 with learners. Make sure that learners understand what they should do.
- Walk around the classroom to support learners as needed.
- Correct Activity 1 with learners so that they can receive immediate feedback.

1. Work with your partner.
Discuss how you find the cut outs you need to make each 3-D object.

2. Work on your own.

a. Use the cut outs to make each 3-D object.
Make Prism A (a prism with a rectangle (or square) as a base)
Make Prism B (a prism with a trapezium as a base)
Make the cylinder.

b. Label each 3-D object and display it in the classroom.

Note to the teacher: This is a practical activity so check the learners' 3-D objects.

5 HOMEWORK ACTIVITY (5 MINUTES)

- Explain what learners need to do for homework.
- Read the question in the LAB with learners. Make sure all the learners understand what to do.
- Answers are provided.

Use the 3-D models you have made as you answer the questions.

1 How many flat faces in a rectangular prism? (6)
2 What is the shape of the base in a rectangular prism? (square or rectangle)
3 What is the shape of the side faces in a prism? (rectangle or square)
4 How many flat faces in a cylinder? (2)
5 How many curved surfaces in a cylinder? (1)

6 REFLECTION AND SUMMARY OF LESSON (5 MINUTES)

Call the whole class to attention and summarise the key concepts of the lesson.

Say: **Today we have learnt to use cut out polygons and circles to make prisms and cylinders.**

Lesson 31: Pyramids and cones

Teacher's notes
This lesson is one of the fully planned lessons to be used to cover the Term 4 curriculum.
CAPS topics: Shape and space: Properties of 3-D objects
Lesson Objective: Learners will be able to describe the properties of a pyramid and a cone and to use 2-D shapes to make pyramids and cones.
Lesson Vocabulary: apex (or vertex), base, circle, cone, pyramid, square, triangle
Teacher Resources: Pyramids and cones collected or built up by teacher, or pictures of pyramids and cones; A3 poster: ***Pyramids and cones***
Learner Resources: Polygons, circles and sectors needed to make pyramids and cones for Lesson 31 at the back of the LAB, scissors, sticking tape
Date: Week Day

1 MENTAL MATHS (5 MINUTES)

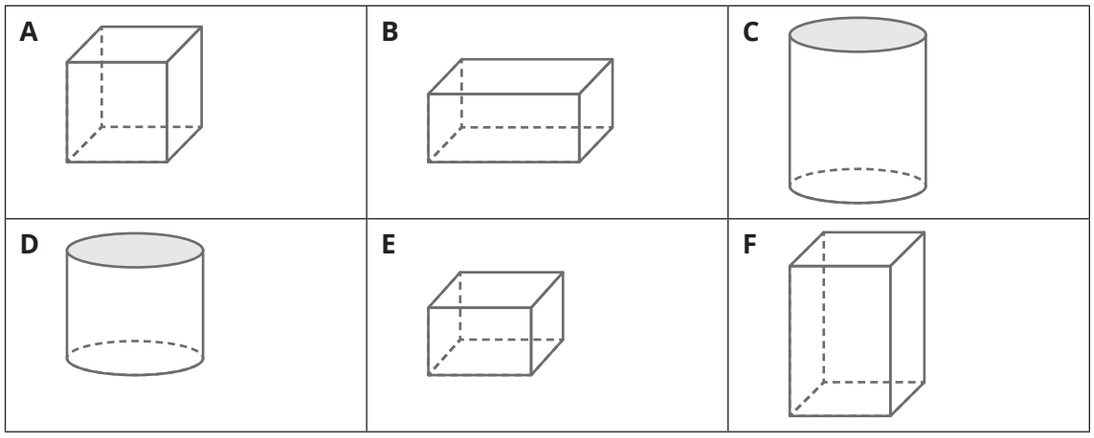
What 3-D object am I?		Answer
1	I have six rectangular faces.	rectangular prism
2	I have a base and a top face which are hexagons and all my side faces are rectangles.	hexagonal prism or a prism that has a base that is a hexagon
3	I have a base which is a circle and a top face which is a circle. I have one curved surface.	cylinder
4	I have two flat faces which are triangles. My side faces are rectangles.	triangular prism or a prism that has a base that is a triangle

2 LINK TO PREVIOUS LESSON (5 MINUTES)

- Refer learners to the activity in the LAB.
- Discuss and mark the work with learners.

