Foundations For Learning

Intermediate Phase Mathematics Lesson plans

Fourth term

Grade 4

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FOURTH TERM OVERVIEW

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10
Conceptual development and Problem Solving	Extending number concept beyond 5 000									Revision of numbers to 10 000
		Different methods to compute addition and subtraction, multiplication and division			Multiplication of multidigit numbers. Division as the inverse of multiplication			Relationship between two variable quantities. Verbal formula. Flow diagrams		Investigate whether multiplication is distributive over addition
		Solve problems using addition and subtraction	Solve problems using multiplication	Solve problems using division	Solve problems converting SI units			Solve problems requiring more than one operation		
								Solve number sentences, checking the solutions by estimation and direct calculation		
	Building up and breaking down numbers							Building up and breaking down numbers		Building up and breaking down numbers
			Solve problems involving rate and ratio			Investigate rates, including time and distance				
						Equal sharing and fractions Equivalence of fractions				
						Consolidation of fractions and decimals				

	Number concept development is continuous throughout the term.						
		Investigate volume/capacity. Conversion to SI units					
		Using measuring jugs to approximate measurements		Viewing the same object from different positions.			
				Tessellations including kites and other quadrilaterals			Non-symmetrical tiling using triangles
						Data collection, recording and interpretation - pictograms	

FOURTH TERM ASSESSMENT OVERVIEW

Important Note: The primary value and purpose of assessment is to gather sound information on what knowledge and skills learners have, as well as how they think. This informs you as the teacher and allows you to focus on providing teaching and learning opportunities which will further develop learners' thinking so that it becomes more sophisticated than what it was when you assessed it. Remember, informal assessment takes place on a regular basis throughout the term and will inform your planning.

	Milestones for Assessment Tasks	Suggested activities for Assessment
Week 1	• Recognises and represents numbers in order to describe and compare them:	Informal assessment to revise number value up to 5000
Week 2	• Recognises and represents numbers in order to describe and compare them: - whole numbers to at least 4 digits • Estimates and calculates by selecting and using operations appropriate to solve problems that involve: - addition and subtraction of whole numbers with at least 4 digits	**Day 5:** Formal written task to assess number value and addition and subtraction of whole numbers to 10000
Week 3	• Recognises and represents numbers in order to describe and compare them: - multiples of single digit numbers to at least 100 • Knows or quickly determines multiples of single-digit numbers to at least 100 (multiplication tables). – new milestones • Knows or quickly determines multiples of 10, 20, 30, 40, 50, 60, 70, 80, 90, 100 up to at least 10 000, e.g. 90 × 70	**Day 5:** Written task to assess multiples of numbers
Week 4	NO FORMAL ASSESSMENT	
Week 5	• Investigates and approximates - Volume/capacity of 3D objects by packing or filling them in order to develop an understanding of cubic units. • Estimates, measures, records, compares and orders 2D shapes and 3D objects using SI units with appropriate precision for: - Capacity (millilitres and litres) • Solves problems involving selecting, calculating with and converting between appropriate SI units listed above	**Day 5:** Formal written task, involving problem solving using and understanding the concept of volume and capacity.
ASSESSMENT TASK 1 COMPLETED		
Week 6	• Recognises and represents numbers in order to describe and compare them: - common fractions with different denominators including halves, thirds, quarters, fifths, sixths, sevenths, eighths, ninths and tenths and mixed numbers involving these fractions	Formal task assessing understanding of and addition, subtraction of fractions
Week 7	NO FORMAL ASSESSMENT	

Week 8	• Estimates and calculates by selecting and using operations appropriate to solve problems that involve: - addition and subtraction of whole numbers with at least 4 digits - multiplication of at least whole 3-digit by 1-digit numbers to 200 - multiplication of 2-digit by 2- digit numbers with answers to at least 10 000 - division of at least whole 3-digit by 1-digit numbers • Recognises, describes and uses: - the reciprocal relationship between multiplication and division • Knows or quickly determines multiples of 10, 20, 30, 40, 50, 60, 70, 80, 90, 100 up to at least - 10 000, e.g. 90 × 70. - In the number range 1 to 10 000 – new milestones	**Day4 and 5:** Assessment activities include: addition and subtraction of 4-digit numbers; multiplication and division; knowledge of multiples (multiplication tables) and the reciprocal relationship between multiplication and division
Week 9	• Draws graphs and interpret data (ungrouped) - Bar graphs	Written task involving drawing of bar graphs and interpreting data National Assessment Task to be completed
ASSESSMENT TASK 2 COMPLETED		
Week 10		

The criteria for the assessment are drawn from the Learning Outcomes, the Assessment Standards and the Milestones

FOURTH TERM : WEEK 1 OVERVIEW

Hours: 5	**Number of Periods: 5**
Mathematics Learning Outcomes and Assessments: **LO 1 AS 3, 4, 6, 10**	**Milestones:** • Counting in a variety of intervals (including 2s, 3s, 5s, 10s, 20s, 25s, 50s and 100s) starting from any number between 0 and 10 000 • Counting given structured collections of objects (pictures and marks) up to 10 000, recording the result by writing the number name in words, by showing it with Flard cards and by writing it in expanded notation. • Investigate and extend number (to at least 10 000) and geometric patterns looking for general rules or a relationship, including patterns represented in physical and diagrammatic form, and patterns of learners own creation.

	Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 5**
Content Focus	The context of money is used to provide learners with opportunities to develop a sense of numbers larger than R5000	Extending number concept beyond 5000.	Practice in writing numbers between 5000 and 10 000 in expanded notation.	Assessment of how well learners understand numbers in the range 5 000 to 10 000.	A continuation of Day 4.
Resources	A pair of scissors and an envelope for each learner. A copy of Term 4 Annexure B (Monies) for each learner. The set of fake banknotes for each learner. A copy of term 4 Annexure C (More multiplication facts) for each learner, preferably printed on heavy paper or light board.	A copy of Term 2 Annexure C (Six apple counting sheets) for each learner. A set of flard cards for each learner. A copy of the 10 by 10 table sheet (Term 4 Annexure D) for each learner.	Each learner must have a full set of flard cards. A copy of the 10 by 10 table sheet (Term 4 Annexure D) for each learner.	Four-digit number strips, cut from Term 4 Annexure A, one strip for each learner. The set of flard cards for each learner. Two copies of Term 3 Annexure B (Number card template) for each learner, **These must be printed on the front and the back**. Kokipens or dark-colored crayons if available. One set of Term 2 Annexure B (Four-digit number cards) for use in the class. Scissors. 25 Plastic bags (like shopping bags).	The Annexure A sheets on which learners wrote numbers the previous day. Scissors. An envelope (it may be a used envelope) for each learner. A plastic bag or small box (for 144 cards) for every four learners. Labels for the plastic bags or boxes.

The lesson plans for days 3 and 4 can also be implemented on days 3 and 4 with some classes, or even on day 5 of Week 1 and day 1 of Week 2, to make the available scissors go round from class to class.

WEEK 1: DAY 1

Notes to the teacher:

- The context of money is used to provide learners with opportunities to develop a sense of numbers larger than R5000. The three activities can be done in any sequence, to allow sharing of the scissors between different classes.

Resources:

- A pair of scissors and an envelope for each learner.
- A copy of Term 4 Annexure B (Monies) for each learner.
- The set of fake banknotes for each learner
- A copy of term 4 Annexure C (More multiplication facts) for each learner, preferably printed on heavy paper or light board.

ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

Activity 1

Hand out a copy of Term 4 Annexure A to each learner. Each learner should also have his/her set of false banknotes (from term 1, with the additional notes made in term 3). Tell learners that Jaamiah, Nathi, Fatima and Cyril each bought a refrigerator. Jaamiah paid with the money A on the sheet, Nathi paid with the money B, Fatima with the money C and Cyril with the money D.

Learners have to find out, individually, how much each person paid in total and show in writing how the amount can be made up with four banknotes only (e.g. R3000 + R400 + R80 + R6). They should also write the amount in condensed notation, e.g. R3486.

Activity 2

Write the following on the board.

R3000	R1000	R2000	R1000
R500	R800	R900	R200
R70	R40	R60	R50
R8	R5	R7	R8

Ask learners to show in writing how the money on the left can be made up with four banknotes only, and also how the money on the right can be made up with four banknotes only. They should also write both amounts in condensed notation.

Then they should find out how much the two amounts together are, and they should describe in writing how they do this. Take this in for assessment purposes.

