

**MATHEMATICS**  
**Grade 4**  
**TERM 1 2020**  
**Lesson**  
**Plans**



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# Unit 3: Approximation and calculation

## INTRODUCTION

This unit focuses on estimation and rounding. Rounding is a way of changing the numbers in a problem to other numbers that we can easily calculate mentally in order to find the approximate answer. These answers are less accurate but are easier to use. In Grade 4 we start off by teaching simple rounding techniques that don't require a rule that the learners have to remember. Learners first round off to the nearest multiple of 10, 100 or 1 000. They then look for numbers they can group together to make numbers that are easy to use in calculations. They then use their rounding skills to do quick calculations and to estimate answers. The concept of rounding off is introduced by showing learners why it is useful to be able to round numbers. It is always a good idea to link mathematics to everyday life.

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 use number lines to represent pictorially what they are doing when they round off.
Procedural fluency	Learners practice the procedure rounding off repeatedly – applying it to rounding to the nearest 10, 100 and 1 000.
Strategic competence	Learners identify and use appropriate strategies when multiplying and dividing large numbers.
Reasoning	Learners use a number line to work out the range of approximate numbers.

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

		Examples
Concept development	✓	This is done in every lesson.
Speaking mathematics	✓	One of the reasons learners are encouraged to work in pairs, groups or with the whole class is so that they have the opportunity to speak mathematics and practice using mathematical vocabulary to communicate mathematical ideas.
Making sense of mathematics	✓	Learners use number lines as they start building the concept of approximation .
Practising procedures	✓	Learners repeatedly round numbers to the nearest 10, 100 and 1 000, with and without number lines.
Problem solving	✓	Learners solve problems in context. For example working out the range of the mass of mother's suitcase given the rounded mass.
Active learning	✓	Learners participate in whole class activities, work in pairs or work on their own.

## Unit 3: Approximation and calculation

Applying mathematics  
in context



Learners use approximation in appropriate everyday contexts like shopping.

### Mathematical vocabulary for this unit

Be sure to teach and use the following vocabulary at the appropriate place in the unit.  
Refer to the bilingual dictionary where necessary.

Term	Explanation / diagram
about	Estimated, approximated
altogether	Take everything together
approximate	Estimate, rounded off
approximately	Estimated, 'about'
approximation	An approximation is close to the exact number, a little more or a little less Numbers that are rounded are approximations
approximating	Estimating or rounding off
at least	Not less than, at the minimum
consecutive	To follow in order Example: 11 and 12 are consecutive numbers
difference	The amount one quantity is greater than or less than another. ___ You find the difference by subtracting the smaller number from the larger number
divide	To share things equally
estimation	a rough calculation of the value, number, quantity, or extent of something.
exact	Precise, not approximated
greater than	Bigger/ more than
grouping	Putting objects or numbers into groups according to a specified rule. A type of division
less	Smaller number or amount
less than	Fewer than
more	Greater number or amount
multiple	The answer you get when you multiply one number by another number. For example, the multiples of 12 would be 12 ( $12 \times 1$ ); 24 ( $12 \times 2$ ); 36 ( $12 \times 3$ )
multiply	When you add lots of the same thing together
number line	A line on which numbers can be plotted according to their value
range	A set or group of numbers between given limits
rounding	Estimating or approximating
rounded down	A number that has been approximated to a number that is smaller than the exact number

Term	Explanation / diagram
rounding down	Approximating to a number that is smaller than the exact number
rounding off	A way of estimating or approximating Writing a number as a multiple of 10, 100 or 1 000 to simplify a calculation. Example: 66 rounded to the nearest multiple of 10 is 70
rounded up	A number that has been approximated to a number that is bigger than the exact number
rounding up	Approximating to a number that is bigger than the exact number

## 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	14-16, 23-24, 31, 95-97, 103, 155-157, 209-211	23-25, 95-97, 196-198, 255 -256	21-22, 25, 81, 127, 211	6, 12, 55-56, 115, 155,	8-9, 180, 157-160, 279-293	43-45, 134- 135,	13-16, 218-219, 311	107- 109, 203- 204, 253	8-9, 127, 173
TG	8-9, 13, 16-17, 65, 69, 120-121, 174-175	43-44, 118-119, 235-238	47-50, 91-93, 123-125, 175	5, 11, 46, 48, 91, 122	6, 93	47-48	11-12, 174-175, 253-254	139- 141, 272- 273, 336-337	10, 68, 88

## UNIT PLAN AND OVERVIEW FOR UNIT 3: Approximation and calculation

LP	Lesson objective	Lesson Resources	Date completed
24	Learners will understand why it is useful to round off numbers and will be introduced to using a number line to round numbers.	Blank number line	
25	Learners will know how to round off to the nearest multiple of 100, round up and round down.	Blank number line	
26	Learners will know how to round off to the nearest multiple of 100 and 1 000	Blank number line	
27	Learners will be able to find the range of approximate numbers.	Blank number line	
28	Learners will use rounded numbers to solve problems in context.	Blank number line	
29	Learners will know how to use rounded numbers when adding and subtracting.	None needed	
30	Learners will know how to use rounded numbers when solving multiplication problems.	Blank number line	
31	Learners will know how to use rounded numbers when solving division problems.	None needed	
32	Learners will know how to estimate by grouping.	None needed	
33	Learners will consolidate the use of approximation and rounding in order to solve problems involving addition, subtraction, multiplication and division.	None needed	

### Assessment for learning

Use the templates provided at the front 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 week? If not, how will you get back on track?*

*What will you change next time? Why?*



## Lesson 24: Approximating numbers

### Teacher's notes

This lesson is one of the fully planned lessons to be used to cover the Term 1 curriculum.

CAPS topics: 1.1. Whole numbers: Rounding off to the nearest 10, 100 and 1 000

Lesson Objective: Learners will understand why it is useful to round off numbers and will be introduced to using a number line to round off numbers.

Lesson Vocabulary: approximation, rounding off, rounding

Resources needed: Blank number line

Date:

Week

Day

### 1 MENTAL MATHS (5 MINUTES)

	What is ...	Answer		What is ...	Answer
1	$29 + 4 =$	33	6	$85 + 7 =$	92
2	$71 + 9 =$	80	7	$58 + 8 =$	66
3	$13 + 8 =$	21	8	$66 + 6 =$	72
4	$33 + 7 =$	40	9	$79 + 2 =$	81
5	$87 + 4 =$	91	10	$25 + 6 =$	31

### 2 LINK TO PREVIOUS LESSON (5 MINUTES)

- Write the calculation using the column method on the board. Fill it in to match the dialogue.
- Point to the Ones column and say:  
**I cannot take 8 ones from 7 ones.**
- Ask: **What should I do?**  
(Borrow 1 ten from the tens column and convert it to 10 ones).

	HTh	TTh	Th	H	T	O
	1	6	8	4	0	7
-	1	2	4	3	5	8

- Point to the 0 in the tens column and say:  
**But I have no tens in the tens column.**
- Ask: **What should I do?** (Borrow 1 hundred from the hundreds column)
- Ask: **How many hundreds do we have once we have borrowed?**  
(4 hundreds – 3 hundreds = 3 hundreds).
- Ask: **So how many tens do I have now?**  
(10 tens).

	HTh	TTh	Th	H	T	O
				3		
	1	6	8	<del>4</del>	10	7
-	1	2	4	3	5	8

- Ask: **What do I do next so that I can subtract the ones?**  
(Borrow 1 ten from the 10 tens, leaving 9 tens).
- Ask: **How many ones do I have now?**  
(10 ones + 7 ones = 17 ones).
- Ask: **What do we do now?** (We subtract 8 ones from 17 ones and get 9 ones)
- Ask: **What do we do now?**  
(We subtract 5 tens from 9 tens and get 4 tens).

	HTh	TTh	Th	H	T	O
				3	9	
	1	6	8	4	<sup>10</sup> 0	17
–	1	2	4	3	5	8
						9

	HTh	TTh	Th	H	T	O
				3	9	
	1	6	8	4	<sup>10</sup> 0	17
–	1	2	4	3	5	8
					4	9

- Ask: **How many hundreds do we now have?**  
(3 hundreds – 3 hundreds = 0 hundreds).

	HTh	TTh	Th	H	T	O
				3	9	
	1	6	8	4	<sup>10</sup> 0	17
–	1	2	4	3	5	8
				0	4	9

- Finish the calculation on the board.
- Then erase all working in the calculation leaving the question only.
- Say: **In your classwork book, write down the calculation and work out the answer for yourself.**
- If necessary, work through the steps again with the learners, filling in all working.

	HTh	TTh	Th	H	T	O
				3	9	
	1	6	8	4	<sup>10</sup> 0	17
–	1	2	4	3	5	8
		4	4	0	4	9

### 3 CORRECT HOMEWORK ACTIVITY (5 MINUTES)

The previous lesson was an assessment (project), so no homework was given.

### 4 LESSON CONTENT – CONCEPT DEVELOPMENT (35 MINUTES)

Many teachers give rules for the learners to follow when rounding off. In TMU we aim to teach *maths for understanding*. We avoid only teaching rules in Grade 4 as it does not help learners to understand the meaning of rounding. We use number lines to represent what we

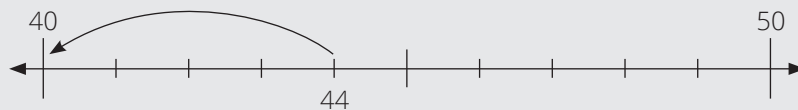
are doing pictorially when we round off. Once the learners understand what rounding off is, and how to use a number line when rounding off, we can move away from the pictorial support of the number line and use more abstract procedures and rules.

Say: **Today we are learning how to use a number line to round off numbers.**

### Activity 1: Whole class activity

- Have your blank number line ready for use during this lesson.
- Write the problem on the board and read it out to the learners: **Mondi has R100 and wants to buy a pair of socks for R24 and a pair of shorts for R82.**
- Ask: **How can he know quickly if he can buy both the socks and the shorts?**
- Let learners discuss and share their ideas with a partner.
- Allow time to share the ideas and conclusions with the whole class. (He cannot buy both, because R20 and R80 is R100. R24 is bigger than R20 and R82 is bigger than R80. So  $R24 + R82$  is more than R100.)
- Say: **You used approximation. You don't need to calculate exactly but can use approximation to decide that R100 is not enough to buy both the socks and the shorts.**
- First revise multiples of 10 with the learners.  
Ask: **Give me an example of a number that is a multiple of 10.** (This can be any number which ends in a 0 in one's place.)  
Say: **Let's count in multiples of 10 up to and including one hundred and twenty.** (10; 20; 30; 40; 50; 60; 70; 80; 90; 100; 110; 120).  
Ask: **Between which two multiples of 10 does 26 lie?** (20 and 30)  
Ask: **Between which two multiples of 10 does 43 lie?** (40 and 50)  
Ask: **Between which two multiples of 10 does 68 lie?** (60 and 70)
- Say: **An *approximation* is a value that is close to the exact number. It is a number that is a little more or a little less than the exact number.**  
Say: **When we go shopping, it is sometimes useful to *approximate* answers to check whether we have enough money to buy what we want to buy.**
- Write another problem on the board and read it out to the learners: **Jabu has R100 and wants to buy a magazine for R44 and a set of pencils for R68. Does he have enough money?**
- Say: **Let's use number lines to write 44 and 68 as a multiple of 10.**  
Stick your blank number line from the Teacher Resource Pack on the board. Write the numbers above and below the line using chalk.

- Say: **We want to find the closest multiple of 10 to 44.**  
 Ask: **Between which two multiples of 10 does 44 lie?** (40 and 50)  
 Say: **We write 40 and 50 on the number line.**



Write 44 on the number line.

Ask: **Is 44 closer to 40 or 50?** (closer to 40)

Say: **We say that 44 is approximately equal to 40.**

**We also say 44 rounded to the nearest multiple of 10 is 40.**

- Now say: **We want to find the closest multiple of 10 to 68.**  
 Ask: **Between which two multiples of 10 does 68 lie?** (60 and 70)  
 Say: **We write 60 and 70 on the number line.**



Write 68 on the number line.

Ask: **Is 68 closer to 60 or to 70?** (closer to 70)

Say: **We say that 68 is approximately equal to 70.**

**We also say 68 rounded to the nearest multiple of 10 is 70**

- Say: **We can now work out that  $R40 + R70 = R110$ . This is not the exact answer, it is an *approximate* answer because we *rounded* the numbers before we added them together. Now we can easily say that Jabu doesn't have enough money to buy both the magazine and the pencils.**

### Activity 2: Learners work in pairs

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

- Read the question and solve the first question with the class.
- Walk around the classroom to support learners as needed.
- Correct Activity 2 with learners so that they can receive immediate feedback.

1 Use the number lines to round the price of each item to the nearest multiple of R10.

**Scissors: R32**



Between which two multiples of 10 does 32 lie?  
Write the two numbers on the number line.  
Write 32 on the number line.  
R32 rounded to the nearest multiple of R10 is \_\_\_\_\_

**Glue: R28**



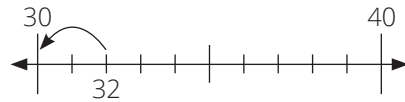
Between which two multiples of 10 does 28 lie?  
Write the two numbers on the number line.  
Write 28 on the number line.  
R28 rounded to the nearest multiple of R10 is \_\_\_\_\_

**Exercise book: R14**

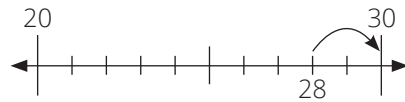


Between which two multiples of 10 does 14 lie?  
Write the two numbers on the number line.  
Write 14 on the number line.  
R14 rounded to the nearest multiple of R10 is \_\_\_\_\_

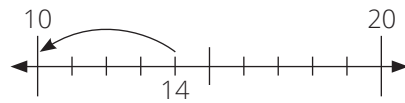
**Answers**



(30 and 40)  
(R30)



(20 and 30)  
(R30)



(10 and 20)  
(R10)

2 You want to buy glue and an exercise book.  
How much money do you need: R40 or R50? Why?

(R50.  
 $R30 + R10 = R40$ , but I am not sure R40 is enough to buy both, because I added R2 to R28 and subtracted R4 from R14.)

### Activity 3: Learners work on their own

Say: Complete Activity 3 in your LAB.

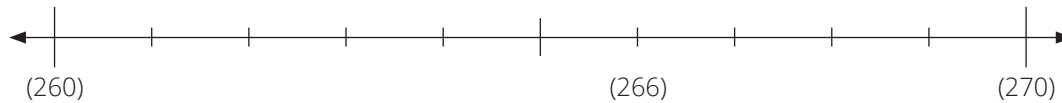
- Say: **When we round a number to the nearest 10 or multiple of 10, we say that we rounded off the number to the nearest 10 or multiple of 10.**
- Read the question for the learners and solve No 1 with the class.
- Walk around the classroom to support learners as needed.
- Correct Activity 3 with learners so that they can receive immediate feedback.
- The answers are given in brackets.

**1** The farmer had 266 cows. He told his friend that he had approximately 260 cows.

Is 260 an exact number or a rounded number? (A rounded number)

Is 266 an exact number or a rounded number? (An exact number)

Use the number line to work out whether he rounded 266 to the nearest multiple of 10.



Between which two multiples of 10 does 266 lie? Write the two multiples on the number line.

Write 266 on the number line.

266 rounded to the nearest multiple of 10 is (270)

Did he round to the nearest multiple of 10? (No, he did not round the number to the nearest multiple of 10)

**2** A newspaper and a TV programme reported the number of people at a soccer match.

- The newspaper said that 10 978 people went to watch the match.
- On the TV they said that 11 980 people went to watch the match.

A number line was used to round 10 978 to the nearest multiple of 10.



Between which two multiples of 10 does 10 978 lie? Write the two multiples on the number line.

Write 10 978 on the number line.


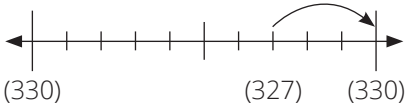

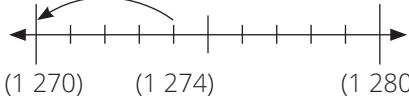

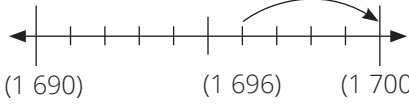
Is 10 978 closer to 10 970 or 10 980? (closer to 10 980)

Is 10 978 an exact number or a rounded number? (exact number)

Is 10 980 an exact number or a rounded number? (rounded number)

**5 HOMEWORK ACTIVITY (5 MINUTES)**

- Read the questions with the learners. Make sure all the learners understand what to do.
- Note that the homework activity only includes questions requiring rounding (approximating) to the nearest 10. There are no questions involving rounding when the digit in the ones column is 5. We will deal with this in the next lesson.

	ANSWERS
<p><b>1</b> Use the number line to show how you would round 327 to the nearest 10.</p>  <p>Between which two multiples of 10 does 327 lie? Write the two numbers on the number line. Write 327 on the number line. 327 rounded to the nearest 10 is _____</p>	 <p>(320 and 330) (327 rounded to the nearest 10 is 330)</p>
<p><b>2</b> Use the number line to show how you would round 1 274 to the nearest 10.</p>  <p>Between which two multiples of 10 does 1 274 lie? Write the two numbers on the number line. Write 1 274 on the number line. 1 274 rounded to the nearest 10 is _____</p>	 <p>(1 270 and 1 280) (1 274 rounded to the nearest 10 is 1 270)</p>
<p><b>3</b> Use the number line to show how you would round 1 696 to the nearest 10.</p>  <p>Between which two multiples of 10 does 1 696 lie? Write the two numbers on the number line. Write 1 696 on the number line. 1 696 rounded to the nearest 10 is _____</p>	 <p>(1 690 and 1 700) (1 696 rounded to the nearest 10 is 1 700)</p>

**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 learned about approximation or rounding off.**

## Lesson 25: Rounding to the nearest multiple of 10, rounding up and rounding down

### Teacher's notes

This lesson is one of the fully planned lessons to be used to cover the Term 1 curriculum.

CAPS topics: 1.1. Whole numbers: Rounding off to the nearest 10, 100 and 1 000

Lesson Objective: Learners will know how to round to the nearest 10 and understand the difference between rounding up and rounding down.

Lesson Vocabulary: approximating, rounding off, rounding up, rounding down, multiple, number line

Resources needed: Blank number line

Date:

Week

Day

### 1 MENTAL MATHS (10 MINUTES)

	Find the sum of	Answer		What is...	Answer
<b>1</b>	26 and 13	39	<b>6</b>	$25 + 20 =$	45
<b>2</b>	71 and 18	89	<b>7</b>	$73 + 24 =$	97
<b>3</b>	33 and 55	88	<b>8</b>	$66 + 32 =$	98
<b>4</b>	69 and 30	99	<b>9</b>	$51 + 12 =$	63
<b>5</b>	13 and 11	24	<b>10</b>	$31 + 43 =$	74

### 2 LINK TO PREVIOUS LESSON (5 MINUTES)

Whole class activity.

Link to concepts learned in previous lessons by asking these questions:

- Say: **Describe one situation in which it is useful to round off or approximate.**  
(When shopping to find out if you have enough money. When talking about how many people attended an event. When estimating distances travelled or still to travel).
- Ask: **Between which two multiples of 10 does 567 lie?** (560 and 570)

### 3 CORRECT HOMEWORK ACTIVITY (5 MINUTES)

The answers to the Homework Activity for Lesson 24 are provided in Lesson 24.

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



#### 4 LESSON CONTENT - CONCEPT DEVELOPMENT (35 MINUTES)

Rounding is a form of approximation or estimation. In Grade 4, learners round to the nearest 10, 100 and 1 000. When we round to the nearest 10, the answer should be a multiple of 10. When the multiple of 10 is larger than the given number, we say we have rounded up. When the multiple of 10 is smaller than the given number, we say we have rounded down.

In this lesson, the scaffolding provided to learners in the form of number lines is gradually withdrawn.

Say: **Today we are going to round numbers up and round numbers down to the nearest multiple of 10.**

#### Activity 1: Whole class activity

- Say: **You know that *rounding* is a way *estimating* or *approximating*. A rounded off number is not an *exact* number.**  
Say: **We can round a number to the nearest ten, hundred, thousand, or any other number.**
- Write 532 on the board  
Say: **Give one multiple of 10 that is bigger than 532.**  
(An infinite number of answers is possible here. Examples: 540, 550, 2 310)  
Say: **Give one multiple of 10 that is smaller than 532.**  
(An infinite number of answers is possible here. Examples: 530, 520, 200)
- Use your blank number line, writing in numbers as you talk. The learners also have a blank number line in the LAB which they can use.  
Say: **Let's round 1 513 to the nearest ten. To do so, we need to know the multiple of 10 just before 1 513 and the multiple of 10 just after 1 513.**  
Ask: **Which multiple of ten comes just before 1 513?** (1 510)  
Ask: **Which multiple of ten comes just after 1 513?** (1 520)

Let learners write 1 510 and 1 520 on the number line in the LAB while you write 1 510 and 1 520 on the number line on the board.

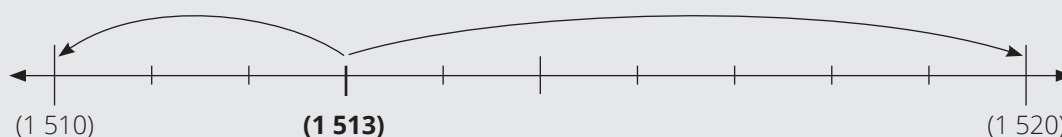
Say: **1 513 rounded to the nearest multiple of ten will be 1 510 or 1 520.**



- Say: **Find the position of 1 513 on the number line.**  
Let learners mark the position of 1 513 on the number line and let a learner come to the board to mark the position on the board.



- Say: **Draw arrows to show whether it would be closer to ‘jump’ from 1 513 to 1 510 or from 1 513 to 1 520.**

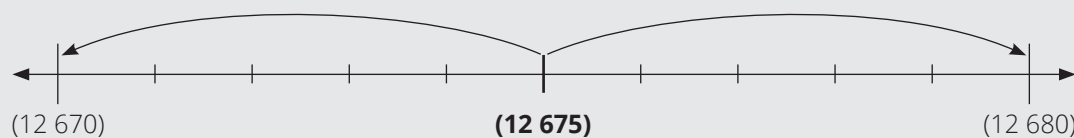


- Ask: **Is the number 1 513 closer to the number 1 510 or to 1 520?** (1 510)  
 Say: **1 513 rounded to the nearest multiple of 10 is 1 510.**  
 Let learners repeat: **1 513 rounded to the nearest multiple of 10 is 1 510.**  
 Say: **We have rounded 1 513 down to 1 510.**  
 Let learners repeat: **We have rounded 1 513 down to 1 510.**

- Say: **Let’s use a number line to round off 12 675 to the nearest 10.**  
 Ask: **Between which two multiples of 10 does the number 12 675 lie?**  
 (12 670 and 12 680)  
 Say: **Write 12 670 and 12 680 in the correct spaces on the number line in your LAB.**  
 Invite one of the learners to write the numbers below the number line on the board.  
 Once the learners have got this correct, say:  
**The number 12 675 lies between 12 670 and 12 680 on the number line.**

Ask a learner to come to the board and draw in the arrows from 12 675 to 12 670, and from 12 675 to 12 680.

Ask: **Is the number 12 675 closer to 12 670 or 12 680?**  
 (It is not closer to either. It is exactly halfway between the two multiples of 10)



Say: **The number 12 675 is exactly halfway between 12 670 and 12 680. People all over the world have agreed that when a number is equally far from the multiples on each side, they will round up.**

Ask: **So, what is 12 675 rounded to?** (12 680)

### Activity 2: Learners work in pairs

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

- Read the questions in the LAB with the learners. Make sure all the learners understand what to do.
- Note that the numbers at the beginning and end of the number line have been filled in for learners for question 1, but that they need to fill in the numbers on the number line themselves for questions 2 and 3. Remind learners that the numbers at each end of the number line must be consecutive multiples of ten.
- Walk around the classroom to support learners as needed.
- Correct Activity 2 with learners so that they can receive immediate feedback.
- Take particular note of whether learners are able to work out what numbers should be at the beginning and end of each number line. As we are rounding to the nearest 10, these number should be multiples of 10.
- The answers are given in brackets.

Round each number to the nearest multiple of 10.  
Show the rounding process on each number line.

1 Round 3 476 to the nearest 10.



Answer                     (3 480)

2 Between which two multiples of 10 does 953 lie?                     (950 and 960)

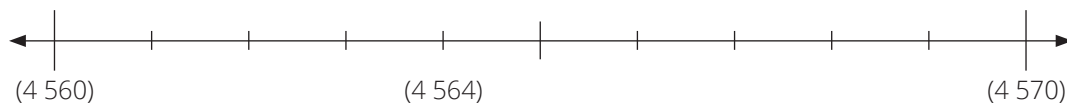
Write these two multiples of 10 on the number line.



Now round 953 to the nearest multiple of 10.                     (950)

3 Between which two multiples of 10 does 4 564 lie?                     (4 560 and 4 570)

Write these two multiples of 10 on the number line.



Now round 4 564 to the nearest multiple of 10.                     (4 560)

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

- Say: **You already know that when we round a number to the nearest 10, the answer must be a multiple of 10.**

Ask: **When we have rounded a number to the nearest 10, what should the last digit be?** (0 / zero)

Say, and write on the board: **8 679 rounded to the nearest 10 is 8 680.**

The digit in the ten's  
column has increased  
by one, from 7 to 8
The last  
digit is  
a zero

- Ask: **Is the rounded number bigger or smaller than the *exact* number?** (Bigger)  
Say: **In this example, we have *rounded up*.**
  - Say, and write on the board: **14 234 rounded to the nearest 10 is 14 230.**  
Ask: **When we rounded 14 234 to the nearest 10, did we round up or did we round down?** (Rounded down)
  - Say: When we round off a number;  
**We find the multiple of 10 smaller than the number and the multiple of 10 bigger than the number.**  
**We then decide which multiple of 10 is closer to the number, and that is the answer.**
  - Write on the board and say: **Between which two multiples of 10 does 325 lie?** (320 and 330)  
Say: **Is 325 closer to 320 or 330?** (325 is half-way between 320 and 330)  
Say: **What is 325 rounded to the nearest multiple of 10?** (330)  
Say: **Why?** (We round the number that is half-way between the two multiples of 10 up to the larger multiple of 10.)  
Say: **Has 327 been rounded up or rounded down?** (Rounded up)
- Say: **Do Activity 3 in your LAB.**
- Read the questions for the learners.
  - Walk around the classroom to support learners as needed. If you find that many of the learners still need help, do another example on the board with the class.
  - Correct Activity 3 with learners so that they can receive immediate feedback.
  - The answers are given in brackets.

Round each number to the nearest multiple of 10.

- 1** Round 76 to the nearest multiple of 10.

Between which two multiples of 10 does 76 lie? (70 and 80)

Which multiple of 10 is 76 closest to? (80)

What is 76 rounded to the nearest multiple of 10? (80)

Has 76 been rounded down or rounded up? (Up)

- 2** Round 953 to the nearest 10.

Between which two multiples of 10 does 953 lie? (950 and 960)

Which multiple of 10 is 953 closest to? (950)

What is 953 rounded to the nearest multiple of 10? (950)

Has 953 been rounded down or rounded up? (Down)

- 3** Round 4 569 to the nearest 10.

Between which two multiples of 10 does 4 569 lie? (4 560 and 4 570)



Which multiple of 10 is 4 569 closest to? (4 570)

What is 4 569 rounded to the nearest multiple of 10? (4 570)

Has 4 569 been rounded down or rounded up? (Up)

**5 HOMEWORK ACTIVITY (5 MINUTES)**

The homework activity is a consolidation of the concepts of rounding to the nearest multiple of 10, rounding up and rounding down. Explain to learners what they are required to do for homework.

		ANSWER
<b>1</b>	Round 843 to the nearest multiple of 10. Between which two multiples of 10 does 843 lie? ..... Which multiple of 10 is 843 closest to? ..... What is 843 rounded to the nearest multiple of 10? ..... Has 843 been rounded down or rounded up? .....	(840 and 850) (840) (840) (Down)
<b>2</b>	Round 3 686 to the nearest multiple of 10.  Between which two multiples of 10 does 3 686 lie? ..... What is 3 686 rounded to the nearest 10? ..... In this question did you round up or round down? .....	(3 680 and 3 690) (3 690) (Up)
<b>3</b>	Round 65 466 to the nearest multiple of 10.  Between which two multiples of 10 does 65 466 lie? What is 65 466 rounded to the nearest 10? ..... In this question did you round up or round down? .....	(65 460 and 65 470) (65 470) (Up)

**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 rounded off to the nearest 10 and have learned what it means to round up and to round down.**

Also say: **When a number lies exactly half-way between two multiples of 10, we always round up.**

## Lesson 26: Rounding off to the nearest multiple of 100 and 1 000

### Teacher's notes

This lesson is one of the fully planned lessons to be used to cover the Term 1 curriculum.

CAPS topics: 1.1 Whole numbers: Rounding off to the nearest 100 and 1 000

Lesson Objective: Learners will know how to round off to the nearest 100 and 1 000

Lesson Vocabulary: approximating, rounding off, rounding up, rounding down, multiple, number line

Resources needed: Blank number line

Date:

Week

Day

### 1 MENTAL MATHS (5 MINUTES)

	Which multiple of 10 is this number closest to?	Answer		Which multiple of 10 is this number closest to?	Answer
1	13	10	6	131	130
2	46	50	7	199	200
3	175	180	8	85	90
4	53	50	9	79	80
5	248	250	10	82	80

### 2 LINK TO PREVIOUS LESSON (5 MINUTES)

Link to concepts learned in previous lessons by asking these questions:

- Ask, and write the numbers: **Which multiple of ten is 6 418 closest to?** (6 420)
- Ask: **Is this an example of rounding up or rounding down?** (Rounding up)
- Ask: **Why this is an example of rounding up.**  
(The rounded number is bigger than the exact number)
- Ask: **When you have rounded to the nearest 10, what should the digit in the ones column always be?** (0 / zero)
- Ask: **When a number is half-way between two multiples of 10, what do we do?**  
(We round up to the larger multiple of 10)
- Ask: **What number do you get when you round 230 off to the nearest multiple of 10?** (230)
- Say: **230 is already a multiple of 10, so we keep 230 as it is.**

### 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 extend their understanding of rounding to rounding off to the nearest multiple of a hundred and rounding off to the nearest multiple of a thousand. Again, in this lesson the scaffolding provided to learners in the form of number lines is gradually withdrawn.

**Say: Today we are learning to round the number to the nearest multiple of 100 and multiple of 1 000**

**Activity 1: Whole class activity**

- Have your blank number line from the Teacher Resource Pack ready for use during the lesson. The learners also have blank number lines in the LAB.
- First revise multiples of 100 with the learners.  
Ask: **Give me an example of a number that is a multiple of 100.**  
(This can be any number that ends in two zeros)  
Say: **Let's count in multiples of 100 up to and including 800.**  
(100; 200; 300; 400; 500; 600; 700; 800)  
Say: **Let's count in multiples of 100 from 2 500 up to and including 3 000.**  
(2 500; 2 600; 2 700; 2 800; 2 900; 3 000)
- Write 325 on the board and ask: **Between which two multiples of 100 does 325 lie?**  
(300 and 400)  
Write 1 340 on the board and ask: **Between which two multiples of 100 does 1 340 lie?**  
(1 300 and 1 400)  
Write 6 875 on the board and ask: **Between which two multiples of 100 does 6 875 lie?**  
(6 800 and 6 900)
- Say: **We need to round 325 to the nearest 100/multiple of 100.**  
Write 325 on the board.  
Ask: **Between which two multiples of 100 does 325 lie?** (300 and 400)  
Let the learners write 300 and 400 on their number line in LAB and then let a learner write 300 and 400 on the number line on the board.



Confirm that the numbers between 300 and 400 on the number line are 310, 320, 330, 340.....390.



Ask a learner to mark the approximate position of 325 on the number line on the board. (between 320 and 330)



Ask: **Is 325 closer to 300 or closer to 400?** (300)

Ask: **What is the answer when we round 325 off to the nearest multiple of 100?** (300)

– Say: **We need to round 936 to the nearest 100 / multiple of 100.**

Write 936 on the board.

Ask: **Between which two multiples of 100 does 936 lie?** (900 and 1 000)

Let learners write 900 and 1 000 on their number line in LAB and let a learner write 900 and 1 000 on the number line on the board for the correction.



Confirm that the numbers of between 900 and 1 000 on the number line are 910, 920, 930, 940.....990.

Ask a learner to mark the approximate position of 936 on the number line on the board. (between 930 and 940, but closer to 940)



Ask: **Is 936 closer to 900 or closer to 1 000?** (900)

Ask: **What is 936 rounded to the nearest multiple of 100?** (900)

### Activity 2: Work with a partner

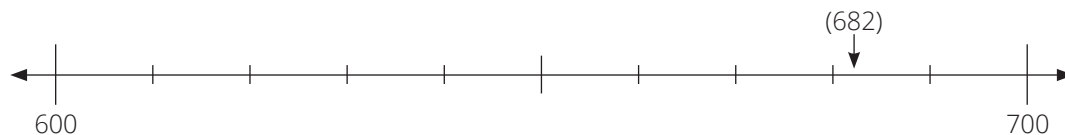
Say: **Do Activity 2 in your LAB.**

- Read the questions with the learners.
- Walk around the classroom to support learners as needed.
- Correct Activity 2 with learners so that they can receive immediate feedback.
- Take particular note of whether the learners are able to work out which numbers should be at the beginning and end of each number line. As we are rounding to the nearest 100, these numbers should be multiples of 100.
- Answers are given in brackets.

Round each number to the nearest multiple of 100.

- 1** Use a number line to round 682 to the nearest multiple of 100

Between which two multiples of 100 does 682 lie? (600 and 700)



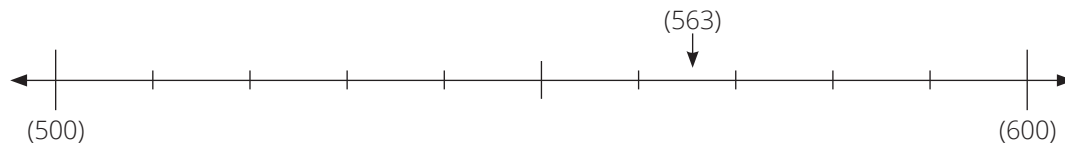
Write 682 on the number line.

Which multiple of 100 is 682 closer to? (700)

What is 682 rounded to the nearest multiple of 100? (700)

- 2** Use a number line to round 563 to the nearest multiple of 100

Between which two multiples of 100 does 563 lie? (500 and 600)



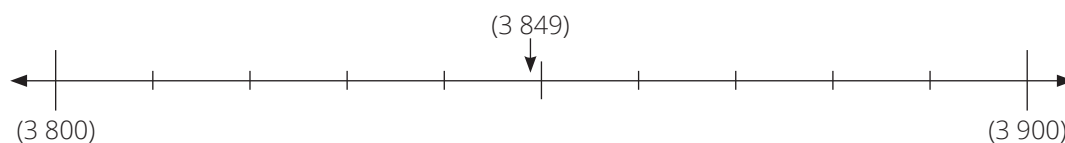
Write 563 on the number line.

Which multiple of 100 is 563 closer to? (600)

What is 563 rounded to the nearest multiple of 100? (600)

- 3** Use a number line to round 3 849 to the nearest multiple of 100

Between which two multiples of 100 does 3 849 lie? (3 800 and 3 900)



Write 3 849 on the number line.