Work with your partner

Look at the 3-D objects and then answer the questions.



1 Give two reasons why 3-D objects A, B, E and F can be sorted into one group.
(Some possible reasons:
They are all rectangular prisms
They all have a rectangular base and top face
They all have 6 flat faces
They all have flat faces which are rectangles)

2 Give two reasons why 3-D objects C and D can be sorted into one group.
(Some possible reasons:
They are both cylinders
They both have 2 flat faces which are circles
They both have one curved surface
They both have a base which is a circle and a top face which is a circle of the same size)

3 Give one reason why 3-D objects C and F *cannot* be sorted into one group.
(Some possible reasons:
F has 6 faces, while C has 2 faces and one curved surface
Only C has faces which are circles
Only F has 6 faces which are rectangles)

3 CORRECT HOMEWORK ACTIVITY (5 MINUTES)

The answers to the Homework Activity for Lesson 30 are provided in Lesson 30.
Use this time to purposefully address gaps in learners' knowledge and to identify and address learner errors.

4 LESSON CONTENT – CONCEPT DEVELOPMENT (35 MINUTES)

- In this lesson, learners investigate the properties of a pyramid and a cone and use 2-D shapes to make pyramids and cones.

Extra information for the teacher:

- Like prisms, pyramids are named according to the shape of the base.
- While the sides of a prism are rectangles, the sides of a pyramid are triangles.
- A prism has a base and a top face.
- A pyramid does not have a top face. The triangular faces meet at a point. This point is called an apex or a vertex.
- Both a cylinder and a cone have a circular base.
- Both a cylinder and a cone have one curved surface.
- A cylinder has a base and a top face, both of which are circles.
- A cone has a circular base only.

Say: **Today we are learning about the properties of a pyramid and a cone and to use 2-D shapes and nets to make pyramids and cones.**

Activity 1: Learners work in pairs and Learners work on their own

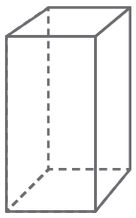
- Learners will need scissors, sticking tape and the 2-D shapes at the back of the LAB.

Say: **Complete Activity 1 in your LAB.**

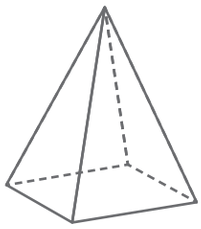
- Read through Activity 1 with learners. Make sure that learners understand what they should do.
- Walk around the classroom to support learners as needed.
- Correct Question 2 with learners before they proceed to Question 3.
- Correct Activity 1 with learners so that they can receive immediate feedback.

Work with your partner.

1 This prism and this pyramid both have square bases.



Square-based prism

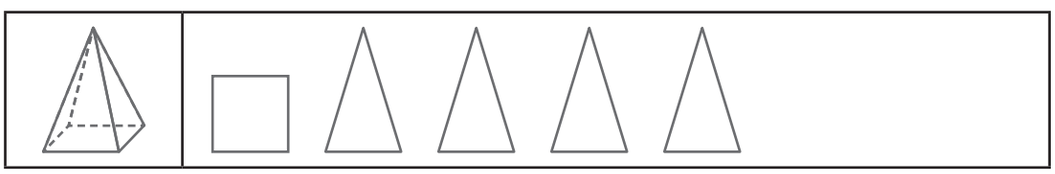


Square-based pyramid

a Give two differences between a square-based prism and a square-based pyramid.
(Some possible answers:
The square-based prism has a square base and a square top face, while the square-based pyramid has a square base and an apex (or vertex).
The side faces in a square-based prism are rectangles, while the sloping faces in a square-based pyramid are triangles)

b Give one way in which a square-based prism and a square-based pyramid are the same.
(Some possible answers:
Both have a square base.
Both have 4 side faces)

2 Draw the polygons you will need to make a square-based pyramid.



3 Turn to the polygons for Lesson 31 at the back of the LAB.
Choose the polygons you need to make a square-based pyramid.
Hint: Use the answer to Question 2 as a guide.

(Note to teachers: This is a practical activity.
Check that the learners have used the square and 4 triangles to make the square-based prism, and that the side faces meet a point called the apex or vertex.)