Activity 3

Hand out a copy of the two-digit multiplications (Term 4 Annexure C), an envelope and a pair of scissors, to each learner. Let them cut out the cards and put it in the envelopes.

WEEK 1: DAY 2

Notes to the teacher:

- The work in this lesson provides learners with further opportunities to extend their number concept beyond 5000.

Resources:

- A copy of Term 2 Annexure C (Six apple counting sheets) for each learner.
- A set of flard cards for each learner.
- A copy of the 10 by 10 table sheet (Term 4 Annexure D) for each learner.

ACTIVITIES FOR THE DAY

ORAL, MENTAL AND CONCEPT DEVELOPMENT

Activity 1

Hand out copies of the six apple counting sheets (Term 2 Annexure C) to each learner. They have to find out how many apples are shown on the six sheets together. Learners have to represent the total with flard cards, and write it in expanded notation.

Activity 2

Write the following on the board. Learners have to copy each sequence and extend it at least until they reach or pass eight thousand:

4300	4399	4498	4597	4696	4795	. . . . .
600	1200	1800	2400	3000	3600	. . . . .
1200	1500	1800	2100	2400	2700	. . . . .
1750	2000	2250	2500	2750	3000	. . . . .

Activity 3

Hand out one copy of the 10 by 10 table sheet to each learner. Learners have to fill the first table in by counting in hundreds, so that it looks like on the right when they have finished.

They have to fill in the second and third sheets by counting in fifties, so that they reach 10 000 again in the last cell of the third table.

100	200	300	400	500	600	700	800	900	1000
1100	1200	1300	1400	1500	1600	1700	1800	1900	2000
2100	2200	2300	2400	2500	2600	2700	2800	2900	3000
3100	3200	3300	3400	3500	3600	3700	3800	3900	4000
4100	4200	4300	4400	4500	4600	4700	4800	4900	5000
5100	5200	5300	5400	5500	5600	5700	5800	5900	6000
6100	6200	6300	6400	6500	6600	6700	6800	6900	7000
7100	7200	7300	7400	7500	7600	7700	7800	7900	8000
8100	8200	8300	8400	8500	8600	8700	8800	8900	9000
9100	9200	9300	9400	9500	9600	9700	9800	9900	10000

WEEK 1: DAY 3

Notes to the teacher:

- Learners will practice to write numbers between 5000 and 10 000 in expanded notation.

Resources:

- Each learner must have a full set of flard cards.
- A copy of the 10 by 10 table sheet (Term 4 Annexure D) for each learner.

ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

Activity 1

Write the following amounts on the board.

R6472

R7078

R9237

R8295

R6789

Learners have to copy each amount, and write down which four banknotes can make the amount up, in the form of a number sentence, for example R6472 = R600 + R400 +R70 + R2.

Learners may use flard cards to help them to figure this out. Note that learners should not use the fake banknotes in this lesson.

Activity 2

Learners should now show how each of the amounts in activity 1 can be made up with 8 banknotes, and write this as a number sentence.

Activity 3

Hand out one copy of the 10 by 10 table sheet to each learner. Learners have to fill in the tables by counting in twenties, and they should hence reach 6 000 in the last cell of the third table.

Activity 4

If there is time left, learners should show how each of the amounts in activity 1 can be made up with 6 banknotes, and write this as a number sentence.

WEEK 1: DAY 4

Notes to the teacher:

- During the first two lessons, you have given learners opportunities to become aware of and work with numbers between 5000 and 10000. In Activity 1 today, you will assess how well they understand numbers in this range.
- Activity 2 is a highly integrated activity: learners will use positions on a numbered grid, write numbers in given intervals and compare numbers.

Resources:

- Four-digit number strips, cut from Term 4 Annexure A, one strip for each learner.
- The set of flard cards for each learner.
- Two copies of Term 3 Annexure B (Number card template) for each learner, preferably printed on light cardboard or heavy paper. **These must be printed on the front and the back**.
- Kokipens or dark-colored crayons if available.
- One set of Term 2 Annexure B (Four-digit number cards) for use in the class.
- Scissors.
- 25 Plastic bags (like shopping bags).

ACTIVITIES FOR THE DAY

ASSESSMENT

Activity 1:

Hand out the strips with 4-digit numbers (5 numbers on each strip), that you have cut from Annexure A. Different learners should get different sets of numbers. Learners should write their names at the top of the sheets.

Proceed exactly as described in Activity 1 for Term 3. Week 1. Day 3.

CONCEPT DEVELOPMENT

Activity 2

Hand out a number card template sheet (Term 3 Annexure B) and one four-digit number card to each learner. Tell learners that they will write numbers in the blocks, using large symbols like on the number card you have given them. Learners should write with pencils. Ask learners to each choose any number between 6800 and 7200, and to write in the cell labeled D2 on their sheets.

Walk around and check that learners get this right, and that they write in big symbols to fill the available space.

Proceed exactly as described in Activities 2 and 3 for Term 3. Week 1. Day 3.

WEEK 1: DAY 5
Notes to the teacher: • This is a continuation of the previous lesson. **Resources:** • The Annexure A sheets on which learners wrote numbers the previous day. • Scissors. • An envelope (it may be a used envelope) for each learner. • A plastic bag or small box (for 144 cards) for every four learners. • Labels for the plastic bags or boxes.
ACTIVITIES FOR THE DAY
CONCEPT DEVELOPMENT **Activity 1** Hand out one Annexure A sheet, that is already completed on one side, to each learner (they do not have to get "their own" sheets back). They now have to complete the other side in exactly the same way, but starting at a different number in cell D2 (but again a number between 6800 and 7200). Hand out scissors and envelopes to learners who finish. Once a learner has finished, he/she should cut out the cards on the lines, and put them in the envelope. Take the envelopes in, and empty the contents of four envelopes into each plastic bag. **Activity 2** Assign every four learners who have handed in their envelopes to a group, and give them a plastic bag with 96 cards. They have to play the Number Placement Game as described in the lesson plan for Term 2 Week 2 Day 1 Activity 3.

FOURTH TERM : WEEK 2 OVERVIEW

Hours: 5	**Number of Periods: 5**
Mathematics Learning Outcomes and Assessments: **LO 1 AS 8,9,10,11**	**Milestones:** • Know or quickly determine addition and subtraction facts: - multiples of 100 to at least 10000, for example 8900 + 400, 7200 – 300 - multiples of 1000 to at least 10000, for example 6000 + 3000, 7000 – 3000. • Mentally add and subtract single-digit numbers, multiples of 10 to at least 100, and multiples of 100 to at least 500, to and from three and four-digit numbers up to at least 10 000, for example 8397 + 8, 9434 – 5, 6367 + 80, 7434 – 50, 5967 + 200, 7134 – 300. • **Solve problems by subtraction.** Understand the following types of situations, can do the calculations needed to solve them, and can judge whether the result makes sense

	Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 5**
Content Focus	Consolidation of learners' methods of addition	Practicing addition without using support material e.g. flard cards.	Solving a variety of problems by doing subtraction and addition, without support material if possible.	Introduce the partitioning method of subtraction, in which both numbers are broken down (expanded notation), and parts are subtracted from parts before building the answer up.	Consolidation of learners' understanding of subtraction as something that can be done to solve a variety of different kinds of problems.
Resources	A set of fake banknotes for each learner. A set of flard cards for each learner.	A copy of the 10 by 10 table sheet (Term 4 Annexure D) for each learner. A set of number bond cards (Term 2 Annexure H) for each group of four or three learners.	A copy of Term 4 Annexure B (Monies) for each learner. The sets of fake banknotes and flard cards should be available to each learner. A class list.	A set of false banknotes for each learner. A set of flard cards for each learner. A copy of the 10 by 10 table sheet (Term 4 Annexure D) for each learner.	A set of false banknotes for each learner. A set of flard cards for each learner.

WEEK 2: DAY 1

Notes to the teacher:

- This lesson provides for consolidation of learners' methods of addition.

Resources:

- A set of fake banknotes for each learner.
- A set of flard cards for each learner.

ACTIVITIES FOR THE DAY

ORAL, MENTAL AND CONCEPT DEVELOPMENT

Activity 1

Let learners individually calculate each of the following.

1. 4387 + 3568
2. 5386 + 2987
3. 6574 + 2876

Learners may use flard cards or fake banknotes to help them to figure it out if they really need to. Circulate between learners and observe their methods. Try to understand how they think, and ask learners to explain their thinking to you in cases where you have difficulty to follow their written work.