Which multiple of 100 is 3 849 closer to? (3 900)

What is 3 849 rounded to the nearest multiple of 100? (3 900)

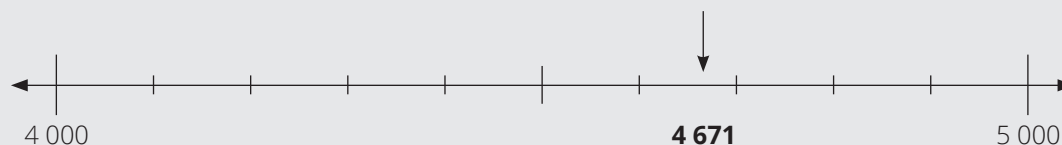
**Activity 3: Whole class activity and then learners work on their own**

- Say: **We are going to round a number to the nearest multiple of 1 000.**
- First revise multiples of 1 000 with the learners.  
Ask: **Give me an example of a number that is a multiple of 1 000.**  
(This can be any number that ends in three zeros)  
Say: **Let's count in multiples of 1 000 up to and including 7 000.**  
(1 000; 2 000; 3 000; 4 000; 5 000; 6 000; 7 000)  
Say: **Let's count in multiples of 1 000 from 32 000 up to and including 37 000.**  
(32 000; 33 000; 34 000; 35 000; 36 000; 37 000)
- Write 1 256 on the board and ask:  
**Between which two multiples of 1 000 does 1 256 lie?** (1 000 and 2 000)  
Write 72 500 on the board and ask:  
**Between which two multiples of 1 000 does 72 500 lie?** (72 000 and 73 000)
- Say: **We need to round 4 671 to the nearest multiple of 1 000.**  
Write 4 671 on the board  
Ask: **Between which two multiples of 1 000 does 4 671 lie?** (4 000 and 5 000)  
Let learners write 4 000 and 5 000 on their number line in the LAB.  
Then let one of the learners come to the board and write 4 000 and 5 000 on the number line on the board.



Confirm that the numbers between 4 000 and 5 000 on the number line are 4 100, 4 200, 4 300, 4 400.....4 900 on the number line.

Let learners mark the approximate position of 4 671 on the number line on the board.  
(between 4 600 and 4 700, but closer to 4 700)



Ask: **Is 4 671 closer to 4 000 or closer to 5 000?** (5 000)

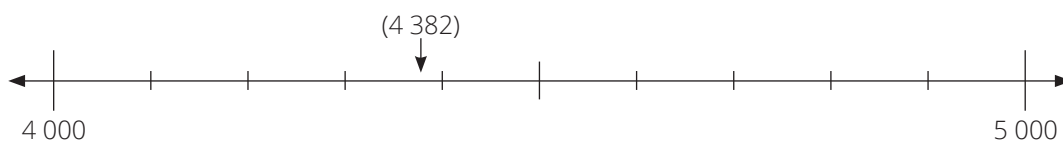
Ask: **What is 4 671 rounded to the nearest multiple of 1 000?** (5 000)

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

- Read the questions with the learners.

- Walk around the classroom to support learners as needed.
- Correct Activity 3 with learners so that they can receive immediate feedback.
- Take particular note of whether the learners are able to work out which numbers should be at the beginning and end of each number line. As we are rounding to the nearest 100, these numbers should be multiples of 100.
- The answers are given in brackets.

1 Use a number line to round 4 382 to the nearest multiple of 1 000.

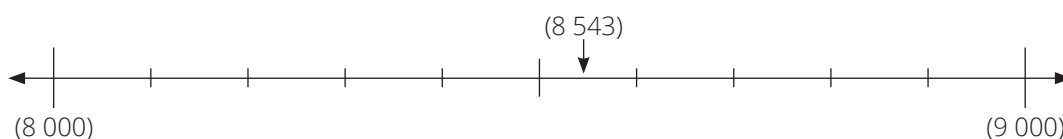


Which multiple of 1 000 is 4 382 closer to? (4 000)

What is 4 382 rounded to the nearest multiple of 1 000? (4 000)

2 Use a number line to round 8 543 to the nearest multiple of 1 000.

Between which two multiples of 1 000 does 8 543 lie? (8 000 and 9 000)

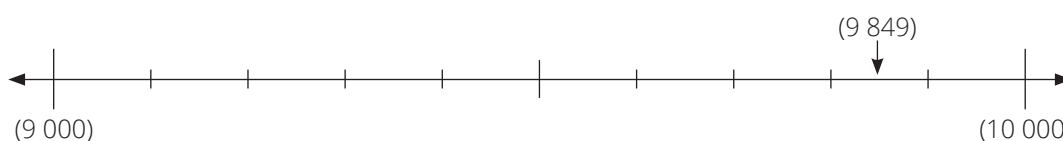


Which multiple of 1 000 is 8 543 closer to? (9 000)

What is 8 543 rounded to the nearest multiple of 1 000? (9 000)

3 Use a number line to round 9 849 to the nearest multiple of 1 000.

Between which two multiples of 1 000 does 9 849 lie? (9 000 and 10 000)

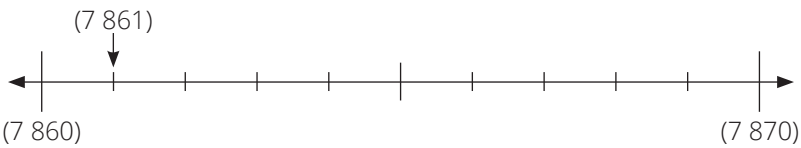
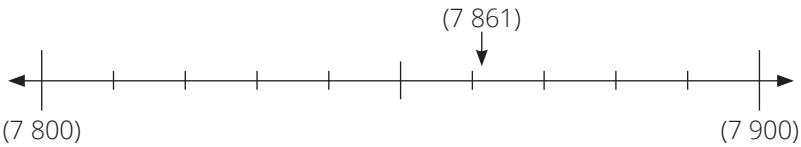
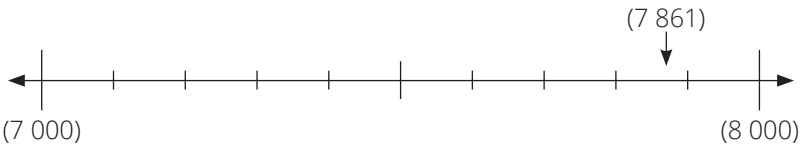


Which multiple of 1 000 is 9 849 closer to? (10 000)

What is 8 849 rounded to the nearest multiple of 1 000? (10 000)

### 5 HOMEWORK ACTIVITY (5 MINUTES)

Explain what learners are required to do for homework.

		ANSWER
<b>1</b>	<p>Use a number line to round 7 861 to the nearest multiple of 10</p> <p>Between which two multiples of 10 does 7 861 lie? .....</p>  <p>What is 7 861 rounded to the nearest multiple of 10? .....</p>	<p>(7 860 and 7 870)</p> <p>(7 860)</p>
<b>2</b>	<p>Use a number line to round 7 861 to the nearest multiple of 100</p> <p>Between which two multiples of 100 does 7 861 lie? .....</p>  <p>What is 7 861 rounded to the nearest multiple of 100? .....</p>	<p>(7 800 and 7 900)</p> <p>(7 900)</p>
<b>3</b>	<p>Use a number line to round 7 861 to the nearest multiple of 1 000</p> <p>Between which two multiples of 1 000 does 7 861 lie? .....</p>  <p>What is 7 861 rounded to the nearest multiple of 1 000? .....</p>	<p>(7 000 and 8 000)</p> <p>(8 000)</p>

UNIT 3

### 6 REFLECTION AND SUMMARY OF LESSON (5 MINUTES)

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

Say: **We have learned how to round off to the nearest ten, hundred and thousand.**

**We also know:**

- when we round to the nearest ten, the answer is a multiple of ten
- when we round to the nearest hundred, the answer is a multiple of a hundred
- when we round to the nearest thousand, the answer is a multiple of a thousand.

## Lesson 27: The range of approximate numbers

### Teacher's notes

This lesson is one of the fully planned lessons to be used to cover the Term 1 curriculum.

CAPS topics: 1.1 Whole numbers: Rounding off to the nearest 10, 100 and 1 000

Lesson Objective: Learners will be able to use the terms greater than and less than to state the range of approximate numbers.

Lesson Vocabulary: greater than, less than, range, approximate

Resources needed for this lesson: Blank number line

Date:

Week

Day

### 1 MENTAL MATHS (5 MINUTES)

	Round off this number to the nearest 100.	Answer		Round off this number to the nearest 100.	Answer
1	165	200	6	519	500
2	432	400	7	972	1 000
3	650	700	8	49	0
4	360	400	9	600	600
5	198	200	10	701	700

### 2 LINK TO PREVIOUS LESSON (5 MINUTES)

Link to concepts learned in previous lessons by asking these questions:

- Ask: **Tino says that rounding to the nearest multiple of 10 means that there will be a 0 in the Ones place. Is he correct?** (Yes)
- Ask: **Mari says that when we round to the nearest multiple of 100 there should always be a zero in the hundreds place. Is she correct?** (No, not always)

Say and write the numbers on the board: **43 012 and 69 458**

**There can be a zero in the hundreds place.**

**For example, when we round off 43 012 to the nearest hundred to get 43 000.**

**BUT there could also be any other number in the hundreds place.**

**For example, when we round off 69 458 to get 69 500.**

### 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.

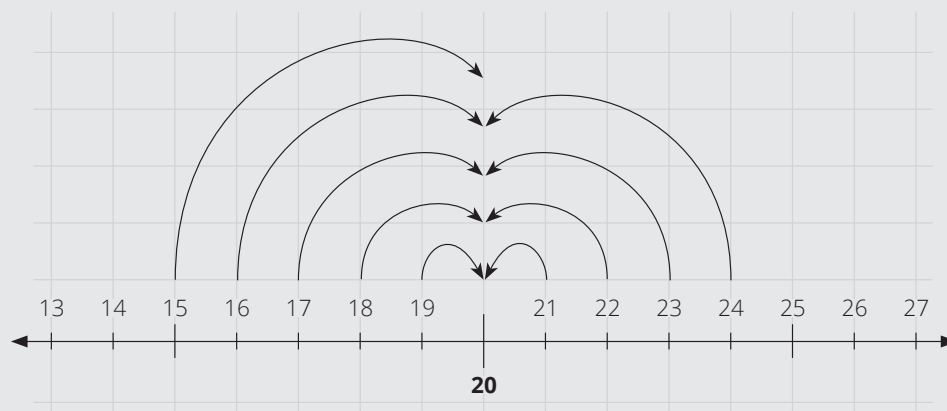
**4 LESSON CONTENT - CONCEPT DEVELOPMENT (35 MINUTES)**

In this lesson learners use 'greater than' and 'less than' to give the range of rounded numbers. This is an effective way of reinforcing their understanding of rounding off. Encourage the learners to use number lines to work out the answers.

Say: **Today we are learning to work out the range of rounded numbers.**

**Activity 1: Whole class activity**

- Use your blank number line to support the explanation.
- Say: **Mother said that the mass of her suitcase is approximately 20 kg.**  
Say: **We want to work out what the actual mass of her suitcase could be.**  
Point to the number on the number line as you ask each question.  
Fill in the arrows one-by-one as you ask these questions.
  - Is 20 the multiple of 10 that is closest to 14? (No)
  - Is 20 the multiple of 10 that is closest to 15? (Yes)
  - Is 20 the multiple of 10 that is closest to 16? (Yes)
  - Is 20 the multiple of 10 that is closest to 17? (Yes)
  - Is 20 the multiple of 10 that is closest to 18? (Yes)



- Is 20 the multiple of 10 that is closest to 19? (Yes)
- Is 20 the multiple of 10 that is closest to 21? (Yes)
- Is 20 the multiple of 10 that is closest to 22? (Yes)
- Is 20 the multiple of 10 that is closest to 23? (Yes)
- Is 20 the multiple of 10 that is closest to 24? (Yes)
- Is 20 the multiple of 10 that is closest to 25? (No)

Say: **The exact mass of mother's suitcase could have been 15 kg, 16 kg, 17 kg, 18 kg, 19 kg, 20 kg, 21 kg, 22 kg, 23 kg or 24 kg.**

Say: **All of those amounts would give us 20 kg if we rounded the amount to the nearest multiple of 10.**

Say: **The range for the mass of mother's suitcase is any number greater than 14 kg and less than 25 kg.**

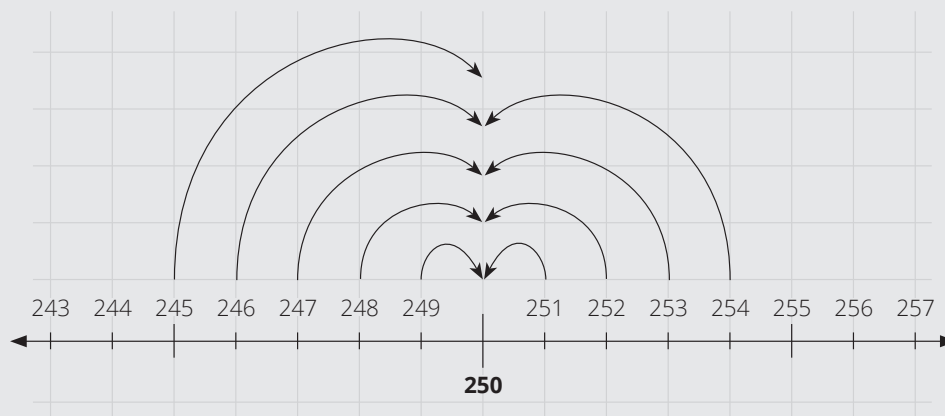
Write on the board: **Range is greater than 14 kg and less than 25 kg.**

- Now say: **Let's work out all the possible numbers that give 250 when rounded to the nearest multiple of ten.**
- Follow the same sequence of questioning as in the example above.  
Again, point to the number on the number line as you ask each question.  
Fill in the arrows one-by-one as you ask each question.

Start:

- **Is 250 the multiple of 10 that is closest to 244?** (No)
- **Is 250 the multiple of 10 that is closest to 245?** (Yes)
- **And so on ....**

Your number line should look like this:



Say: **The following numbers all round off to 250:**

**245; 246; 247; 248; 249; 250; 251; 252; 253 and 254.**

Say: **The numbers are all greater than 244 and less than 255.**

Write on the board: **Range is greater than 244 and less than 255.**

### Activity 2: Learners work in pairs

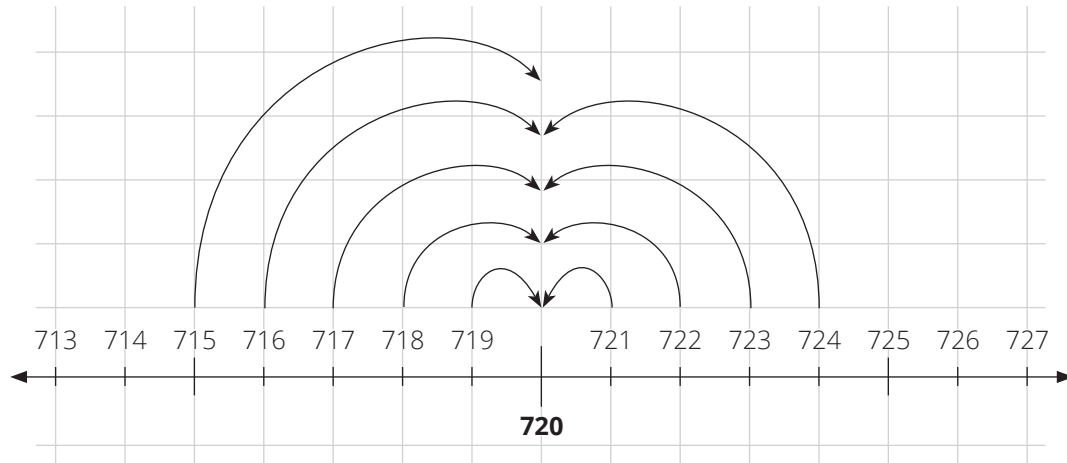
Say: **Do Activity 2 in your LAB.**

- Read the questions with the learners.
- Walk around the classroom to support learners as needed.
- Correct Activity 2 with learners so that they can receive immediate feedback.
- The answers are given in brackets.



Use each number line to work out the range of the following approximate numbers.  
An example has been done for you.

**Example:** Which numbers give 720 when rounded to the nearest multiple of 10?

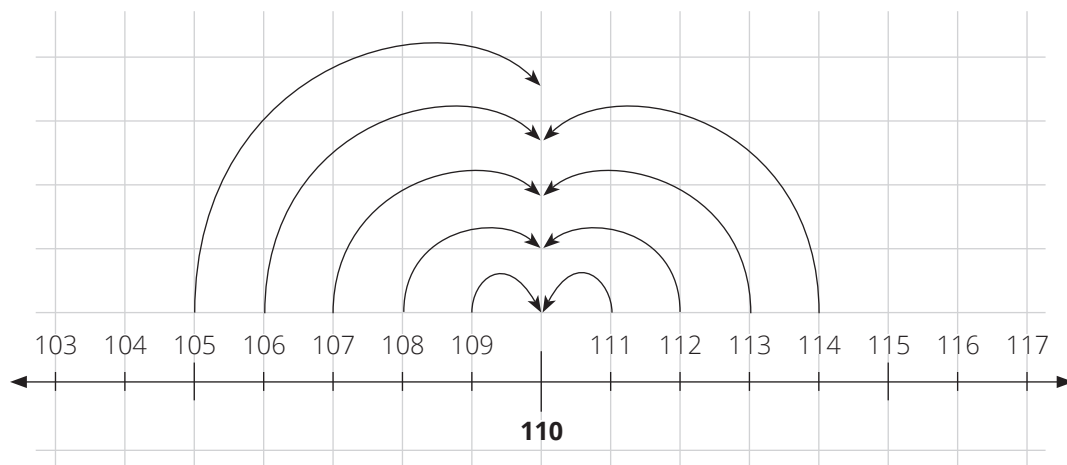


715; 716; 717; 718; 719; 720; 721; 723 and 724 all give 720 when rounded to the nearest multiple of 10.

The numbers are all greater than 714 and less than 725.

1 Which numbers give 110 when rounded to the nearest multiple of 10?

Use the number line to find the answer.



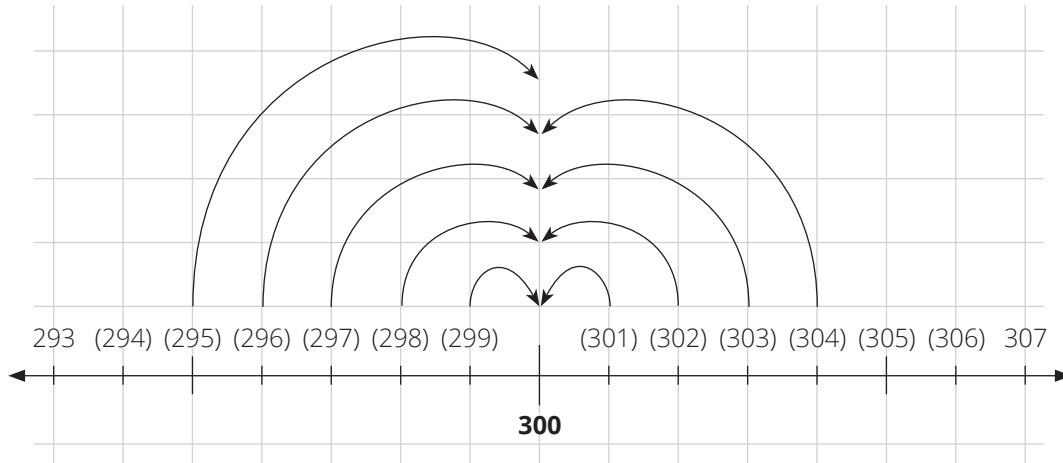
Numbers that give 110 when rounded to the nearest multiple of 10 are:

(105; 106; 107; 108; 109; 110; 111; 112; 113; 114)

The numbers are all greater than (104) and less than (115)

2 Which numbers give 300 when rounded to the nearest multiple of 10?

Use the number line to find the answer.



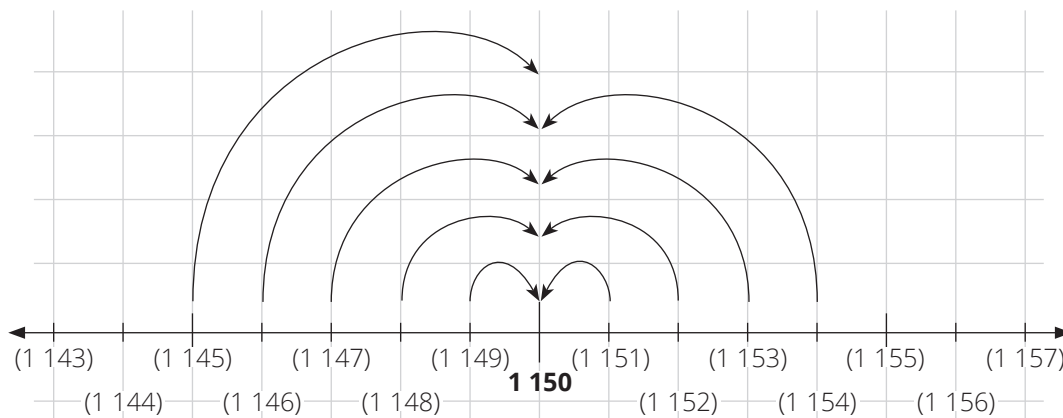
Numbers that give 300 when rounded to the nearest multiple of 10 are:

(295; 296; 297; 298; 299; 300; 301; 302; 303; 304)

The numbers are all greater than (294) and less than (305)

3 Which numbers give 1 150 when rounded to the nearest multiple of 10?

Use the number line to find the answer.



Numbers that give 1 150 when rounded to the nearest multiple of 10 are:

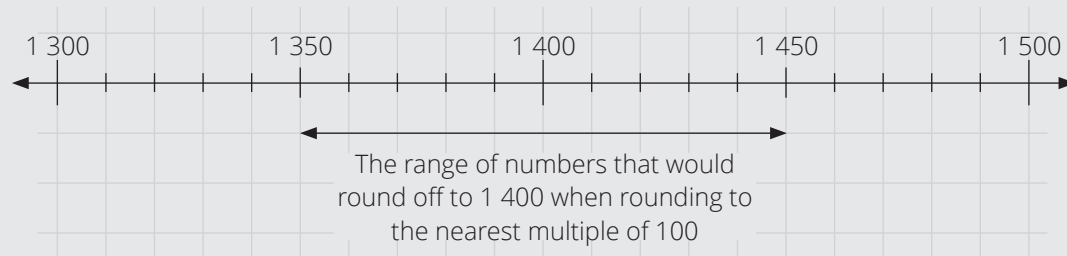
(1 145; 1 146; 1 147; 1 148; 1 149; 1 150; 1 151; 1 152; 1 153; 1 154)

The numbers are all greater than (1 144) and less than (1 155)

**Activity 3: Whole class activity and then learners work in pairs**

- Use your blank number line on the board.
- Say: **Let's work out all the numbers that give 1 400 when rounded to the nearest multiple of 100.**  
Allow the learners to make educated guesses and mark the numbers on the number line.

Then, underneath the number line, write "the range of number that would round off to 1 400 when rounding to the nearest multiple of 100".



**Ask: What is the range of numbers that round off to 1 400 when rounding to the nearest multiple of 100?** (The range is greater than 1 349 and less than 1 450)

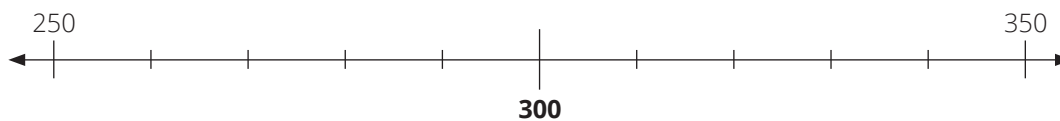
**Say: Give me some of the numbers that round off to 1 400 when rounding to the nearest multiple of 100.** (There are many possible numbers here. They need to be greater than 1 349 and less than 1 450. Examples are 1 350; 1 351; 1 352; 1 353; 1 354 up to 1 449)

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

- Read the questions with the learners.
- Walk around the classroom to support learners as needed.
- Correct Activity 3 with learners so that they can receive immediate feedback.
- The answers are given in brackets.

- 1** Which numbers give 300 when rounded to the nearest multiple of 100?

Use the number line to find the answer.



Write down five numbers that would give 300 when rounded to the nearest multiple of 100:

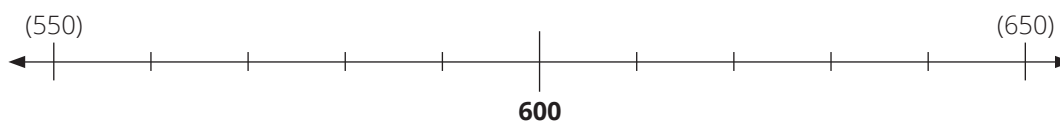
(These could be any of the following numbers: 250; 251; 252; 253; up to 349)

What is the range of numbers that give 300 when rounded to the nearest multiple of 100?

The range is greater than (249) and less than (350)

- 2** Which numbers give 600 when rounded to the nearest multiple of 100?

Use the number line to find the answer.



Write down five numbers that would give 600 when rounded to the nearest multiple of 100:

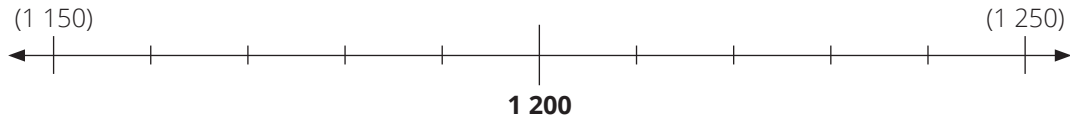
(These could be any of the following numbers: 550; 551; 552; 553; up to 649)

What is the range of numbers that give 600 when rounded to the nearest multiple of 100?

The range is greater than (549) and less than (650)

**3** Which numbers give 1 200 when rounded to the nearest multiple of 100?

Use the number line to find the answer.



Write down 5 numbers that would give 1 200 when rounded to the nearest multiple of 100:

(These could be any of the following numbers: 1 150; 1 151; 1 152; 1 153; up to 1 249)

What is the range of numbers that give 1 200 when rounded to the nearest multiple of 100?

The range is greater than           (1 149)           and less than           (1 250)          

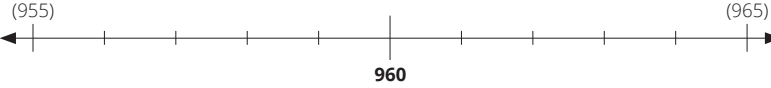

**5 HOMEWORK ACTIVITY (5 MINUTES)**

Explain to learners what they need to do for homework. As this is a challenging concept for most Grade 4 learners, the questions are restricted to the range of numbers that are rounded to the nearest multiple of 10.

Encourage the learners to use the number line to work out the answers.

		ANSWER
<b>1</b>	<p>Which numbers give 470 when rounded to the nearest multiple of 10?</p> <p>Use the number line to find the answer.</p> <p>Numbers that give 470 when rounded to the nearest multiple of 10 are: .....</p> <p>The numbers are all greater than ..... and less than .....</p>	<p>(465; 466; 467; 468; 469; 470; 471; 472; 473 and 474)</p> <p>(Greater than 464 and less than 475)</p>

## Unit 3: Approximation and calculation

<p><b>2</b></p>	<p>Which numbers give 960 when rounded to the nearest multiple of 10?</p> <p>Use the number line to find the answer.</p>  <p>Numbers that give 960 when rounded to the nearest multiple of 10 are: .....</p> <p>The numbers are all greater than ..... and less than .....</p>	<p>(955; 956; 957; 958; 959; 960; 961; 962; 963 and 964)</p> <p>(Greater than 954 and less than 965)</p>
<p><b>3</b></p>	<p>Which numbers give 300 when rounded to the nearest multiple of 10?</p> <p>Use the number line to find the answer.</p>  <p>Numbers that give 300 when rounded to the nearest multiple of 10 are: .....</p> <p>The numbers are all greater than ..... and less than .....</p>	<p>(295; 296; 297; 298; 299; 300; 301; 302; 303 and 304)</p> <p>(Greater than 294 and less than 305)</p>

### 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 learned to work out the range of numbers that all round off to the same number.**

## Lesson 28: Using rules to round off numbers

### Teacher's notes

This lesson is one of the fully planned lessons to be used to cover the Term 1 curriculum.

CAPS topics: 1.1 Whole numbers: Rounding off to the nearest 10, 100 and 1 000

Lesson Objective: Learners will use rules to round numbers to solve problems in context.

Lesson Vocabulary: at least, exact, rounded up, rounded down, more, less

Resources needed for this lesson: Blank number line, Place Value Flash Cards (O to TTh)

Date:

Week

Day

### 1 MENTAL MATHS (5 MINUTES)

	Round off this number to the nearest 1 000.	Answer		Round off this number to the nearest 1 000.	Answer
1	2 500	3 000	6	526	1 000
2	2 499	2 000	7	7 456	7 000
3	459	0	8	4 500	5 000
4	7 759	8 000	9	1 687	2 000
5	8 005	8 000	10	3 149	3 000

### 2 LINK TO PREVIOUS LESSON (5 MINUTES)

Link to concepts learned in previous lessons by asking these questions:

- Ask: **Is a rounded-up number bigger or smaller than the exact number?** (Bigger)
- Ask: **Is a rounded-down number more or less than the exact number?** (Less)

### 3 CORRECT HOMEWORK ACTIVITY (5 MINUTES)

The answers to the Homework Activity for Lesson 27 are provided in Lesson 27.

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

### 4 LESSON CONTENT – CONCEPT DEVELOPMENT (35 MINUTES)

It is always good to show learners how mathematics is used in everyday life. Rounding is often used in contexts such as checking to see whether you have enough money when shopping, and in all situations where it is not essential to know the exact number – for example the number of people attending an event.

Say: **Today we are learning the rules we can use to round numbers off.**

**Activity 1: Whole class activity and then the learners work on their own**

- Use your Place Value Flash Cards and draw lines to make a Place Value table like this:

H	T	O

Refer to the columns/ place values during the discussion.

- Say: **Rounding to the nearest ten means seeing which multiple of 10 is closest to the number being rounded.**
- Say: **We want to round 53 off to the nearest ten.**  
Write 53 on the board and ask: **Is 53 closer to 50 or to 60?** (They should answer 50.)  
Ask: **What is 53 rounded to the nearest ten?** (50)
- Say: **Draw the table in your classwork books. Write 53 in the table and underline the digit in the Ten's position.**
- Ask: **Who will come to the board and write 53 in the place value table, and underline the 5?**

H	T	O
	<u>5</u>	3

Say: **We are going to draw a circle around the digit in the next smaller place, which is what?** (3 in the Ones place)

H	T	O
	<u>5</u>	③

Say: **Draw a circle around the 3 in the Ones place.**

Say: **If the digit in the One's place is a 0, 1, 2, 3 or 4, we change the digit in the One's place to a 0, and leave the digit in the Ten's place as it is like this:**

Th	H	T	O
		<u>5</u>	③
		5	0

Say: **We also say that 53 is approximately equal to 50.**

- Say: **We want to round 175 off to the nearest ten.**
- Ask: **Which digit do we underline?** (The digit in the Ten's place.)  
**Why?** (Because we are rounding off the number to the nearest ten, we want to know if the digit in the Ten's place changes or stays as it is.)



- Say: **Draw the Place Value table in your classwork books, write 175 in the table and underline the digit in the Ten's position.**
- Ask: **Who will come to the board and write 175 in the Place Value table and underline the 7?**

Th	H	T	O
	1	<u>7</u>	5

- Ask: **Which digit do we draw the circle around?** (The 5 in the One's place)  
**Why?** (Because the digit in One's place tells me whether I should round up or round down.)

Let learners draw a circle around 5 in their Place Value table and confirm it on the board.

Th	H	T	O
	1	<u>7</u>	⑤

Ask: **What is 175 rounded to the nearest ten?** (180)

Say: **If the digit in the One's place is a 5, 6, 7, 8 or 9, we change the digit in the One's position to a 0, and make the digit in the Ten's position one bigger like this:**

Th	H	T	O
	1	<u>7</u>	⑤
	1	8	0

Say: **We also say that 175 is approximately equal to 180.**

- Write the following on the board for the learners to refer to as they work through Activity 1.

Digit in the One's place	
0; 1; 2; 3; 4	Round down to the nearest 10.
5; 6; 7; 8; 9	Round up to the nearest 10.

Say: **Do Activity 1 in your LAB**

- Walk around the classroom to support learners as needed.
- Correct Activity 1 with learners so that they can receive immediate feedback.

- It is always good to show learners how mathematics is used in everyday life.
- The answers are given in brackets.
- Say: **There are many high waterfalls in different countries in the world.**  
 Ask: **What is a waterfall?** (A waterfall is a place where water flows over the edge of a steep, high cliff in hills or mountains, and falls into a pool below.)  
 Say: **Did you know? The Tugela Falls which is in the Drakensburg in KZN is the second highest waterfall in the World.**

Use the rule to round the height of each waterfall to the nearest ten metres

	Name of the waterfall	Country	Height in metres	Rounded to the nearest 10 metres
1.	Angel Falls	Venezuela	979	(980)
2.	Tugela Falls	South Africa	948	(950)
3.	Tres Hermanas Falls	Peru	914	(910)
4.	Olo'upena Falls	Hawaii	900	(900)
5.	Yumbilla Falls	Peru	896	(900)
6.	Vinnufossen	Norway	860	(860)

- Say: **The Olo'upena Falls is 900 m high and it stays as it is when you round off to the nearest 10. Why?** (Because 900 is already a multiple of 10.)

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

- Draw a Place Value table on the board. Stick 'Place Value Flash Cards' on the correct column, as follows:

Th	H	T	O

Refer to the columns / place values during the discussion.

- Say: **Rounding to the nearest hundred means seeing which multiple of 100 is closest to the number being rounded.**
- Say: **We want to round 613 off to the nearest hundred.**  
 Ask: **Is 613 closer to 600 or to 700?** (They should answer 600.)  
 Ask: **What is 613 rounded to the nearest hundred?** (600)

Say: Draw the table in your classwork books; write 613 in the table and then underline the digit in the Hundred's position.

TTh	Th	H	T	O
		<u>6</u>	1	3

- Ask: Which digit do we draw a circle around? (1)
- Ask: Why? (Because it will tell us whether we round the digit in the Hundred's place up or down.)

TTh	Th	H	T	O
		<u>6</u>	①	3

Say: If the digit in the Ten's place is a 0, 1, 2, 3 or 4, we change the digit in both the Ten's and One's place to a 0, and leave the digit in the Hundred's place as it is like this:

TTh	Th	H	T	O
		<u>6</u>	①	3
		6	0	0

Say: We say that 613 is approximately equal to 600.

- Say: We want to round 47 579 off to the nearest hundred.
- Ask: Between which two multiples of hundred does 47 579 lie? (47 500 and 47 600) Write 47 539 on the board and ask: Is 47 579 closer to 47 500 or to 47 600? (47 579 is closer to 47 600.)  
If learners have problems with this question, ask: Is 579 closer to 500 or to 600? (Closer to 600)  
Ask: What is 47 579 rounded to the nearest hundred? (47 600)

- Say: Draw the Place Value Table in your classwork book and write 47 579 in the Place Value Table. Underline the digit to be focused on (5 in Hundred Place).
- Draw the Place Value Table on the board to confirm with the learners that the 5 must be underlined.

TTh	Th	H	T	O
4	7	<u>5</u>	7	9

Ask: Why do we underline the 5 in the Hundred's place (because we are rounding off to the nearest 100.)

Ask: **Which digit are we going to draw a circle around, in the Ten's place or in the Thousand's place?** (Ten's place because we judge whether we round up or round down with the digit in the next smaller place, that is Tens place.)

TTh	Th	H	T	O
4	7	<u>5</u>	⑦	9

- Draw the Place Value Table on the board to confirm with the learners that the 7 must be circled.

Say: **If the digit in the Ten's place is a 5, 6, 7, 8 or 9, we change the digits in both the One's place and the Ten's place to a 0, and make the digit in the Hundred's place one bigger like this:**

TTh	Th	H	T	O
4	7	<u>5</u>	⑦	9
4	7	6	0	0

Say: **We say that 47 579 is approximately equal to 47 600.**

- Write the following on the board for the learners to refer to as they work through Activity 1.

Digit in the Ten's place	
0; 1; 2; 3; 4	Round down to the nearest 100
5; 6; 7; 8; 9	Round up to the nearest 100

- Say: **Did you know? The Nile River which runs through Egypt is the longest river in the World.**  
**The Orange River in South Africa is the 62<sup>nd</sup> longest river in the World.**

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

- It is always good to show learners how mathematics is used in everyday life.
- Walk around the classroom to support learners as needed.
- Correct question 1 with learners so that they can receive immediate feedback.
- Say: **(choose one of the learners in the class) – Please tell the class your answer to question 1. Explain how you got your answer.**  
(I looked at the digit in the Hundred's place which is a 6. I then circled the digit in the Ten's place. It is a 5, so my answer is 6 700. 6 650 is half-way between 6 600 and 6 700, so I took the larger multiple of 100, which is 6 700.)
- The answers are given in brackets.