Activity 2: Learners work in pairs and Learners work on their own

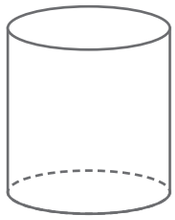
- Learners will need scissors, glue, and the net of a cone at the back of the LAB.

Say: **Complete Activity 2 in your LAB.**

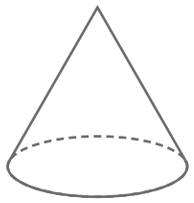
- Read through Activity 2 with learners. Make sure that learners understand what they should do.
- Walk around the classroom to support learners as needed.
- Correct Question 2 with learners before they proceed to Question 3.
- Correct Activity 2 with learners so that they can receive immediate feedback.

Work with your partner.

1 This cylinder and this cone both have bases which are circles.



Cylinder

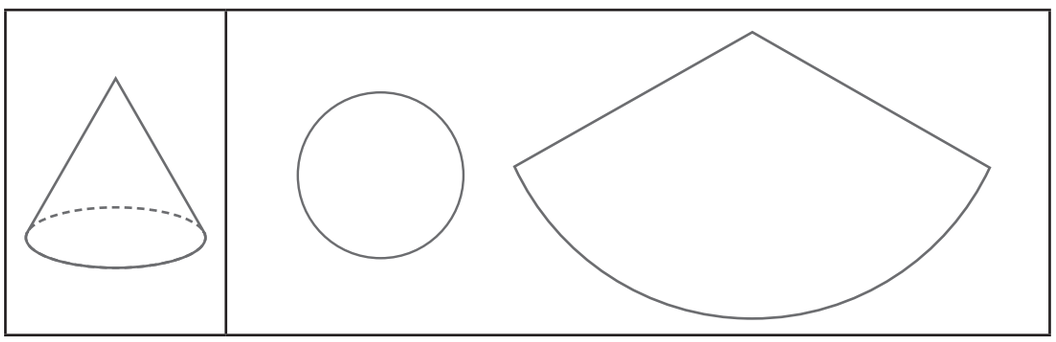


Cone

a Give one difference between a cylinder and a cone.
(One possible answer:
The cylinder has a base and a top face that is a circle, while the cone only has one base that is a circle. A cone has a base and an apex or vertex)

b Give one way in which a cylinder and a cone are the same.
(Some possible answers:
Both have a base which is a circle
Both have one curved side surface)

2 Cut a cone into the base and the slanting surface. Then cut the slanting surface and lie it flat. Draw the shapes that make a cone.



UNIT 5

3 Turn to the shapes for Lesson 31 at the back of the LAB.
Choose the shapes you need to make a cone.
Hint: Use the answer to Question 2 as a guide.

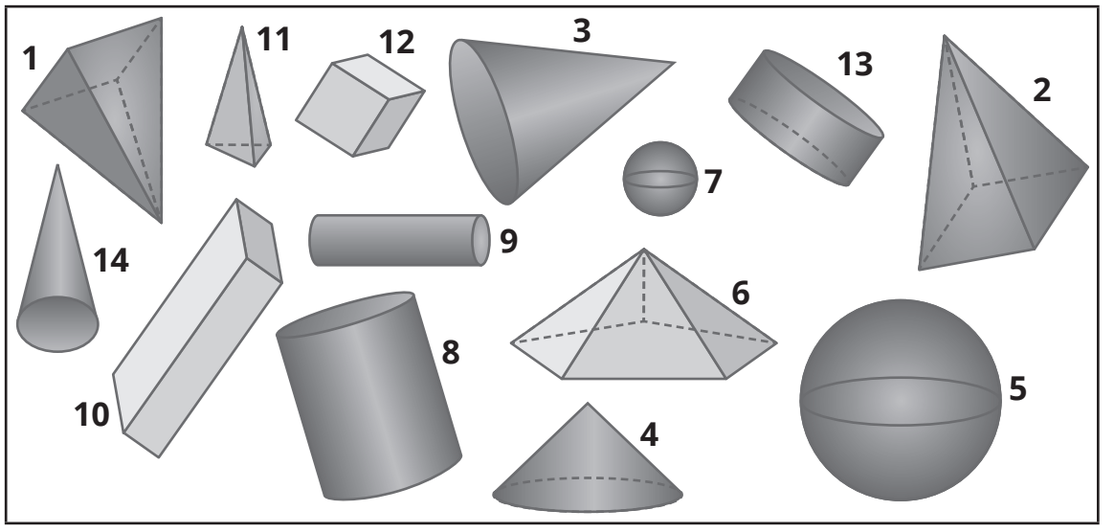
(Note to teachers: This is a practical activity.
Check that the learners have used the circle and the piece of the circle to make the cone, and that the side surface forms an apex)