Activity 2

As soon as all learners have finished question 1 of activity 1, write 3695 + 4837 on the board and call their attention. Tell them that you will demonstrate one way of adding two numbers, and a way of showing the thinking in writing, and you want them to take note of it. Tell them that many of them use this method, that it may not be better than other methods that some people use, but that it is used by many people and you want them to be aware of it and understand it.

Ask learners to pack both numbers out with flard cards or bank notes, next to each other, and to write both numbers in expanded notation. Circulate while they start doing this, then go to the board and write the numbers in expanded notation, so that your board exposition looks like the example on the right.

3695 + 4847

= (3000 + 600 + 90 + 5) + (4000 + 800 + 40 + 7)

= (3000 + 4000) + (600 + 800) + (90 + 40) + (5 + 7)

Ask learners to rearrange their flard card or money notes to make it easier to find the answer. Write the rearranged line on the board, and ask learners to compare their rearrangement with what you have written. Ask learners to complete the calculation. Circulate between learners and observe what they write. Then go back to the board and complete the written exposition, as shown on the right. Ask learners to consider whether your writing describes what they have done to produce the answer. Allow some learners who believe they have worked differently to demonstrate to small groups of other learners, in writing, how they have worked. Observe what they do, and ask learners with interesting ideas to explain that on the board to the whole class.

= 7000 + 1400 + 130 + 12

= 7000 + 1000 + 400 + 100 + 30 + 10 + 2

= 8000 + 500 + 40 + 2

Activity 3

Ask learners to do the following calculations by using the method that you have demonstrated in writing on the board, as well as any of the calculations in activity 1 that they have not yet completed.

7784 + 976

6378 + 1845

Activity 4

Ask learners to calculate 4387 + 3568 (the first sum in activity 1) again, now using the method that you have demonstrated in activity 2.

CONSOLIDATION

Activity 5

Ask learners to clearly describe, in writing, the differences between the method they originally used to calculate 4387 + 3568, and the method they used in activity 4. Take this in for assessment of how well learners can represent methods of computation in writing.

WEEK 2: DAY 2

Notes to the teacher:

- Learners will practice addition.
- Encourage learners to work without flard cards or fake money notes in activity 2.

Resources:

- A copy of the 10 by 10 table sheet (Term 4 Annexure D) for each learner.
- A set of number bond cards (Term 2 Annexure H) for each group of four or three learners.

ACTIVITIES FOR THE DAY

ORAL AND MENTAL ACTIVITIES

Activity 1

Let learners play the Number Bond Game (as described in the lesson plan for Term 1, Week 4 Day 1) with the cards in Term 2 Annexure H.

CONCEPT DEVELOPMENT

Activity 2

Let learners do the following calculations, individually. Write the questions on the board.

Encourage them to try to do it without using flard cards or fake banknotes, but do not prohibit the use of these supports.

1. 4375 + 3876
2. 879 + 7265
3. 5234 + 2413
4. 879 + 2746 + 768
5. 5027 + 3054
6. 7647 + 849 + 388
7. 674 + 674 + 674 + 674 + 674 + 674 + 674 + 674 + 674 + 674
8. 1078 + 584 + 2374 + 749 + 1268

Circulate and monitor what they do.

Identify learners who seem to struggle or who do not show their methods clearly in writing. Ask them to tell you what they are doing or trying to. You may provide guidance by encouraging learners to write the numbers in expanded notation before they try to do the calculations.

Activity 3

Hand out one copy of the 10 by 10 table sheet to each learner. Learners have to fill in the first two tables by counting in forties, and they should hence reach 8 000 in the last cell of the second table. They should fill in the third table by counting in nineties.

WEEK 2: DAY 3

Notes to the teacher:

- In this lesson learners will solve a variety of problems by doing subtraction and addition.
- Different learners may work in different ways: some may use flard cards or fake banknotes as supports for their thinking, while others may just use writing.
- Since you definitely want learners to become able to do calculations like these without needing flard cards or fake banknotes as supports, they should be encouraged but not forced to work without the supports.

Resources:

- A copy of Term 4 Annexure B (Monies) for each learner.
- The sets of fake banknotes and flard cards should be available to each learner.
- A class list.

ACTIVITIES FOR THE DAY

MENTAL AND PROBLEM SOLVING

Activity 1

Hand out a copy of the sheet with four collections of banknotes (Annexure B). Inform learners that Bertha, Joel, Nare and Tobeka have all saved money to buy new furniture. Money A is Bertha's savings, money B is Joel's savings, money C is Nare's savings and money D is Tobeka's savings. Learners have to write down how much money each person has saved, in condensed notation.

Activity 2

Inform learners that the four persons now spent the following amounts of money on furniture for their houses: Bertha spent R1534. Joel spent R3708. Nare spent R3276. Tobeka spent R989.

Do not write the amounts on the board. Learners have to listen to you and make notes.

Ask learners to work out how much the four people together spent on furniture.

Activity 3

Learners have to work out how much money each person will have left. Circulate and observe which learners use the flard cards or banknotes to support their thinking, and which learners just use writing. Make a record of your observations on the class list, so that you can in future lessons monitor learners' progress to working without the supports. You may observe that some learners do the subtractions by "filling up", for example work as follows for Tobeka's situation:

R989 + R11 → R1000 + R7453 = R8453 and then R7453 + R11 = R6464. This is fine, for now. In the lessons that now follow, learners will be led to also learn to subtract by breaking the numbers, and hence the work, up into parts (as is done in "column subtraction").

Ask learners who used flard cards or banknotes to put these away, and to again work out how much each person will have left, this time without using the supports.

WEEK 2: DAY 4

Notes to the teacher:

- In this lesson you will introduce learners to the partitioning method of subtraction, in which both numbers are broken down (expanded notation), and parts are subtracted from parts before building the answer up.

Resources:

Do not hand these resources out. Allow learners to request it if they need it.

- A set of false banknotes for each learner.
- A set of flard cards for each learner.
- A copy of the 10 by 10 table sheet (Term 4 Annexure D) for each learner.

ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

Activity 1

Say to the learners that you will guide them to learn a specific method of subtraction. Tell them that some of them may already use this method, that it may not be better than other methods that some people use, but that it is used by many people and you want them to be aware of it and understand it.

Say to learners that you will use 7586 – 2345 as an example.

Ask them to each calculate this individually, using the method that they are comfortable with at the moment. Circulate. Assign learners who have finished to groups of four or three and ask them to explain to each other how they did the calculation.

Write this on the board, saying to learners that this is one way of doing it, and that it is called the "filling up" method:

2345 + 55 → 2400 + 600 → 3000 + 4586 = 7586 and 55 + 600 + 4586 = 5241

Activity 2

Each learner will need the set of fake banknotes for this activity.

Say to learners that you will now guide them to a way of calculating 7586 – 2345 that may be different than the method they have used. Say to learners that you want them to think of the numbers as amounts of money to help them to understand.

Ask them to represent R7586 with four banknotes, and to write R7586 in expanded notation.

Circulate to check that they do this. Then write this on the left part of the board, with spaces on the left and between the parts, like this:

R7586 = R7000 + R500 + R80 + R6.

Ask them to also represent the number 2345 as money with four banknotes, and to write it in expanded notation. Circulate to check that they do this. Then write this on the right part of the board:

R2345 = R2000 + R300 + R40 + R5.

Activity 3

Ask learners to now represent R7586 with eight banknotes, including the banknotes they used to represent R2345, namely R2000, R300, R40 and R5. Circulate to check that they do this. Then write this on the left part of the board, below the previous work. Write it twice, so that your board exposition now looks like this:

R7586 = R7000 + R500 + R80 + R6.

= R5000 + R2000 + R300 + R200 + R40 + R40 + R5 + R1.

Ask learners to copy this.

Ask them to try to see how the two representations are linked.

Point out to them that the R7000 is now split into R5000 and R2000, the R500 is split into R300 and R200 etc. You may insert some brackets on your board exposition to highlight this:

R7586 = R7000 + R500 + R80 + R6.

= (R5000 + R2000) + (R300 + R200) + (R40 + R40) + (R5 + R1).

Ask learners to try to see what will be left behind if they take the R2345 away from the second line in the representation. Give them about 3 minutes to think about this, then write the following on the board, directly below the above:

R7586 – R2345 = R5000 + R200 + R40 + R1.