Round the lengths of the seven longest rivers in Africa to the nearest 100 km.

		Length	Rounded to the nearest 100 km
1.	Nile River	6 650 km	(6 700)
2.	Congo River	4 705 km	(4 700)
3.	Niger River	4 210 km	(4 200)
4.	Zambezi River	2 693 km	(2 700)
5.	Ubangi River	2 270 km	(2 300)
6.	Kasai River	2 153 km	(2 200)
7.	Orange River	2 092 km	(2 100)

### 5 HOMEWORK ACTIVITY (5 MINUTES)

Explain to learners what they need to do for homework. They have to use the rule to round the numbers off to either the nearest 10 or the nearest 100.

		ANSWERS
1	The exact number of mealies picked on Friday was 1 213. Round the number of mealies off to the nearest 10 .....	(1 210)
2	Peter has saved R2 129. Round this amount of money off to the nearest R100 .....	(R2 100)
3	The exact distance between Place A and Place B is 1 650 kilometres. Round the distance off to the nearest 100 km .....	(1 700 km)

### 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 used rules to round off to the nearest 10 and to the nearest 100 and have rounded numbers in everyday situations.**

## Lesson 29: Using rounded numbers when adding and subtracting

### Teacher's notes

This lesson is one of the fully planned lessons to be used to cover the Term 1 curriculum.

CAPS topics: Whole numbers: Rounding off to the nearest 10, 100 and 1 000

Lesson Objective: Learners will know how to use rounded numbers to approximate the answer to adding and subtracting examples.

Lesson Vocabulary: multiples, altogether, approximately, about, difference

No resources needed for this lesson

Date:

Week

Day

### 1 MENTAL MATHS (5 MINUTES)

	Round off to the nearest 10	Answer		Round off to the nearest 100	Answer
1	563	560	6	487	500
2	986	990	7	1 111	1 100
3	6 344	6 340	8	3 000	3 000
4	1 365	1 370	9	7 895	7 900
5	2 508	2 510	10	5 049	5 000

### 2 LINK TO PREVIOUS LESSON (5 MINUTES)

Link to concepts learned in previous lessons by asking these questions:

- Ask, and write the number on the board:  
**Between which multiples of ten does the number 3 756 lie?** (3 750 and 3 760)
- Ask: **What is 3 756 rounded to the nearest 10?** (3 760)
- Ask: **Did you round up or round down to get the answer?** (Rounded up)

### 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)

Learners use estimation to do find the approximate answers to addition and subtraction calculations. Emphasise that the answers are not exact. They are estimated or approximate answers.

It is usually best to round the numbers being used to the same place value.

Answers are generally closer to the exact answer when we round to the nearest ten than when we round to the nearest hundred or thousand.

Say: **Today we are learning to use rounded numbers to find the approximate answers to adding and subtracting calculations.**

### Activity 1: Whole class activity

- Ask, and write the numbers on the board: **46 people got on the train at the first station and 32 people got on the train at the second station. *Approximately* how many people were on the train?**

Say: **The question asks for an approximate number. This would be the same as asking: About how many people were on the train?**

Say: **Because we only need an approximate answer, here we will round the numbers to the nearest 10 like this:**

Write the calculation on the board and ask the learners to write the calculation in their classwork books

$$46 + 32 = \square$$

Write the two numbers in a Place Value Table like this:

T	O
<u>4</u>	⑥
<u>3</u>	②

Ask: **What is 46 rounded to the nearest 10?** (50)

Ask: **What is 32 rounded to the nearest 10?** (30)

Say: **Now we can find the approximate answer to  $46 + 32 = \square$**

Write on the board:

$$\begin{aligned} 46 + 32 &\rightarrow 50 + 30 \\ &= 80 \end{aligned}$$

**There were approximately 80 people on the train.**

Tell the learners to write the calculation in their classwork books.

Say: **Find the exact answer in your classwork books.** ( $46 + 32 = 78$ )

Ask: **What is the difference between the approximate answer and the exact answer?**  
( $80 - 78 = 2$ )

Say: **The approximate answer is 2 more than the actual answer.**

- Say, and write the numbers: **Sam had 51 bananas. He sold 38 bananas. *Approximately* how many bananas does he have left?**

Say: **Which operation are we going to use here?** (subtraction or minus)

Say: **When you subtract, you often round off the 2<sup>nd</sup> number only.**

Write the calculation on the board and ask the learners to write the calculation in their classwork books

$$51 - 38 = \square$$

Ask: **What is 38 rounded to the nearest 10?** (40)

Write on the board

$$\begin{aligned} 51 - 38 &\rightarrow 51 - 40 \\ &= 11 \end{aligned}$$

**There were approximately 11 bananas left.**

Tell the learners to write the calculation in their classwork books.

Then say: **Work out the exact answer in your classwork books.**

	T	O
	4	
	5	1
-	3	8
	1	3

Ask: **What is the difference between the approximate answer and the exact answer?**

$$(13 - 11 = 2)$$

Say: **The approximate answer is 2 less than the actual answer.**

### Activity 2: Learners work in pairs

- Refer to the example in Activity 2. Explain that the arrow means 'becomes'. We cannot say that  $368 + 213$  equals  $370 + 210$ . But we can say that  $368 + 213$  becomes  $370 + 210$  (or  $368 + 213 \rightarrow 370 + 210$ ) when rounded to the nearest ten. Notice that  $370$  plus  $210$  is equal to  $580$ , so we write  $370 + 210 = 580$ .

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

- Walk around the classroom to support learners as needed.
- Correct Activity 2 with learners so that they can receive immediate feedback.
- The answers are given in brackets.



Calculate the approximate answer by rounding off **BOTH** numbers to the nearest 10.

**Example:**  $368 + 213 \rightarrow 370 + 210 = 580$

- 1  $86 + 62$  ( $\rightarrow 90 + 60 = 150$ )
- 2  $353 + 248$  ( $\rightarrow 350 + 250 = 600$ )
- 3  $413 + 369$  ( $\rightarrow 410 + 370 = 780$ )
- 4  $564 - 327$  ( $\rightarrow 560 - 330 = 230$ )
- 5  $1\ 256 - 1\ 109$  ( $\rightarrow 1\ 260 - 1\ 110 = 150$ )

- 6 Mother had 194 apples. She sold 116 apples.  
Approximately how many apples does she have left?

First write the number sentence:

$$(194 - 116 = \square)$$

Then find the approximate answer to the number sentence:

$$(\rightarrow 190 - 120 = 70 \text{ apples})$$

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

- Say: **Sometimes it is better to round off to the nearest 100 before working out an approximate answer.**
- Say: **Give the approximate answer for  $1\ 345 + 2\ 563$ .**
- Say and write the numbers on the board: **First round the two numbers to the nearest 100.**
- If learners struggle to round off the two numbers, let them write the two numbers in a Place Value Table:

Th	H	T	O
1	3	④	5
2	<u>5</u>	⑥	3

Ask: **When we round off to the nearest hundred, which digit do we underline?**

(The digit in the hundred's place)

Ask: **Which number do we circle?** (The digit in the ten's place)

Now go back to the Place Value Table.

Ask: **For 1 345, will the 4 in the Ten's place affect the 3 in the Hundred's place?** (No)

Ask: **What is 1 345 rounded to the nearest hundred?** (1 300)

Ask: **And what is 2 563 rounded to the nearest hundred?** (2 600, because the 6 in Ten's place rounds the 5 in the Hundred's place to 6.)

Ask: **What is the approximate answer?** ( $1\ 300 + 2\ 600 = 3\ 900$ . So the answer is 3 900.)

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

- Read and explain what to do in Activity 3.
- Walk around the classroom to support learners as needed.
- Correct Activity 3 with learners so that they can receive immediate feedback.
- If learners struggle to round off numbers, let them underline the digits in Hundred's place to identify which digit to be rounded.
- The answers are given in brackets.

Calculate the approximate answer by rounding off BOTH numbers to the nearest 100.

1  $243 + 278$  ( $\rightarrow 200 + 300 = 500$ )

2  $386 + 558$  ( $\rightarrow 400 + 600 = 1\ 000$ )

3  $413 + 369$  ( $\rightarrow 400 + 400 = 800$ )

4  $564 - 327$  ( $\rightarrow 600 - 300 = 300$ )

5  $1\ 256 - 1\ 109$  ( $\rightarrow 1\ 300 - 1\ 100 = 200$ )

6 Tino is going on a journey.

The total distance is 1 224 kilometres.

Tino has driven 981 kilometres.

Approximately how many kilometres does Tino still have to drive?

First write the number sentence:

$$(1\ 224 - 981 = \square)$$

Then find the approximate answer to the number sentence:

$$(\rightarrow 1\ 200\ \text{km} - 1\ 000\ \text{km} = 200\ \text{km})$$

**5 HOMEWORK ACTIVITY (5 MINUTES)**

Explain to learners what they need to do for homework.

Remind learners that the arrow means ‘becomes’.

		<b>ANSWERS</b>
<b>1</b>	Calculate the approximate answer. Round each number to the nearest hundred. $673 - 252$ → ..... = .....	$(700 - 300 = 400)$
<b>2</b>	David had 752 marbles. He gave 146 marbles to his brother. Approximately how many marbles does David have now? First write the number sentence: ..... Then round each number to the nearest ten and find the answer. ..... .....	$(752 - 146 = \square)$  $(\rightarrow 750 - 150 = 600 \text{ marbles})$
<b>3</b>	Nina wants to buy a computer which costs R6 799 and a printer which costs R2 849. Approximately how much will it cost for the computer and the printer? First write the number sentence: ..... Then round each number to the nearest thousand and find the answer. ..... .....	$(R6\ 799 + R2\ 849 = \square)$  $(\rightarrow R7\ 000 + R3\ 000 = R10\ 000)$

UNIT 3

**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 learned to use rounded numbers to find approximate answers to addition and subtraction calculations.**

## Lesson 30: Using rounded numbers when multiplying

### Teacher's notes

This lesson is one of the fully planned lessons to be used to cover the Term 1 curriculum.

CAPS topics: 1.1 Whole numbers: Rounding off to the nearest 10, 100 and 1 000

Lesson Objective: Learners will know how to use rounded numbers when finding the approximate answer to multiplication problems.

Lesson Vocabulary: multiply, approximate

Resources needed for this lesson: Blank number line

Date: \_\_\_\_\_ Week \_\_\_\_\_ Day \_\_\_\_\_

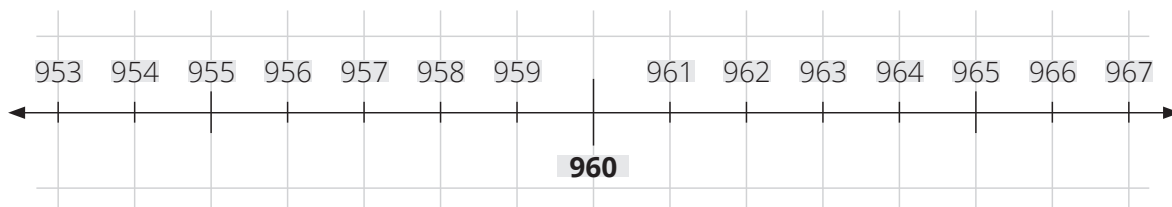
### 1 MENTAL MATHS (5 MINUTES)

	What is ...	Answer		What is ...	Answer
<b>1</b>	$3 \times 4 =$	12	<b>6</b>	$6 \times 3 =$	18
<b>2</b>	$5 \times 6 =$	30	<b>7</b>	$5 \times 0 =$	0
<b>3</b>	$7 \times 10 =$	70	<b>8</b>	$9 \times 8 =$	72
<b>4</b>	$8 \times 8 =$	64	<b>9</b>	$10 \times 1 =$	10
<b>5</b>	$3 \times 9 =$	27	<b>10</b>	$5 \times 9 =$	45

### 2 LINK TO PREVIOUS LESSON (5 MINUTES)

Link to concepts learned in previous lessons by asking these questions:

- Use the number line in the LAB.



Say: **Let's work out the range of numbers that would round to 960, when rounding to the nearest ten.**

Ask, and point to each number as you discuss it:

- **Would 954 round to 960?** (No)
  - **Would 955 round to 960** (Yes). Draw a tick above the number 955.
  - Continue until all numbers up to 965 have been discussed.
- Ask, and write on the board: **What is the range of numbers that will round to 960?** (Greater than 954 and less than 965).

**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)**

This lesson is a continuation of the previous lesson in that it emphasises the use of rounding to make calculations simpler. What is different in this lesson is that learners round numbers in order to get approximate answers involving multiplication. Once again, you need to stress that the answers are approximate (estimates). When numbers are difficult to multiply, we can use rounding to make the calculation simpler. We do not always round both numbers to the same place value.

Say: **Today we are learning to use rounding when multiplying.**

**Activity 1: Whole class activity**

- Say, and write the word problem on the board:
- **Teacher is planning to take the class on a trip to the zoo.**

**There are 49 learners in the class and**

**the transport and entry tickets cost R58 per learner.**

**How much will it cost for the class to go to the zoo?**

- Read the problem.
- Let learners read the problem until they read it fluently.
- Underline the numbers.
- Underline the question with a wavy line.
- Let learners reproduce the story with a picture;

R58

R58

R58

R58

R58

R58

R58

-----> 49 learners

**Ask: Which operation do we use to find the cost for the class? And why?**

(Multiplication, because this is 49 groups of R58, and we want to know the total cost.)

Let learners write the number sentence in their classwork book.

Let some learners write number sentences on the board. Correct as necessary.

$(43 \times R58 = \square)$

Say: **Let's work out the approximate answer.**

**Ask: Which multiple do you think we use for approximation in this problem?**

(To the nearest 10 because the numbers given are 2-digit numbers/ because I don't want to have big difference between the exact number and rounded number.)

Ask: **What is 49 rounded to the nearest 10?** (50)

Ask: **What is 58 rounded to the nearest 10?** (60)

Ask: **How can we use these rounded numbers to work out the approximate answer?**

( $49 \times R58 \rightarrow 50 \times R60$ )

Ask: **What is  $50 \times 60$ ?** (3 000;  $(5 \times 6)$  tens = 30 tens = 3 000)

Say: **It would cost *approximately* R3 000 for the whole class to go to the zoo.**

Ask: **Which calculation is easier to do:  $49 \times R58 = \square$  or  $50 \times R60 = \square$ ?**

(I cannot calculate  $49 \times R58$  mentally, but I can do  $50 \times R60$  mentally.  $50 \times R60$  is simpler/faster/easier than  $49 \times R58$ .)

## Activity 2: Learners work in pairs

Say: **Do Activity 2 questions 1-3 in your LAB.**

- Read the questions with the learners and explain 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.
- Do question 2 with the whole class.
- The answers are given in brackets.

**1** Round each number to the nearest 10 and then work out the approximate answer.

**a**  $7 \times 57$

$\rightarrow$            (10 × 60)          

$=$            (600)          

**b**  $41 \times 18$

$\rightarrow$            (40 × 20)          

$=$            (800)          

**c**  $85 \times 14$

$\rightarrow$            (90 × 10)          

$=$            (900)

- 2 Round the first number to the nearest 100 and the second number to the nearest 10. Then find the approximate answer:

$$123 \times 15$$

$$\rightarrow \underline{\hspace{2cm}} \quad (100 \times 20)$$

$$= \underline{\hspace{2cm}} \quad (2\,000)$$

### Activity 3: Learners work in pairs

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

- Read the question one by one. Get learners to underline the numbers with a straight line and the question with a wavy line.
- Walk around the classroom to support learners as needed.
- Correct Activity 3 with learners so that they can receive immediate feedback.
- The answers are given in brackets.

- 1 The distance from Siya's house to school and back is 6 kilometres.

If Siya goes to school for 196 days in the year,  
what is the approximate distance he would walk each year?

Write the number sentence for the word problem:

$$\underline{\hspace{2cm}} \quad (196 \times 6 = \square)$$

Work out the approximate answer by rounding each number to the nearest 10:

$$\underline{\hspace{2cm}} \quad (\rightarrow 200 \times 10 = 2\,000)$$

Answer: Siya will walk approximately (2 000) kilometres each year.

- 2 In winter when there is no grass for the cows to eat, Farmer Maria feeds her cows hay. Each cow eats 13 kilograms of hay per day.

Approximately how much hay will 28 cows eat in a day?

Write the number sentence for the word problem:

$$\underline{\hspace{2cm}} \quad (28 \times 13 = \square)$$

Work out the approximate answer by rounding each number to the nearest 10:

$$\underline{\hspace{2cm}} \quad (\rightarrow 30 \times 10 = 300)$$

Answer: 28 cows will eat approximately (300) kilograms of hay in a day.

**3** There are 32 apples in a box.  
Approximately how many apples will there be in 96 boxes?

Write the number sentence for the word problem:

\_\_\_\_\_ (96 × 32 = □)

Work out the approximate answer by rounding each number to the nearest 10:

\_\_\_\_\_ (→ 100 × 30 = 3 000)

Answer: There will be approximately (3 000) apples in 96 boxes.

**5 HOMEWORK ACTIVITY (5 MINUTES)**

Explain what learners need to do for homework. Remind them to use their multiplication facts.

1	Find the approximate answer by rounding each number to the nearest ten before you multiply	<b>Answers</b>
	<b>a</b> 9 × 56 → ..... = .....	(→ 10 × 60 = 600)
	<b>b</b> 17 × 36 → ..... = .....	(→ 20 × 40 = 800)
	<b>c</b> 35 × 72 → ..... = .....	(→ 40 × 70 = 2 800)
	<b>d</b> 19 × 104 → ..... = .....	(→ 20 × 100 = 2 000)
<b>2</b>	One hen lays <u>18</u> eggs per month. <u>Approximately how many eggs will 58 hens lay in a month?</u> Write the number sentence: ..... Work out the approximate answer by rounding each number to the nearest 10: ..... Answer: 58 hens will lay approximately ..... eggs in a month.	(58 × 18 = □) (→ 60 × 20 = 1 200) (58 hens will lay approximately <u>1 200</u> eggs in a month)



**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 learned how to use rounded numbers when multiplying.**

## Lesson 31: Using rounded numbers when dividing

### Teacher's notes

This lesson is one of the fully planned lessons to be used to cover the Term 1 curriculum.

CAPS topics: 1.1 Whole numbers: Rounding off to the nearest 10, 100 and 1 000

Lesson Objective: Learners will know how to use rounded numbers when solving division problems.

Lesson Vocabulary: division, approximate

No resources needed for this lesson

Date:

Week

Day

### 1 MENTAL MATHS (5 MINUTES)

	What is ...	Answer		What is ...	Answer
<b>1</b>	$4 \times 4 =$	16	<b>6</b>	$8 \times 8 =$	64
<b>2</b>	$5 \times 5 =$	25	<b>7</b>	$2 \times 9 =$	18
<b>3</b>	$9 \times 9 =$	81	<b>8</b>	$4 \times 10 =$	40
<b>4</b>	$6 \times 6 =$	36	<b>9</b>	$10 \times 10 =$	100
<b>5</b>	$7 \times 7 =$	49	<b>10</b>	$6 \times 9 =$	54

### 2 LINK TO PREVIOUS LESSON (5 MINUTES)

Link to concepts learned in previous lessons by asking these questions:

- Ask: **Mpho says that when we round numbers to make multiplication calculations easier, the answer is not exact, it is approximate. Is Mpho correct? (Yes)**

### 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)

When we need to know an approximate answer to a division calculation, we can use rounding to make the calculation easier and quicker. We do not always round both numbers to the same Place Value.

Say: **Today we learn to use rounded numbers to solve problems involving division.**

**Activity 1: Whole class activity**

- Remind learners: **You already know how to divide by 10, 100 and 1 000.**

Ask learners: **How do you divide a number by 10?** (Move all the digits of the number one place to the right. Example:  $3\ 600 \div 10 = 360$ )

Draw the table below on the chalkboard.

	Th	H	T	O
	3	6	0	0
$\div 10$		3	6	0

Ask the learners: **How do you divide a number by 100?** (Move all the digits of the numbers two places to the right. Example  $3\ 600 \div 10 = 360$ ,  $3\ 600 \div 100 = 36$ ).

	Th	H	T	O
	3	6	0	0
$\div 10$		3	6	0
$\div 100$			3	6

Ask the learners: **How do you divide a number by 1 000?** (Move all the digits three places to the right. Example:  $48\ 000 \div 10 = 4\ 800$ ,  $48\ 000 \div 100 = 480$ ,  $48\ 000 \div 1\ 000 = 48$ )

	TTh	Th	H	T	O
	4	8	0	0	0
$\div 10$		4	8	0	0
$\div 100$			4	8	0
$\div 1\ 000$				4	8

- Write the word problem on the board:

**The distance around the field is 503 metres.**

**Approximately how many times must Mabel run around the field if she wants to run 5 245 metres?**

Say: **Write the number sentence in your classwork book.** ( $5\ 245 \div 503 = \square$ )

Ask two or three learners to come to the board and to write the number sentence on the board.

Discuss the number sentences. With the class reach a decision as to which one is correct.

Say: **Let's find the approximate answer by rounding the first number to the nearest thousand and the second number to the nearest hundred.**

Say: **We need to round 5 243 to the nearest thousand.**

Let learners underline the digit in the Thousand's place and draw a circle around the digit to be rounded off. (5243)

Ask: **What is the approximate value of 5 245? (5 000)**

Say: **We need to round 503 to the nearest hundred.**

Let learners underline the digit in the Hundred's place and draw a circle around the digit to be rounded off. (503)

Ask: **What is the approximate value of 503? (500)**

Say: **Write the new number sentence in your classwork books and then work out the answer.**

(5 000  $\div$  500 = 10)

Say: **Ask two or three learners to come to the board and to write the new number sentence with the answer on the board.**

If necessary, discuss the number sentences and with the class reach a decision as to which one is correct.

If learners are daunted by the big numbers, remind them that  $500 = 5 \times 100$ , so they can divide by 5 000 by 5, then divide by 100.

Remind the learners that  $5\,245 \div 503$  is not equal to  $5\,000 \div 500$  because we have rounded off, so we write  $5\,245 \div 503 \rightarrow 5\,000 \div 500 = 10$

Say: **Mabel will need to run around the field approximately 10 times.**

## Activity 2: Learners work in pairs

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

- Read the questions with learners.
- Walk around the classroom to support learners as needed.
- Correct Activity 2 with learners so that they can receive immediate feedback. The answers are given in brackets.

Find the approximate answer:

Round the first number to the nearest 100.

Round the second number to the nearest 10.

1  $643 \div 27 = \square$  ( $\rightarrow 600 \div 30 = 20$ )

2  $459 \div 247 = \square$  ( $\rightarrow 500 \div 250 = 2$ )

3  $3\,246 \div 83 = \square$  ( $\rightarrow 3\,200 \div 80 = 40$ )

4  $6\,347 \div 698 = \square$  ( $\rightarrow 6\,300 \div 700 = 9$ )

### Activity 3: Learners work on their own

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

- Read the word problems one-by-one with learners.
- Walk around the classroom to support learners as needed.
- Correct Activity 3 with learners so that they can receive immediate feedback.
- The answers are given in brackets.

1 Masudu planted 178 tomato plants.

He plants the tomato plants in rows.

If there are 7 tomato plants in a row, approximately how many rows will he have?

Write the number sentence:  $\underline{\hspace{2cm}} (178 \div 7 = \square) \underline{\hspace{2cm}}$

Work out the approximate answer by rounding each number to the nearest 10:

$\underline{\hspace{2cm}} (\rightarrow 180 \div 10 = 18) \underline{\hspace{2cm}}$

Approximately how many rows of tomato plants will Masudu have?  $\underline{\hspace{2cm}} (18 \text{ rows}) \underline{\hspace{2cm}}$

2 Vuyo has 356 apples.

He wants to put 16 apples in a packet

Approximately how many packets can he fill?

Write the number sentence:  $\underline{\hspace{2cm}} (356 \div 16 = \square) \underline{\hspace{2cm}}$

Work out the approximate answer by rounding each number to the nearest 10:

$\underline{\hspace{2cm}} (\rightarrow 360 \div 20 = 18) \underline{\hspace{2cm}}$

Approximately how many packets can Vuyo fill with apples?  $\underline{\hspace{2cm}} (18 \text{ packets}) \underline{\hspace{2cm}}$

- 3** There are 489 runners at the athletics competition,  
There are 14 runners in each race.  
Approximately how many races will be run?

Write the number sentence:  $\underline{\hspace{2cm}}$  ( $489 \div 14 = \square$ )

Work out the approximate answer by rounding the first number to the nearest 100 and the second number to the nearest 10:

$\underline{\hspace{2cm}}$  ( $\rightarrow 500 \div 10 = 50$ )

Approximately how many races will be run?  $\underline{\hspace{2cm}}$  (50 races)

**5 HOMEWORK ACTIVITY (5 MINUTES)**

Explain to learners what they need to do for homework.

Say: **You know how to round off to the nearest 10, 100 and 1 000. You also know how to divide by 10, 100 and 1 000. Use this knowledge when doing your homework.**

		ANSWER
<b>1</b>	Tom sells sweets. He packs 18 sweets in a bag. He has 159 sweets. Approximately how many bags will Tom need? Write the number sentence: ..... Work out the approximate answer by rounding each number to the nearest 10: ..... Answer: Tom will need approximately ..... bags.	$(159 \div 18 = \square)$ $(\rightarrow 160 \div 20 = 8)$ (8 bags)
<b>2</b>	There are 789 learners in the school. There are 18 classes. Approximately how many learners in each class? Write the number sentence: ..... Work out the approximate answer by rounding the first number to the nearest 100 and the second number to the nearest 10: ..... Answer: There will be approximately ..... learners in each class.	$(789 \div 18 = \square)$ $(800 \div 20 = 40)$ (40 learners)

<b>3</b>	<p>There are 1 477 cars in the parking area.</p> <p>There are 48 cars in each row.</p> <p>Approximately how many rows are there?</p> <p>Write the number sentence: .....</p> <p>Work out the approximate answer by rounding the first number to the nearest 100 and the second number to the nearest 10: .....</p> <p>Answer: There will be approximately ..... rows.</p>	<p>(1 477 ÷ 48 = □)</p> <p>(1 500 ÷ 50 = 30)</p> <p>(30 rows)</p>
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**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 learned to round numbers to find the approximate answers to division problems.**

## Lesson 32: Approximation by grouping

### Teacher's notes

This lesson is one of the fully planned lessons to be used to cover the Term 1 curriculum.

CAPS topics: 1.1 Whole numbers: Rounding off to the nearest 10, 100 and 1 000

Lesson Objective: Learners will know how to estimate by grouping.

Lesson Vocabulary: approximation, grouping

Resources needed for this lesson: None

Date:

Week

Day

### 1 MENTAL MATHS (5 MINUTES)

	Find the sum of	Answer		What is ...	Answer
1	23 and 71	94	6	$56 + 13 =$	69
2	19 and 10	29	7	$41 + 41 =$	82
3	34 and 43	77	8	$47 + 12 =$	59
4	15 and 20	35	9	$16 + 63 =$	79
5	74 and 21	95	10	$21 + 57 =$	78

### 2 LINK TO PREVIOUS LESSON (5 MINUTES)

Link to concepts learned in previous lessons by asking these questions:

- Say: **Let's round 3 995 off to the nearest 10.**
- Write the number 3 995 in Place Value columns like this and then discuss:

Th	H	T	O
3	9	9	5

Ask: **What number are we rounding to?** (10)

Say: **We underline the digit in the Tens place (which is a 9) and circle the digit in the Ones place (which is a 5).**

Th	H	T	O
3	9	<u>9</u>	⑤

Ask: **The circled number is 5, so what must we do?** (Write a 0 in the One's place and increase the number in the Tens place)



Ask: **What happens when we increase the number in the Tens place?** (We get 10)

Ask: **Can we write 10 in the Tens column?**

(No, we have to exchange 10 tens for 1 hundred and write '0' on Ten's place.)

Say: **We now have a zero in the Ones place and a zero in the Tens place.** (Show this working on the Place Value table).

Th	H	T	O
3	9	<u>9</u>	⑤
<del>4</del>	10 <del>9</del>	10 <del>9</del>	0
4	0	0	0

Ask: **What should we do in the Hundreds place?**

- Add the carried 1 H to the 9 H
- Exchange 10 H for 1 Th and carry to the Th place
- Write zero in the Hundred's place).

Ask: **What should we do in the Thousand place?**

(Add the carried 1 Th to the 3 Th to get 4 Th)

Ask: **What is 3 995 rounded to the nearest 10?** (4 000)

This example of rounding requires learners to move from one place value column to the next in order to round to the nearest 10. It also yields a number with three zeros at the end, while learners will expect numbers rounded to the nearest 10 to end with one zero. A discussion of this example gives an opportunity to revise and could deepen learners understanding of rounding off.

### 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 (25 MINUTES)

Learners have used rounding to find approximate answers to addition, subtraction, multiplication and division problems more easily. In this lesson, we add another approximation technique. Learners combine, or group numbers with the aim of forming numbers that are close to multiples of 10, 100 or 1 000. We do this because we know that it is quicker and easier to perform operations on numbers that are multiples of 10, 100 or 1 000.

Say: **Today we are learning to approximate by grouping.**

**Activity 1: Whole class activity**

- Before the lesson draw the following table on the board.

	Mon	Tues	Wed	Thurs	Fri	Sat	Sun
Number of km	71	28	48	53	97	41	58

- Say: **Betty's mother travels the number of kilometres shown in the table every day for one week.**
- Say: **Approximately how far does Betty's mother travel in one week?**
- Say: **Let's group the numbers and then add to get an approximate answer. We are going to group the numbers so that each of the totals come to nearly 100 because it is easy to add hundreds.**
- Group the numbers like this – show workings on the board.

71	28	48	53	97	41	58
	/		/			/
70 + 30 = 100		50 + 50 = 100		100		40 + 60 = 100

- Say: **Each pair makes 100 approximately and we can round 97 off to 100.**
- Ask: **Approximately how far did Betty's mother travel in one week?**  
(100 + 100 + 100 + 100 = 400 kilometres)

**Activity 2: Learners work in pairs**

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

- Read the questions with learners and explain what to do.
- Walk around the classroom to support learners as needed.
- Correct Activity 2 with learners so that they can receive immediate feedback.
- The answers are given in brackets.

- 1** Find the approximate total of the following numbers:

$$673 + 320 + 128 + 869 + 994 + 500 + 510 + 403 + 613$$

Group the numbers to make addition easier. Make number combinations of about 1 000.

What are the best combinations to make 1 000?

(Best combinations: 673 and 320; 128 and 869; 994 on its own; 500 and 510; 403 and 613)

What is the approximate total?

(Approximate total = 1 000 + 1 000 + 1 000 + 1 000 + 1 000 = 5 000)

- 2 Find the approximate total of the following numbers:

$$210 + 740 + 410 + 580 + 980 + 380 + 630$$

What are the best combinations to make 1 000?

\_\_\_\_\_ (Best combinations: 210 and 740; 410 and 580; 980 on its own; 380 and 630)

Approximately what is the total?

\_\_\_\_\_ (Approximate total = 1 000 + 1 000 + 1 000 + 1 000 = 4 000)

### Activity 3: Learners work on their own

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

- Read the word problems one-by-one with learners.
- Walk around the classroom to support learners as needed.
- Correct Activity 3 with learners by writing numbers and encircling the pairs on the chalkboard, so that they can receive immediate feedback.
- The answers are given in brackets.

- 1 Siya's class collected bottle tops for 6 weeks.

They recorded the number of bottle tops in a table.

Use grouping to work out approximately how many bottle tops they collected altogether.

Week	1	2	3	4	5	6
Number of bottle tops	28	68	13	84	53	45

What are the best combinations to make 100?

\_\_\_\_\_ (Best combinations: 28 and 68; 13 and 84; 53 and 45)

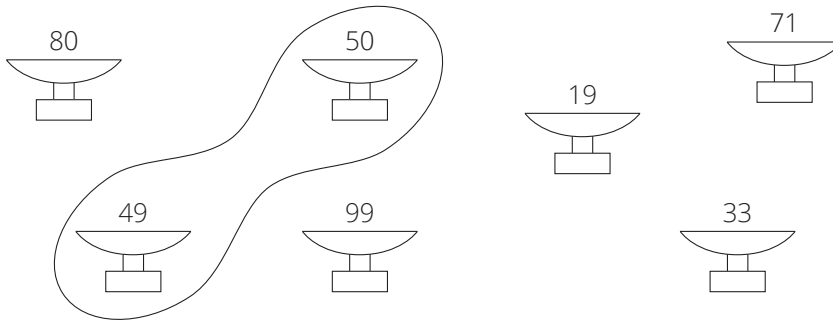
Approximately how many bottle tops did Siya's class collect?

\_\_\_\_\_ (Approximate total = 100 + 100 + 100 = 300 bottle tops)

- 2** Siza used a mass meter (or scale) to measure the mass, in grams, of seven different items.  
Use grouping to work out the approximate total mass of all the items.  
One number combination has been done for you.



Mass-meter or scale



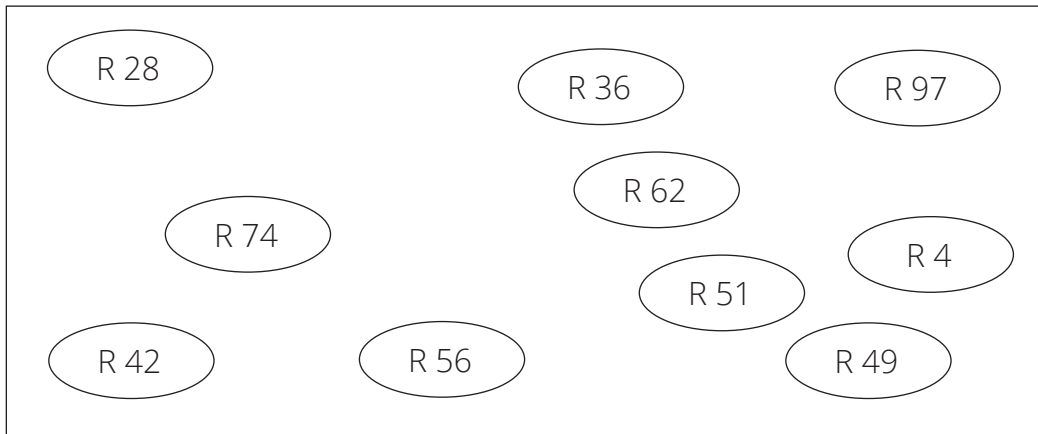
What are the best combinations to make 100?

(Best combinations: 49 and 50; 71 and 33; 99 on its own; 80 and 19)

What is the approximate total mass?

(Approximate total mass = 100 + 100 + 100 + 100 = 400 grams)

- 3** Mother is going shopping.  
Here are the prices for things Mother wants to buy.  
Use grouping to work out approximately how much money Mother needs.



What are the best combinations to make 100?

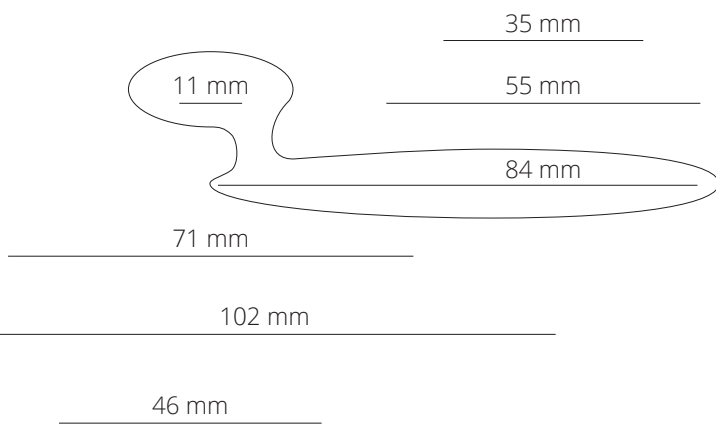
(Best combinations: 28 and 74; 36 and 62; 97 and 4; 51 and 49; 42 and 56)

Approximately how much money does Mother need?