5 HOMEWORK ACTIVITY (5 MINUTES)

- Explain what learners need to do for homework.
- Read the question in the LAB with learners. Make sure all the learners understand what to do.
- Answers are provided below.

Decide whether these 3-D object are prisms, pyramids, cones, spheres or cylinders.

Write the number of the object under the correct heading.



Prisms	Pyramids	Cones	Spheres	Cylinders
10, 12	1, 2, 6, 11	3, 4, 14	5, 7	8, 9, 13

6 REFLECTION AND SUMMARY OF LESSON (5 MINUTES)

Call the whole class to attention and summarise the key concepts of the lesson.

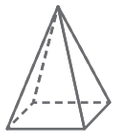
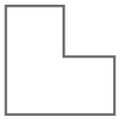
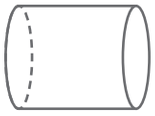
Say: **Today we have learnt about the properties of pyramids and cones and how to use polygons and circles to make pyramids and cones.**
We know that:

- **Pyramids are named according to the shape of the base**
- **The sides of a prism are rectangles and the sides of a pyramid are triangles**
- **A prism has a base and a top face**
- **A pyramid does not have a top face. The triangular faces meet at a point called the apex or vertex**
- **Both a cylinder and a cone have a base which is a circle**
- **Both a cylinder and a cone have one curved surface**
- **A cylinder has a base and a top face, both of which are circles**
- **A cone has a circular base only.**

Lesson 32: Viewing objects

Teacher's notes
This lesson is one of the fully planned lessons to be used to cover the Term 4 curriculum.
CAPS topic: Shape and space: Position and views
Lesson Objective: Learners will be able to match different views of everyday objects and identify objects from different views.
Lesson Vocabulary: cube, cylinder, hexagon, pentagon, plan, quadrilateral, rectangle, rectangular prism, square, square-based pyramid, triangle, plan (or plan view)
Teacher and Learner Resources: everyday objects such as teapots, mugs, cups and milk jugs
Date: Week Day

1 MENTAL MATHS (5 MINUTES)

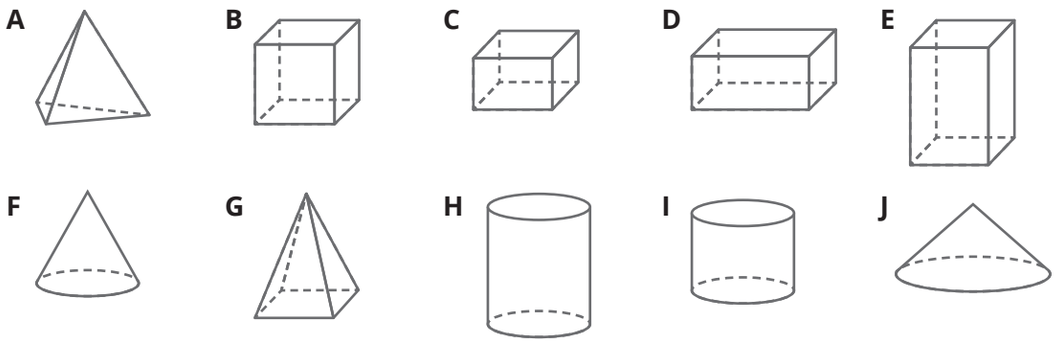
Name the 2-D shape		Answer	Name the 3-D object		Answer
1		square	**6**		cylinder
2		rectangle	**7**		pyramid or square-based pyramid or square pyramid
3		pentagon	**8**		cube
4		quadrilateral	**9**		rectangular prism
5		hexagon	**10**		cylinder

2 LINK TO PREVIOUS LESSON (5 MINUTES)

- Refer learners to the activity in the LAB.
- Mark the work with learners.