Activity 4

Ask learners to do the following calculations in the above way (write the questions on the board), and to check their answers by using the "filling up" method:

7869 – 2547 9538 – 4315

CONSOLIDATION

Activity 5

If there is time, hand out one copy of the 10 by 10 table sheet to each learner. Learners have to fill in the tables by counting in thirties, and they should hence reach 9 000 in the last cell of the third table. If there is no time for this today, please remember to let them do it soon on another day. They will need this table late in week 3.

WEEK 2: DAY 5

Notes to the teacher:

- This lesson provides for consolidation of learners' understanding of subtraction as something that can be done to solve a variety of different kinds of problems.

Resources:

Do not hand these resources out. Allow learners to request it if they need it.

- A set of false banknotes for each learner.
- A set of flard cards for each learner.

ACTIVITIES FOR THE DAY

ORAL, MENTAL AND PROBLEM SOLVING

Activity 1

Describe this situation to learners:

Bongani buys a guitar for R8325. He cannot pay all the money immediately. His arrangement with the shop is that he will pay what he can, and pay more later. The shop will keep the guitar until he has paid all the money. His first payment is R5758.

Do not write it on the board: learners have to listen to you while you tell the story, and make notes about the situation. Then ask them work out how much Bongani still has to pay before the shop will release the guitar to him. Circulate and observe how learners do it. Most learners will probably do it by "filling up" from 5758 to 8325, then adding the parts needed to fill up:

5758 + <u>42</u> → 5800 + <u>200</u> → 6000 + <u>2325</u> = 8325.

42 + 200 + 2325 = 242 + 2325 = 2567

Some learners may try to use the partitioning method of the previous lesson (either for this problem or one of the following problems), with or without success. Look out for learners may try to use partitioning and then land into trouble. Tell them that they need not use that method for these questions because it is difficult, and advise them to use another method now, for example "filling up".

Activity 2

Describe this situation to learners, and ask them to make notes:

A total of 8325 people work in a factory that produces motor cars. 5758 of the workers are men.

Ask learners to figure out how many of the workers are women.

Circulate and observe how they do it. You may find it quite interesting to see whether some learners recognise that they can use their work for activity 1 to answer this question. Many learners may not recognise this. They may do new work, and may even use a different method than what they have used for question 1. Do not engage learners about this.

Assign learners who finish to groups of four or three, and ask learners to tell each other how they worked in activity 1, and how they figured out the number of women in the factory.

Activity 3

Describe this situation to learners, and ask them to make notes:

There used to be 8325 houses in a village. Then a terrible thing happened. A huge storm, with wind and rain hit the village. Only 5757 houses were left.

Ask learners to figure out how many houses were destroyed.

Circulate and observe how they do it. Again, you may find it quite interesting to see whether some learners recognise that they can use their work for activity 1 or 2 to answer this question. Many learners may not recognise this. They may do new work, and may even use a different method than what they have used for questions 1 and 2.

Assign learners who finish to groups of four or three, and ask learners to tell each other how they worked in activity 3, and to compare this with how they worked in activities 1 and 2.

Activity 4

Write the following set of problems on the board for learners to do. Use this exercise towards assessment Task 1:

Kealeboga also buys a guitar for R8325. She cannot pay all the money immediately. Her arrangement with the shop is that she will pay what he can, and pay more later. The shop will keep the guitar until she has paid all the money. Her first payment is R2343. Work out how much she still has to pay.

A total of 8325 people work in a factory that produces motor cars. 5758 of the workers are men. How many of the workers are women?

There used to be 8325 houses in a village. Then a terrible thing happened. A huge storm, with wind and rain hit the village. Only 5757 houses were left. How many houses were destroyed?

ASSESSMENT	Formal assessment against the milestones: • Estimates and calculates by selecting and using operations appropriate to Solves problems that involve: - addition and subtraction of whole numbers with at least 4 digits

FOURTH TERM: WEEK 3 OVERVIEW

Hours: 5	**Number of Periods: 5**
Mathematics Learning Outcomes and Assessments: LO 1: AS 7, 8, 9,10,11	**Milestones:** • Know or quickly determine addition and subtraction facts: - multiples of 100 to at least 10000, for example 8900 + 400, 7200 – 300 - multiples of 1000 to at least 10000, for example 6000 + 3000, 7000 – 3000. • Know or quickly determine multiples of 10, 20, 30, 40, 50, 60, 70, 80, 90, 100 up to at least 10 000, e.g. 90 × 70. • Multiplication of two-digit by two digit numbers with answers to at least 10 000 • Solve problems by subtraction in the number range 1 to 10 000. • Solve problems involving ratio (proportion),in the number range 1 to 10 000

	Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 5**
Content Focus	Subtraction by partitioning the problem into separate parts (breaking down and building up)	Learners will practice the "break into parts" method of subtraction for more difficult cases.	Solve problems involving ratio.	Consolidation of learners ready knowledge of multiplication facts.	Multiply multidigit numbers by breaking the numbers down and multiplying the parts separately.
Resources	A copy of the 10 by 10 table sheet (Term 4 Annexure D) for each learner. The set of false banknotes for each learner.		A copy of the next page (labeled rectangles) for each learner, and scissors and a ruler.	A set of the multiplication fact cards that were cut in term 2 (Term 2 Annexure K) A copy of the 10 by 10 table sheet (Term 4 Annexure D) for each learner. The set of two-digit multiplication fact cards (Term 4 Annexure C) for each learner.	10x10 multiplication grid

The lesson for day 3 can happen on any day of the week, to make the available scissors go round

WEEK 3: DAY 1

Notes to the teacher:

- In this lesson you will lead the learners to do subtraction by partitioning the problem into separate parts (breaking down and building up), for the cases of subtraction where this method is more difficult.

Resources:

- A copy of the 10 by 10 table sheet (Term 4 Annexure D) for each learner.
- The set of false banknotes for each learner.

ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

Activity 1

Demonstrate the partioning method of subtraction (as in the lesson for Week 2, Day 4) again, using 8547 – 3226 as an example. Tell learners that this may be called the "break into parts" method of subtraction.

Ask learners to calculate 7658 – 2316, using the "break into parts" method. Also ask them to check their answer by using the "filling up" method.

Circulate to check that they get it right and provide help where necessary.

Activity 2

Ask learners to try to calculate 8325 – 5757 by using the "break into parts" method of subtraction. Circulate to monitor how they manage. Most learners will probably not manage. this fine. After a few minutes, tell them that you understand the problems they experience, and that you will now help them to do it.

Activity 3

Each learner will need the set of fake banknotes for this activity.

Ask them to represent R8325 with four banknotes, and to write 8325 in expanded notation.

Circulate to check that they do this. Then write this on the board:

R8325 = R8000 + R300 + R20 + R5.

Tell them that we want to figure out how much money will be left if R5757 is taken away from this amount, and that you will guide them to do this in a certain way.

Ask them to also represent R8325 with seven banknotes, including a R1000 note, a R100 note and a R10 note. Write the following incomplete number sentence on the board to make your question clear:

R8325 = R1000 R100 R10

Put the following question to learners:

Suppose we manage to complete this number sentence, so that the parts make a total of R8325, how will that help us to find out how much R8325 − R5757 is?

Allow learners to think about this individually for 3 – 5 minutes, then ask them to discuss the question in small groups. Circulate and listen to their discussions. Some learners may come up with the idea that one may then take away the R700 of the R5757 from R1000, the R50 from the R100 and the R7 from the R10, so that the remaining money forms the answer for R8325 – R5757. However, it is fine if this does not happen.

Activity 4

Let learners now try to build the number sentence. You may help struggling learners by asking them where they may get the R1000, R100 and R10 from. If that does not help, you may even suggest that they get the R1000 from the R8000, the R100 from the R300 and the R10 from the R20. Once all or most of the learners have managed, write the requested number sentence on the board.

R8325 = R7000 + R1000 + R200 + R100 + R10 + R10 + R5

Let learners copy this, and then ask them to then express R5757 with four banknotes, and to write this as a number sentence below the above sentence. Circulate to check that learners do this right, and then do it on the board, so that the board display now looks like this:

R8325 = R8000 + R300 + R20 + R5.

R8325 = R7000 + R1000 + R200 + R100 + R10 + R10 + R5

R5757 = R5000 + R700 + R50 + R7

Ask learners to try to see how one may find the answer to R8325 – R5757 from this representation. Circulate and talk to learners who have not yet produced the answer now. You may help them by asking “from what parts of the R8325 can you easily subtract the R5000, the R700, the R50 and the R7?”

CONSOLIDATION

Activity 5

Ask learners to try to use this method to calculate 7253 – 3688, and to then check their answer by also calculating it with the filling up method.