(Approximate total = 100 + 100 + 100 + 100 + 100 = R500)

**5 HOMEWORK ACTIVITY (5 MINUTES)**

- Explain what learners are required to do for homework.
- Remind learners that the numbers to be grouped to make the best combinations are not always written next to each other.
- Also remind learners that some numbers are already close to the rounded number so don't need to be grouped with another number.

		<b>ANSWERS</b>
<b>1</b>	<p>The lengths of seven lines are shown below. Use grouping, making number combinations of about 100 mm, to work out the approximate total length of the lines.</p> <p>11 mm and 84 mm have already been grouped for you.</p>  <p>What are the best combinations to make 100? .....</p> <p>What is the approximate total length of the seven lines? .....</p>	<p>Best combinations: 11 and 84; 102; 71 and 35; 55 and 46</p> <p>Approximate total length = 100 + 100 + 100 + 100 = 400 mm</p>

<p><b>2</b> What is the approximate total of these numbers? Use grouping, making number combinations of about 1 000.</p> <p>901 and 102 have already been grouped for you.</p> <div style="text-align: center; margin: 20px 0;"> </div> <p>What are the best combinations to make 1 000? .....</p> <p>What is the approximate total of the numbers? .....</p>	<p>(Best combinations: 901 and 102; 728 and 270; 510 and 487; 604 and 390 823 and 199)</p> <p>(Approximate total = 1 000 + 1 000 + 1 000 + 1 000 + 1 000 = 5 000)</p>
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**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 learned to approximate answers by grouping numbers to make 100 or 1 000.**

## Lesson 33: Consolidation

### Teacher's notes

This lesson allows for consolidation of the unit's content.

CAPS topics: 1.1 Whole numbers: Rounding off to the nearest 10, 100 and 1 000

Lesson Objective: Learners will consolidate the use of approximation and rounding in order to solve problems involving addition, subtraction, multiplication and division.

Lesson Vocabulary: rounding off, rounding up, rounding down, approximation

No resources are needed for this lesson.

Date:

Week

Day

### 1 NOTES FOR THE TEACHER RELATING TO THIS UNIT'S WORK

In Unit 3: Approximation and Calculation, the learners use the number line to round numbers off to the nearest 10, 100 and 1 000. The learners then discover a rule for rounding off to the nearest 10 and 100. They use rounding off to find approximate answers to a calculation.

### 2 POSSIBLE MISCONCEPTIONS LINKED TO THE WEEK'S WORK

Some learners fail to see the value of zero as a place holder. This can lead to errors in the rounding process.

### 3 CORRECT HOMEWORK ACTIVITY (5 MINUTES)

Complete this week's classwork as needed.

Say: **Today we are going over what we learned in this unit. We will revise how to use approximate answers to make calculations quicker and easier.**

### 4 ADDITIONAL ACTIVITIES FOR CONSOLIDATION

Refer to the table: Further practice for learners. Select additional activities from the textbook/s you have.

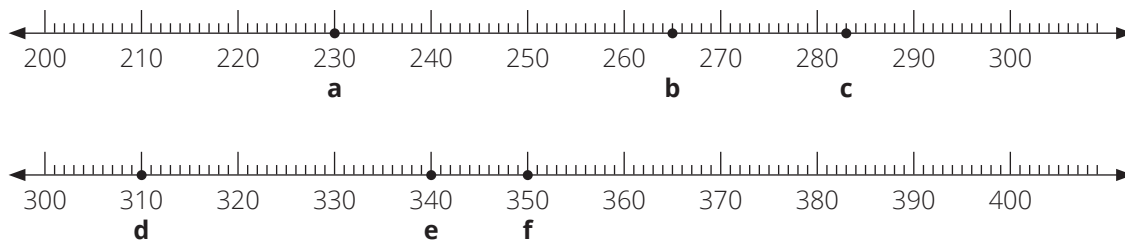
	Fabulous	Oxford Headstart	Oxford Successful	Platinum	Premier	Sasol Inzalo	Solutions for All	Study & Master	Viva
LB	14-16, 23-24, 31, 95-97, 103, 155-157, 209-211	23-25, 95-97, 196-198, 255 -256	21-22, 25, 81, 127, 211	6, 12, 55-56, 115, 155,	8-9, 180, 157-160, 279-293	43-45, 134- 135,	13-16, 218-219, 311	107- 109, 203- 204, 253	8-9, 127, 173
TG	8-9, 13, 16-17, 65, 69, 120-121, 174-175	43-44, 118-119, 235-238	47-50, 91-93, 123-125, 175	5, 11, 46, 48, 91, 122	6, 93	47-48	11-12, 174-175, 253-254	139- 141, 272- 273, 336-337	10, 68, 88

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

### Consolidation Activity

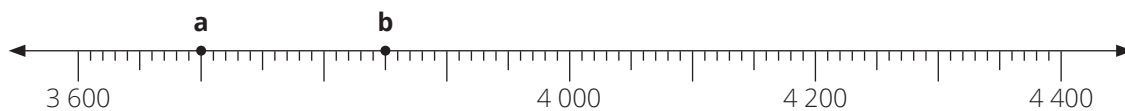
- Answers are given below in brackets.

1 Round off the numbers shown by a dot to the nearest 100.



	Number at the dot	Number at the dot rounded to the nearest 100
<b>a</b>	(230)	(200)
<b>b</b>	(265)	(300)
<b>c</b>	(283)	(300)
<b>d</b>	(310)	(300)
<b>e</b>	(340)	(300)
<b>f</b>	(350)	(400)

2 Round off the numbers shown by a dot to the nearest 1 000



	Number at the dot	Number at the dot rounded to the nearest 1 000
<b>a</b>	(3 700)	(4 000)
<b>b</b>	(3 850)	(4 000)



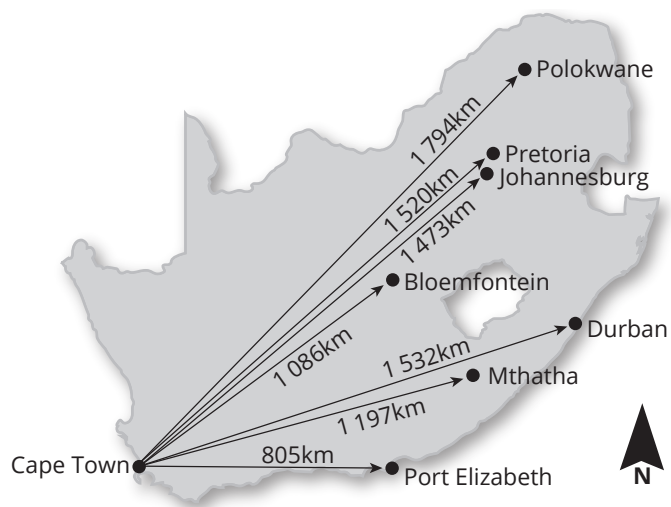
- 3 What is the approximate answer to  $1\ 567 + 2\ 473$  when each number is rounded to the nearest 1 000?

Working out: \_\_\_\_\_ ( $2\ 000 + 2\ 000$ )

Circle the correct answer.

- |                |                |                |                |
|----------------|----------------|----------------|----------------|
| a. About 2 000 | b. About 3 000 | c. About 4 000 | d. About 5 000 |
|----------------|----------------|----------------|----------------|

- 4 Work out the approximate distance of each of these South African towns and cities from Cape Town. Round each distance to the nearest 100 kilometres.



Cape Town to Polokwane is about (1 800) km

Cape Town to Pretoria is about (1 500) km

Cape Town to Johannesburg is about (1 500) km

Cape Town to Bloemfontein is about (1 100) km

Cape Town to Durban is about (1 500) km

Cape Town to Mthatha is about (1 200) km

Cape Town to Port Elizabeth is about (800) km.

## 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 approximation by rounding off numbers. We know:**

- **how to round to the nearest 10, 100 and 1 000**
- **how to use rounded numbers when solving problems involving addition, subtraction, multiplication and division.**
- **how to approximate by grouping.**

# Unit 4: Number patterns, geometric patterns and number sentences

## INTRODUCTION

This unit focuses on number patterns, geometric patterns and number sentences.

Patterns are an integral part of mathematics and the ability to recognise and work with patterns is an important foundational concept for the Senior and FET phases. An understanding of number patterns develops the idea of a relationship between variable quantities. In Grade 3 learners copied, extended and described patterns made with numbers. While in Grade 3, the description of the patterns was verbal, Grade 4 learners also work with flow diagrams and tables, and the patterns are more complex.

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	Developed in every lesson. For example, the thread running through all lessons in this unit is that all patterns have one thing that remains unchanged.
Procedural fluency	Learners use flow diagrams and tables repeatedly so that they get used to working with input, rule and output.
Strategic competence	Learners choose which strategy to use when solving number pattern problems. For example, they decide whether to represent the data using a flow diagram or a table.
Reasoning	Learners explain why they say a particular list of numbers is a number pattern.

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

Concept development		Done in every lesson
Speaking mathematics	✓	Use of the language to communicate ideas and thoughts on patterns and number sentences, for example input, rule, output
Making sense of mathematics	✓	Using different representations such as flow diagrams and tables to make sense of geometric patterns
Connecting representations	✓	Using flow diagrams and tables to capture data from geometric patterns
Addressing gaps in learners' knowledge	✓	Activities in consolidation lessons specifically designed to target gaps, misconceptions and errors
Addressing learners' errors	✓	


## Unit 4: Number patterns, geometric patterns and number sentences

Active learning	✓	Learners actively involved in whole class activities, writing ideas and suggested answers in their classwork books
Applying mathematics in context	✓	Using numbers sentences to solve everyday problems

### 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.

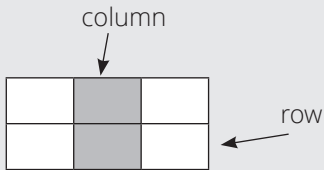
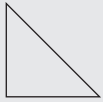
Refer to the bilingual dictionary where necessary.

Term	Explanation / diagram
add	To join two or more numbers together to find the total amount Example: $3 + 2 + 1 = 6$
brackets ( )	These symbols ( ) are brackets. Brackets tell us how to group the numbers and what we should do first.
calculation plan	Method of finding an answer
circle	2D shape that is perfectly round 
consecutive	Following one another in a logical, unbroken sequence
data	Information or facts
difference	The answer found when subtracting one number from another number Example: The difference between 10 and 6 is 4
equal sign (=)	Symbol used to show equal quantities or numbers.
extend (a pattern)	To add terms to a pattern. To do this you need to find the rule for the pattern. Example: Extend the pattern by giving the next three terms in the pattern: 4, 9, 14 ... Rule: Add 5 each time to get the next term. Extended pattern: 4, 9, 14, 19, 24, 29 ...
flow diagram	Diagram that shows input values, a rule and output values <b>Input</b> → <b>Rule</b> → <b>Output</b>
geometric pattern	Pattern formed by the repetition of geometric shapes or objects
input	Number that goes into a flow diagram <b>Input</b> → <b>Rule</b> → <b>Output</b>

## Unit 4: Number patterns, geometric patterns and number sentences

Term	Explanation / diagram												
interval	The amount of time or space between two things Example: The interval between the numbers 5; 8; 11; 14 is 3												
multiple	A number made by multiplying together two other numbers Example: 10 is a multiple of 2 since $10 = 2 \times 5$ .												
multiply	The operation in which you increase something a number of times Example: $7 \times 2 = 14$ .												
numeric	To do with numbers												
number bond	The number pairs that add up to a given number Example: The number bonds of 4 are $0 + 4 = 4$ ; $1 + 3 = 4$ ; $2 + 2 = 4$ ; $3 + 1 = 4$ and $4 + 0 = 4$												
number pattern	List of numbers made up using a certain rule												
number sentence	Mathematical sentence that uses numbers, words and symbols like +; -; $\times$ ; $\div$ ; =; $\square$ Examples are $3 \times 4 = \square$ ; 9 subtract 2 leaves 7; $13 > 9$												
operation	Symbols used to show that you are adding, subtracting, multiplying and dividing (+; -; $\times$ ; $\div$ )												
output	Number produced after an operation has been performed or a rule applied. Number that comes out of a flow diagram  <div style="text-align: center;"> <b>Input</b> <math>\longrightarrow</math> <span style="border: 1px solid black; padding: 2px 10px;"><b>Rule</b></span> <math>\longrightarrow</math> <b>Output</b> </div>												
pattern	An arrangement of numbers, lines or shapes that follows a rule Example: 5, 10, 15, 20 is a number pattern												
placeholder ( $\square$ )	Symbol used to show the place to write a missing number or operation												
plus	The name for the addition symbol +												
predict	Say what you think will happen												
record	Write down or draw												
repeat/ repetition	Do again												
represent	Show Example: A graph such as a pictograph is used to represent data.												
row	List that goes horizontally/ from side to side Example: <table border="1" style="display: inline-table; margin-right: 20px;"> <tr><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr style="background-color: #cccccc;"><td>5</td><td>6</td><td>7</td><td>8</td></tr> <tr><td>9</td><td>10</td><td>11</td><td>12</td></tr> </table> <span style="display: inline-block; vertical-align: middle; text-align: center;"> <math>\longleftarrow</math> row                 </span>	1	2	3	4	5	6	7	8	9	10	11	12
1	2	3	4										
5	6	7	8										
9	10	11	12										

## Unit 4: Number patterns, geometric patterns and number sentences

Term	Explanation / diagram
rule	<p>The procedure we follow to change the input number into the output</p> <p style="text-align: center;"><b>Input</b> → <span style="border: 1px solid black; padding: 2px 10px;"><b>Rule</b></span> → <b>Output</b></p>
sign	A short way of saying something. For example, + is the addition sign; - is the subtraction sign.
subtract	The operation that involves taking one number away from another number Also called take away. Example $4 - 1 = 3$
symbol	A sign used to stand for words. It is a mathematical shorthand way of writing something. Examples are +; -; ×; ÷; =; □
table	<p>System of arranging information in rows and columns</p> <p>Example:</p> <div style="text-align: center;">  </div>
total	The full amount or value
triangle	<p>2D shape enclosed by three straight sides</p> <div style="text-align: center;">  </div>
word problem	<p>Problem written in words</p> <p>Example: There are 21 bags of sweets and 11 sweets in each bag. How many sweets are there altogether?</p>

## 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	25-35	41-45	16-17	8-11	13-18	18-25	18-26	11-19	15
	42-50	143-151	31-36	18-21	89-93	51-59	137-141	30-31	95-98
	129-134	224-226	118-121	88-90	162-165	181-188	207-214	39-42	148-150
	181-187	238-240	181-185	136-139	214-216	262-267	229-234	155-161	215-216
	242-244	301-302	196-197 273	198-201		281-285 339-342		223-227 289-292	
TG	14-18	63-69	57-59	8-9	8-10	54-63	14-22	16-29	13
	25-50	178-182	116-120	16-17	42-45	200-209	99-102	44-46	52-53
	91-96	260-263	154-157	73-74	84-85	300-305	165-168	59-68	76-78
	149-153	275-276	164-165	106-108	111-112	396-397	188-189	204-212	106-107
	202-204	344-346	208	153-155				294-302 382-386	

**UNIT PLAN AND OVERVIEW FOR UNIT 4****Number Patterns, Geometric Patterns and Number Sentences**

<b>LP</b>	<b>Lesson objective</b>	<b>Lesson Resources</b>	<b>Date completed</b>
	Learners will be able to:	Learners need classwork books, LABs and writing materials for all lessons	
34	recognise, describe and extend number patterns.	Blank number line	
35	use input values, output values and rules to complete flow diagrams.	No resources needed	
36	use input values, output values and rules to complete tables.	No resources needed	
37	recognise, describe and use number patterns and use flow diagrams and tables.	No resources needed	
38	describe and extend geometric patterns verbally and in written form.	2D shapes – circles and triangles. 12 pairs of circles	
39	use tables to record information from geometric patterns.	No resources needed	
40	use tables and flow diagrams to record information from geometric patterns and to develop and use rules for some patterns.	No resources needed	
41	use tables to record information from geometric patterns and to develop and use rules for some patterns.	No resources needed	
42	assess their knowledge of the work done so far this term	The teacher must photocopy the test for each of the learners	
43	recognise a number sentence and able to write simple number sentences to describe and solve everyday problems.	Flashcards of +; -; ÷; ×; =, and □	
44	identify and use patterns in addition and subtraction number bonds and number facts.	Flashcards of +; -; ÷; ×; =, and □	
45	work out how and when to use inverse operations and the commutative property in addition and subtraction calculations.	Bottle tops	
46	work out how and when to use the associative property to make calculations easier. Learners will understand the meaning of equivalence and the equal sign.	No resources needed	



47	know what happens when you add and subtract the same number from a number; and will solve and complete number sentences by inspection and by trial and improvement.	No resources needed	
48	revise number patterns, geometric patterns and number sentences.	No resources needed	

**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?*

## Lesson 34: Seeing patterns

### Teacher's notes

This lesson is one of the fully planned lessons to be used to cover the Term 1 curriculum.

CAPS topics: 2.1 Number and geometric patterns and number sentences

Lesson Objective: Learners will be able to recognise, describe and extend number patterns.

Lesson Vocabulary: number pattern, interval, consecutive

Resources needed for this lesson: Blank number line

Date:

Week

Day

### 1 MENTAL MATHS (5 MINUTES)

	What is ...	Answer		What is ...	Answer
<b>1</b>	$7 + 6 =$	13	<b>6</b>	$8 + 5 =$	13
<b>2</b>	$9 + 7 =$	16	<b>7</b>	$6 + 9 =$	15
<b>3</b>	$8 + 8 =$	16	<b>8</b>	$9 + 5 =$	14
<b>4</b>	$9 + 4 =$	13	<b>9</b>	$7 + 7 =$	14
<b>5</b>	$9 + 9 =$	18	<b>10</b>	$8 + 9 =$	17

### 2 LINK TO PREVIOUS LESSON (5 MINUTES)

As this is the first lesson of the unit, there is no strong link to the previous lesson.

You should, however, revise what learners learned about patterns in Grade 3.

– Say as you write each pattern on the board:

**How are these patterns are formed?**

- 202; 204; 206; 208 (Counting forwards in 2s starting at 202)
- 349; 449; 549; 649 (Counting forwards in 100s starting at 349)
- 9 456; 8 456; 7 456 (Counting backwards in 1 000s starting at 9 456)

– Say as you write each pattern on the board:

**What are the next three numbers in these patterns?**

- 266; 276; 286 (296; 306; 316)
- 6 500; 7 500; 8 500 (9 500, 10 500, 11 500)

### 3 CORRECT HOMEWORK ACTIVITY (5 MINUTES)

No homework from previous lesson.

### 4 LESSON CONTENT – CONCEPT DEVELOPMENT (35 MINUTES)

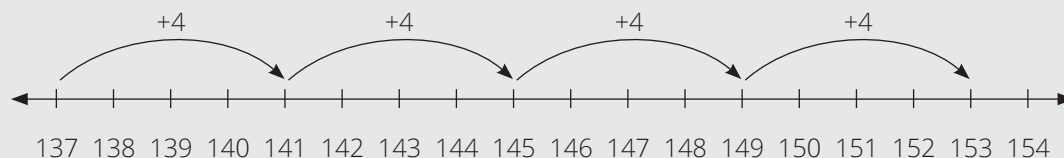
In this lesson, learners find out what a number pattern is, as well as how to work with number patterns. This lesson is largely a revision of Grade 3 work on number patterns. It is always a good idea to work from the known to the unknown as it helps build learners'

confidence in mathematics. We start with simple number patterns when the same amount is added or subtracted to make the pattern.

Say: **Today we are learning to recognise and work with number patterns. Remember we used the words ‘number patterns’ in Grade 3.**

### Activity 1: Whole class activity

- You will need a blank number line which you stick on the board with Prestik. Write the numbers below the number line with chalk.
- Say: **A *number pattern* is a list of numbers that follow each other according to a certain rule.**
- Write the following pattern on the board: **137; 141; 145; ..... ; .....**  
Say: **We want to find the next two numbers in the number pattern.**  
Say: **We first work out the rule. We then find the next two numbers in the number pattern.**
- Let learners mark 137, 141 and 145 on their number lines in their LAB.  
Ask: **Are the numbers getting bigger or smaller?** (Bigger)  
Ask: **What do we do to get the next number from one number?** (Add 4)  
Say: **Let’s check if ‘adding 4’ is correct.** ( $137 + 4 = 141$ ,  $141 + 4 = 145$ , so that’s correct.)
- Draw 2 ‘hops’ on the number line on the board.  
Help learners to work out the size of the ‘hops’ along their number lines as well.



Say: **We know that the numbers in this number pattern are getting bigger, and that each of the jumps between the numbers is 4. We say the “interval” between the numbers is 4.**

Say: **The rule is start at 137 and add 4 each time.**

Say: **Use the rule to find the next two numbers in this number pattern.**

Let learners hop by 4 on their number lines to find the next two numbers.

( $145 + 4 = 149$ ;  $149 + 4 = 153$ ).

Let a learner draw hops on the number line on the board.

**Activity 2: Learners work in pairs**

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

- Read the questions in the LAB with the learners. Make sure all the learners understand what to do.
- Do the example with the whole class to make sure all learners understand what to do.
- Walk around the classroom to support learners as needed.
- Correct Activity 2 with learners so that they can receive immediate feedback.
- The answers are given in brackets.

**Example:** 145; 150; 155; ..... ; ..... ; .....

What is the rule? Start at 145. 'Count forwards in 5s' or 'Add 5'

Use the rule to write the next 3 numbers in the pattern:

145; 150; 155; 160; 165; 170

**1** 670; 680; 690; ..... ; ..... ; .....

What is the rule? (Start at 670. Count forwards in 10s / Add 10s)

Use the rule to write the next 3 numbers in the pattern:

670; 680; 690; (700) ; (710) ; (720)

**2** 645; 545; 445; ..... ; ..... ; .....

What is the rule? (Start at 645. Count backwards in 100s / Subtract 100s)

Use the rule to write the next 3 numbers in the pattern:

645; 545; 445; (345) ; (245) ; (145)

**3** 997; 992; 987; ..... ; ..... ; .....

What is the rule? (Start at 997. Count backwards in 5s/ Subtract 5s)

Use the rule to write the next 3 numbers in the pattern:

997; 992; 987; (982) ; (977) ; (972)

**4** 657; 757; 857; ..... ; ..... ; .....

What is the rule? (Start at 657. Count forwards in 100s/ Add 100s)

Use the rule to write the next 3 numbers in the pattern:

657; 757; 857; (957) ; (1 057) ; (1 157)

5 740; 730; 720; ..... ; ..... ; .....

What is the rule?        (Start at 740. Count backwards in 10s/ Subtract 10s)

Use the rule to write the next 3 numbers in the pattern:

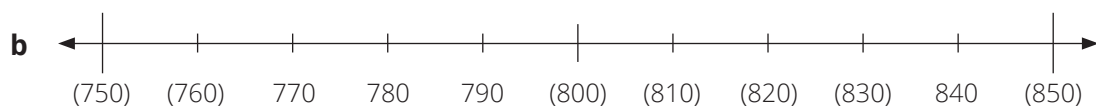
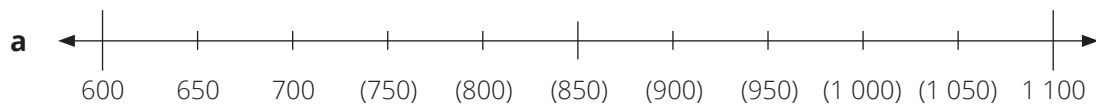
740; 730; 720; (710) ; (700) ; (690)

### Activity 3: Learners work in pairs

Say: Complete Activity 3 in your LAB.

- Read the questions in the LAB with the learners.  
Make sure all the learners understand what to do.
- Walk around the classroom to support learners as needed.

1 Write all the missing numbers on the number lines.



2 Fill in the missing numbers in each number pattern:


a 274; 279; 284; (289) ; 294; (299) ; (304)

b 2 278; 2 288; (2 298) ; (3 008) ; 3 018

c 796: (798) ; 800; 802; (804) ; 806; (808) ; 810

**5 HOMEWORK ACTIVITY (5 MINUTES)**

- Explain to learners what they need to do for homework.
- Read the questions in the LAB with learners. Make sure all the learners understand what to do.
- The answers are given in brackets.

<b>1</b>	<p>470; 472; ____; ____; 478</p> <p>What is the rule? (Start at 470. Add 2 or Count forwards in 2s)</p> <p>Use the rule to find the two missing numbers: 470; 472; (474); (476); 478</p>
<b>2</b>	<p>22; __; __; 16; __; 12; 10</p> <p>What is the rule? (Start at 22. Subtract 2 or Count backwards on 2s)</p> <p>Use the rule to find the three missing numbers: 22; (20); (18); 16; (14); 12; 10</p>
<b>3</b>	<p>Fill in the missing numbers on the number line:</p> 

**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 learned to recognise and work with number patterns.**

## Lesson 35: Number patterns and flow diagrams

### Teacher's notes

This lesson is one of the fully planned lessons to be used to cover the Term 1 curriculum.

CAPS topics: 2.1 Number and geometric patterns and number sentences

Lesson Objective: Learners will be able to use input values, output values and rules to complete flow diagrams.

Lesson Vocabulary: difference, flow diagram, input, output, rule, interval, consecutive

No resources needed for this lesson

Date:

Week

Day

### 1 MENTAL MATHS (5 MINUTES)

	Find the difference between	Answer		What is...	Answer
<b>1</b>	13 and 4	9	<b>6</b>	$15 - 7 =$	8
<b>2</b>	16 and 8	8	<b>7</b>	$18 - 9 =$	9
<b>3</b>	14 and 9	5	<b>8</b>	$14 - 6 =$	8
<b>4</b>	13 and 4	9	<b>9</b>	$13 - 8 =$	5
<b>5</b>	16 and 7	9	<b>10</b>	$15 - 9 =$	6

### 2 LINK TO PREVIOUS LESSON (5 MINUTES)

- Write this number pattern on the board: 163; 171; 179; \_\_\_\_; \_\_\_\_; \_\_\_\_  
 Ask: **Are the numbers getting bigger or smaller?** (Bigger)  
 Ask: **What is the rule for this number pattern?** (Start at 163. Increase by 8 / add 8)  
 Ask: **What are the next three numbers in the number pattern?** (187; 195; 203)

### 3 CORRECT HOMEWORK ACTIVITY (5 MINUTES)

The answers to the Homework Activity for Lesson 34 are provided in Lesson 34.

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, we build on learners' knowledge and understanding of number patterns through the use of flow diagrams. Flow diagrams are very versatile. Through the careful selection of the rule, or calculation plan, you can provide opportunities to practice operations and operation facts. As flow diagrams can work in both directions – that is, from input, through the rule to the output; or from output, through the rule to the input; they provide an excellent opportunity for reinforcing the concept of inverse operations.

Remember that learners do not need to know the term ‘inverse operation’, but they do need to understand and work with inverse operations.

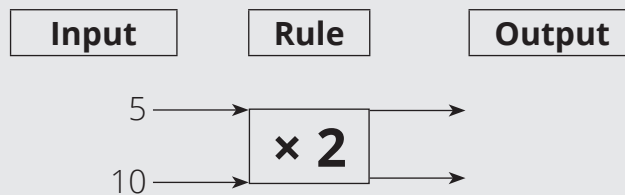
Say: **Today we are learning to work with flow diagrams.**

### Activity 1: Whole class activity

- Draw the following flow diagram on the board before the lesson.

Fill in the two input numbers (5 and 10)

Fill in the rule ( $\times 2$ )



Show learners how the input number and the rule can be used to find the output number.

Ask: **If the *input* is 5, and the *rule* is ‘multiply by 2’, what is the *output*?** (10).

Ask: **If the *input* is 10, and the *rule* is ‘multiply by 2’, what is the *output*?** (20)

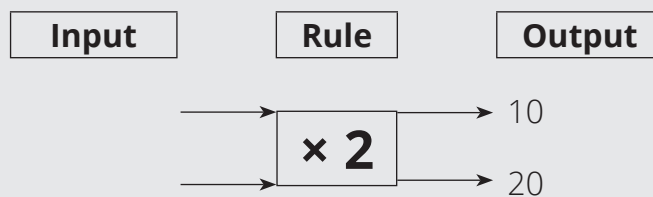
Write output; 10 and 20 on flow diagram.

- Erase the input numbers and write in the output numbers.

Ask: **If the *output* number is 10 and the *rule* is ‘multiplied by 2’, what is the *input* number?** (5)

Ask: **If the *output* number is 20 and the *rule* is ‘multiplied by 2’, what is the *input* number?** (10)

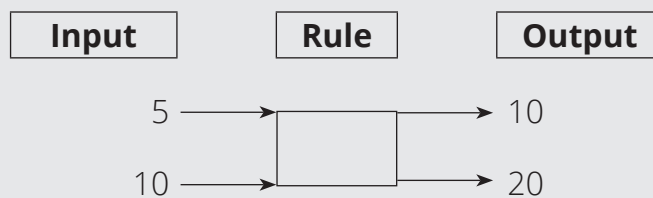
Ask: **What did we do when we found the input numbers?** (We divided:  $10 \div 2 = 5$ ,  $20 \div 2 = 10$ )



- Show learners how the input and the output can be used to find the rule:

Erase the rule. Keep the input and output numbers:

Make sure that the arrows are in the correct direction.





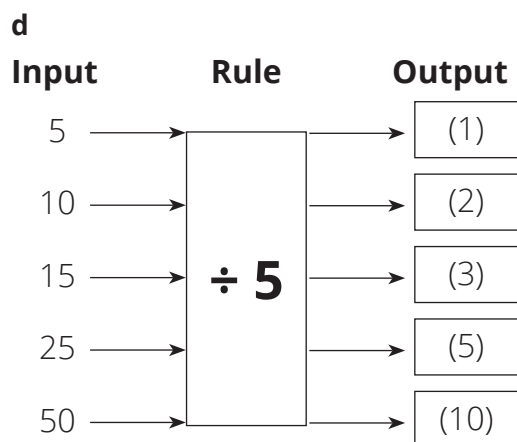
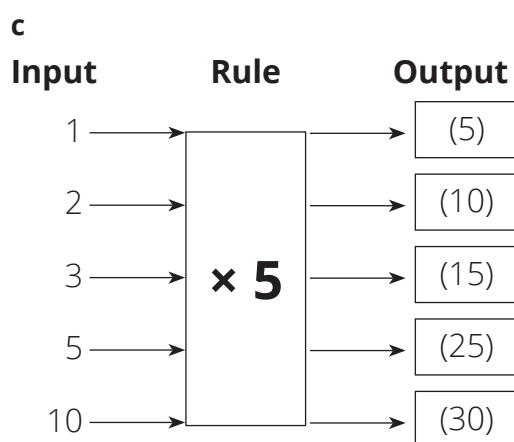
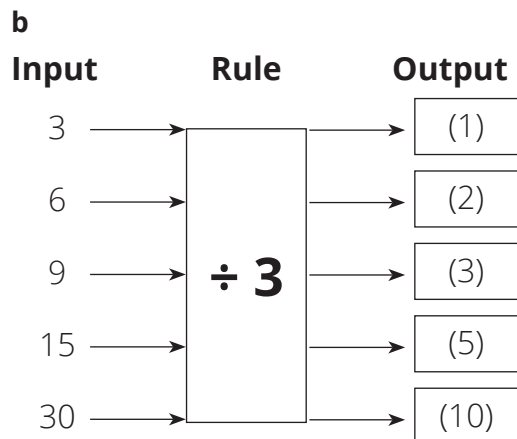
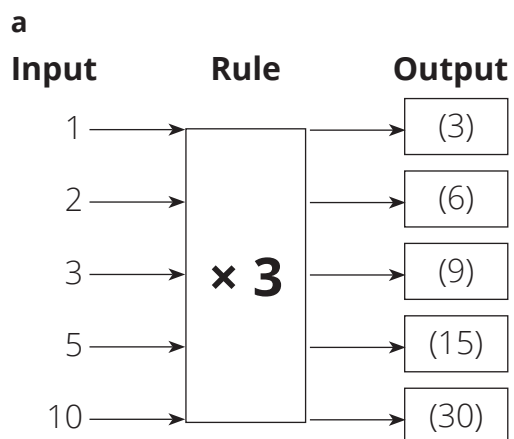
Ask: If the input is 5 and the output is 10, what is the rule? ( $\times 2$  / double)

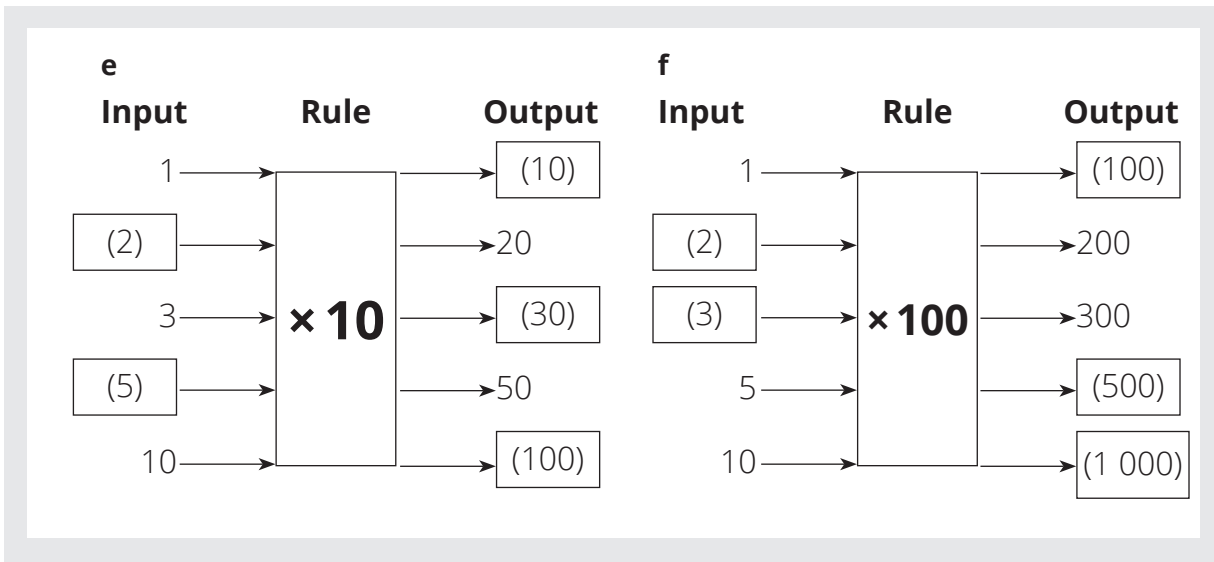
Ask: If the input is 10 and the output is 20 what is the rule? ( $\times 2$  / double)

### Activity 2: Learners work on their own

- Read the questions in the LAB with the learners.  
Make sure all the learners understand what to do.
- Walk around the classroom to support learners as needed.
- Correct Activity 3 with learners so that they can receive immediate feedback.
- The answers are given in brackets.

#### 1 Complete the flow diagrams



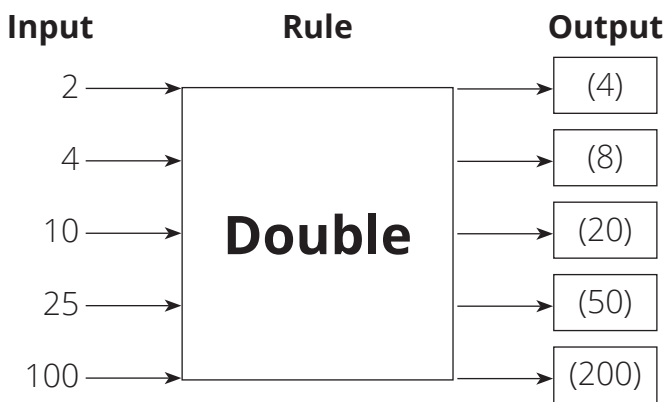


### Activity 3: Learners work in pairs

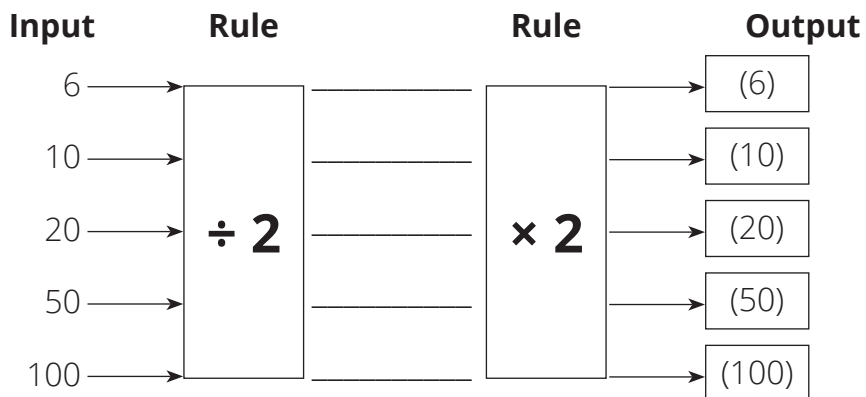
Say: Do Activity 3 in your LAB.