Work with your partner

Look at the 3-D objects and then answer the questions.



1 What is the same about 3-D objects B, C, D and E?
(Some possible answers:
They are all prisms
They all have identical top faces and bases
They all have side (or vertical) faces that are quadrilaterals.)

2 What is the same about the 3-D objects A and G?
(Some possible answers:
They are both are pyramids
The side faces on both are triangles
Neither has a top face
Both have an apex or vertex.)

3 What is the same about the 3-D objects F, H, I and J?
(Some possible answers:
They all have bases which are circles
They all have one curved surface)

4 What is the difference between the 3-D objects F and H?
(Some possible answers:
One is a cone and one is a cylinder
The cylinder (H) has a top face, while the cone (F) has an apex or vertex.)

3 CORRECT HOMEWORK ACTIVITY (5 MINUTES)

The answers to the Homework Activity for Lesson 31 are provided in Lesson 31.
Use this time to purposefully address gaps in learners' knowledge and to identify and address learner errors.

4 LESSON CONTENT – CONCEPT DEVELOPMENT (35 MINUTES)

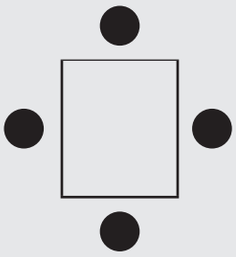
- In this lesson, learners develop their spatial sense of three-dimensional objects by investigating how the same object can look very different when it is viewed from different positions.
- It is important that learners can link, with reasons, the position of the viewer with the correct view of the object.

Say: **Today we are learning to match views of objects to the position of the viewer; and to identify objects from different views.**

Activity 1: Learners work in groups of four and then learners work in pairs

- Each group of learner needs a teacup or a coffee mug with a handle.
  The learners should work in their classwork book.

- Say: **Sit opposite each other at your desk.**
  Make sure that learners understand the meaning of the word opposite and sit correctly like this:



Sitting opposite each other

- Say: **Put the teacup or coffee mug on the desk.**

- Say: **Draw the teacup or coffee mug as you see it. This might not be the same as what others can see.** Give the learners time to do a simple drawing of their view of the 3-D object.

- Say: **Discuss the drawings of everyone in your group. Are they the same? What do you notice?**
  (The drawings are not all the same; in each drawing the handle is on a different side)

- Show the class the drawings done by different learners. Discuss the position of the handle of the mug or cup in particular.

For example:

- Ask: **Why do you think the drawings are different?**
  (We are looking from different sides or positions)

Say: **Complete Activity 1 in your LAB.**

- Read through Activity 1 with learners. Make sure that learners understand what they should do.
- Walk around the classroom to support learners as needed.
- If learners are struggling, give them a cup or coffee mug with a handle to look at and discuss.
- Correct Activity 1 with learners so that they can receive immediate feedback.

Work with your partner

Mpho and Sam each drew a teacup that was on the table between them.
This is what their drawings looked like:

Mpho's drawing	Sam's drawing
	

1 Why do you think the drawings look different?
(Mpho and Sam are looking at the teacup from different positions or sides of the table)

2 Sam's little sister saw a different view of the teacup.

Sam's little sister's drawing

Where do you think the sister was when she looked at the teacup?

Give a reason for your answer.

(Sam's little sister is looking at the teacup from the same side of the table as Mpho, but below the level of the table)

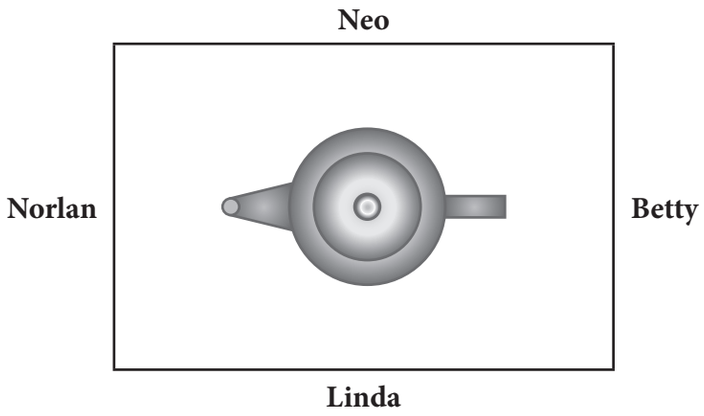
Activity 2: Learners work on their own

Say: **Complete Activity 2 in your LAB.**

- Read through Activity 2 with learners. Make sure that learners understand what they should do.
- Walk around the classroom to support learners as needed.
- Correct Activity 2 with learners so that they can receive immediate feedback.
- Answers are provided below.