WEEK 3: DAY 2

Notes to the teacher:

- In this lesson learners will practice the "break into parts" method of subtraction for more difficult cases.
- There may be learners that do not manage the "break into parts" method now. You may assist them to some extent, but you should also be ready to tell some learners that it is fine if they do not master it now. Tell them that the filling up method is actually the better method, so it is fine if the stick to it.

ACTIVITIES FOR THE DAY

ORAL, MENTAL AND CONCEPT DEVELOPMENT

Activity 1

Ask learners to calculate each of the following by using the "break into parts" method that was dealt with on the previous day. They should work individually.

6158 – 3643 8382 – 3688 6223 – 2576

Circulate to see how learners are doing. Do not provide assistance now. Some learners may struggle.

Activity 2

Repeat activities 3 and 4 of the previous lesson, for 6223 – 2576.

Activity 3

Ask learners to calculate each of the following by using the "break into parts" method. They should work individually, and they may check their answers by using another method.

1. 5274 – 1889
2. 9025 – 2356
3. 7111 – 5888
4. 8643 – 4754

Circulate and identify learners that may be struggling. Try to understand why they are struggling. If they struggle with minor issues, help them. If they seem completely lost, tell them that may use another method, for example the filling up method.

CONSOLIDATION

Activity 4

If there is time, give more questions like those in activity 3.

WEEK 3: DAY 3

Notes to the teacher:

- This lesson is about the very evasive idea of ratio. Learners have to match cut-out rectangles according to what they look like, and then have to explain why they put certain rectangles together.

Resources:

- A copy of the next page (labeled rectangles) for each learner, and scissors and a ruler.

ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

Activity 1

Hand out copies of the sheet with rectangles and scissors. Learners have to cut out the rectangles.

Activity 2

Ask learners to identify rectangles that look alike although they may differ in size, then to put these rectangles aside from the others. Most learners will probably quickly identify the two squares J and K.

Circulate between the learners. When you notice that most of them have identified J and k as belonging together, write this on the board:

J and K

Keep circulating. Several learners may soon recognise that C and H belong together. When this happens, write this on the board too:

C and H

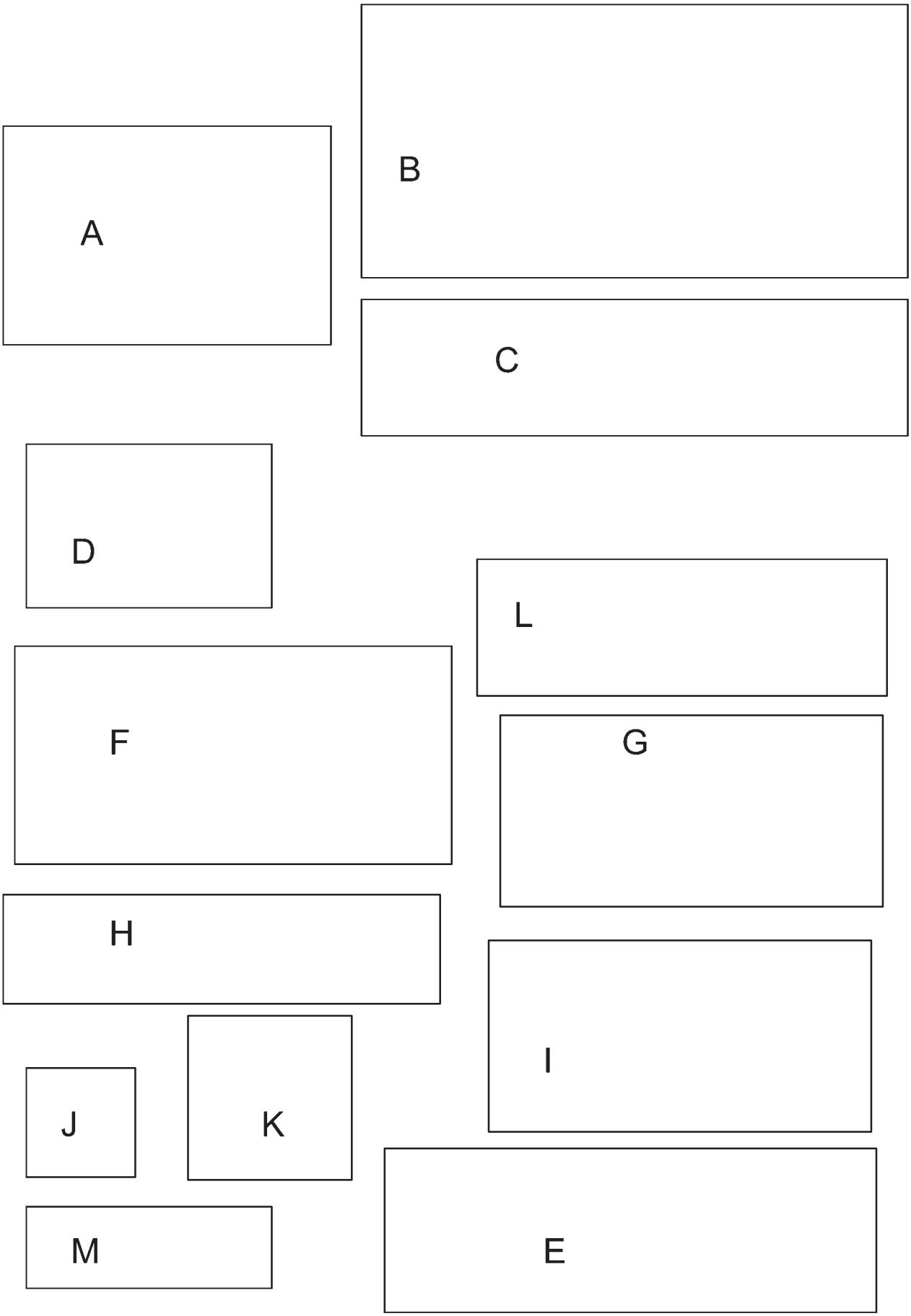
Ask all learners to consider whether they agree that C and H belong together. Ask learners to write their findings down, like you have done on the board. Let learners continue.

Activity 3

When most learners have formed two more groups of look-alike rectangles (possibly F, B and G, and M and L), ask them to try to look for an explanation why certain rectangles look alike. Ask them to measure the width and the height (or length and breadth) of all the rectangles, and to write the measurements on the rectangles.

Activity 4

Let learners form groups to seek for an explanation of why certain rectangles look alike. Some groups may come up with the observation that the relationship between the length and the width is the same in these rectangles, for example that in B, F and G the length is two times the width.


A
B
C
D
L
F
G
H
I
J
K
M
E

WEEK 3: DAY 4

Notes to the teacher:

- In this lesson learners get more opportunities to develop understanding of ratio. They do this by grappling with a quite challenging problem.

ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT AND PROBLEM SOLVING

Activity 1

Discuss this situation with the class:

The Grade 4 learners from a certain school go on an excursion. They will travel with two buses. 36 learners will travel on the one bus and 48 learners will travel on the other bus. They will eat a meal while they travel, on the buses.

The food for the smaller bus is loaded. It is 6 large bottles of juice, 9 loaves of bread and 3 watermelons.

Let learners join in small groups (3 or 4) to talk about the food on the buses for about 5 minutes. The purpose of this is just to ensure that all learners actually attend to and engage with the situation in their minds.

Activity 2

Learners have to figure out, individually, how much juice, bread and watermelons should be loaded on the larger bus, so that learners on the two buses have the same amounts of food.

Circulate among learners. Interact with learners who seem to be inactive: ask them to tell you the story of the buses to check whether they understand and engage with the situation at all.

Arrange learners who believe they have found an answer in groups of 3 and 4 to share and discuss their thoughts on the matter.

Activity 3

Put the following questions to learners who still struggle after about 20 minutes:

How many watermelons do you think should go on the larger bus with 48 learners, three or four or five or six?

How many of each food should go on a bus with 72 learners?

Once they have made a choice, they should try to explain why they made the particular choice.

Learners who have already solved the problem may try to figure out how much juice, bread and watermelons should go on a bus with 24 learners, and a bus with 42 learners.

WEEK 3: DAY 5

Notes to the teacher:

- This lesson provides for consolidation of learners ready knowledge of multiplication facts.

Resources:

- A set of the multiplication fact cards that were cut in term 2 (Term 2 Annexure K) for each learner.
- A copy of the 10 by 10 table sheet (Term 4 Annexure D) for each learner.
- The set of two-digit multiplication fact cards (Term 4 Annexure C) for each learner.