- Read the questions in the LAB with the learners. Make sure all the learners understand what to do.
- Walk around the classroom to support learners as needed.
- Correct Activity 3 with learners so that they can receive immediate feedback.
- The answers are given in brackets

1 Complete the flow diagram by writing the output numbers on the flow diagram.



- 2 This flow diagram has two rules: first divide by 2 and then multiply the answer by 2. Complete the flow diagram by writing the output numbers on the flow diagram.



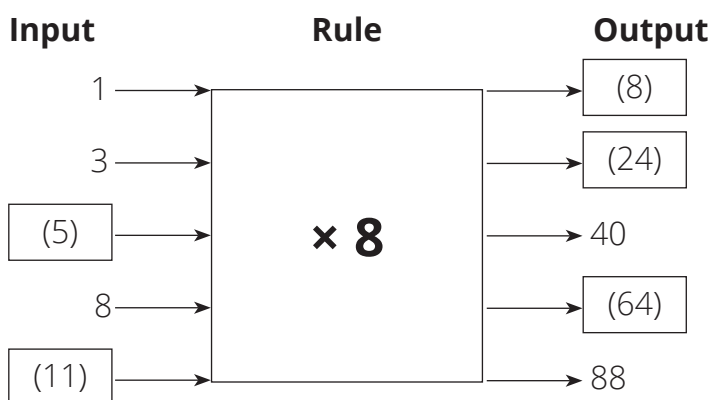
What do you notice about each input number and its matching output number? Why?

(Each input numbers is the same as its matching output number. This is because dividing by two is 'undone' by multiplying by 2.)

- 3 Complete the flow diagram by writing the missing input and output numbers on the flow diagram

Remember: When you are working from the output to the input you must use the opposite operation.

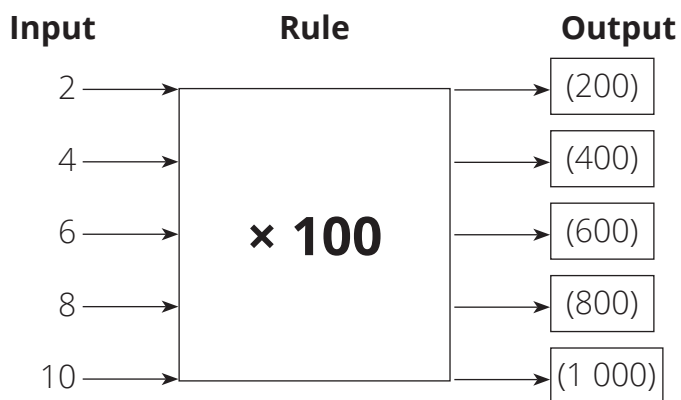
So, instead of multiplying by 8, you must divide by 8.



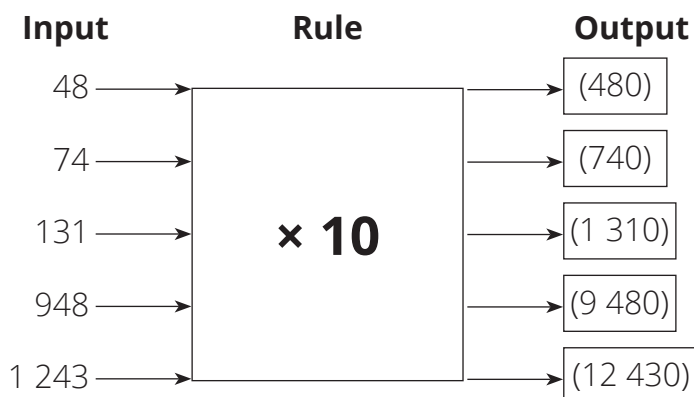
**5 HOMEWORK ACTIVITY (5 MINUTES)**

- Explain what learners should do for homework.
- Read the questions in the LAB with the learners.  
Make sure all the learners understand what to do.
- The answers are given in brackets.

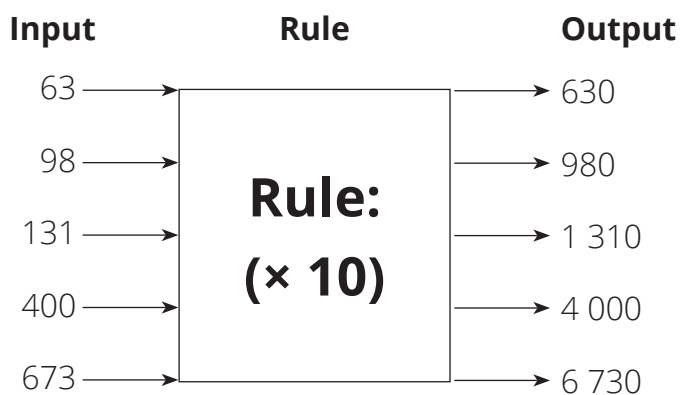
1 Complete the flow diagram by writing the output numbers on the flow diagram.



2 Complete the flow diagram by writing the output numbers on the flow diagram.



3 Fill in the rule in this flow diagram.



## 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 learned to use flow diagrams. We know how to:**

- **Find the output number when we have the input number and the rule.**
- **Find the input number when we have the output number and the rule.**
- **Find the rule when we have the input number and the output number.**

## Lesson 36: Number patterns and tables

### Teacher's notes

This lesson is one of the fully planned lessons to be used to cover the Term 1 curriculum.

CAPS topics: 2.1 Number and geometric patterns and number sentences

Lesson Objective: Learners will be able to use input values, output values and rules to complete tables.

Lesson Vocabulary: input, output, rule, table

No resources needed for this lesson

Date:

Week

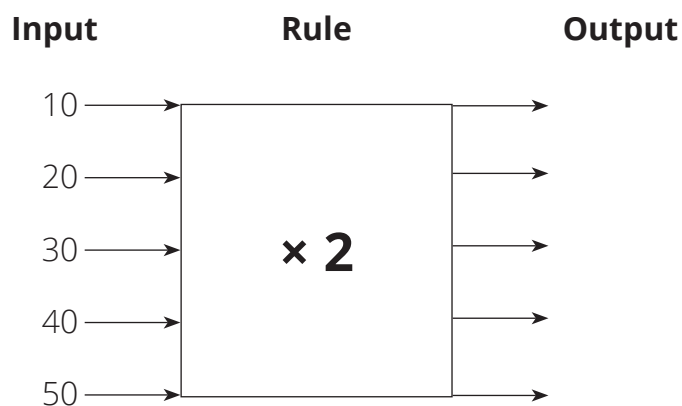
Day

### 1 MENTAL MATHS (5 MINUTES)

	What is ...	Answer		What is ...	Answer
<b>1</b>	$5 \times 4 =$	20	<b>6</b>	$10 \times 3 =$	30
<b>2</b>	$9 \times 6 =$	54	<b>7</b>	$8 \times 6 =$	48
<b>3</b>	$3 \times 7 =$	21	<b>8</b>	$9 \times 2 =$	18
<b>4</b>	$5 \times 5 =$	25	<b>9</b>	$1 \times 10 =$	10
<b>5</b>	$8 \times 4 =$	32	<b>10</b>	$9 \times 0 =$	0

### 2 LINK TO PREVIOUS LESSON (5 MINUTES)

- Draw the following diagram on the board:



Ask: **What are the input numbers?** (10; 20; 30; 40; 50)

Ask: **What is the rule for this flow diagram?** ( $\times 2$ )

Ask: **What are the output numbers?** (20; 40; 60; 80; 100)

**3 CORRECT HOMEWORK ACTIVITY (5 MINUTES)**

The answers to the Homework Activity for Lesson 35 are provided in Lesson 35. 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 are familiar with the following concepts: number pattern, input, output and rule. We extend these concepts by getting learners to use tables.

Say: **Today we use tables to recognise and describe number patterns.**

**Activity 1: Whole class activity**

- Draw the following table on the board before the lesson.
- Say: **When Thandi was born, her father was 25 years old. As Thandi was growing up, her mother recorded the father's age and daughter's age in a table like this:**

Age of daughter (years)	0	1	2	3	4	5	10	20
Age of father (years)	25	26	27	28	29	30		

Show the learners how to read the information from the table, and ask:

**How old was the father when the daughter was born?** (25 years)

Ask: **How old was the father when the daughter was 2 years old?** (27 years)

Ask: **How old is the daughter when the father was 30 years old?** (5 years)

Say: **Let's describe the father and daughter's ages in words.**

Say, and write the sentence: **The father is always \_\_\_\_\_ years older than the daughter.** (25)

Say, and write the sentence: **Father's age = Daughter's age + \_\_\_\_\_** (25)

Say: **Let's work out the rule:**

Age of daughter (years)	0	1	2	3	4	5	10	20
Age of father (years)	0 + <b>25</b>	1 + <b>25</b>	2 + <b>25</b>	3 + <b>25</b>	4 + <b>25</b>	5 + <b>25</b>		
	25	26	27	28	29	30		

If possible, write the +25 in another colour.

Say: **Write the rule to find the father's age when we know the daughter's age.**

(Rule: Add 25 years to the daughter's age).

Say: Use the rule to work out the father's age when the daughter is 10 years old.  
 ( $10 + 25 = 35$  years).

Write this output value in your table:

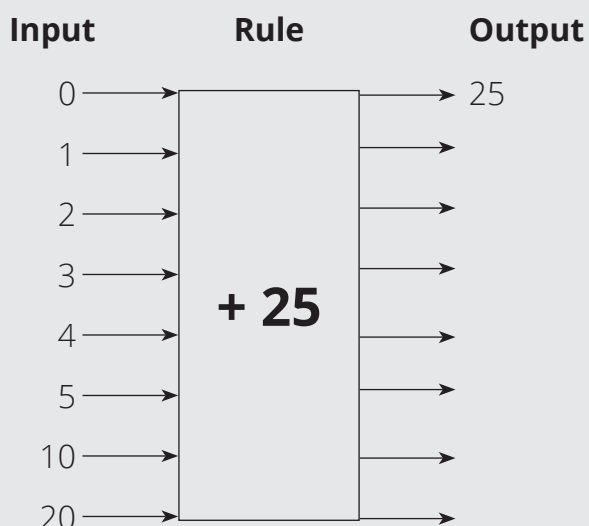
Age of daughter (years)	0	1	2	3	4	5	10	20
Age of father (years)	$0 + 25$	$1 + 25$	$2 + 25$	$3 + 25$	$4 + 25$	$5 + 25$	$10 + 25$	
	25	26	27	28	29	30	<b>35</b>	

Say: Use the rule to work out the father's age when the daughter is 20 years old.  
 ( $20 + 25 = 45$  years). Write this output value in your table:

Age of daughter (years)	0	1	2	3	4	5	10	20
Age of father (years)	$0 + 25$	$1 + 25$	$2 + 25$	$3 + 25$	$4 + 25$	$5 + 25$	$10 + 25$	$20 + 25$
	25	26	27	28	29	30	<b>35</b>	<b>45</b>

– Say: Let's draw a flow diagram of this table.

Draw the following diagram on the board.

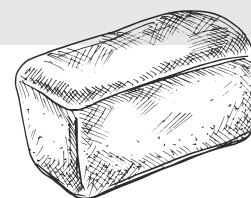


Work with the learners to write the missing output numbers in the spaces.  
 (26; 27; 28; 29; 30; 35; 45)



**Activity 2: Learners work in pairs**Say: **Complete Activity 2 in your LAB.**

- Read the questions in the LAB with the learners. Make sure all the learners understand what to do.
- Correct Activity 2 with learners, question by question.
- The answers are given in brackets.



- 1 The table shows the cost of loaves of bread.  
(Remember: we say 1 loaf of bread, many loaves of bread)

Number of loaves of bread	1	2	3	4	5	6	7	10	(20)
Cost (in Rand)	10	20	(30)	(40)	(50)	(60)	(70)	(100)	200

- a How much does one loaf of bread cost?       (R10)
- b Complete the table by writing in the missing values.
- c Is the number of loaves of bread the input value or the output value? (Input value)
- d Is the cost (in Rand) the input value or the output value?       (Output value)
- e What rule do we use to find the cost? (Multiply the number of loaves by 10 or by R10)
- 2 The rule for calculating the output numbers in this table from input numbers is: 'Add 4'.

Complete the table by filling in the missing input numbers.

The first one has been done as an example for you.

Input Numbers	1	(3)	(6)	(26)	(99)	(298)	(1 000)
Output Numbers = Input Numbers + 4	5	7	10	30	103	302	1 004

**Activity 3: Learners work on their own.**Say: **Do Activity 3 in your LAB.**

- Read the questions in the LAB with the learners. Make sure all the learners understand what to do.
- Walk around the classroom to support learners as needed.
- Correct Activity 3 with learners so that they can receive immediate feedback.
- The answers are given in brackets.



- 1** Akhona wants to buy a new bicycle.  
She manages to save R50 per week for the bicycle.

**a** Complete the table and then answer the questions.

Number of weeks	1	2	3	4	5	6	8	10	16
Amount Saved (In Rand)	50	(100)	(150)	(200)	(250)	(300)	(400)	(500)	(800)

- b** The bicycle costs R800. How many weeks will it take Akhona to save enough money? (16 weeks)

**2**

Input	6	12	18	54	(60)	600	(6 000)
Output	1	2	3	(9)	10	(100)	1 000

Use the first three pairs of input numbers and output numbers to find the rule and complete the table.

The rule is  $(\div 6)$

Use the rule to complete the table.

**5 HOMEWORK ACTIVITY (5 MINUTES)**

- Explain what learners need to do for homework.
- Read the questions in the LAB with the learners.  
Make sure all the learners understand what to do.
- Remind learners that we always use the rule to calculate the output number from the input number. If we want to calculate the input number from the output number, we need to do the opposite of the rule.
- The answers are given in brackets.



- 1 There are four wheels on each car.
- a Complete the table showing the number of wheels.

Number of cars	1	2	3	8	10	15	(25)
Number of wheels = number of cars $\times$ 4	(4)	(8)	(12)	(32)	(40)	(60)	100

- b How many wheels do 8 cars have? (32 wheels)
- c How many wheels do 15 cars have? (60 wheels)
- d There are 100 wheels. How many cars? (25 cars)

- 2 The following table shows input and output values.

Input	5	10	15	20	40	50	100	1 000
Output	1	2	3	4	8	10	20	200

What is the rule for finding the output values from the input values?

The rule is (Input  $\div$  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 used tables to know how to:**

- Calculate the output if we know the input and the rule.
- Calculate the input if we know the output and the rule.
- Work out the rule if we know the input number and matching output number.

## Lesson 37: Number patterns, flow diagrams and tables

### Teacher's notes

This lesson is one of the fully planned lessons to be used to cover the Term 1 curriculum.

CAPS topics: 2.1 Number and geometric patterns and number sentences

Lesson Objective: Learners will be able to recognise, describe and use number patterns and use flow diagrams and tables.

Lesson Vocabulary: input, output, rule, table, flow diagram, calculation plan, number pattern, consecutive

No resources needed for this lesson

Date: \_\_\_\_\_ Week \_\_\_\_\_ Day \_\_\_\_\_

### 1 MENTAL MATHS (5 MINUTES)

	What is ...	Answer		What is ...	Answer
<b>1</b>	$3 \times 7 =$	21	<b>6</b>	$10 \times 6 =$	60
<b>2</b>	$4 \times 2 =$	8	<b>7</b>	$6 \times 9 =$	54
<b>3</b>	$5 \times 7 =$	35	<b>8</b>	$0 \times 8 =$	0
<b>4</b>	$7 \times 8 =$	56	<b>9</b>	$9 \times 5 =$	45
<b>5</b>	$10 \times 1 =$	10	<b>10</b>	$9 \times 9 =$	81

### 2 LINK TO PREVIOUS LESSON (5 MINUTES)

- Draw the following table on the board before the lesson:

Number of candles	1	2	3	4	5	10	20	100
Cost (in Rand) of the candles	7	14		28				

Ask: **What are the inputs in this table?** (Number of candles)

Ask: **What are the outputs in this table?** (Cost in Rand)

Ask: **How much does one candle cost?** (R7)

Ask: **What is the rule? Some people think of the rule as a calculation plan.**  
(Number of candles  $\times$  7)

Say: **Fill in the cost of 3 candles.** ( $3 \times R7 = R21$ )

Say: **Complete the table.** ( $5 \times R7 = R35$ ;  $10 \times R7 = R70$ ;  $20 \times R7 = R140$ ;  
 $100 \times R7 = R700$ )

### 3 CORRECT HOMEWORK ACTIVITY (5 MINUTES)

The answers to the Homework Activity for Lesson 36 are provided in Lesson 36. Use this time to purposefully address gaps in learners' knowledge and to identify and address learner errors. Be sure that learners are able to use inverse operations to check answers.

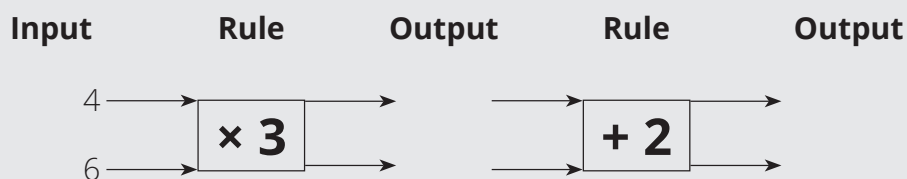
### 4 LESSON CONTENT - CONCEPT DEVELOPMENT (35 MINUTES)

In this lesson we continue to build on learners' understanding of number patterns, flow diagrams and tables.

Say: **Today we are learning more about number patterns, flow diagrams and tables.**

#### Activity 1: Whole class activity

- Say: **Flow diagrams can have two rules.**
- Draw a two-step flow diagram on the board. Fill in the input numbers and the two rules:



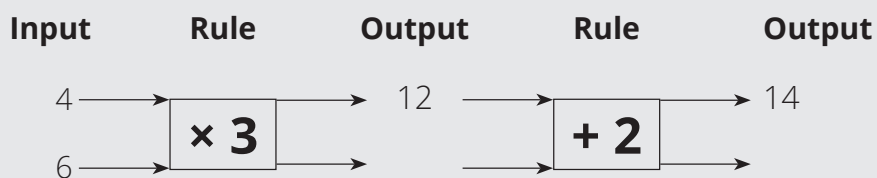
Ask: **What is  $4 \times 3$ ?** (12)

Write this output number on the flow diagram, between the two steps.

Ask: **What is  $12 + 2$ ?** (14).

Ask: **What is the first output number?** (14).

Write this output number on the flow diagram, after the second step

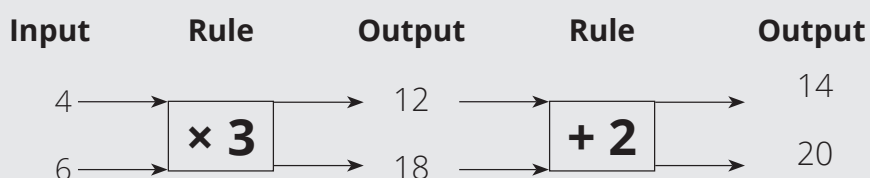


Ask: **What is  $6 \times 3$ ?** (18)

Write this output number on the flow diagram, between the two steps.

Ask: **What is the second output number?** ( $18 + 2 = 20$ ).

Write this output number on the flow diagram, after the second step.

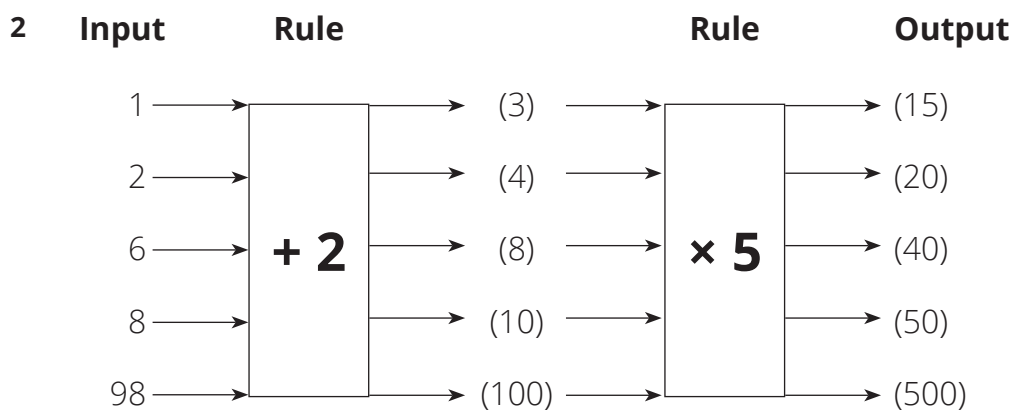
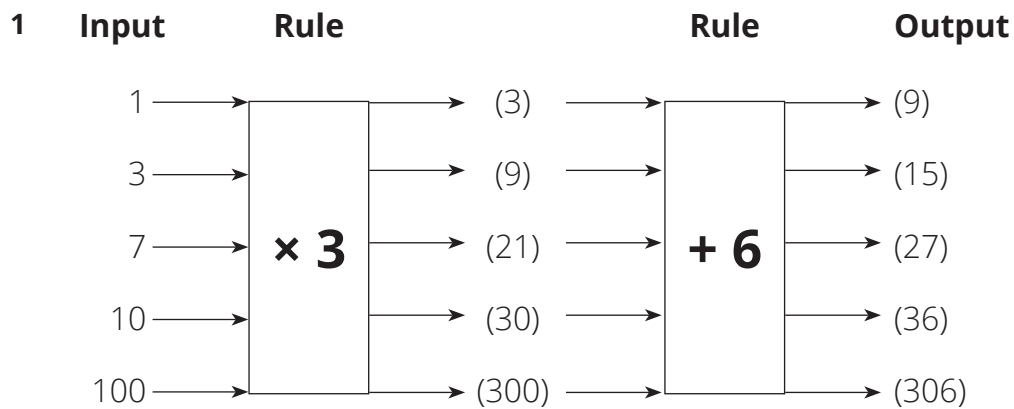


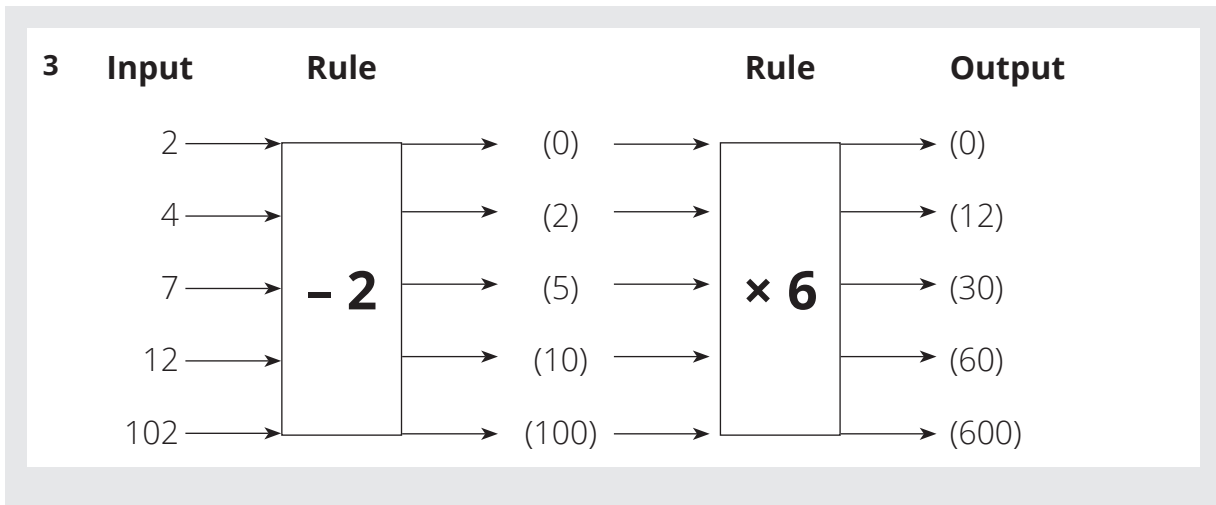
### Activity 2: Learners work in pairs

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

- Read the questions in the LAB with the learners.  
Make sure all the learners understand what to do.
- Do Question 1 with the whole class.
- Before Question 3, ask:  
**When we multiply zero by any number, what is the answer? (0)**
- Walk around the classroom to support learners as needed.
- Correct Activity 2 with learners so that they can receive immediate feedback.
- The answers are given in brackets.

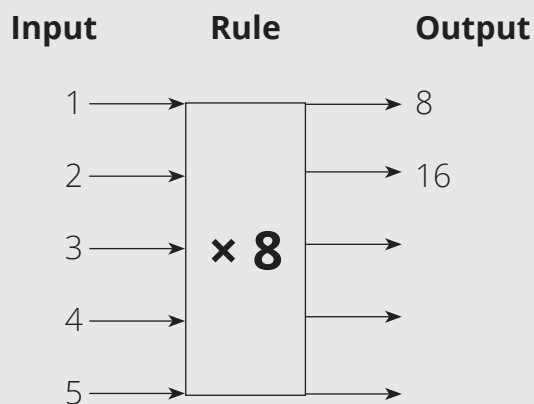
Complete the flow diagrams.





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

- Draw this flow diagram on the board.
- Say: **Tito sells bunches of bananas for eight rand per bunch. Tito showed the amount of money he should get for the bananas in a flow diagram like this:**  
Say: **Look at the flow diagram in your LAB.**



Ask: **How much money will Tito get if he sells 1 bunch of bananas? (R8)**

Ask: **How much money will Tito get if he sells 2 bunch of bananas? (R16)**

Ask: **How much money will Tito get if he sells 3 bunches of bananas? (R24)**

Let learners write the outputs on their flow diagram

Say: **Complete your flow diagram.** (They should add R32 and R40)

Let two learners complete the flow diagram on the chalkboard so that the rest of the class can correct their flow diagrams.

– Say: **Let's show the same information on a table.**

Draw the following flow diagram on the board.

Number of bunches					
Amount (in Rand)					

The learners go to the table in their LAB.

Ask: **What is the input?** (Number of bunches)

Ask: **What is the output?** (Amount (in Rand))

Say: **Write the input numbers in your table.**

(The learners should write 1, 2, 3, 4 and 5 in the top row of the table).

Say: **Now write the output numbers in your table.**

(The learners should write 8; 16; 24; 32 and 40 in the correct places in the bottom row of the table.)

Ask one or two learners to write the input and output numbers on the table on the board so the rest of the class can check their answers.

Number of bunches	(1)	(2)	(3)	(4)	(5)
Amount (in Rand)	(8)	(16)	(24)	(32)	(40)

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

- Read the questions in the LAB with the learners and make sure all learners understand what to do.
- Walk around the classroom to support learners as needed.
- Correct Activity 3 with learners so that they can receive immediate feedback.
- The answers are given in brackets.

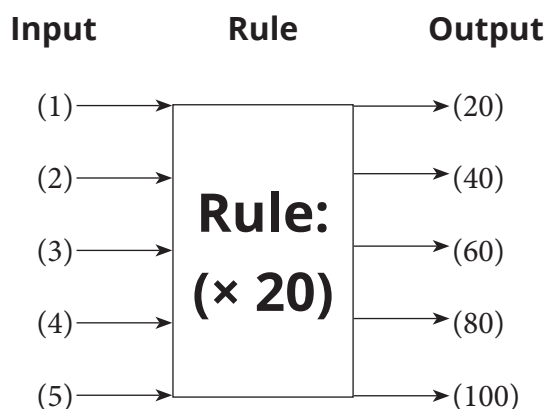
**1** Farmer Maria uses 20 metres of wire to make one cage for her hens.

- a** She used a flow diagram to show how much wire she would need to make 1 cage, 2 cages, 3 cages, 4 cages and 5 cages.

What are the input values? (The number of cages: 1; 2; 3; 4; 5)



**b** Write the input values on the flow diagram:



**c** What are the output values? (The amount of wire needed for each cage.)

**d** What is the rule? (× 20)

**e** Write the rule on the flow diagram and then write the output values for 1 cage, 2 cages, 3 cages, 4 cages and 5 cages.

**f** Farmer Maria also put all in the information in the following table:

Number of cages	1	2	3	4	5	6
Length of wire (metres)	(20)	(40)	(60)	(80)	(100)	(120)

Fill in the missing information on the table.

**2** Complete these number patterns and say what the rule is.

**a** 1 028; 1 032; 1 036; (1 040; 1 044; 1 048; 1 052; 1 056; 1 060)

What is the rule used to find this number pattern?

(Rule: Add 4 or + 4)

**b** 95 325; 95 225; 95 125; (95 025; 94 925; 94 825; 94 725; 94 625; 94 525)

What is the rule used to find this number pattern?

(Rule: Minus 100 or - 100)

**5 HOMEWORK ACTIVITY (5 MINUTES)**

- Explain what learners need to do for homework.
- Read the questions in the LAB with the learners.  
Make sure all learners understand what to do.
- Remind learners that we always use the rule to calculate the output value or the input value. If we want to calculate the input number from the output number, we need to do the opposite of the rule.
- The answers are given in brackets.

**1** Complete these number patterns and say what the rule is.

**a** 324; 330; 336; (342; 348; 354; 360; 366; 372)

Rule: (Add 6 or + 6)

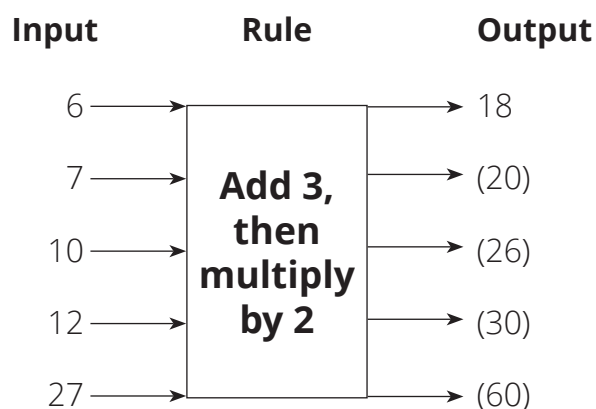
**b** 1 218; 1 238; 1 258; (1 278; 1 298; 1 318; 1 338; 1 358; 1 378)

Rule: (Add 20 or + 20)

**c** 2 000; 1 990; 1 980; (1 970; 1 960; 1 950; 1 940; 1 930; 1 920)

Rule: (Minus 10 or – 10)

**2 a** Complete the flow diagram:



**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 learned more about number patterns, flow diagrams and tables.**

## Lesson 38: Describe and extend geometric patterns

### Teacher's notes

This lesson is one of the fully planned lessons to be used to cover the Term 1 curriculum.

CAPS topics: 2.1 Number and geometric patterns and number sentences

Lesson Objective: Learners will be able to describe and extend geometric patterns verbally and in written form.

Lesson Vocabulary: geometric pattern, repeat / repetition, square, rectangle, circle, hexagon, triangle, pentagon, extend, apex, base

Resources needed for this lesson: 2D shapes from the Teacher's Resources as well as 22 pairs of circles. You will need Prestik to stick the shapes on the board.

Date:

Week

Day

### 1 MENTAL MATHS (5 MINUTES)

	What is ...	Answer		What is ...	Answer
<b>1</b>	$9 \times 5 =$	45	<b>6</b>	$7 \times 9 =$	63
<b>2</b>	$10 \times 10 =$	100	<b>7</b>	$1 \times 9 =$	9
<b>3</b>	$6 \times 8 =$	48	<b>8</b>	$3 \times 5 =$	15
<b>4</b>	$4 \times 4 =$	16	<b>9</b>	$9 \times 9 =$	81
<b>5</b>	$3 \times 8 =$	24	<b>10</b>	$8 \times 5 =$	40

### 2 LINK TO PREVIOUS LESSON (5 MINUTES)

Link to concepts learned in previous unit by asking questions:

- Say: **Extend the pattern 2; 4; 6; 8; .....; .....; ....** (10; 12; 14)  
 Ask: **What do we do to each number to get the next number?** (Add 2)  
 Say: **Extend the pattern 30; 25; 20; 15; .....; .....; ....** (10; 5; 0)  
 Ask: **What do we do to each number to get the next number?** (Subtract 5)

### 3 CORRECT HOMEWORK ACTIVITY (5 MINUTES)

The answers to the Homework Activity for Lesson 37 are provided in Lesson 37.

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 Grade 3, learners copied, described and extended patterns made with numbers, objects or drawings. The descriptions were verbal. In Grade 4 the patterns become more complex and learners use different representations of patterns, for example in flow diagrams and

tables. The foundational concept regarding patterns, including geometric patterns, is that of repetition.

In this lesson, learners revise what they did in Grade 3. By using 2D shapes, we connect with the Content Area: Space and Shape so that we can revise the 2D shapes and their terminology.

Say: **Today we are learning to describe and extend *geometric patterns*.**

### Activity 1: Whole class activity

- You are going to need the 3 cut-out triangles and 3 cut-out circles which are given in the Teacher's Resource Pack. You will also need Prestik to stick the shapes on the board.
- Say: **You learned about *geometric patterns* in Grade 3. Remember that a geometric pattern has lines or shapes such as triangles, circles and squares, arranged in a repeated way.**
- Stick 2 triangles and 2 circles on the board to show this geometric pattern. These 4 shapes are given in the LAB for the learners.



Say: **Name the shapes in this pattern.** (Triangle, circle)

Say: **Describe the pattern in words.** (Triangle, circle, triangle, circle)

Say: **Use your shapes to copy the pattern.**

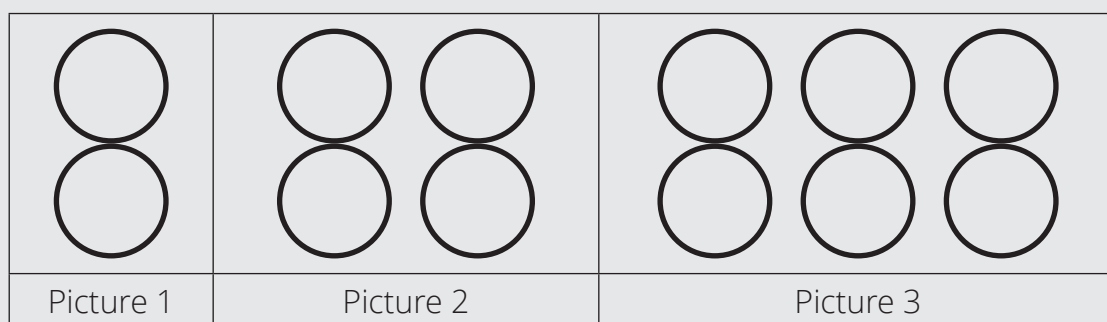
- Say: **Extend the pattern in your LAB. Remember that when you extend a pattern, it has to look exactly the same. This means that in this geometric pattern, the shapes must be in the same order.**

Walk around the class to make sure that the learners have extended the pattern correctly.

Ask one or two learners to come and complete the pattern on the board so that the rest of the class can check that their pattern is correct.