Work on your own.

1 Neo, Norlan, Betty and Linda sat around a table. There was a teapot on the table. This is what the table and the teapot looked like from above.
We say that this is the **top view** or **plan** of the teapot and the table:



a Why are the legs of the table not shown in the plan view?
(You can't see the legs from above the table. The legs are hidden under the table.)

b Write the name of the person who drew each drawing:

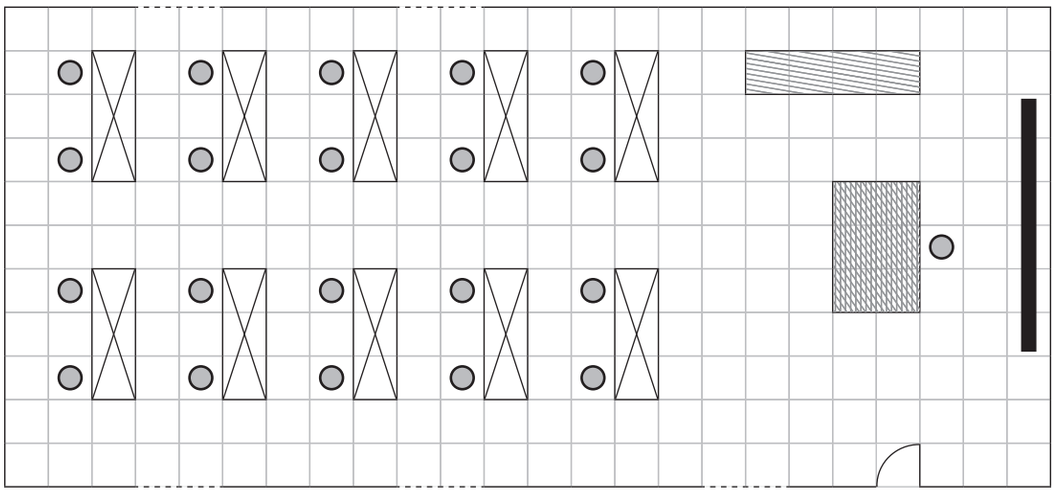

(Neo) drew this picture

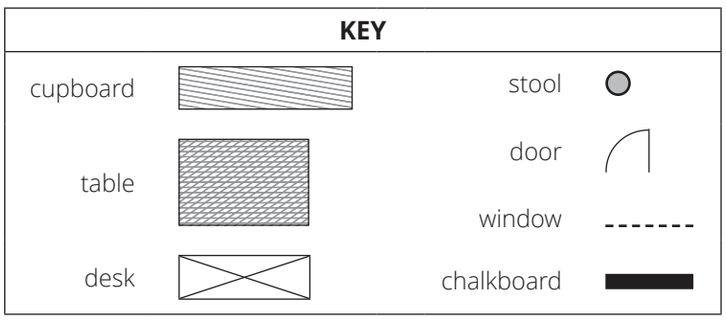

(Betty) drew this picture


(Norlan) drew this picture


(Linda) drew this picture

2 Look at the plan (or top view) of the classroom.





a How many windows are there in the classroom? (5)
b How many stools are there in the classroom? (21)
c How many learners sit at each desk? (2)
d If you enter the classroom through the door, what object will you see directly in front of you? (table)

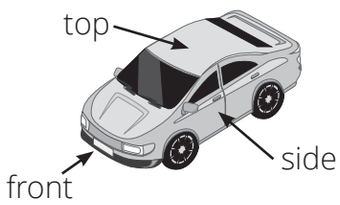
5 HOMEWORK ACTIVITY (5 MINUTES)

- Read the question in the LAB with learners. Make sure all the learners understand what to do.