ACTIVITIES FOR THE DAY

ORAL AND MENTAL ACTIVITIES

Activity 1

Let learners, in groups of four or three, play the Number Bond Game, as described in the lesson plan for Term 1, Week 4 Day 1, with the multiplication fact cards (excluding the two-digit cards they cut in Week 1).

CONCEPT DEVELOPMENT

Activity 2

Hand out one copy of the 10 by 10 table sheet to each learner. Learners have to fill in the first table by counting in sixties, the second table by counting in eighties, and the third table by counting in seventies.

Activity 3

Each learner must have a set of two-digit multiplication fact cards. Each learner should also have the 10 by 10 tables for counting in twenties, thirties, forties, fifties and nineties, that they have completed in previous lessons. They must identify the cards for which they know the answers straightaway and write these facts as full number sentences in their classwork books. Then each learner should look up the answer to each of the remaining cards in his/her completed 10 by 10 tables, and write these facts as full number sentences in their classwork books too.

FOURTH TERM: WEEK 4 OVERVIEW

Hours: 5	**Number of Periods: 5**
Mathematics Learning Outcomes and Assessments: **LO 1 AS 6, 8, 9, 10, 11**	**Milestones:** • Knows or quickly determines multiples of single-digit numbers to at least 100 (multiplication tables). • . Knows or quickly determines multiples of 10, 20, 30, 40, 50, 60, 70, 80, 90, 100 up to at least 10 000, e.g. 90 × 70. • Knows how different multiples of 1000 up to 10 000 can be formed in different ways as a sum of multiples of 1000, e.g. 10 000 = 4000 + 6000. • Solves problems that involve grouping and sharing • Multiplication of 2-digit by 2- digit numbers with answers to at least 10 000

	Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 5**
Content Focus	Consolidation of ready knowledge of multiplication facts.	Multiplication of multidigit numbers by breaking the numbers down and multiplying the parts separately.	Multiplication of two-digit by two-digit numbers.	Division (both sharing and grouping) as the inverse of multiplication, using a break down and build up technique of computation.	Sharing problems
Resources	A set of the multiplication fact cards that were cut in term 2 (Term 2 Annexure K) for each learner. A copy of the 10 by 10 table sheet (Term 4 Annexure D) for each learner. The set of two-digit multiplication fact cards (Term 4 Annexure C) for each learner.		A new blank copy of the table sheet used in the previous lesson, for each learner.		

WEEK 4: DAY 1

Notes to the teacher:

- This lesson provides for consolidation of learners ready knowledge of multiplication facts.

Resources:

- A set of the multiplication fact cards that were cut in term 2 (Term 2 Annexure K) for each learner.
- A copy of the 10 by 10 table sheet (Term 4 Annexure D) for each learner.
- The set of two-digit multiplication fact cards (Term 4 Annexure C) for each learner.

ACTIVITIES FOR THE DAY

ORAL AND MENTAL ACTIVITIES

Activity 1

Let learners, in groups of four or three, play the Number Bond Game, as described in the lesson plan for Term 1, Week 4 Day 1, with the multiplication fact cards (excluding the two-digit cards they cut in Week 1).

CONCEPT DEVELOPMENT

Activity 2

Hand out one copy of the 10 by 10 table sheet to each learner. Learners have to fill in the first table by counting in sixties, the second table by counting in eighties, and the third table by counting in seventies.

Activity 3

Each learner must have a set of two-digit multiplication fact cards. Each learner should also have the 10 by 10 tables for counting in twenties, thirties, forties, fifties and nineties, that they have completed in previous lessons. They must identify the cards for which they know the answers straightaway and write these facts as full number sentences in their classwork books. Then each learner should look up the answer to each of the remaining cards in his/her completed 10 by 10 tables, and write these facts as full number sentences in their classwork books too.

Activity 4

Let learners, in groups of four or three, play the Number Bond Game, as described in the lesson plan for Term 1, Week 4 Day 1, with the two-digit multiplication fact cards.

WEEK 4: DAY 2

Notes to the teacher:

- In this lesson learners will multiply multidigit numbers by breaking the numbers down and multiplying the parts separately.

Resources:

You may make copies of the table on the next page, and the questions below, to have more learning time in class.

ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

Activity 1

Let learners make a copy of and complete the table on the next page. You may tell them that the number 12 in the table indicates that 3 items at R4 each costs R12, the number 15 indicates that 3 items at R5 each cost R15, and so on.

Each learner who finishes should join another learner who finishes, and they should check that their table entries are the same. You should also do as much checking as possible.

Activity 2

Write the following on the board and ask learners to use tables they have completed to find out how much each purchase will cost. They must work individually.

A. 8 tins of beans at R7 each.

B. 8 packs of rice at R60 each.

C. 7 tins of fish at R8 each and 7 packs of rice at R60 each.

D. 7 bottles of cooking oil at R68 each.

E. 8 boxes of apples at R76 each.

F. 7 boxes of cereal at R57 each.

Circulate between the learners while they do this. Specifically focus on learners when they do the cooking oil item, D. Give some guidance to learners who do not, after some time, realize by themselves that the amount of R68 can be broken down into R60 and R8 to allow two separate readings from the table, namely 7 × R60 = R420 and 7 × R8 = R56, which can then be added to get the answer. When all learners have finished the cooking oil item, demonstrate the following way of writing on the board, and suggest that they use it for the further items.

7 × 60 = 420 and 7 × 8 = 56, and 420 + 56 = 476

Observe what learners write to do items E and F above, which both require two separate lookups in the table.

Write the following items on the board, for learners to find the costs. Items M and N are only intended for learners who work faster than the others.:

G. 80 tins of beans at R7 each

H. 80 packs of rice at R60 each

I. 70 tins of fish at R8 each and 70 packs of rice at R60 each
J. 80 large bottles of cooking oil at R68 each
K. 60 boxes of apples at R76 each
L. 80 boxes of cereal at R57 each
M. 84 boxes of cereal at R57 each
N. 76 boxes of cereal at R57 each

Activity 3

Let learners, in groups of four or three, play the Number Bond Game, as described in the lesson plan for Term 1, Week 4 Day 1, with the two-digit multiplication fact cards.

	1	2	3	4	5	6	7	8	9	10	20	30	40	60	70	80	90
1																	
2																	
3				12	15	18	21	24	27	30	60	90					
4																	
5																	
6																	
7																	
8																	
9																	
10																	
20																	
30																	
40																	
50																	
60																	
70																	
80																	
90																	
100																	

WEEK 4: DAY 3

Notes to the teacher:

- In this lesson learners will have opportunity to consolidate their know-how to multiply two-digit by two-digit numbers. A key aspect of multiplication with larger numbers is that we make use of known facts like 20 × 30 = 600. The key to multiplying two larger numbers is to break down the task into known facts, for example to break down 87

Resources:

- A new blank copy of the table sheet used in the previous lesson, for each learner.

ACTIVITIES FOR THE DAY

ORAL, MENTAL AND CONCEPT DEVELOPMENT

Activity 1

Hand out a blank copy of the table sheet used in the previous lesson, to each learner. Ask learners to complete it, starting at the right bottom corner (90 times R90) and working upwards and to the left from there. While they work, you may write the questions for activity 2 on the board.

Activity 2

Point out to learners that they have done the following two questions in activity 2 on the previous day:

7 bottles of cooking oil at R68 each.

80 bottles of cooking oil at R68 each.

Ask them to look again at what they did to figure these costs out, and to use the answers they have produced to find out how much 87 large bottles of cooking oil will cost, at R68 for one bottle.

When learners have finished, have a brief classroom discussion about what readings they took from the table to find out how much 87 bottles of cooking oil cost.

> A key aspect of multiplication with larger numbers is that we make use of known or easily-reproduced facts like 20 × 30 = 600. The key to multiplying two larger numbers is to break down the task into known facts, for example to break down 87×68 into
> 7×60 + 7×8 + 80×60 + 80×8.
> Taking readings from the table will help learners to understand how the process works. However, it is important that they gradually come to remember the facts recorded in the table, so that they can become independent of the table.

During this discussion, write up the various readings on the board as shown below.

7 × 60 = 420 7 × 8 = 56 80 × 60 = 4800 80 × 8 = 640

The answer can then be obtained by calculating 420 + 56 + 4800 + 640. In whatever way each learner prefers to do it.

Now ask learners to write down what readings they would have to make on the table, if they want to calculate how much *64 boxes of apples at R76 each* would cost. Ask learners not to write down the answers yet.