- You will need your 22 pairs of circles plus Prestik for the next activity.
- Say: **Let's describe and extend another pattern.**  
Put up 6 pairs of circles on the board as follows:

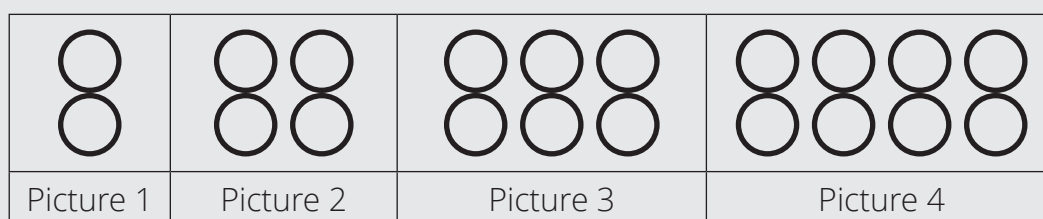


– Say: **Describe the pattern.**

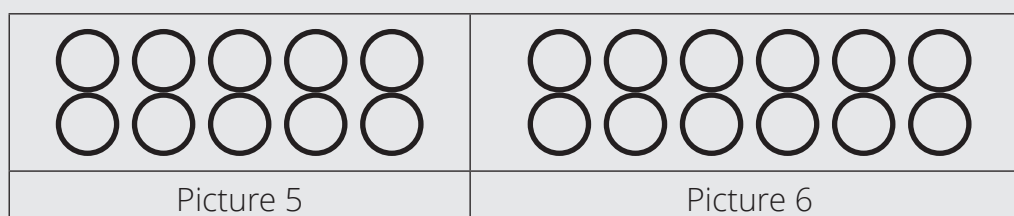
(There are many possible answers. Here are some examples:

- 2 circles, 4 circles, 6 circles.
- 2 circles in 1 column, 4 circles in 2 equal columns, 6 circles in 3 equal columns.
- Each Picture has 2 circles more than the Picture before.
- A more sophisticated answer: 2 circles in Picture 1, 4 circles in Picture 2, 6 circles in Picture 3.)

– Ask: **Who would like to come and use the circles to make Picture 4 on the board?**



– Repeat this step with Pictures 5 and 6.







### Activity 2: Learners work in pairs

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


- Read the questions in the LAB with the learners.  
Make sure all the learners understand what to do.
- Work through Activity 2 with learners so that they can receive immediate feedback.
- The answers are given in brackets or marked as answers.

1 Study this pattern.


		
Picture 1	Picture 2	Picture 3

What shape is in Picture 1? (one black circle or )

What shapes are in Picture 2? (black circle, white circle, black circle or )

What did we add to Picture 1 to get Picture 2?  
(add a white circle and a black circle or add )

What shapes are in Picture 3?  
(black circle, white circle, black circle, white circle, black circle, or added )

What did we add to Picture 2 to get Picture 3?  
(add a white circle and a black circle or add )



Write a rule for this pattern (Answers will vary. Here are two examples:

- Start with  and add  to get the next picture.)

- Start with a black circle and add a white circle and a black circle to get the next picture.)






Draw Picture 4 and Picture 5

ANSWERS

	
Picture 4	Picture 5

2 These triangles are made with matchsticks.

Study the pattern.

				
Picture 1	Picture 2	Picture 3	Picture 4	Picture 5

How many matchsticks are used for Picture 1? (3)

How many matchsticks are used for Picture 2? (5)

How many matchsticks did we add to Picture 1 to get Picture 2? (2)

How many matchsticks are used for Picture 3? (7)



How many matchsticks did we add to Picture 2 to get Picture 3? (2)

Write a rule for this pattern.




(Answers will vary. Here is an example: Start with triangle made with 3 matchsticks. Add 2 matchsticks to get to each new picture.)

Draw Picture 4 and Picture 5

ANSWERS

	
Picture 4	Picture 5

- 3 These pictures are made with dots.  
Study the pattern.

		
Picture 1	Picture 2	Picture 3

How many dots are used for Picture 1? (4)

How many dots are used for Picture 2? (8)

How many dots did we add to Picture 1 to get Picture 2? (4)



How many dots are used for Picture 3? (12)

How many dots did we add to Picture 2 to get Picture 3? (4)

Write a rule for this pattern (Answers will vary. Here is an example: Start with picture made with 4 dots. Each time put 1 dot next to each of the 4 dots to make an X-shape.)

Draw Picture 4 and Picture 5



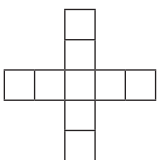
ANSWERS

	
Picture 4	Picture 5

**5 HOMEWORK ACTIVITY (5 MINUTES)**

- Read the questions in the LAB with the learners.  
Make sure all learners understand what to do.
- The answers are given in brackets or are marked as answers

1. Study the pattern.

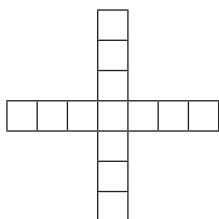
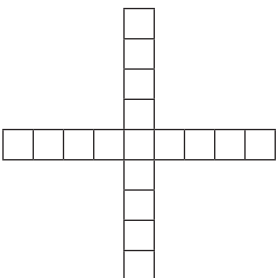
				
Picture 1	Picture 2	Picture 3	Picture 4	Picture 5

2. Describe the pattern. Use the word square in your description

(Answers will vary: For example: the pattern consists of a square in the middle. The pattern grows as one square is added to each side of the square to form a + shape.)

3. Draw Picture 4 and Picture 5

ANSWERS

	
Picture 4	Picture 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 learned that a geometric pattern has lines or shapes arranged in a repeated way. We have also learned to describe and extend geometric patterns.**



## Lesson 39: From patterns to tables

### Teacher's notes

This lesson is one of the fully planned lessons to be used to cover the Term 1 curriculum.

CAPS topics: 2.1 Number and geometric patterns and number sentences

Lesson Objective: Learners will be able to use tables to record information from geometric patterns.

Lesson Vocabulary: column, row, table, input, output, rule, record

No resources needed for this lesson

Date:

Week

Day

### 1 MENTAL MATHS (5 MINUTES)

	What is ...	Answer		What is ...	Answer
<b>1</b>	$2 \times 3 =$	6	<b>6</b>	$8 \times 8 =$	64
<b>2</b>	$7 \times 5 =$	35	<b>7</b>	$6 \times 6 =$	36
<b>3</b>	$6 \times 0 =$	0	<b>8</b>	$7 \times 7 =$	49
<b>4</b>	$8 \times 7 =$	56	<b>9</b>	$4 \times 9 =$	36
<b>5</b>	$6 \times 9 =$	54	<b>10</b>	$7 \times 3 =$	21

### 2 LINK TO PREVIOUS LESSON (5 MINUTES)

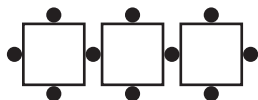
- Draw this table on the board before the beginning of the lesson.  
The same table is found in the LAB.

- Say: **Study these two Pictures.**

			
Picture 1	Picture 2	Picture 3	Picture 4

- Say: **Draw the next Picture in the table in your LAB.**  
Ask: **Who would like to come to the board and draw the next Picture?**

(Picture 3 looks like this:



Once the Picture has been drawn by one or two of the learners, ask the learners:

**Is that correct?**

If the Picture is not correct, ask: **How do you think the Picture should be changed?**

(Answers will vary but make sure this is a class activity where the whole class works together to get the answer. There should be no laughter at anyone who gets the wrong answer.)


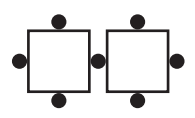
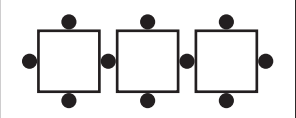
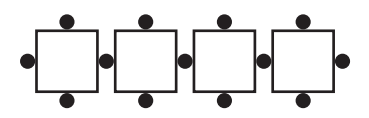
- Ask: **What changes from one Picture to the next?** If necessary, prompt the learners by telling them to use the words square and dot or circle. (One square and three dots are added to the Picture so that there is one dot in the middle of each side of every square)

- Say: **Draw the fourth picture in your LAB.**

Then ask: **What does Picture 4 look like?**

(Answers will vary. For example: 4 squares; 4 dots on top; 4 dots at the bottom; 1 dot on the left; 1 dot on the right; 1 dot between each of the 4 squares)

The final table should look like this:

			
Picture 1	Picture 2	Picture 3	Picture 4

### 3 CORRECT HOMEWORK ACTIVITY (5 MINUTES)

The answers to the Homework Activity for Lesson 38 are provided in Lesson 38.

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

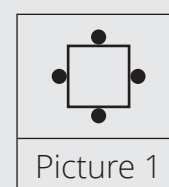
### 4 LESSON CONTENT - CONCEPT DEVELOPMENT (30 TO 35 MINUTES)

Having described and extended geometric patterns, learners move on to recording data in tables. The important concepts required to do this are input, output and rule. Recording data in tables is not a goal in itself – it is a way of helping learners to work out rules which they can use to do calculations for any Picture number without having to draw all the Pictures.

Say: **Today we are learning to use tables to record information from geometric patterns.**

#### Activity 1: Whole class activity

- Sketch Picture 1 on the board:  
Say, pointing at the four dots and the rectangle:  
**Four learners can sit at a desk like this.**



- Say: **We will fill in the table as we go along.**

Say, as you draw and label the table.

**We will record the number of desks in this row of the table.** →

**We will record the number of learners in this row of the table.** →

Number of desks				
Number of learners				

- Say: **Look at the diagram on the board and in your LAB.**

Ask: **How many desks are there?** (1 desk)

Write 1 in the top row, second column of the table on the board

Ask: **How many learners are there?** (4 learners).

Write 4 in the second row, second column of the table on the board.

Learners write 1 and 4 in their table in LAB.

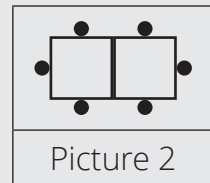
Number of desks	1			
Number of learners	4			

- Say: **Another desk is added like this:**

Draw only another desk (not the learners around the desks).

Learners also draw another desk in their LAB and draw the dots.

Draw the dots on Picture 2 on the board so that the learners can correct their pictures if necessary.



- Say: **Look at the picture.**

Ask: **How many desks are there?** (2 desks)

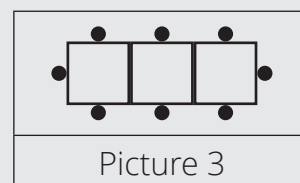
Learners write 2 in the top row, third column of the table in their LAB. You write 2 in the table on the board so that the learners can correct their table if necessary.

Ask: **How many learners are there?** (6 learners).

Learners write 6 in the bottom row, third column of the table in their LAB. You write 6 in the table on the board so that the learners can correct their table if necessary.

Number of desks	1	2		
Number of learners	4	6		

- Repeat these steps with Picture 3.



- Say: **Add in the number of desks and the number of learners.**

Number of desks	1	2	3		
Number of learners	4	6	8		

- Say: **We want to find out how many learners could sit at 20 desks set out in the same way. But it will take too long to draw the Pictures.**

Ask: **What can we do without drawing and counting?** (Find a rule)

Possible suggestions from studying the pictures of the pattern with the learners.

- **Picture 1 has 1 desk and  $1 + 1 + 1 + 1 = 4$  learners**
- **Picture 2 has 2 desks, 2 learners along the first long-row/upper side, 2 learners along the second long-row/lower side and 1 learner on each of the shorter sides.**

Circle the 2 dots on upper side and the 2 dots on lower side and 1 dot on each of shorter sides.

**So, Picture 2 has 2 desks and  $2 + 2 + 1 + 1 = 6$  learners.**

- **Picture 3 has 3 desks and  $3 + 3 + 1 + 1 = 8$  learners.**
- **Confirm: the number of learners/dots on upper side and lower side are the same as number of desks. The one dot/learner on each shorter side does not change, so the number sentence is always “desk number + desk number + 1 + 1 = number of learners”.**

Write on the board: **desk number + desk number + 1 + 1 = number of learners.**

- Ask the learners: **How do we work out the number of learners that can sit around 4 desks?**

Allow the learners time to discuss this and come up with suggestions.

Say: **Picture 4 has 4 desks and the number sentence must be “ $4 + 4 + 1 + 1 = 10$  learners”.** (This must come from learners and you write the number sentence on the board.)

Tell the learners to fill in 4 and 10 on their table.

You write 4 and 10 in the table on the board for them to check.

Number of desks	1	2	3	4	
Number of learners	4	6	8	10	

- Say: **Use your rule to work out how many learners can be seated at 20 desks.**

Number of learners =  $20 + 20 + 1 + 1 = 42$ .

Tell the learners to fill in 20 and 42 on their table.

You write 20 and 42 in the table on the board for them to check.




Number of desks	1	2	3	4	20
Number of learners	4	6	8	10	42

### Activity 2: Learners work in pairs

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

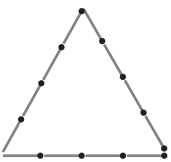
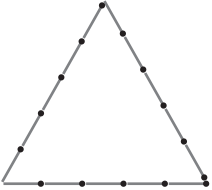
- Read the questions in the LAB with the learners. Make sure all learners understand what to do.
- Walk around the classroom to support learners as needed.
- Correct Activity 2 with learners so that they can receive immediate feedback.
- The answers are given in brackets or marked as answers.

1 This pattern is made with matchsticks.

				
Picture 1	Picture 2	Picture 3	Picture 4	Picture 5

- a Name the geometric shape in this pattern. (Triangle)
- b What changes from one shape to the next?  
(The Picture 'grows'/ gets bigger by adding one matchstick to each side of the triangle.)
- c Draw Pictures 4 and 5.

#### ANSWERS

	
Picture 4	Picture 5

**d** Use Pictures 1 to 5 to fill in the Number of matchsticks

Picture number	1	2	3	4	5	6	7	8	10	20	100
Number of matchsticks	3	(6)	(9)	(12)	(15)						

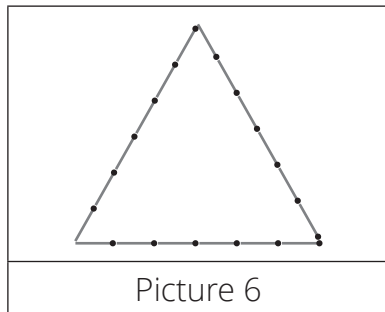
**e** Think of a way of working out how many matchsticks there will be in Picture 6 without drawing and counting.

(Each side in Picture 6 must have 6 matchsticks)

(Number of matchsticks in Picture 6 =  $6 \times 3 = 18$ )

**f** Check your rule by drawing Picture 6 and counting the matchsticks.

**ANSWER**



How many matchsticks? (18)

**g** Work out how many matchsticks there will be in Pictures 7, 8, 10, 20 and 100. Complete the table.

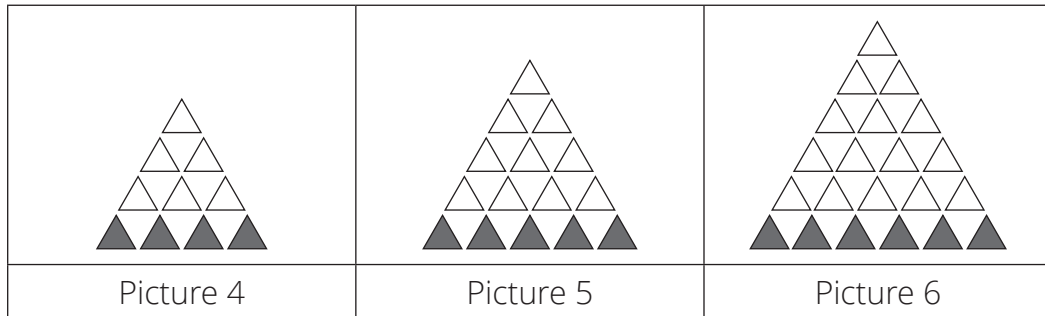
Picture number	1	2	3	4	5	6	7	8	10	20	100
Number of matchsticks	3	(6)	(9)	(12)	(15)	(18)	(21)	(24)	(30)	(60)	(300)

**2** This pattern is made from triangles.

Picture 1	Picture 2	Picture 3	Picture 4	Picture 5	Picture 6

- a Draw Picture 4, Picture 5 and Picture 6.

**ANSWER**



- b Explain how you got from Picture 3 to Picture 4.  
(Add a row of 4 grey triangles at the bottom.)
- c Describe the pattern.  
(The pattern grows by adding another row of triangles to the bottom of previous picture. The number of triangles in the added row must be one more than previous picture's bottom row.)
- d Complete this table.

Picture number	Number of triangles
1	1
2	$1 + 2 = 3$
3	$1 + 2 + 3 = (6)$
4	$(1 + 2 + 3 + \mathbf{4} = 10)$
5	$(1 + 2 + 3 + 4 + \mathbf{5} = 15)$
6	$(1 + 2 + 3 + 4 + 5 + \mathbf{6} = 21)$

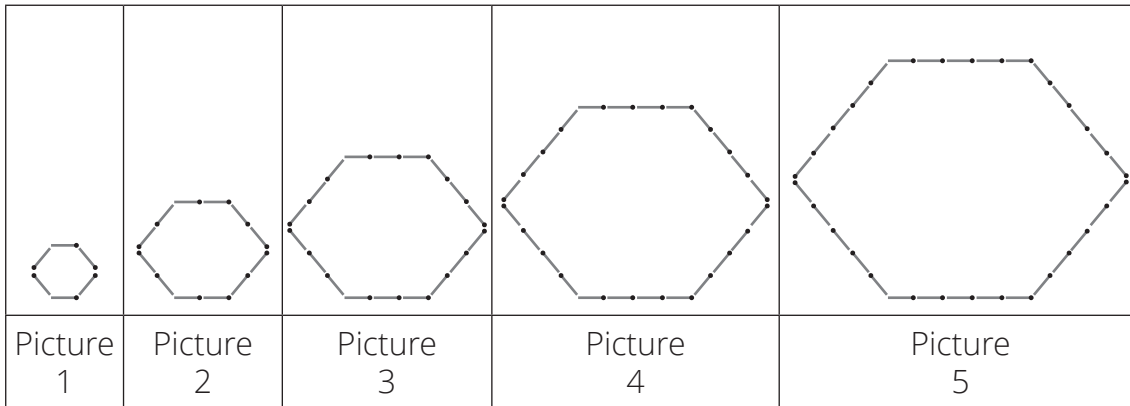
- e Now complete this table:

Picture number	1	2	3	4	5	6
Number of triangles	1	3	(6)	(10)	(15)	(21)

**5 HOMEWORK ACTIVITY (5 MINUTES)**

- Explain to learners what they need to do for homework
- Read the questions in the LAB with the learners. Make sure all the learners understand what to do.
- The answers are given in brackets

This pattern is made with matchsticks.



- 1 How many sides in this geometric shape? (6 sides)
- 2 Explain how to get from Picture 4 to Picture 5.  
(‘Grow’ the Picture by adding one matchstick to each side. Each side of the 6-sided shape in Picture 5 consists of 5 matchsticks.)
- 3 Write the number of matchsticks in Picture 1, Picture 2, Picture 3, Picture 4 and Picture 5 in this table:

Diagram number	1	2	3	4	5
Number of matchsticks	(6)	(12)	(18)	(24)	(30)

- 4 a How many matchsticks will be in each side of Picture 6? (6)
- b How many matchsticks altogether in Picture 6? (6 sides made up of 6 matchsticks = 36 matchsticks)

**6 REFLECTION AND SUMMARY OF LESSON (5 MINUTES)**

We can represent the input numbers on a table; and then use the rule to work out the matching output numbers for a geometric pattern.

Say: **Today we have learned to use tables to record information about geometric patterns.**



## Lesson 40: Geometric patterns and flow diagrams

### Teacher's notes

This lesson is one of the fully planned lessons to be used to cover the Term 1 curriculum.

CAPS topics: 2.1 Number and geometric patterns and number sentences

Lesson Objective: Learners will be able to use tables and flow diagrams to record information from geometric patterns and to develop and use rules for some patterns.

Lesson Vocabulary: input, output, rule, flow diagram, record, data, predict

No resources needed for this lesson

Date:

Week

Day

### 1 MENTAL MATHS (5 MINUTES)

	What is ...	Answer		What is ...	Answer
<b>1</b>	$7 \times 6 =$	42	<b>6</b>	$6 \times 3 =$	18
<b>2</b>	$9 \times 9 =$	81	<b>7</b>	$2 \times 10 =$	20
<b>3</b>	$10 \times 10 =$	100	<b>8</b>	$9 \times 5 =$	45
<b>4</b>	$4 \times 5 =$	20	<b>9</b>	$7 \times 3 =$	21
<b>5</b>	$8 \times 9 =$	72	<b>10</b>	$8 \times 8 =$	64

### 2 LINK TO PREVIOUS LESSON (5 MINUTES)

- Before the lesson draw the following table on the board.

Input	2	3	4
Output	7	8	9

- Say: **Look carefully at the table.**

Ask: **What is the rule?** (Add 5 to the Input value to get to the Output value.)

Say: **Explain how you found the rule.** (Answers will vary here)

### 3 CORRECT HOMEWORK ACTIVITY (5 MINUTES)

The answers to the Homework Activity for Lesson 39 are provided in Lesson 39.

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


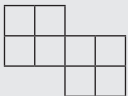
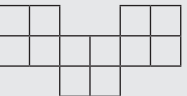
### 4 LESSON CONTENT – CONCEPT DEVELOPMENT (35 MINUTES)

This lesson builds on learners' knowledge of geometric patterns and tables. In this lesson, learners also see how flow diagrams can be used to record number information from geometric patterns and to help develop rules for the patterns.

Say: Today we are learning to use tables and flow diagrams to record data from geometric patterns and to develop the calculation plan, or rule, for the pattern.

**Activity 1: Whole class activity**

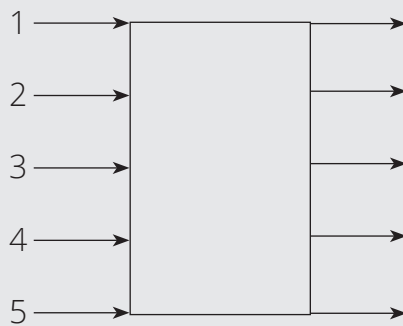
- Draw Pictures 1, 2 and 3 on the board. Leave space for Picture 4 and Picture 5. Draw a blank flow diagram on the board. Fill in the headings. Learners have the Pictures and the flow diagram in their LAB.

				
Picture 1	Picture 2	Picture 3	Picture 4	Picture 5

**Number of big squares**

**Our rule**

**Number of tiles**



Say: Explain to the class how these Pictures are made.

(Answers will vary here. An example of an explanation is:

Picture 1 is made up of a big square. This square is made up of 4 small tiles.

Picture 2 is made of 2 big squares like the one in Picture 1. The second big square is next to first big square but moved down a little. Each big square is made up of 4 small tiles, so Picture 2 is made up of 8 small tiles.

Picture 3 is made of 3 big squares. The first two big squares are the same as the squares in Picture 2, and the third big square is moved up a little. Each big square is made up of 4 small tiles, so Picture 3 is made up of 12 small tiles.

Each Picture has 4 more tiles than the one before.)

Ask: How many tiles in:

- **Picture 1** (1 square of 4 tiles). Write the input and output values on the flow diagram every time.
- **Picture 2** (2 squares of 4 tiles;  $4 + 4 = 8$  tiles)
- **Picture 3** (3 squares of 4 tiles;  $4 + 4 + 4 = 12$  tiles)

Some learners may realise this is repeated addition or multiplication by 4.

Ask: **How many tiles are added with each new Picture?** (4 tiles)

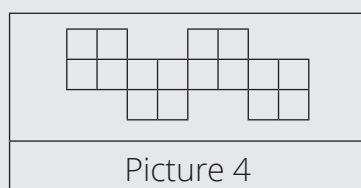
Say: **Predict how many tiles there will be in Picture 4.**

( $12 + 4 = 4 + 4 + 4 + 4 = 4 \times 4 = 16$  tiles)

Say: **Check your prediction by drawing Picture 4 in your LAB.**

Give learners time draw Picture 4. Remind them that it is a sketch. They don't need to draw with a ruler.

Draw Picture 4 on the board.



Say: **Check that you have drawn Picture 4 correctly. Correct your work if necessary.**

Say: **Write these numbers on the flow diagram.**

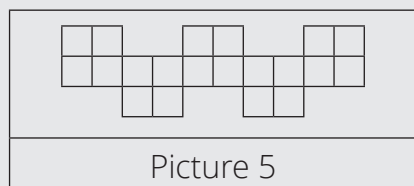
Say: **Predict how many tiles there will be in Picture 5.**

( $16 + 4 = 4 + 4 + 4 + 4 + 4 = 5 \times 4 = 20$  tiles)

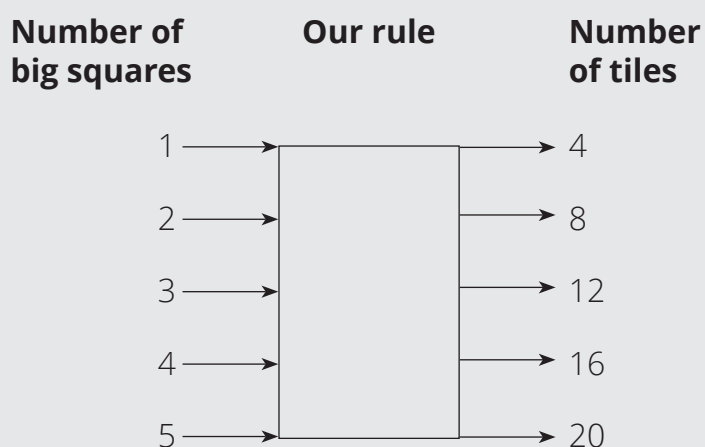
Say: **Check your prediction by drawing Picture 5 in your classwork book.**

Give learners time draw Picture 5.

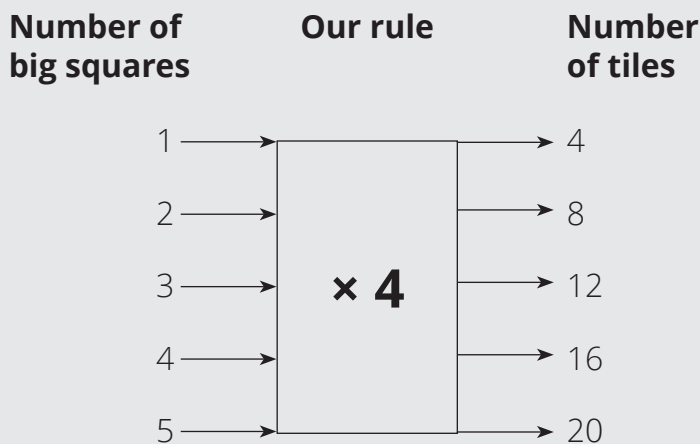
Draw Picture 5 on the board.



When learners finish drawing Picture 5, they should complete the flow diagram.



- Say: **Let's develop a rule for this pattern that will help us work out the number of tiles without needing to draw and then count the tiles.**
- Ask, pointing at the input-output numbers as you speak: **How can 1 change to 4?** (Multiply 1 by 4. Learners might say:  $1 + 3$ . This is also correct, but learners will soon see that it won't give a rule that works for all input-output numbers pairs).
- Ask, pointing at the input-output numbers as you speak: **How can 2 change to 8?** (Multiply 2 by 4. Note:  $2 + 3$  won't work here).
- Say: **It looks like our rule, or calculation plan, could be multiply by 4. Let's test it on one more input number.**
- Ask: **What is 3 multiplied by 4?** (12)
- Ask: **Look at the Picture 3 diagram. How many tiles in Picture 3?** (12 tiles)  
Say: **Our rule for this pattern: Multiply by 4 is correct.**
- Fill in the rule on the flow diagram:



- Say: **Let's represent the flow diagram in the table.**
- Ask: **What is the title for the first row?** (It is the input, so it is "Number of big squares".)  
**What is the title for the second row?** (It is the output, so it is "Number of tiles".)
- Let learners write the titles in the first column.

Number of big squares	1	2	3	4	5	10
Number of tiles						

Give learners time to complete the table and predict the number of tiles when the number of big square is 10. Let the learners share their answers with the whole class.

Picture Number	1	2	3	4	5	10
Number of tiles	(4)	(8)	(12)	(16)	(20)	(40)

Ask: If Bheki has 400 tiles, how many big squares can he build? (100).

Show learners how to read this from the flow diagram.



$$(400 \div 4 = 100)$$

## Activity 2: Learners work in pairs

Say: Do Activity 2 in your LAB.

- Read the questions in the LAB with the learners. Make sure all the learners understand what to do.
- Walk around the classroom to support learners as needed.
- Correct Activity 2 with learners so that they can receive immediate feedback.
- The answers are given in brackets or are marked answers

Look carefully at the pattern and then answer the questions.

Each Picture has been made with matchsticks.

Picture 1	Picture 2	Picture 3	Picture 4	Picture 5

- 1 Explain how to get from Picture 1 to Picture 2.  
(A second triangle is added onto the first triangle.)
- 2 Explain how to get from Picture 2 to Picture 3.  
(A third triangle is added onto the other two triangles.)
- 3 Predict how to get from Picture 3 to Picture 4.  
(A fourth triangle is added onto the other three triangles.)
- 4 Predict how to get from Picture 4 to Picture 5.  
(A fifth triangle is added onto the other four triangles.)
- 5 Draw Picture 4 and Picture 5.

### ANSWERS

Picture 4	Picture 5

**6** Write the input and output values in the flow diagram after each question

How many matchsticks are used to make Picture 1?

(1 triangle of 3 matchsticks, 3)

How many matchsticks are used to make Picture 2?

(2 triangles of 3 matchsticks, 6)

How many matchsticks are used to make Picture 3?

(3 triangles of 3 matchsticks, 9)

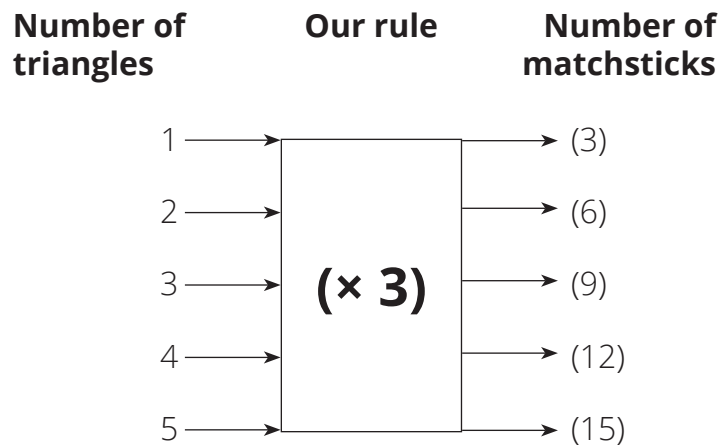
How many matchsticks are used to make Picture 4?

(4 triangles of 3 matchsticks, 12)

How many matchsticks are used to make Picture 5?

(5 triangles of 3 matchsticks, 15)




**7** Write the rule on the flow diagram.



**5 HOMEWORK ACTIVITY (5 MINUTES)**

- Explain to learners what they need to do for homework.
- Read the questions in the LAB with the learners.  
Make sure all the learners understand what to do.
- The answers are given in brackets or are marked as Answers.

Look carefully at the pattern and then answer the questions.

				
Picture 1	Picture 2	Picture 3	Picture 4	Picture 5

- 1 Describe the pattern in your own words.

(Answers will vary. One possible answer is: Picture 2 is a square and Picture 3 is a bigger square, when the pattern goes on, 1 column and 1 row are added each time.)

- 2 How many dots are used to make Picture 1? (1)

How many dots are used to make Picture 2? ( $2 \times 2 = 4$ )

How many dots are used to make Picture 3? ( $3 \times 3 = 9$ )

- 3 Predict how many dots will be used for Picture 4.

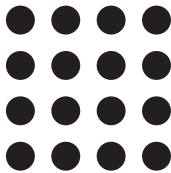
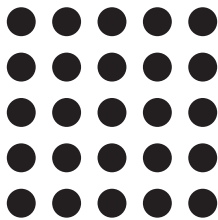
(Answers will vary. Possibly the learners will say  $4 \times 4 = 16$ )

Predict how many dots will be used for Picture 5.

(Answers will vary. Possibly the learners will say  $5 \times 5 = 25$ )

- 4 Draw Picture 5 and Picture 6.

**ANSWERS**

	
Picture 4	Picture 5

- 5 Was your prediction right? (Answers will vary)

**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 learned to use flow diagrams to record information from geometric patterns.**

## Lesson 41: More geometric patterns and tables

### Teacher's notes

This lesson is one of the fully planned lessons to be used to cover the Term 1 curriculum.

CAPS topics: 2.1 Number and geometric patterns and number sentences

Lesson Objective: Learners will be able to use tables to record information from geometric patterns and to develop and use rules for some patterns.

Lesson Vocabulary: column, row, table, input, output, rule, record, data

No resources needed for this lesson

Date:

Week

Day

### 1 MENTAL MATHS (5 MINUTES)

	What is ...	Answer		What is ...	Answer
<b>1</b>	$50 \div 10 =$	5	<b>6</b>	$81 \div 9 =$	9
<b>2</b>	$18 \div 3 =$	6	<b>7</b>	$36 \div 4 =$	9
<b>3</b>	$49 \div 7 =$	7	<b>8</b>	$14 \div 2 =$	7
<b>4</b>	$48 \div 6 =$	8	<b>9</b>	$63 \div 9 =$	7
<b>5</b>	$21 \div 3 =$	7	<b>10</b>	$50 \div 5 =$	10

### 2 LINK TO PREVIOUS LESSON (5 MINUTES)

- Write this table on the board before the lesson.

Input value	6	9	c.
Output value = Input value + 10	a.	b.	22

Ask: **What number does a. represent?** (16)

Ask: **How did you get this answer?** (The rule is 'add 10'. I added 10 to 6 to get 16)

Ask: **What number does b. represent?** (19)

Ask: **How did you get this answer?** (The rule is 'add 10', so I added 10 to 9 to get 19)

Ask: **What number does c. represent?** (12)

Ask: **How did you get this answer?** (The rule is 'add 10', but I am calculating the input number from the output number, so I subtracted 10 from 22 to get 12)

### 3 CORRECT HOMEWORK ACTIVITY (5 MINUTES)

The answers to the Homework Activity for Lesson 40 are provided in Lesson 40.

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



**4 LESSON CONTENT - CONCEPT DEVELOPMENT (35 MINUTES)**

This lesson is a continuation of Lesson 40.

Say: **Today we are learning to use tables to record geometric patterns.**






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

- Say: **In a geometric pattern, a geometric shape is repeated according to a rule. Sometimes the pattern is made with different colours.**

Say: **Do Activity 1 in the LAB**

- Read the questions in the LAB with the learners.  
Make sure all the learners understand what to do.
- Walk around the classroom to support learners as needed.
- Correct Activity 2 with learners so that they can receive immediate feedback.
- The answers are given in brackets.

- 1 Mara is planning to tile her kitchen. She needs to find a way of working out how many grey tiles and white tiles she needs. She starts off by making smaller shapes and counting the numbers of tiles. She then makes bigger shapes and tries to work out a way of calculating the total number of tiles used.

		Number of grey tiles	Number of white tiles	Total number of tiles
Picture 1		(4)	(4)	$(4 + 4 = 8)$
Picture 2		(6)	(6)	$(6 + 6 = 12)$
Picture 3		(7)	(7)	$(7 + 7 = 14)$
Picture 4		(8)	(8)	$(8 + 8 = 16)$
Picture 5		(11)	(11)	$(11 + 11 = 22)$

- 2 Mara did this to work out the number of white tiles in each example.

Number of white tiles = number of grey tiles $\times$ 2
---

Is Mara's method correct? (No)

Complete the following:

Number of white tiles = (number of grey tiles)

Total number of tiles = (number of grey tiles + number of white tiles)

- 3 Use the rule for working out the following:


Number of grey tiles	Number of white tiles	Total number of tiles
5	(5)	(5 + 5 = 10)
(10)	10	(10 + 10 = 20)
20	(20)	(20 + 20 = 40)

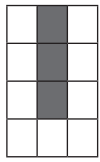
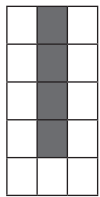
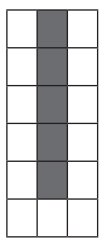
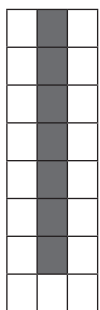
### Activity 2: Learners work on their own

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

- Read the questions in the LAB with the learners. Make sure all the learners understand what to do.
- Read the story and questions one by one and give learners time to write down the answer.
- Walk around the classroom to support learners as needed.
- Correct Activity 3 with learners so that they can receive immediate feedback.
- The answers are given in brackets.