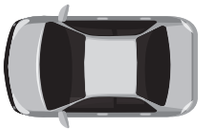
For each of the given objects, three views are given.

Say which view is the top view, which is the front view and which is the side view.

1



A car

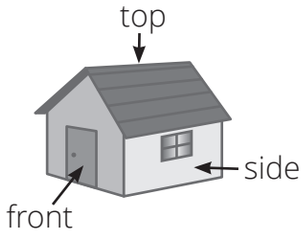


(Top view)

(Side view)

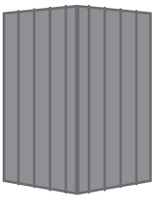
(Front view)

2

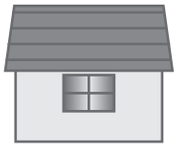


A hut

(Front view)



(Top view)



(Side view)

6 REFLECTION AND SUMMARY OF LESSON (5 MINUTES)

Call the whole class to attention and summarise the key concepts of the lesson.

Say: **Today we have learnt to match views of objects to the position of the viewer; and to identify objects from different views. We know that objects look different in different positions.**

Lesson 33: Consolidation

Teacher's notes		
This lesson allows for consolidation of the properties and classification of 3-D objects, and views of objects from different positions. CAPS topics: Shape and space: Properties of 3-D objects, Position and views Lesson Objective: Learners will revise and consolidate the properties of prisms, cylinders, cones and pyramids; the matching of different views of everyday objects; and the identification of objects from different views. Lesson Vocabulary: cone, cylinder, position, prism, pyramid, view Resources: Grade 4 Learner's Books and Teacher's Guides (if available)		
Date:	Week	Day

1 NOTES FOR THE TEACHER RELATING TO THIS UNIT'S WORK

The main topics in this section were the properties of 3-D objects as well as Position and Views.

2. POSSIBLE MISCONCEPTIONS LINKED TO THE UNIT'S WORK

- Many young learners struggle with the top view in particular. Research has shown that this is an unfamiliar view due to the fact that young learners are not very tall, and don't often see things from above. Spend extra time helping learners with the top (plan) view.

3 CORRECT HOMEWORK ACTIVITY (5 MINUTES)

The answers to the Homework Activity for Lesson 32 are provided in Lesson 32.
Use this time to purposefully address gaps in learners' knowledge and to identify and address learner errors.

4 CLASSWORK

- You could use this time for learners to complete classwork or homework activities as necessary.
- You could use the Additional Activities from textbooks that you have or use the given Consolidation Activity.

Additional activities for consolidation

Refer to the following table. Select additional activities from the textbook/s you have.

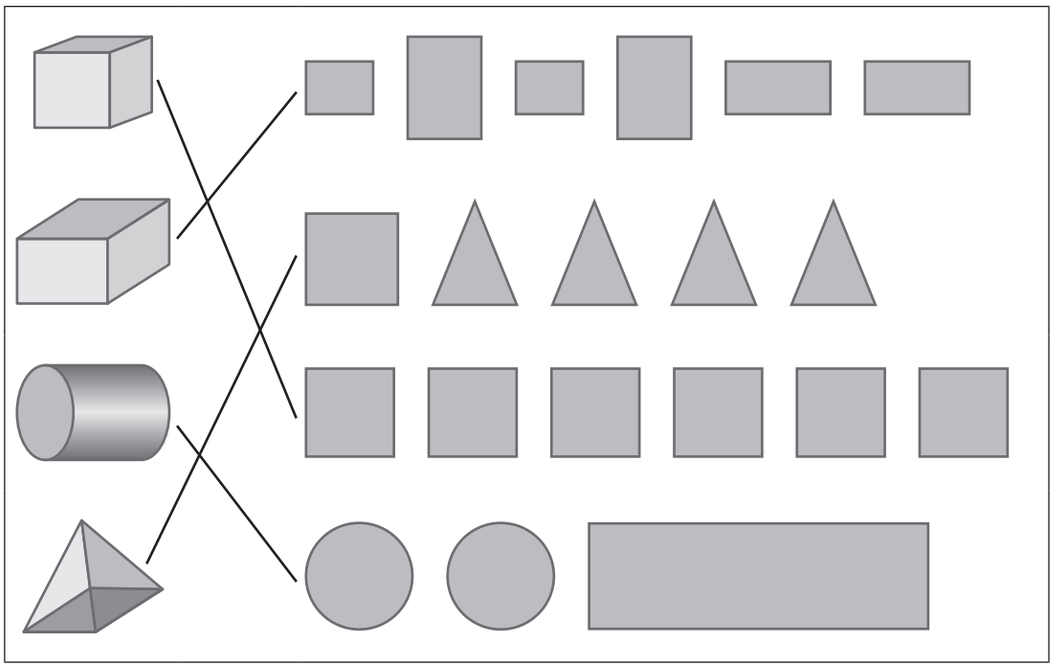
Use the answers given in the Teacher's Guide to mark the work.