Circulate to check that learners get it right then write the four items on the board:

60 × 70 60 × 6 4 × 70 4 × 6

Use this display for a discussion about multiplication. Ask each learner to establish whether he/she knows some of the four answers by heart. If so, they may write these answers down. Then ask learners to each try very hard to find the other answers, without consulting the table. Give them some time to work on this.

After about 5 minutes, tell learners they may look up facts in the table if they need to, and they should complete the calculation.
Circulate and monitor learners' progress.
When most learners have finished, interrupt them and pose the following question:
What would you like to be able to do: to know the small multiplication facts by heart, or to always have a table with you so that you can look up the answers?
Allow learners to discuss this in small groups for about 5 minutes. Take some feedback into a whole class discussion. Conclude this discussion by stating that in South Africa and in most parts of the world, people are supposed to know the facts in the table they have made by heart, or at least be able to very quickly reproduce facts they may have forgotten.

Activity 3
Write the following on the board, for learners to work out the total prices individually, trying to manage without the tables. They have to write their work up as shown above.

A. *86 boxes of cereal at R57 each.*
B. *46 sets of cutlery at R83 for one set.*
C. *53 sets of glasses at R47 for one set.*
D. *72 pairs of socks at R46 for one pair.*
E. *64 T-shirts at R89 for one T-shirt.0*
F. *78 caps at R79 for one cap.*
G. *57 × 64*
H. *68 × 93*

WEEK 4: DAY 4

Notes to the teacher:

- In this lesson learners engage with division (both sharing and grouping) as the inverse of multiplication, using a break down and build up technique of computation.

Resources:

You may make copies of the table below, and the questions, to have more learning time in class.

ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

Activity 1

Let learners copy and complete this table of prices (in rand) for items at a shop.

Number of items	A pack of matches	A half-loaf of bread	A kitchen sponge	A kitchen cloth	A loaf of bread	A tin of soup	A tin of beans
1					7		9
2							
3							
4							
5			5				45
6							
7							
8				48			
9							
10		40				80	
20							
30							
40	120						
50							
60							
70							
80							
90							
100							
200							
300							
400							
500							
600							
700							
800							
900							
1000							

Activity 2

Ask learners to use their tables to find out how much each of the following purchases will cost at the shop. You may suggest that a large hospital will make purchases like this.

86 loaves of bread

374 kitchen sponges

683 kitchen cloths

PROBLEM SOLVING

Activity 3

Let learners do the following problems. They may use the table they completed in activity 1, or they may work in other ways.

1. How many packs of matches can be bought with R950?
2. How many half-loaves of bread can be bought with R950?
3. How many kitchen sponges can be bought with R950?
4. How many kitchen cloths can be bought with R950?
5. How many loaves of bread can be bought with R950?
6. How many tins of soup can be bought with R950?
7. How many tins of beans can be bought with R950?

CONSOLIDATION

Activity 4

Let learners answer the same set of questions for a different amount, namely R840. Suggest that they now try to do it without using the table.

Continue with the following different amounts, encouraging learners to find ways of working without the table:

R980, R670, R720, R890

WEEK 4: DAY 5

Notes to the teacher:

- In this lesson, learners will work at sharing problems.

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ACTIVITIES FOR THE DAY

PROBLEM SOLVING

Activity 1

Tell this story to the class:

Nathi has 6 children, who all go to school. He has 950 sheets of paper and he now wants to share this between the six children. He wants to give the same number of sheets to each child. Nathi now wonders how many sheets of paper he can give to each child. Instead of working it out, he decides to ask the children to make proposals. One child, John, proposes that each of the 6 children should get 200 sheets.

Ask learners to consider whether John's proposal of 200 sheets for each child is a good idea. While they consider this, individually, write the statements for activity 2 on the board.
Conduct a brief whole-class discussion about John's proposal. Conclude this discussion by clarifying that for each child to get 200 sheets, a total of 1200 sheets is required, but that this is not available.

Activity 2

Write the following on the board.

Tebogo proposes 50 sheets for each child.
Lerato proposes 10 sheets for each child.
Humphrey proposes 150 sheets for each child.
Petrus proposes 180 sheets for each child.
Sammy proposes 160 sheets for each child.

The purpose of this activity is to allow learners to experience that one may estimate and test to work towards the solution of a fair sharing problem.

Ask learners to consider each of these proposals, and then to finally come up with their own proposal. They have to do this individually.
Circulate and observe what learners do. Arrange learners who believe they have finished into small groups, and ask them to compare their answers and their methods of working.

Activity 3

Ask learners to figure out how many sheets each child will get if there are only 4 children, with 950 sheets available. Circulate and observe their work. In the case of learners who lack ideas on what to do, you may suggest that they consider the proposals in activity 2 for this case (4 children) too, or make proposals of their own and test it.
Let learners also figure out how 950 sheets may be fairly shared between 3, 5, 7, 8 and 9 children.

Activity 4 Ask learners to compare their answers for the question in activities 2 and 3 to their answers for activity 3 of the previous day. Let them work on this individually for about 5 minutes and then discuss it in small groups for about 5 minutes. This may lead to learners starting to realize that although the problems in the previous lesson (grouping problems are quite different from the problems in today's lesson (sharing problems), there is something similar about them too.
CONSOLIDATION **Activity 5** Let learners figure out how each of the following amounts may be fairly shared between 3, 4, 5, 6, 7, 8 and 9 people: R980, R670, R720, R890

FOURTH TERM: WEEK 5 OVERVIEW

Hours: 5					**Number of lessons: 5**
Mathematics Learning Outcomes and Assessments: LO 4 AS 5,6,7,8			**Milestones:** • Uses the appropriate SI units (millilitres and litres) to estimate, measure, record and compare capacity: • Investigates and approximates volume/capacity of three-dimensional objects (by packing or filling them) in order to develop an understanding of cubic units. • Solve problems involving selecting, calculating with and converting between appropriate SI units: - millilitres↔litres. • Use appropriate measuring instruments to appropriate levels of precision including: - measuring jugs to measure capacity.		
	Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 5**
Content Focus	Revise capacity using non-standard measures	Investigates volume/capacity by filling 3D objects	Conversion to SI units used for capacity	Using measuring jugs to approximate measurements	Problem solving using capacity as the context
Resources:	An ice-cream container, bucket, a jug, a milk carton, a plastic juice bottle, cups, bucket of water	Dough or clay, with which learners can make small cubes. Scissors. Empty cereal or other boxes of similar or smaller size (for example the boxes in which tea bags come). A copy of Term 3 Annexure E (square cm grid)	Teaspoons, tablespoons, cups, litre containers, water, egg-cups, thimbles, bottle tops, small jugs, vases, etc.	A 1 litre plastic bottle e.g. milk or juice bottle for each learner, marking pens, rulers, water, calibrated measuring containers.	Paper, pencils, workbooks, marbles, cereal boxes, blocks, sand.

WEEK 5: Day 1

Notes to the teacher:
This week you will be dealing with capacity. You will start off the week by working with non-standard units as revision of work done in the Foundation Phase. You will work through the week gradually building up an understanding of capacity/volume leading to using standard units of measurement. By the end of the week you will expect your learners to be able to convert between litres and millilitres. Most of the work this week will be practical. Learners will need to bring as many containers as they can for use during the week.

Resources:
An ice-cream container, bucket, a jug, a milk carton, a plastic juice bottle, cups, bucket of water

ACTIVITIES FOR THE DAY

ORAL AND MENTAL ACTIVITY (10 minutes)

- Choose a 4 digit number and the first learner adds 10 to the number, the next learner adds 20 to the number and so on until 90 has been added to the number. The next learner takes away 10 from the last number said, the next learner takes away 20 and so on until 90 has been taken away. Choose another 4 digit number and continue like this until everyone has had a turn.
- Let the learners stand behind their chairs. Start by asking how much 321 plus 11 is. The first learner with the correct answer sits down and may not answer any more. Keep adding or subtracting 11s or 99s e.g. 321+99=420, 421+11=432, 471-11=460, 461+299 etc. As learners answer correctly they sit down till there are only a few learners left standing. These learners get a chance to answer first the next time you play this game.

CONCEPT DEVELOPMENT (40 minutes)

- Take the class outside and put them into groups of 6. Each group has a cup and also chooses 3 containers bigger than a cup e.g. an ice-cream container, bucket, a jug, a milk carton, a plastic juice bottle, etc. Each group must have a bucket of water. Learners first estimate how many cups of water each container will hold, then check by measuring with the cup. Learners need to record first their estimates, then the actual amount e.g.