- 1 Pinky is planning to tile her bathroom. She needs to find a way of working out how many grey tiles and white tiles she needs. She starts off by making smaller Pictures and counting the numbers of tiles. She then makes bigger shapes and tries to work out a way of calculating the total number of tiles used.

		Number of grey tiles	Number of white tiles	Total number of tiles used
Picture 1		(1)	(5)	(1 + 5 = 6)

<b>Picture 2</b>		(3)	(9)	$(3 + 9 = 12)$
<b>Picture 3</b>		(4)	(11)	$(4 + 11 = 15)$
<b>Picture 4</b>		(5)	(13)	$(5 + 13 = 18)$
<b>Picture 5</b>		(6)	(19)	$(6 + 19 = 27)$


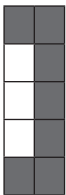
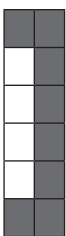

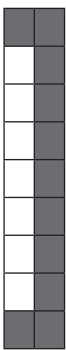
- Write a rule for working out the number of white tiles.  
 (Number of white tiles =  $(2 \times \text{number of grey tiles}) + 3$ )  
 OR (Number of white tiles = number of grey tiles + number of grey tiles + 3)
- Write a rule for working out the total number of tiles.  
 (Total number of tiles = number of grey tiles + number of white tiles)
- Use the rules for working out the following:

Number of grey tiles	Number of white tiles	Total number of tiles
6	$(2 \times 6 + 3 = 15)$	$(6 + 15 = 21)$
7	$(2 \times 7 + 3 = 17)$	$(7 + 17 = 24)$
9	$(2 \times 9 + 3 = 21)$	$(9 + 21 = 30)$
10	$(2 \times 10 + 3 = 23)$	$(10 + 23 = 33)$
$(7 - 3 = 4; 4 \div 2 = 2)$	7	$(2 + 7 = 9)$

**5 HOMEWORK ACTIVITY (5 MINUTES)**

- Explain what learners need to do for homework.
- Read the questions in the LAB with the learners.  
Make sure all the learners understand what to do.
- The answers are given in brackets.

1 Here is another tiling pattern.

		Number of white tiles	Number of grey tiles	Total number of tiles used
<b>Picture 1</b>		(1)	(5)	$(1 + 5 = 6)$
<b>Picture 2</b>		(3)	(7)	$(3 + 7 = 10)$
<b>Picture 3</b>		(4)	(8)	$(4 + 8 = 12)$
<b>Picture 4</b>		(5)	(9)	$(5 + 9 = 14)$
<b>Picture 5</b>		(7)	(11)	$(7 + 11 = 18)$

- 2 Write a rule for working out the number of grey tiles.  
 (Number of grey tiles = number of white tiles + 4)  
 OR (Number of grey tiles = number of white tiles + 2 grey tiles at the top + 2 grey tiles at the bottom)
- 3 Write a rule for working out the total number of tiles.  
 (Total number of tiles = number of grey tiles + number of white tiles)
- 4 Use the rules for working out the following:

Number of grey tiles	Number of white tiles	Total number of tiles
2	$(2 + 4 = 6)$	$(2 + 6 = 8)$
6	$(6 + 4 = 10)$	$(6 + 10 = 16)$
9	$(9 + 4 = 13)$	$(9 + 13 = 22)$
10	$(10 + 4 = 14)$	$(10 + 14 = 24)$
$(12 - 4 = 8)$	12	$(8 + 12 = 20)$

**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 used tables to record information from geometric shapes and have developed and used rules to find totals.**

## Lesson 42: Formal Assessment: Test

### Teacher's notes

This lesson should be used for assessment of the content covered so far in Term 1.

Resources: Printable tests are given in the Teachers Resource Pack. Print one copy of the test for each learner.

Date: \_\_\_\_\_ Week \_\_\_\_\_ Day \_\_\_\_\_

### 1 SETTLE THE CLASS AND ADMINISTER THE ASSESSMENT. (60 MINUTES)

Say: **The assessment for today is linked to the work covered so far in Term 1.**

- Read the questions in the Test with the learners. Make sure all the learners understand what to do.
- Take in the learners' work when they are done.
- There might be time for you to discuss a few of the items with the class:
  - use this opportunity to reflect on different methods used by learners (allow some learners to write their solutions on the board).
  - speak about misconceptions that may have arisen in learners' responses.
- The answers are given in brackets below.
- The analysis of the test is given at the end of the Marking Memorandum.

### MARKING MEMO

#### QUESTION 1: NUMBERS UP TO 1 000 000

(6 MARKS)

a. What is the value of the underlined digit: <u>1</u> 23 982? (1 hundred thousand or 100 000 or 1 HTh) ✓	K	(1)
b. Write thirty-six thousand, six hundred and fifty-seven as a number (36 657) ✓	K	(1)
c. Write 47 001 in expanded notation. (4 TTh + 7 Th + 1 or 40 000 + 7 000 + 1) ✓	K	(1)
d. Write either < or > or = between these two numbers to make the number sentence true: ✓ (correct sign) 53 276 (<) 53 726	R	(1)

e. Write 4 323 and 4 328 in the correct place on this number line:

	R	(2)
--	---	-----

**QUESTION 2: ADDITION AND SUBTRACTION**

**(6 MARKS)**

<p>a. Find the answer. Show all the steps.</p> <table style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <thead> <tr> <th style="border: none;"></th> <th style="border: none; text-align: center;">TTh</th> <th style="border: none; text-align: center;">Th</th> <th style="border: none; text-align: center;">H</th> <th style="border: none; text-align: center;">T</th> <th style="border: none; text-align: center;">O</th> </tr> </thead> <tbody> <tr> <td style="border: none;"></td> <td style="border: none;"></td> <td style="border: none; text-align: center;">1</td> <td style="border: none;"></td> <td style="border: none;"></td> <td style="border: none;"></td> </tr> <tr> <td style="border: none;"></td> <td style="border: none; text-align: center;">3</td> <td style="border: none; text-align: center;">5</td> <td style="border: none; text-align: center;">2</td> <td style="border: none; text-align: center;">5</td> <td style="border: none; text-align: center;">6</td> </tr> <tr> <td style="border: none; text-align: right;">+</td> <td style="border: none; text-align: center;">4</td> <td style="border: none; text-align: center;">3</td> <td style="border: none; text-align: center;">9</td> <td style="border: none; text-align: center;">1</td> <td style="border: none; text-align: center;">2</td> </tr> <tr> <td style="border: none;"></td> <td style="border: none; text-align: center;">(7</td> <td style="border: none; text-align: center;">9</td> <td style="border: none; text-align: center;">1</td> <td style="border: none; text-align: center;">6</td> <td style="border: none; text-align: center;">8)</td> </tr> </tbody> </table> <p>✓ (for carrying correctly)    ✓ (for correct answer)</p>		TTh	Th	H	T	O			1					3	5	2	5	6	+	4	3	9	1	2		(7	9	1	6	8)	R	(2)					
	TTh	Th	H	T	O																																
		1																																			
	3	5	2	5	6																																
+	4	3	9	1	2																																
	(7	9	1	6	8)																																
<p>b. Find the answer. Show all the steps.</p> <table style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <thead> <tr> <th style="border: none;"></th> <th style="border: none; text-align: center;">HTh</th> <th style="border: none; text-align: center;">TTh</th> <th style="border: none; text-align: center;">Th</th> <th style="border: none; text-align: center;">H</th> <th style="border: none; text-align: center;">T</th> <th style="border: none; text-align: center;">O</th> </tr> </thead> <tbody> <tr> <td style="border: none;"></td> <td style="border: none;"></td> <td style="border: none;"></td> <td style="border: none;"></td> <td style="border: none;"></td> <td style="border: none; text-align: center;">8</td> <td style="border: none;"></td> </tr> <tr> <td style="border: none;"></td> <td style="border: none; text-align: center;">5</td> <td style="border: none; text-align: center;">6</td> <td style="border: none; text-align: center;">7</td> <td style="border: none; text-align: center;">3</td> <td style="border: none; text-align: center;"><del>9</del></td> <td style="border: none; text-align: center;">10</td> </tr> <tr> <td style="border: none; text-align: right;">-</td> <td style="border: none; text-align: center;">3</td> <td style="border: none; text-align: center;">2</td> <td style="border: none; text-align: center;">4</td> <td style="border: none; text-align: center;">1</td> <td style="border: none; text-align: center;">3</td> <td style="border: none; text-align: center;">6</td> </tr> <tr> <td style="border: none;"></td> <td style="border: none; text-align: center;">(2</td> <td style="border: none; text-align: center;">4</td> <td style="border: none; text-align: center;">3</td> <td style="border: none; text-align: center;">2</td> <td style="border: none; text-align: center;">5</td> <td style="border: none; text-align: center;">4)</td> </tr> </tbody> </table> <p>✓ (for carrying correctly)    ✓ (for correct answer)</p>		HTh	TTh	Th	H	T	O						8			5	6	7	3	<del>9</del>	10	-	3	2	4	1	3	6		(2	4	3	2	5	4)	R	(2)
	HTh	TTh	Th	H	T	O																															
					8																																
	5	6	7	3	<del>9</del>	10																															
-	3	2	4	1	3	6																															
	(2	4	3	2	5	4)																															
<p>c. I am playing Diketo with my brother. We are using stones to play the game.                  I have <u>9</u> stones.                  I have <u>4</u> less stones than my brother has.  <u>How many stones does my brother have?</u></p> <p>(My brother has 4 more stones than me.                  He has <math>9 + 4 = 13</math> stones)</p> <p>✓ (for adding 9 and 4)    ✓ (for correct answer)</p>	PS	(2)																																			

UNIT 4

**QUESTION 3: APPROXIMATE NUMBERS AND CALCULATIONS (6 MARKS)**

<p><b>a.</b> What is 97 523 rounded to the nearest 1 000? (98 000) ✓</p>	K	(1)							
<p><b>b.</b> Find the approximate answer to <math>189 + 724</math> by rounding each number to the nearest 100. (→ <math>200 + 700 = 900</math>) ✓ (for correct method)                      ✓ (for correct answer)</p>	K	(2)							
<p><b>c.</b> Mother is going to the shops.</p> <table border="1" data-bbox="314 860 1231 919"> <tr> <td>Price of her shopping</td> <td>R41</td> <td>R29</td> <td>R63</td> <td>R17</td> <td>R65</td> <td>R82</td> </tr> </table> <p>Use grouping to estimate the how much money she must take with her. (Each pair makes 100 approximately. <math>R100 + R100 + R100 = R300</math>) ✓ (for showing some form of grouping) ✓✓ (for correct answer)</p>	Price of her shopping	R41	R29	R63	R17	R65	R82	CP	(3)
Price of her shopping	R41	R29	R63	R17	R65	R82			

**QUESTION 4: NUMERIC PATTERNS**

**(4 MARKS)**

<p>Write the missing input numbers and missing output numbers on this flow diagram.</p> <table border="1" data-bbox="326 1648 1111 2048"> <thead> <tr> <th>Input</th> <th></th> <th>Output</th> </tr> </thead> <tbody> <tr> <td>1 →</td> <td rowspan="5" style="text-align: center; vertical-align: middle;"><b>× 2</b></td> <td>→ (7) ✓</td> </tr> <tr> <td>✓ (2) →</td> <td>→ 9</td> </tr> <tr> <td>7 →</td> <td>→ 19</td> </tr> <tr> <td>9 →</td> <td>→ (23) ✓</td> </tr> <tr> <td>✓ (10) →</td> <td>→ 25</td> </tr> </tbody> </table>	Input		Output	1 →	<b>× 2</b>	→ (7) ✓	✓ (2) →	→ 9	7 →	→ 19	9 →	→ (23) ✓	✓ (10) →	→ 25	RP	(4)
Input		Output														
1 →	<b>× 2</b>	→ (7) ✓														
✓ (2) →		→ 9														
7 →		→ 19														
9 →		→ (23) ✓														
✓ (10) →		→ 25														



**QUESTION 5: GEOMETRIC PATTERNS**

**(3 MARKS)**

<p><b>a.</b> Each of these pictures are made with matches.</p> <table border="1" style="width: 100%; text-align: center;"> <tr> <td data-bbox="350 442 503 588"></td> <td data-bbox="503 442 717 588"></td> <td data-bbox="717 442 947 588"></td> </tr> <tr> <td data-bbox="350 588 503 646">Picture 1</td> <td data-bbox="503 588 717 646">Picture 2</td> <td data-bbox="717 588 947 646">Picture 3</td> </tr> </table> <p>Draw Picture 4.</p> <p><b>ANSWER</b></p> <table border="1" style="width: 100%; text-align: center;"> <tr> <td data-bbox="350 834 640 1011"></td> </tr> <tr> <td data-bbox="350 1011 640 1070">Picture 4</td> </tr> </table> <p>✓ (for drawing Picture 4 correctly. There must be 4 matches on each of the sides of the square)</p>				Picture 1	Picture 2	Picture 3		Picture 4	RP	(1)
Picture 1	Picture 2	Picture 3								
Picture 4										
<p><b>b.</b> How many matches will you need for Picture 10?</p> <p>(Picture 10 will have 10 matches along each side of the square so the number of matchsticks = <math>4 \times 10</math> matches = 40 matches)</p> <p>✓ (for correct method)                      ✓ (for correct answer)</p>	CP	(2)								

UNIT 4

**TOTAL: 25 MARKS**

**GRADE 4 MATHEMATICS FRAMEWORK****TERM 1 TEST – 2020****TIME: 40 MINUTES****TOTAL MARKS:25**

Item	Content Area	Topics	Descriptive statements The learner must be able to (i.e. do or know):-	Cognitive Level	Score	
1a.	Numbers, Operations and Relationships 48% <b>12 marks</b>	Numbers up to 1 000 000	Give the value of the underlined digit	K	1	
1b			Represent a number in words as a number	K	1	
1c			Write a number in expanded notation	K	1	
1d			Compare 2 numbers and say which one is smaller	R	1	
1e			Plot 2 numbers on a number line	R	2	
2a		Addition and subtraction		Add two 5-digit numbers with one carrying	R	2
2b				Subtract two 6-digit numbers with one borrowing	R	2
2c				Solve a “compare” word problem	PS	2
3a	Patterns, functions and Algebra 52% <b>13 marks</b>	Approximate numbers and calculations	Round a 5-digit number to the nearest 1 000	K	1	
3b			Find an approximations to an addition example by rounding the numbers to the nearest 100	K	2	
3c			Use grouping to estimate the amount of money mother must take with her	CP	3	
4		Number patterns	Find both input and output numbers on a flow diagram	RP	4	
5a		Geometric patterns	Draw the 4 <sup>th</sup> picture in a geometric pattern	RP	1	
5b			Calculate the number of matches needed for Picture 10	CP	2	

**SUMMARY: CONTENT AREA**

Content Area	Number of items	Total marks	Proportion (%) of total test mark (Weighting)
Numbers, Operations and Relationships	8	12	48%
Patterns, Functions and Algebra	6	13	52%
<b>Grand Total</b>	<b>14</b>	<b>25</b>	<b>100%</b>

**SUMMARY: COGNITIVE LEVELS**

Cognitive Level		Number of items	Total marks	Proportion (%) of total test mark (Weighting)
K	Knowledge ( $\approx 25\%$ )	5	6	24%
R	Routine Procedures ( $\approx 45\%$ )	6	12	48%
C	Complex Procedures ( $\approx 20\%$ )	2	5	20%
P	Problem-solving ( $\approx 10\%$ )	1	2	8%
	<b>Grand Total</b>	<b>14</b>	<b>25</b>	<b>100%</b>

## Lesson 43: Writing and working with number sentences

### Teacher's notes

This lesson is one of the fully planned lessons to be used to cover the Term 1 curriculum.

CAPS topics: 2.1 Number and geometric patterns and number sentences

Lesson Objective: Learners will be able to recognise a number sentence and will be able to write simple number sentences to describe and solve everyday problems.

Lesson Vocabulary: number sentence, operator, plus, add, subtract, multiply, altogether

Teacher Resources needed for this lesson: Four flashcards of each of the following: +; -;  $\times$ ;  $\div$ ; =,  $\square$

Date:

Week

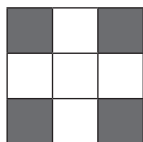
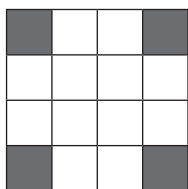
Day

### 1 MENTAL MATHS (5 MINUTES)

	What is ...	Answer		What is ...	Answer
<b>1</b>	$8 \times 7 =$	56	<b>6</b>	$3 \times 0 =$	0
<b>2</b>	$9 \times 8 =$	72	<b>7</b>	$8 \times 4 =$	32
<b>3</b>	$6 \times 9 =$	54	<b>8</b>	$5 \times 9 =$	45
<b>4</b>	$7 \times 3 =$	21	<b>9</b>	$10 \times 6 =$	60
<b>5</b>	$5 \times 2 =$	10	<b>10</b>	$7 \times 7 =$	49

### 2 LINK TO PREVIOUS LESSON (5 MINUTES)

- Draw the following on the board:

	
<b>Picture 1</b>	<b>Picture 2</b>
5 white tiles	12 white tiles

- Say: **Look at the Pictures.**

Ask: **How many grey tiles in each Picture?** (4)

Ask: **Without counting, how could you work out how many tiles there are altogether in Picture 1?**

(Answers will vary. Possible answers:

Number of white tiles + number of grey tiles =  $5 + 4 = 9$  tiles.

Or Picture 1 is a square; each side is 3 blocks long, so altogether there are  $3 \times 3 = 9$  tiles)

Ask: **Without counting, how could you work out how many tiles altogether in Picture 2?** (Answers will vary. Possible answers: Number of white tiles + number of grey tiles =  $12 + 4 = 16$  tiles. Or Picture 2 is a square; each side is 4 blocks long, so altogether there are  $4 \times 4 = 16$  tiles)

### 3 CORRECT HOMEWORK ACTIVITY (5 MINUTES)

There was no homework in Lesson 42. The answers to the Homework Activity for Lesson 41 are provided in Lesson 41. Use this time to purposefully address gaps in learners' knowledge and to identify and address learner errors.

### 4 LESSON CONTENT - CONCEPT DEVELOPMENT (35 MINUTES)

A number sentence uses numbers, words and symbols (+; -;  $\times$ ;  $\div$ ; =;  $\square$ ) to describe a problem situation. Writing number sentences is a way of preparing learners to write algebraic equations in the Senior Phase. In this lesson, learners use number sentences to describe problem situations / stories.

Say: **Today we are learning to use number sentences to solve word problems.**

#### Activity 1: Whole class activity

- Stick the flashcards +; -;  $\div$ ;  $\times$ ; =; and  $\square$  on the board so that the learners can see them.
- Read this story to learners. Do not write anything on the board.  
**The library had 378 books.**  
**The community gave the library 48 books today.**  
**How many books does the library have now?**  
 (It is likely that learners will have difficulty answering this – don't push for a final answer.)
- Say: **Let's try to write something that will help us answer this question.**  
 Read the story/ question again:  
**The library had 378 books.**  
**The community gave the library 48 books today.**  
**How many books does the library have now?**  
 Ask: **What do we know?**  
 (That the library had 378 books and then got another 48 books)  
 Say and write: **Write these numbers in your classwork book. Leave a space between the numbers like this:**

$$378 \quad 48$$
 Ask: **What is the question?** (How many books the library has now)  
 Say: **If we want to know how many books there are now, what should we do with the 378 books and the 48 books?** (Add them)

Ask: **Do we put a +, -, × or ÷ symbol between the two numbers to show that we are adding? (+)**

Say: **Write the symbol between the two numbers in your classwork book.**

Use the + flashcard like this:

$$378 + 48$$

Say: **As we don't know the answer yet, we use an equal sign (=) and a placeholder to show where the answer must go.**

Write the full number sentence on the board:

$$378 + 48 = \square$$

Read pointing to each number and symbol:

**Three hundred and seventy-eight plus forty-eight equals placeholder.**

Say: **Work out the answer in your classwork book. Use the column method for addition.**

- Once learners have had a chance to do the calculation, ask a few of the learners to write their calculations on the board. If there are differences in the answers, discuss the answers and revise the concept of carrying with learners.

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

Say: **Three hundred and seventy-eight plus forty-eight equals four hundred and twenty-six.**

Write:

$$378 + 48 = 426$$

Say: **The library has four hundred and twenty-six books.**

Then write 'The library has 426 books' on the board while learners write the answer in their classwork books.

Say:  **$378 + 48 = 426$  is an example of a number sentence.**

Say: **A number sentence is a mathematical sentence using numbers, words and symbols like +; -; ×; ÷; = and  $\square$ .**

## Activity 2: Learners work in pairs

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

- Read the questions in the LAB with the learners. Make sure all the learners understand what to do.

- Remind the learners that a number sentence is a mathematical sentence using numbers, words and symbols like +; -; ×; ÷; = and □.
- Walk around the classroom to support learners as needed.
- Correct Activity 2 with the learners so that they can receive immediate feedback.
- The answers are given in brackets.

1 Use + or - and = to write a number sentences for each of these.

**Example:** Write two number sentences which have 35 as the answer when we add two numbers.

Two possible answers:  $30 + 5 = 35$  and  $20 + 15 = 35$

(Write all answers learners give on the board.)

**a** Write five number sentences which have 50 as the answer when we **add two numbers**.

(Some possible answers:

$$49 + 1 = 50$$

$$25 + 25 = 50$$

$$0 + 50 = 50$$

$$10 + 40 = 50$$

$$15 + 35 = 50)$$

**b** Write three number sentences which has 10 as the answer when we **subtract two numbers**.

(Some possible answers:

$$20 - 10 = 10$$

$$110 - 100 = 10$$

$$15 - 5 = 10)$$

2 Find the answers.

Remember that the placeholder □ stands for the answer you have to find.

**a**  $234 + 16 = \square$       ( $234 + 16 = \mathbf{250}$ )

**b**  $10 \times 7 = \square$       ( $10 \times 7 = \mathbf{70}$ )

**c**  $700 - 300 = \square$       ( $700 - 300 = \mathbf{400}$ )

### Activity 3: Learners work on their own

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

- Read the questions in the LAB with the learners.  
Make sure all the learners understand what to do.

- Write the four things they have to do on the board:
  - a** Decide whether you are going to use + or – to find the answer.
  - b** Write a number sentence using +, –, = and  $\square$ .
  - c** Find the answer.
  - d** Write the answer using a sentence.
- Walk around the classroom to support learners as needed.
- Correct Activity 3 with learners as they do each question so that they can receive immediate feedback.
- The answers are given in the answer column.

For each word problem do these four things:

- a** Decide whether you are going to use + or – to find the answer (+)
- b** Write a number sentence using +, –, = and  $\square$  ( $4\ 568 + 2\ 428 = \square$ )
- c** Find the answer
- d** Write the answer using a sentence

**1** Lindi bought 4 568 black cellphones and 2 428 silver cellphones.

How many cellphones did Lindi buy altogether?

- a** Are you going to use + or – ? (+)
- b.** Write a number sentence using +, –, = and  $\square$  : ( $4\ 568 - 2\ 428 = \square$ )
- c.** Use the column method to find the answer

**ANSWER**

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

- d** Write the answer using a sentence (Lindi bought 6 996 cellphones altogether.)

**2** Amy collects marbles.

She had 563 marbles, but then she loses 137 marbles.

How many marbles does Amy have left?

- a** Are you going to use + or – ? (–)
- b.** Write a number sentence using +, –, = and  $\square$  : ( $563 - 137 = \square$ )



- c. Use the column method to find the answer:

**ANSWER**

	H	T	O
		5	
	5	¢	13
-	1	3	7
	4	2	6

- d. Write the answer using a sentence:

Amy has (426) marbles left.

- 3 The farm workers picked three thousand apples on Monday.  
They picked two thousand apples on Tuesday.  
How many apples did the farmworkers pick altogether?

- a Are you going to use + or - ? (-)
- b. Write a number sentence using +, -, = and  $\square$ :  $(3\ 000 + 2\ 000 = \square)$
- c. Find the answer:  
(Learners should be able to do this addition mentally or as  $(3+2)$  thousands)
- d. Write the answer using a sentence:

The farmworkers picked (5 000) apples altogether.

### 5. HOMEWORK ACTIVITY (5 MINUTES)

- Explain what learners need to do for homework.
- Remind the learners that a number sentence is a mathematical sentence using numbers, words and symbols like +; -;  $\times$ ;  $\div$ ; = and  $\square$ .
- Read the questions in the LAB with the learners. Make sure all the learners understand what to do.
- The answers are given in brackets or as circled answers.

## Unit 4: Number patterns, geometric patterns and number sentences

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- 1 Lesego collects plastic bottles for recycling.  
She collected 78 bottles in January and 46 bottles in February.  
How many more bottles did she collect in January than in February?

a Draw a circle around the number sentence that should be used to answer this question:

$$46 - 78 = \square$$

$$46 + 78 = \square$$

$$78 - 46 = \square$$

b. Use the number sentence to calculate the answer:

$$(78 - 46 = 32 \text{ bottles.})$$

- 2 There are 42 children in Grade 4A and 37 children in Grade 4B.  
How many children are there altogether?

a Draw a circle around the number sentence that should be used to answer this question:

$$42 - 37 = \square$$

$$42 + 37 = \square$$

$$42 \times 37 = \square$$

b. Use the number sentence to calculate the answer:

$$(42 + 37 = 79 \text{ children})$$

### 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 learned that we can use number sentences to solve word problems.**

**A number sentence is mathematical sentence using numbers, words and symbols like +; -;  $\times$ ;  $\div$ ; = and  $\square$ .**

## Lesson 44: Number sentences and patterns

### Teacher's notes

This lesson is one of the fully planned lessons to be used to cover the Term 1 curriculum.

CAPS topics: 2.1 Number and geometric patterns and number sentences

Lesson Objective: Learners will identify and use patterns in addition and subtraction number bonds and number facts.

Lesson Vocabulary: number sentence, pattern, multiple, number bond, symbol/ sign, placeholder

Resources needed for this lesson: Four flashcards of each of the following: +; -;  $\times$ ;  $\div$ ; =,  $\square$

Date:

Week

Day

### 1 MENTAL MATHS (5 MINUTES)

	What is ...	Answer		What is ...	Answer
<b>1</b>	$4 \times 8 =$	32	<b>6</b>	$3 \times 10 =$	30
<b>2</b>	$8 \times 6 =$	48	<b>7</b>	$2 \times 9 =$	18
<b>3</b>	$4 \times 7 =$	28	<b>8</b>	$7 \times 5 =$	35
<b>4</b>	$5 \times 5 =$	25	<b>9</b>	$6 \times 9 =$	54
<b>5</b>	$9 \times 4 =$	36	<b>10</b>	$7 \times 3 =$	21

### 2 LINK TO PREVIOUS LESSON (5 MINUTES)

- Use flashcards from Teacher's Resource Pack: (+; -;  $\times$ ;  $\div$ ; =  $\square$ ). Place the flashcards where learners can see them and access them.
- Say: **Remember, a number sentence is mathematical sentence using numbers, words and symbols like +; -;  $\times$ ;  $\div$ ; = and  $\square$ .**
- Write these numbers (without the +, -,  $\times$  or  $\div$ ) on the board:

$$75 \quad 25 = 50$$

$$30 \quad 3 = 10$$

$$40 \quad 80 = 120$$

$$200 \quad 3 = 600$$

- Ask: **Who would like to come to the board and put +; -;  $\times$  or  $\div$  in the number sentence to make the number sentence true?**

ANSWERS

$$75 - 25 = 50$$

$$30 \div 3 = 10$$

$$40 + 80 = 120$$

$$200 \times 3 = 600$$

**3 CORRECT HOMEWORK ACTIVITY (5 MINUTES)**

The answers to the Homework Activity for Lesson 43 are provided in Lesson 43. 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 number sentences to investigate and revise addition and subtraction number bond patterns for multiples of 10, 100, 1000 and 10 000.

Say: **Today we are learning about patterns in number sentences**

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

- Have the +, -, × and ÷ flashcards ready for use in the lesson. Start by revising the terminology of number sentences.
- Say: **Remember, a number sentence is mathematical sentence using numbers, words and symbols like +, -, ×, ÷, = and □.**
- Say: **3 + 7 = □ is an example of a number sentence.**  
Point to the + symbol and ask: **What do we call this symbol?** (Plus, or add)  
Point to the = symbol and ask: **What do we call this symbol?** (Equals or is equal to)  
Ask: **What does the equal sign tell us?** (We must find the answer)  
Point to the □ and ask: **What does this symbol tell us?**  
(Where we must be put the answer)
- Point to the number sentence written on the board and say:  
**Write the number sentence 3 + 7 = □ and the answer in your classwork book.**  
(3 + 7 = 10)
- Say: **Copy the four number sentences in your classwork book and find the value of the place holder for each one.**

$$3 + 7 = 10$$

$$30 + \square = 100 \quad (30 + \boxed{70} = 100)$$

$$300 + \square = 1\ 000 \quad (300 + \boxed{700} = 1\ 000)$$

$$3\ 000 + \square = 10\ 000 \quad (3\ 000 + \boxed{7\ 000} = 10\ 000)$$

- Say: **Describe the pattern in the number sentences.**  
(Answers will vary. Some examples are:
  - Each number sentence adds a 3 and a 7. The answer is a 10 with zeros.
  - The 3 and the 7 stay the same. But the second row is addition of tens, the third row is addition of hundreds and the last row is addition of thousands.
  - Knowing the answer to 3 + 7 helps us to find the answers to the other; (3 + 7) tens, (3 + 7) hundreds, (3+7) thousands).

**Activity 2: Learners work in pairs**

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

- Read the questions in the LAB with the learners. Make sure all the learners understand what to do.
- Walk around the classroom to support learners as needed.
- Correct Activity 2 with learners so that they can receive immediate feedback.
- The answers are given in the placeholders.

Study the following number patterns.

- 1 Write a number in each placeholder that makes the number sentence true.

$$1 + \boxed{9} = 10$$

$$10 + \boxed{90} = 100$$

$$100 + \boxed{900} = 1\ 000$$

$$1\ 000 + \boxed{9\ 000} = 10\ 000$$

- 2 Write a number in each placeholder that makes the number sentence true.

$$10 - \boxed{9} = 1$$

$$100 - \boxed{90} = 10$$

$$1\ 000 - \boxed{900} = 100$$

$$10\ 000 - \boxed{9\ 000} = 1\ 000$$

- 3 Write a number in each placeholder that makes the number sentence true.

$$4 + 6 = \boxed{10}$$

$$40 + 60 = \boxed{100}$$

$$400 + 600 = \boxed{1\ 000}$$

$$4\ 00 + 6\ 000 = \boxed{10\ 000}$$

- 4 Write a number in each placeholder that makes the number sentence true.

$$\boxed{10} - 4 = 6$$

$$\boxed{100} - 40 = 60$$

$$\boxed{1\ 000} - 400 = 600$$

$$\boxed{10\ 000} - 4\ 000 = 6\ 000$$

**Activity 3: Learners work in pairs**

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

- Read the questions in the LAB with the learners. Make sure all the learners understand what to do.

- Move around the classroom to support learners as needed.
- Correct Activity 3 with learners so that they can receive immediate feedback.
- The answers are given in placeholders and in brackets.

Study the following number patterns.

- 1 Write a number in each placeholder that makes the number sentence true.

$$4 \times 10 = \boxed{40}$$

$$40 \times 10 = \boxed{400}$$

$$400 \times 10 = \boxed{4\,000}$$

$$4\,000 \times 10 = \boxed{40\,000}$$

$$40\,000 \times 10 = \boxed{400\,000}$$

- 2 True or False?

If it is false, re-write the sentence to make it true.

When you multiply a number by 10, there should always be at least one 0 (zero) in the One's place. (True)

- 3 Write a number in each placeholder that makes the number sentence true.

$$4 \times \boxed{1} = 4$$

$$40 \times \boxed{1} = 40$$

$$400 \times \boxed{1} = 400$$

$$4\,000 \times \boxed{1} = 4\,000$$

$$40\,000 \times \boxed{1} = 40\,000$$

- 4 True or False?

If it is false, re-write the sentence to make it true.

When you multiply any number by 1, the number changes. (False)

(When you multiply any number by 1, the number doesn't change.)

- 5 Write a number in each placeholder that makes the number sentence true.

$$3 + \boxed{0} = 3$$

$$69 + \boxed{0} = 69$$

$$356 + \boxed{0} = 356$$

$$4\,672 + \boxed{0} = 4\,672$$

$$87\,341 + \boxed{0} = 87\,341$$

- 6 True or False?

If it is false, re-write the sentence to make it true.

When you add 0 to any number, the number stays the same. (True)

**5 HOMEWORK ACTIVITY (5 MINUTES)**

- Read the questions in the LAB with the learners. Make sure all the learners understand what to do.
- Explain what learners need to do for homework.
- The answers are given in brackets.

**1** Sally collected 43 bottles for recycling.  
Sally's friend collected 10 times as many bottles.  
How many bottles did Sally's friend collect?

- a** Write a number sentence to describe the word problem. ( $10 \times 43 = \square$ )
- b.** Do the calculation and find the answer (Sally's friend collected 430 bottles.)

**2** Are these number sentences true or false?

	Number sentence	True	False
<b>a</b>	$351 \times 10 = 35\ 100$		(FALSE)
<b>b</b>	$351 + 0 = 351$	(TRUE)	
<b>c</b>	$1\ 678 \times 100 = 167\ 800$	(TRUE)	
<b>d</b>	$900 + 10 = 9\ 000$		(FALSE)

**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 learned that number sentences sometimes show number patterns. We know:**

- **When we multiply by 10, the digits move one place value column to the left and there is a zero in the one's column**
- **When we multiply by 100, the digits move two place value columns to the left and there is a zero in the one's column and the tens column**
- **When we multiply by 1 000, the digits move three place value columns to the left and there is a zero in the one's column, the tens column and the hundreds column**
- **When we add zero, the number stays the same**
- **When we multiply by one, the number stays the same.**

## Lesson 45: More number sentences (1)

### Teacher's notes

This lesson is one of the fully planned lessons to be used to cover the Term 1 curriculum.

CAPS topics: 2.1 Number and geometric patterns and number sentences

Lesson Objective: Learners will know how and when to use inverse operations and the commutative property in addition and subtraction calculations.

Lesson Vocabulary: row, number sentence, altogether

Resources needed for this lesson: bottle tops

Date:

Week

Day

### 1 MENTAL MATHS (5 MINUTES)

	What is ...	Answer		What is ...	Answer
<b>1</b>	$3 \times 7 =$	21	<b>6</b>	$9 \times 7 =$	63
<b>2</b>	$8 \times 9 =$	72	<b>7</b>	$7 \times 9 =$	63
<b>3</b>	$2 \times 10 =$	20	<b>8</b>	$4 \times 8 =$	32
<b>4</b>	$7 \times 7 =$	49	<b>9</b>	$6 \times 9 =$	54
<b>5</b>	$10 \times 1 =$	10	<b>10</b>	$5 \times 9 =$	45

### 2 LINK TO PREVIOUS LESSON (5 MINUTES)

- Say: **Work with your partner. Use your bottle tops. Write your number sentences in your classwork book.**

Say, and draw the bottle tops: **Lay out your bottle tops like this:**



Say: **Write a number sentence for the number of bottle tops in the top row of the pattern.** ( $1 + 2 = \square$ )

Say: **Use your number sentence to calculate how many bottle tops there are altogether in row 1.** (3)

Say: **Write a number sentence for the number of bottle tops in row 2 of the pattern.** ( $2 + 3 = \square$ )

Say: **Use your number sentence to calculate how many bottle tops there are altogether in row 2.** (5)

Say: **Check your answer by counting the number of bottle tops in row 2.** (5)

Say, pointing at the black and white bottle tops: **Altogether there are more black bottle tops than white bottle tops. Write a number sentence for how many more black bottle tops than white bottle tops there are.** ( $9 - 6 = 3$ )



**3 CORRECT HOMEWORK ACTIVITY (5 MINUTES)**

The answers to the Homework Activity for Lesson 44 are provided in Lesson 44. 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 are given the opportunity to investigate and use inverse operations for addition and subtraction and the commutative property/law for addition.