	Fabulous	Oxford Headstart	Oxford Successful	Platinum	Premier	Sasol Inzalo	Solutions for All	Study & Master	Viva
LB	124-128	137-142	111-114	76-79	84-88	173-180	128-136	149-154	89-93
	225-226	263-266	222-226	166-171	192-194	306-309	263-270	259-263	184-188
	173-174	208-209	162-164	124-127	138-141	250-254	194-196	206-208	133-134
TG	87-90	172-177	112-116	62-65	40-42	191-203	95-98	197-203	49-51
	184-186	309-314	181-184	133-137	100-101	352-354	218-222	352-354	93-95
	136-137	246-248	145-146	99-100	70-71	283-288	157-159	277-281	71-72

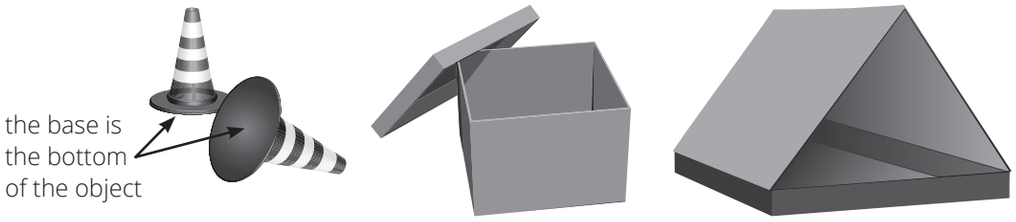
OR, learners could complete the Consolidation Activity in their LAB.

Consolidation Activity

1 Draw a line to match the 3-D object with the group of polygons and circles needed to make the 3-D object.



2 Look at the pictures.



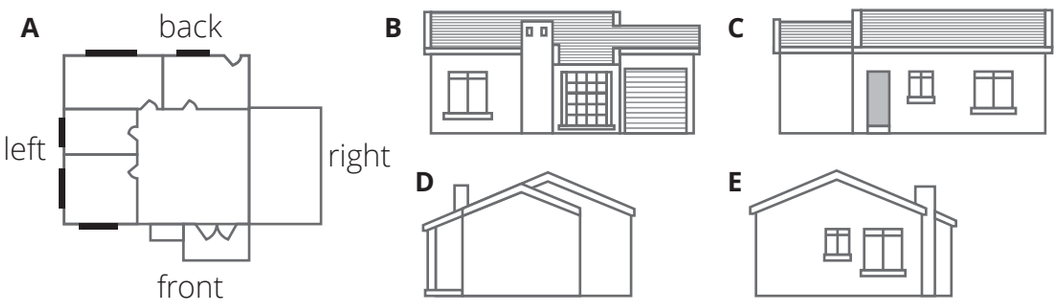
Traffic cones Box Tent

Use the words from the word box to fill in the names of the 3-D objects.

WORD BOX:				
four	five	six	cylinder	rectangular prism
circle	pyramid	triangle	triangular prism	cone

a The shape of the base of the traffic cone is a (circle).
b The traffic cone is made up of two 3-D objects – a (cylinder) and a (cone).
c The lid of the box has (five) faces.
d The open box has (five) faces.
e The box is a (rectangular prism).
f The tent is a (triangular prism).

3 Look at the views of the house.



a. Which picture shows the floor plan of the house? ____(A)____

b. Use the floor plan of the house to identify the view of the front, back, left side and right side of the house.
The left side has been done for you.

Side	Drawing
Front View	(B)
Back View	C
Right View	(D)
Left View	(E)

UNIT 5