**Inverse operations** undo or reverse an operation. (Addition and subtraction are inverse operations. Multiplication and division are also inverse operations.)

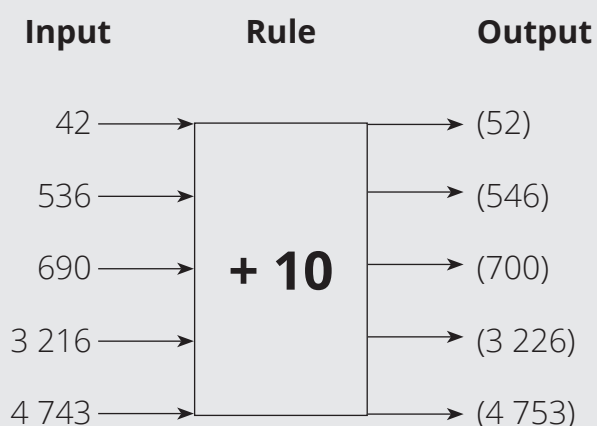
Addition and multiplication are **commutative** because  $3 + 4$  gives the same answer as  $4 + 3$  and because  $3 \times 4$  gives the same answer as  $4 \times 3$ . But  $3 - 4$  is not the same as  $4 - 3$ , and  $3 \div 4$  is not the same as  $4 \div 3$  so subtraction and division are not commutative.

Remember that learners do not need to know these terms but need to know how and when to use inverse operations and the commutative property in calculations.

Say: **Today we are learning some ways of checking addition and subtraction calculations and making addition and subtraction easier.**

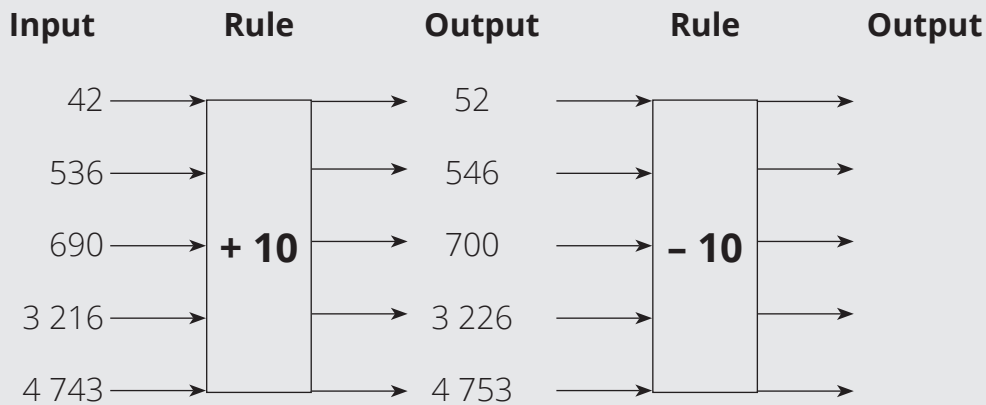
**Activity 1: Whole class activity and learners work in pairs**

- Draw this flow diagram on board.  
Tell the learners to go to the flow diagram in their LAB.



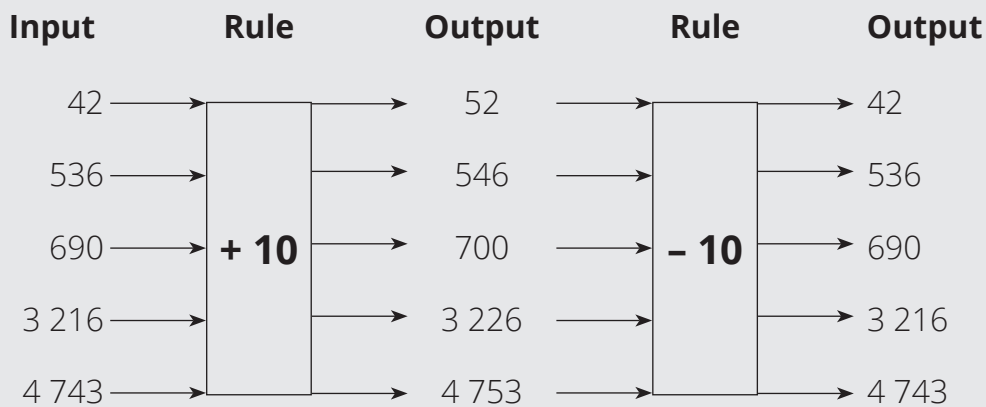
Once learners have had time to complete the flow diagram, discuss the answers with learners as you fill them on the board.

- Extend the flow diagram by adding arrows to the right of the output numbers and the new rule as follows:



- Say: **What are the output numbers now?** (42; 536; 690; 3 216 and 4 743)

- Say: **Look at the flow diagram:**



Ask: **What do you notice?**

(The numbers on the left are the same as the numbers on the right)

Write on the board and ask the learners to give you the missing word:

We see that \_\_\_\_\_ undoes addition. (We see that subtraction / take away undoes addition)

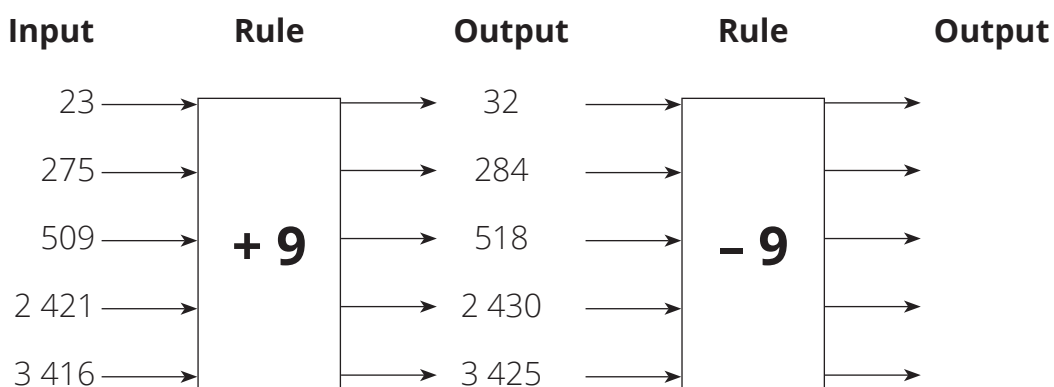
We see that \_\_\_\_\_ undoes subtraction. (We see that addition undoes subtraction)

Say: **It is useful to know that addition undoes subtraction and that subtraction undoes addition.**

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

- Read the questions in the LAB with the learners.  
Make sure all the learners understand what to do.
- Move around the classroom to support learners as needed.
- Correct Activity 1 with learners so that they can receive immediate feedback.

1 a Complete the flow diagram.



b Complete the sentences:

Subtraction of the same number will undo the operation of (Addition)

Addition of the same number will undo the operation of (Subtraction)

We can use (Addition) to check subtraction

We can use (Subtraction) to check addition

2 Calculate and then check your answer

	H	T	O
	1	1	
	4	3	2
+	1	7	9
	(6	1	1)

→

	H	T	O
	( <sup>5</sup> 6	<sup>10</sup> 1	11)
-	(1	7	9)
	(4	3	2)

(Note: It is also correct if learners calculated:  $611 - 432 = 179$ )

### Activity 2: Whole class activity and learners work in pairs

- Write these number sentences on the board:

$$6 + 9 = \square$$

$$9 + 6 = \square$$

Say: **Write these number sentences in your classwork book. Find the answer to each number sentence.** ( $6 + 9 = 15$ ;  $9 + 6 = 15$ )

Ask: **What do you notice?** (The answers are the same)

Say and write; we can also write the number sentence like this:  **$6 + 9 = 9 + 6$ , because the values each side of the = sign must be the same.**

Ask: **True or false? We can add numbers in any order.** (True)

- Write this number sentence on the board:  $9 - 6 = \square$   
Ask: **What number does the placeholder represent?** (3)  
Write this number sentence on the board:  $6 - 9 = \square$   
Ask: **Can we take 9 from 6?** (No. Note: Grade 4 learners are unaware of negative numbers). Demonstrate this concretely with bottle tops if necessary.  
Ask: **True or false? We can subtract numbers in any order.** (False)

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

- Read the questions in the LAB with the learners.  
Make sure all the learners understand what to do.
- Move around the classroom to support learners as needed.
- Correct Activity 2 with learners so that they can receive immediate feedback.
- The answers are given in the placeholders and in brackets.

**1** Write a number in each placeholder that will make the sentence true

**a**  $4 + 7 = \square(11)$

**b**  $7 + 4 = \square(11)$

**c**  $21 + \square(15) = 36$

How do you know the placeholder is 15? ( $36 - 21 = 15$ )

**d**  $\square(21) + 15 = 36$

**e** Discuss with your partner.

What do you notice about the answers to **a.** and **b.**?

What do you notice about the answers to **c.** and **d.**?

Start your answer like this:

When we add numbers, (we can add in any order / the order doesn't matter).

**2** True or false?

**a**  $16 - 9 = 9 - 16$  (False)

**b** We can add numbers in any order, but we cannot subtract numbers in any order. (True)

**5 HOMEWORK ACTIVITY (5 MINUTES)**

- Explain what learners need to do for homework.
- Read the questions in the LAB with the learners.  
Make sure all the learners understand what to do.
- The answers are given in brackets, or are marked as answers.

- 1** Farmer Joe had 132 cows, and then bought 19 more cows.  
He wrote this number sentence to help him calculate how many cows he had altogether.

$$132 + 19 = \square$$

- a** Calculate how many cows Farmer Joe has altogether. Use the column method.

$$(132 + 19 = 151 \text{ cows})$$

**ANSWER**

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

- b** Show Farmer Joe how he can check his answer. Use the column method.

$$(151 - 19 = 132)$$

OR

$$151 - 132 = 19$$

**ANSWERS**

	H	T	O
	1	<del>4</del>	11
-		1	9
	1	3	2

	H	T	O
	1	<del>4</del>	11
-	1	3	2
		1	9

- 2 a** Draw a circle around the number sentence you would use to find the number that is 218 less than 521:

$$521 - 218 = \square$$

$$218 + 521 = \square$$

$$218 - 521 = \square$$

- b** Use the column method to find the answer to your number sentence.

**ANSWER**

	H	T	O
	5	<del>2</del>	11
-	2	1	8
	3	0	3

**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 learned to use addition to check subtraction and subtraction to check addition. We also know that we can change the order of numbers when we add, but that we cannot change the order of numbers when we subtract.**

## Lesson 46: More number sentences (2)

### Teacher's notes

This lesson is one of the fully planned lessons to be used to cover the Term 1 curriculum.

CAPS topics: 2.1 Number and geometric patterns and number sentences

Lesson Objective: Learners will know how and when to use the associative property to make calculations easier. Learners will understand the meaning of equivalence and the equal sign.

Lesson Vocabulary: brackets, operator

No resources needed for this lesson

Date:

Week

Day

### 1 MENTAL MATHS (5 MINUTES)

	What is ...	Answer		What is ...	Answer
<b>1</b>	$3 \times 4 =$	12	<b>6</b>	$3 \times 9 =$	27
<b>2</b>	$6 \times 4 =$	24	<b>7</b>	$4 \times 10 =$	40
<b>3</b>	$6 \times 6 =$	36	<b>8</b>	$9 \times 5 =$	45
<b>4</b>	$7 \times 6 =$	42	<b>9</b>	$8 \times 8 =$	64
<b>5</b>	$4 \times 0 =$	0	<b>10</b>	$5 \times 4 =$	20

### 2 LINK TO PREVIOUS LESSON (5 MINUTES)

Link to concepts learned in previous lessons by asking questions:

- Write the following on the board and ask: **True or false?**
  - $9 + 3 = 3 + 9$  (True)
  - $9 - 3 = 3 - 9$  (False)
  - Subtraction can be used to check multiplication. (False)
  - Addition can be used to check subtraction. (True)

### 3 CORRECT HOMEWORK ACTIVITY (5 MINUTES)

The answers to the Homework Activity for Lesson 45 are provided in Lesson 45.

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 main objective for all work done in the topic of number sentences is to improve learners' calculation and problem-solving skills. Although number sentences are specifically dealt with in this topic, remember that number sentences should be included in all content areas. In this lesson, learners see how the **associative property** can be used to make calculations easier.

**An operation (like + and  $\times$ ) is associative** because, when three numbers are added or multiplied, it does not matter how the brackets are placed.

For example,  $1 + 2 + 3 = (1 + 2) + 3 = 1 + (2 + 3) = 6$ ,

And  $2 \times 3 \times 4 = (2 \times 3) \times 4 = 2 \times (3 \times 4) = 24$ . Subtraction and division are not associative.

Before explaining the associative property, you need to explain the function of brackets in a number sentence. In this lesson, we also look more carefully at the meaning of the equal sign in a number sentence.

NOTE:

1. Learners do not need to know the term 'associative property' but must know how and when to use it to make calculations easier.
2. Many learners have the limited view that an equal sign (=) means 'here comes the answer'. It is important that learners understand that the equal sign indicates equivalence. This means that what is on either of the equal sign has the same value. For example, in the number sentence:  $3 + 2 = 6 - 1$ , on the left-hand side of the equals sign we have  $3 + 2 = 5$ . On the right-hand side of the equals sign we have  $6 - 1 = 5$ . For this reason, we include number sentences with expressions on both sides of the equal sign in this lesson.

Say: **Today we learn calculations and we also learn more about the equal sign in a number sentence.**

### Activity 1: Whole class activity

- Write this number sentence on the board:

$$7 + 6 + 4 = \square$$

Say, pointing to the three numbers: **In this calculation we need to add three numbers. However, we can only add two numbers at a time.**

Let learners do the calculation in their classwork books.

Ask: **What is the answer?** (17)

Ask: **How did you get the answer?**

(Expect different answers from the learners)

- I first did  $7 + 6 = 13$  and then did  $13 + 4 = 17$ ,
- I did  $6 + 4 = 10$  first and added 7 to 10, to give 17)

Note: if no learner did the second way, suggest to the learners that they should first add 6 and 4 and then add 7.)

Ask: **When you add 6 and 4 first, is the final answer different to adding 7 + 6 first?**

(No, the answers are same.)

Say: **It is not always best to start by adding the first two numbers.**

- Say: **Write this number sentence  $37 + 76 + 24 = \square$  in your classwork book.**

**Solve the number sentence as quickly as you can.**

Give the learners time to find the answer and then ask: **What is  $37 + 76 + 24$ ?** (137)

Ask: **How did you get the answer?** (Learners respond)

Say: **Come to the board and show us how you grouped the numbers to get the answer.** (Answers might vary but eventually the answer you want is 'I added 76 and 24 to make 100, then I added 37 to get 137')

Say: **The answer is 137 whether you added the first 2 numbers first or the second 2 numbers first.**

Ask: **Is it easier to add 37 and 76 first and to then add 24 OR to add 76 and 24 first and to then add 37?** (Adding 76 and 24 first and to then add 37)

Ask: **Why do you think so?** (Because I know 76 and 24 make 100 and it is easy to add 100 and 37. I can do it in my head.)

Say: **It is always easier to add or subtract numbers involving multiples of 10, 100, 1 000. In this example we did not add the first two numbers. We added the second two numbers to get 100, then added 37.**

Say: **We can show the order in which we did the calculation on the board by using brackets.**

Write the number sentence, with brackets, on the board:

$$37 + (76 + 24) = \square$$

Say, pointing to the brackets: **These symbols are brackets. Brackets tell us how to group the numbers and what we should do first.**

Say: **Re-write the numbers sentence, with brackets in your classwork book and then solve the number sentence following the instruction the brackets are giving you.**

Write:  $37 + (76 + 24) = \square$

$$(37 + (76 + 24) = 37 + 100 = 137)$$

- Now write the following on the board:

**Amy had R432 in her savings account.**

**She saved another R46 and then another R54.**

**How much money does she now have?**

Say: **Write a number sentence to show what we have to do in your classwork books.**

( $R432 + R46 + R54 = \square$ )

Say: **Solve the problem as quickly as you can. Use brackets to show which numbers you worked with first.**

(The learners should add the R46 and R54 together first as follows:

$$R432 + (R46 + R54) = R432 + R100 = R532$$

Amy has R532.)

Ask several learners to write their number sentence and the answer on the board.



**Activity 2: Learners work in pairs**Say: **Do Activity 2 in your LAB.**

- Read the questions in the LAB with the learners. Make sure all the learners understand what to do.
- Move around the classroom to support learners as needed.
- Correct Activity 2 with learners so that they can receive immediate feedback.
- The answers are given in brackets, and in the circles.

Draw a circle around the grouping of numbers that makes the number sentence quick and easy to solve. Then solve the number sentence.

1  $37 + 63 + 49 = \square$

$(37 + 63) + 49 = \square$

$37 + (63 + 49) = \square$

Answer:  $((37 + 63) + 49 = 100 + 49 = 149)$

2  $59 + 1\,275 + 325 = \square$

$(59 + 1\,275) + 325 = \square$

$59 + (1\,275 + 325) = \square$

Answer:  $(59 + (1\,275 + 325) = 59 + 1\,600 = 1\,659)$

**Activity 3: Whole class activity and then learners work in pairs**

- Write '=' on board and ask: **How do we say this: = ?** (equals/ is equal to)  
Ask: **What does the equal sign mean?**  
(It tells us that things on each of the equal sign have the same value)
- Write this number sentence on the board:  
 $6 \times 3 = 9 \times 2$   
Say: **Is this number sentence true?** (Encourage the learners to discuss the answers.)  
Say: **What is 6 times 3 equal to?** (18)  
Say: **What is 9 times 2 equal to?** (18)  
Ask: **Is it true to say  $6 \times 3 = 9 \times 2$ ?** (Yes. Both sides are equal to 18)

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

- Read the questions in the LAB with the learners. Make sure all the learners understand what to do.
- Move around the classroom to support learners as needed.
- Correct Activity 3 with learners so that they can receive immediate feedback.
- Answers are given in brackets.

**1** Solve each number sentence.

Remember that the brackets show how the numbers are grouped and what you should do first.

**a**  $(17 - 7) - 2 = \square$   
 $= \underline{(10 - 2)}$   
 $= \underline{(8)}$

**b**  $17 - (7 - 2) = \square$   
 $= \underline{(17 - 5)}$   
 $= \underline{(12)}$

- c** Compare the number sentences and answers in **a.** and **b.**  
 What do you notice?

*(The two answers are different.) Note to the teacher – subtraction is not associative.*

**2 a** Calculate:  $149 + 51 = \underline{(149 + 51 = 200)}$

**b** Calculate:  $2 + 98 = \underline{(2 + 98 = 100)}$

**c** Is  $149 + 51 = 2 + 98$  true? (NO)

**3 a** Calculate:  $12 \times 100 = \underline{12 \times 100 = (1\ 200)}$

**b** Calculate:  $6 \times 200 = \underline{6 \times 200 = (1\ 200)}$

**c** Is  $12 \times 100 = 6 \times 200$  true? (YES)

- Once the learners have finished the activity say: **We can add in any order and the answer is always the same. But in subtraction, the answers will be different when we change the order of calculation.**

**5 HOMEWORK ACTIVITY (5 MINUTES)**

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

- 1 Solve each number sentence as quickly as you can.  
Group the numbers to make the calculations easy.  
Use brackets to show the order in which you worked.

a  $98 + 69 + 102 = \square$   
 $(98 + 69 + 102$   
 $= (98 + 102) + 69$   
 $= 200 + 69$   
 $= 269)$

b  $631 + 892 + 108 = \square$   
 $(631 + 892 + 108$   
 $= 631 + (892 + 108)$   
 $= 631 + 1\ 000$   
 $= 1\ 631)$

- 2 Write the number that should replace the placeholder so that the left side and the right side have the same value.

a  $13 + 7 = 1 + \square$   
 $(13 + 7 = 20$   
 So,  $1 + \square = 20$   
 So,  $1 + \boxed{19} = 20)$

b  $\square + 16 = 30 + 6$   
 $(30 + 6 = 36$   
 $\square + 16 = 36$   
 So,  $\boxed{20} + 16 = 36)$

**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 learned that when we are adding, we can group numbers involving multiples of 10, 100, 1 000 to make the calculation quicker and easier.**

**We have also learned that the equal sign in a number sentence tells us the value of the numbers on the left of the equals sign is the same as the value of the numbers on the right of the equals sign.**

## Lesson 47: More number sentences (3)

### Teacher's notes

This lesson is one of the fully planned lessons to be used to cover the Term 1 curriculum.

CAPS topics: 2.1 Number and geometric patterns and number sentences

Lesson Objective: Learners will know what happens when you add and subtract the same number from a number; and will solve and complete number sentences by inspection and by trial and improvement.

Lesson Vocabulary: placeholder, represent

Resources needed for this lesson: None

Date: \_\_\_\_\_ Week \_\_\_\_\_ Day \_\_\_\_\_

### 1 MENTAL MATHS (5 MINUTES)

	What is ...	Answer		What is ...	Answer
<b>1</b>	$9 \times 1 =$	9	<b>6</b>	$8 \times 7 =$	56
<b>2</b>	$5 \times 7 =$	35	<b>7</b>	$6 \times 9 =$	54
<b>3</b>	$9 \times 8 =$	72	<b>8</b>	$10 \times 0 =$	0
<b>4</b>	$3 \times 6 =$	18	<b>9</b>	$5 \times 6 =$	30
<b>5</b>	$4 \times 10 =$	40	<b>10</b>	$8 \times 4 =$	32

### 2 LINK TO PREVIOUS LESSON (5 MINUTES)

Link to concepts learned in previous lessons by asking questions.

- Say: **A number sentence is true if the value before the equal sign is equal to the value after the equal sign.**
- Ask, writing on the board as you go along: **What number would make each number sentence true?**

Say: **Remember that the brackets tell us what numbers should be grouped together and what to do first.**

$$400 - \square = 100 \text{ (Answer: } \square = 300 \text{)}$$

$$(3 \times 10) - \square = 25 \text{ (Answer: } \square = 5 \text{)}$$

$$(200 + 500) - \square = 400 \text{ (Answer: } 700 - \square = 400 \text{. So, } \square = 300 \text{)}$$

### 3 CORRECT HOMEWORK ACTIVITY (5 MINUTES)

The answers to the Homework Activity for Lesson 46 are provided in Lesson 46.

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 discover for themselves that if you first add and then subtract the same number from a given number, the number remains the same. Mathematically the reason for this is that addition and subtract are inverse operations (they 'undo' each other). We add two new strategies for solving and completing number sentences – inspection and trial-and-improvement. Once again, learners are not required to know these terms but must know how and when to use the strategies.

**Say: Today we learn what happens when you first add and then subtract the same number. We also learn some other methods of solving number sentences.**

**Activity 1: Whole class activity**

- Write the number sentence on the board:

$$\Delta + \Delta = 10$$

Say, pointing at the placeholders: **In this number sentence the triangle represents a placeholder and both placeholders are the same. This tells us that the numbers must be the same.**

Say: **Priya thinks the value of the placeholder is 3. In your classwork books replace each placeholder with the number 3 and then calculate to see whether Priya's number sentence is true.**

Ask: **Is the number sentence true?** (No)

Ask: **Why do you say that the number sentence is not true?**

( $3 + 3 = 6$ , 6 does not equal 10.)

Say: **Replace the placeholders with another number and test to see whether you can make the number sentence true. Hint:  $3 + 3 = 6$  which was too low. You need to try a number that is bigger than 3.**

Ask: **What number makes the number sentence true?** (5 because  $5 + 5 = 10$ )

Say: **Sometimes we can look at a number sentence and then test some numbers to try to solve the number sentence. We must think carefully about the numbers we choose and not just guess.**

**Activity 2: Learners work in pairs**

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

- Read the questions in the LAB with the learners.  
Make sure all the learners understand what to do.
- Move around the classroom to support learners as needed.
- Correct Activity 2 with learners so that they can receive immediate feedback.
- The answers are given in brackets.

1 Complete the calculations.

a.  $(567 + 10) - \square = 567$   
 $(576 - \square = 567$   
 $\square = 10)$

b.  $(1\ 347 + 1\ 000) - \square = 1\ 347$   
 $(2\ 347 - \square = 1\ 347$   
 $\square = 1\ 000)$

2 Look carefully at the answers in question 1.

Write down what you notice about the calculations and the answers:

(If you add and subtract the same number from a number, that number stays the same.)

3 Why can we say that this diagram represents a number sentence that is true?



The scale is balanced which means the amount on the left is the same as the amount on the right.

$9 + 7 = 16$

$8 + 8 = 16$

4 Write numbers in the placeholders to make these number sentences true:

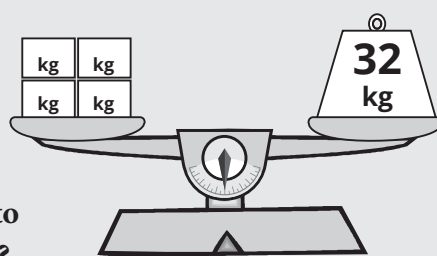
a.  $4 + 3 = 5 + \square$   
 $(4 + 3 = 7$   
 So,  $5 + \square = 7$   
 $\square = 2)$

b.  $17 + 9 = \square + 26$   
 $(17 + 9 = 26$   
 So,  $\square + 26 = 26$   
 $\square = 0)$

c.  $100 + \square = 98 + 14$   
 $(98 + 14 = 112$   
 So,  $100 + \square = 112$   
 $\square = 12)$

**Activity 3: Learners work in pairs**

- Draw a rough diagram like this on the board.  
The learners have this diagram in the LAB.



- Say: **The mass of the four boxes on the left is equal to the mass on the right. What is the mass of one box?**  
(Note – all four boxes have the same mass).
- Say: **Write a number sentence in your LAB that we can use to solve the problem. You can use the place holder  $\square$  to stand for something we don't know.**  
Ask one or two learners to write their number sentences on the board.  
Discuss the answers with the learners.

POSSIBLE ANSWERS:

Let  $\square$  represent one box

Number sentence:  $\square + \square + \square + \square = 32$  OR  $4 \times \square = 32$

Test: I know that  $4 \times 8 = 32$ , so I will try:  $8 + 8 + 8 + 8 = 32$ .

Now the value on the left is the same as the value on the right.

So, the mass of one box is 8 kg.

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

- Read the questions in the LAB with the learners. Make sure all the learners understand what to do.
- Move around the classroom to support learners as needed.
- Correct Activity 3 with learners so that they can receive immediate feedback.
- Answers are given in brackets.

**1 Use number sentences to solve the problems**

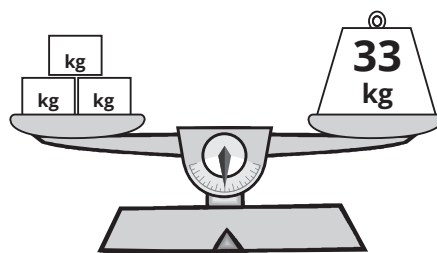
- a** What is the mass of one box?  
All the boxes have the same mass.  
Let  $\square$  represent one box.  
First write the number sentence.

\_\_\_\_\_ ( $\square + \square + \square = 33$ , or  $3 \times \square = 33$ )

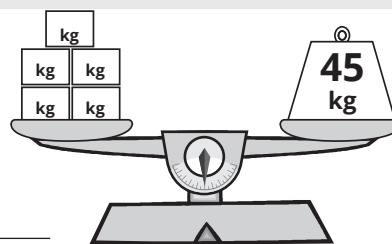
Then find the answer.

\_\_\_\_\_ (Ask: what number added together three times gives 33.)

\_\_\_\_\_ ( $\square = 11$  kg)



- b** What is the mass of one box?  
 All the boxes have the same mass.  
 Let  $\square$  represent one box.  
 First write the number sentence.



           $(\square + \square + \square + \square + \square = 45$  OR  $5 \times \square = 45)$           

Then find the answer.

          (Ask: what number added together five times gives 45.)          

           $\square = 9$  kg)          

- 2** Complete each number sentence. Remember that placeholders that are the same represent the same number in the number sentence.

You might need to test a few numbers to find the correct answers.?

**a**  $\square + \square + \square + \square = 400$

( $\square = 100$ , because

$100 + 100 + 100 + 100 = 400)$

**b**  $\diamond \times \diamond = 100$

( $\diamond = 10$ , because

$10 \times 10 = 100)$

**c**  $\Delta + \Delta + 8 = 38$

( $\Delta + \Delta + 8 = 38$

means that  $\Delta + \Delta = 30$

So,  $\Delta = 15$ , giving

$15 + 15 + 8 = 38)$

**d**  $10 \times \square \times \square = 360$

( $10 \times \square \times \square = 360$

means that  $\square \times \square = 36$

So,  $\square = 6$

$10 \times 6 \times 6 = 360)$



**5 HOMEWORK ACTIVITY (5 MINUTES)**

- Explain what learners need to do for homework.
- Read the questions in the LAB with the learners. Make sure all the learners understand what to do.
- The answers are given in the answer column.

Find the values of  $\square$  that make the number sentences true.

		ANSWERS
1	$25 + 0 = \square$	$\square = 25$
2	$37 + 49 = 49 + \square$	$\square = 37$
3	$103 + \square = 103$	$\square = 0$
4	$\square + 0 = 1\ 234$	$\square = 1\ 234$
5	$(79 + 63) - \square = 79$	$\square = 63$
6	$(657 + 42) + 13 = 657 + (\square + 13)$	$\square = 42$
7	$1\ 245 + \square = 1\ 246$	$\square = 1$
8	$5 \times 2 = \square$	$\square = 10$
9	$4 \times 3 = \square$	$\square = 12$
10	$351 - 237 + 237 = \square$	$\square = 351$

**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 learned that:**

- **when you add and subtract the same number from a given number, the given number stays the same.**
- **values on either side of the equal sign must be the same if the number sentence is true.**
- **when you add or subtract zero from a number, the number stays the same.**

## Lesson 48: Consolidation

### Teacher's notes

This lesson allows for consolidation of the lesson content in Unit 4.

CAPS topics: 2.1 Number and geometric patterns and number sentences

Lesson Objective: Learners will revise number patterns, geometric patterns and number sentences.

Lesson Vocabulary: number pattern, geometric pattern, number sentence, total

No resources needed for this lesson

Date:

Week

Day

### 1 NOTES FOR THE TEACHER RELATING TO THIS UNIT'S WORK

The main topics in this unit were number patterns, geometric patterns and number sentences. These three representations are inter-related, and these relationships should be highlighted wherever possible. As with all concepts, whether familiar or new, remind learners to ask: *What have I done before that can help me here?*

### 2 POSSIBLE MISCONCEPTIONS LINKED TO THE UNIT'S WORK

- Learners think that they can subtract or divide numbers in any order when this rule only applies to addition and multiplication.
- Learners see the equal sign as 'here comes the answer', which is often the case. Learners fail to recognise that the equal sign indicates equivalence.

### 3 CORRECT HOMEWORK ACTIVITY (5 MINUTES)

The answers to the Homework Activity for Lesson 47 are provided in brackets in lesson 47. 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 working with number patterns and geometric patterns and number sentences.

- You could use this time for learners to complete classwork or homework activities as necessary.
- You could find additional activities in textbooks that you have or use the Consolidation Activity given.

#### 4 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 correct the work.

	Fabulous	Oxford Headstart	Oxford Successful	Platinum	Premier	Sasol Inzalo	Solutions for All	Study & Master	Viva
LB	25-35	41-45	16-17	8-11	13-18	18-25	18-26	11-19	15
	42-50	143-151	31-36	18-21	89-93	51-59	137-141	30-31	95-98
	129-134	224-226	118-121	88-90	162-165	181-188	207-214	39-42	148-150
	181-187	238-240	181-185	136-139	214-216	262-267	229-234	155-161	215-216
	242-244	301-302	196-197 273	198-201		281-285 339-342		223-227 289-292	
TG	14-18	63-69	57-59	8-9	8-10	54-63	14-22	16-29	13
	25-50	178-182	116-120	16-17	42-45	200-209	99-102	44-46	52-53
	91-96	260-263	154-157	73-74	84-85	300-305	165-168	59-68	76-78
	149-153	275-276	164-165	106-108	111-112	396-397	188-189	204-212	106-107
	202-204	344-346	208	153-155				294-302 382-386	

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

#### Consolidation Activity

- Read the questions in the LAB with the learners. Make sure all the learners understand what to do.
- Work through the example with the learners.
- Then let the learners carry on and finish the rest of the Activity, either on their own or with a partner.
- Answers are given in brackets.

#### EXAMPLE

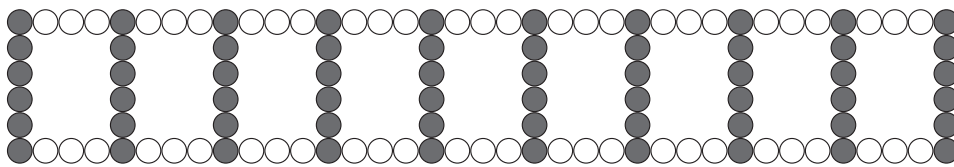
Amir, Jacob and Busi worked out how many beads in this string of beads.



- Amir saw the pattern as 5; 3; 5; 3; 5; 3; 5; 3. He counted the beads and added them together as he counted like this: 5; 8; 13; 16; 21; 24; 29; 32 beads.

- Jacob saw the pattern as 5 grey; 3 white; 5 grey; 3 white; 5 grey; 3 white; 5 grey; 3 white and wrote the number sentence  $(4 \times 5 \text{ grey}) + (4 \times 3 \text{ white}) = 20 \text{ grey} + 12 \text{ white} = 32 \text{ beads}$ .
- Busi added the white and black beads together:  $5 + 3 = 8 \text{ beads}$ . She then wrote the number sentence  $4 \times (5 + 3) = 4 \times 8 \text{ beads} = 32 \text{ beads}$ .

1 How many beads in this pattern?



- a Use one of the children's method or one of your own to show how to find out the number of beads in the pattern without having to count one-by-one.  
(There are 9 patterns consisting of 6 grey + 3 white + 3 white. And there is an extra pattern of 6 grey. Whichever method the learners use they should get a total of 114 beads.)

b Write a number sentence that you could use to find:

The number of white beads:  $(18 \times 3 = 54)$

The number of grey beads:  $(10 \times 6 = 60)$

The total number of beads:  $(54 + 60 = 114)$

2 a Use the column method to calculate  $4\ 692 - 1\ 326 = \square$

	Th	H	T	O
	4	6	<del>9</del>	12
-	1	3	2	6
	(3	3	6	6)

b Show how you can check your answer.

	Th	H	T	O
(	3	3	16	6
+	1	3	2	6
	4	6	9	2)

**3** Re-write one side of each of these number sentences to make them true:

**a**  $6 + 6 = 4 \times 4$

(Many answers are possible. Here are two:

$$6 + 6 = 4 \times 3$$

$$6 + 10 = 4 \times 4$$

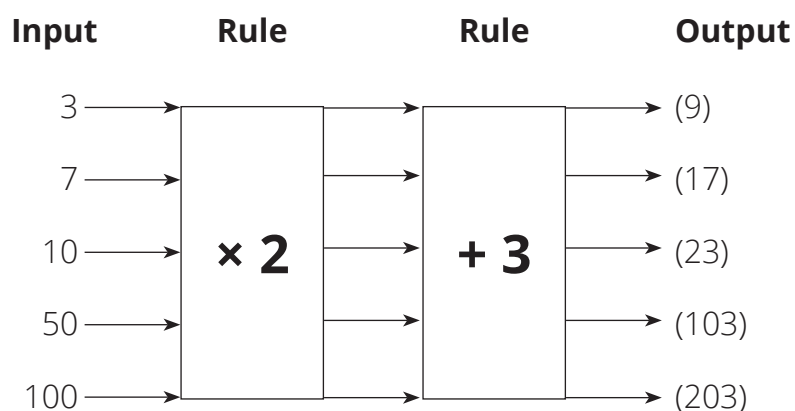
**b**  $1 + 4 = 4 + 0$

(Many answers are possible. Here are two:

$$0 + 4 = 4 + 0$$

$$1 + 4 = 4 + 1$$

**4 a** Complete the flow diagram:



**b** Write a number sentence for the first pair of input and output numbers

$(3 \times 2) + 3 = 9$

### 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 number patterns and geometric patterns and using number sentences.**

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