Container	Estimate	Tally	Actual number	Difference
Ice-cream container	11 cups	卌 卌 IIII	14	3 less
Bottle	4 cups	卌	5	1 less
Dish	9 cups	卌 II	7	2 more

- Learners now estimate how many cupfuls of water there are in a plastic bottle. It does not matter whether it is a 1 litre or a 2litre bottle. They check their estimates by:
  - Filling the bottle using a cup and counting the number of cupfuls and
  - Filling the cup from the bottle and counting the number of cups.
- Ask the learners if they think the number of cupfuls in a bottle will change if they use something else, like sand, instead of water. Let them experiment with other objects e.g. marbles, sand, beans, sugar, etc.

CONSOLIDATION (10 minutes) • Back in the classroom, let the different groups compare the charts that they filled in. They need to look for things like: - Which containers held the same number of cupfuls of water? - Which container held the most/least? - Which shape container was the most difficult to estimate? Why? • Discuss the need for a standard unit of measurement for capacity.	
ASSESSMENT	**Formal :** No formal, recorded Assessment **Informal :** Unrecorded assessment of learners oral responses and ability to participate

WEEK 5: Day 2

Notes to the teacher:
In this lesson you will provide learners with an experience of estimating how many small cubes (approximately 1 cm by 1cm) can be packed into a given box, then to pack cubes into the box as tightly as possible to check the estimate.

Resources:
- Dough or clay, with which learners can make small cubes.
- Scissors.
- Empty cereal or other boxes of similar or smaller size (for example the boxes in which tea bags come).
- A copy of Term 3 Annexure E (square cm grid) for each learner.

ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT (60 minutes)

- Give each learner a copy of the square cm grid, and some clay. Learners have to make cubes of as close to 1 cm by 1 cm by 1 cm as they can. A good way is to take a small piece of clay (dough) and roll it into a ball, then press it slightly flat between the thumb and one finger, first in one direction, then another, then another to from a rough cube. The rough cubed may then be improved, and The learner should then test the size by holding the rough cube against one of the squares on the grid, and add or remove clay (dough). With a little practice learners should soon manage to make reasonable approximately 1 cm by 1 cm by 1cm cubes. Each learner should make approximately 30 cubes.
- Each learner should cut of the bottom portion of a box, about 3 cm deep.
- Arrange learners in groups of five or four. The group should inspect their boxes and arrange them from biggest (the one they believe will take the most cubes) to the smallest. The group members should now each predict how many of their cubes can be packed tightly against each other in the smallest box, and write the prediction down. Then one group member should pack some of their available cubes into the box until it is full. The other group members should make more cubes in the meantime. When the group member who packed has filled the box, he/she should determine the number of cubes that fitted into the box and announce the result. The group members should then check how well they predicted, and a winner (the one with the best prediction) should be identified. Group members should then predict how many cubes will fit into the second smallest box. A different group member should now pack cubes in this box, while the others make still more cubes. The process should be continued until they have dealt with all the boxes.

WEEK 5: Day 3

Notes to the teacher:
Today you will deal with standard units of measurement for capacity. This was introduced in Grade 3, so should be familiar to most learners. Make sure learners identify millilitres as the smaller unit of measurement and litres as the bigger.

Resources:
Teaspoons, tablespoons, cups, litre containers, water, egg-cups, thimbles, bottle tops, small jugs, vases, etc.

ACTIVITIES FOR THE DAY

ORAL AND MENTAL ACTIVITY (10 minutes)

- Give learners a worksheet containing multiplication number sentences. Learners need to write and explain how they got the answer, e.g.

3x25=	I know this because_____.
6x25=	I know this because _____.
12x25=	I know this because _____.
24x25=	I know this because _____.
24x50=	I know this because _____.
25x25=	I know this because _____.

CONCEPT DEVELOPMENT (40 minutes)

- Take the class outside and let them sit in a big circle so that everyone can see. Show learners a collection of different containers e.g. coldrink tin marked 340ml., Juice bottle marked 1 litre, bucket marked 5 litres, set of measuring spoons marked from 2ml. to 25 ml., measuring jug marked from 100ml. to 1 litre, etc. You should also have an assortment of unmarked containers e.g. egg-cups, thimbles, bottle tops, small jugs, vases, etc. Discuss the different containers and what the capacity of each container is. Ask someone to arrange the containers in order of the least capacity to the most capacity. If you have enough containers, let one learner arrange the containers that are measured in ml. and another learner arrange the containers measured in litres. Encourage learners to check the measurement of different containers e.g. does the vase hold more or less water than the 1 litre plastic bottle?
- Now put the learners into groups of 6. Each group has a teaspoon (5ml.), a tablespoon (25ml.), a cup (250ml.), a litre container and some water. Learners use the different measures to do the following, each time recording the amounts, e.g.
  - How many teaspoons in a tablespoon?
  - How many teaspoons in a cup?
  - How many tablespoons in a cup?
  - How many cups in a litre?
  - If there are 4 cups in a litre, how many ml. in each cup?
  - If there are 250ml. in a cup, how many ml. in a tablespoon? *Use the number of tablespoons in a cup to help you work it out.*

- If there are 25ml. in a tablespoon, how many ml. are there in a teaspoon? *Use the number of teaspoons in a tablespoon to help you work it out.*
- How many teaspoons are there in a litre? How do you know?
- How many tablespoons are there in a litre? How do you know?

• Learners choose from the collection of containers two that they think will hold less than a teaspoon and two that they think will hold more than 1 litre. They will measure and record e.g. the bottle top holds less than 5ml..

CONSOLIDATION (10 minutes)

• Revise the different measurements e.g.
- A cup measures 250ml.. 4 cups make 1 litre. So a litre is 1 000ml..
- A quarter of 1 000 is 250. So a cup holds a quarter of a litre.
- A teaspoon is 5ml. So 10 teaspoons are 50ml. That is one fifth of a cup (250ml.).
- If 1 liter is 1 000ml. a half a litre is 500ml, which is 2 cups, etc.

ASSESSMENT	**Formal :** No formal, recorded Assessment **Informal :** Unrecorded assessment of learners oral responses and ability to participate

WEEK 5: Day 4

Notes to the teacher:
Today you will be dealing with a measuring jug. This is the most common calibrated container in homes and usually used in the kitchen. Learners will make their own measuring jug of 1 litre.

Resources:
A 1 litre plastic bottle e.g. milk or juice bottle for each learner, marking pens, rulers, water, calibrated measuring containers.

ACTIVITIES FOR THE DAY

ORAL AND MENTAL ACTIVITY (10 minutes)

- Play 'My secret capacity number' e.g.
  - I am more than 4 teaspoons, but less than a tablespoon. I am even and am in the 6 counting pattern.
  - I am more than 3 cups and 10 teaspoons but less than 1 litre. I am made up 90 tens.
  - I am more than 3 2litre bottles and less than half of 7 2litre bottles. I am exactly half way between the two
- Give each learner a piece of paper on which they write 5 number sentences without the answers. Swap the papers and the next learner fills in the answers. Swap the paper again, and the third learner checks if the answer is correct.

CONCEPT DEVELOPMENT (35 minutes)

- You will need a few measuring jugs – at least one for each group. Put the jug in the middle of the group and let them examine the markings on the jug. Ask different learners to show the following markings:
  - the litre mark
  - the 500ml. mark
  - the 100ml. mark etc.

  Discuss how many 100ml are needed to fill the jug to the 1 litre mark. Ask how many cups will be needed to fill the measuring jug to the 1 litre mark, and check it by letting a learner fill cups and pour it into the jug. Spend time making sure that learners understand that the measuring jug is an accurate measure.
- Make sure each learner has a 1 litre clear plastic bottle. Using the measuring jug, learners fill their container with 1 litre of water and mark the level with a marking pen (a thick koki will work).
- Once everyone has marked their container, discuss how they can find out where half a litre (500ml.) will be. Using a ruler or tape measure, and making sure the container is on a flat surface, learners measure from the base of the container to the 1 litre mark. They then work out where the half way mark is and mark the bottle as 500ml. Learners then mark the intervals of 100ml.
- Working in pairs, one learner fills his/her bottle to 100ml and pours this into the partner's bottle to check if it reaches the 100ml. mark. Taking turns, learners check that the different levels are the same in both bottles e.g. 500ml in one bottle is 500ml when poured into the other bottle.

CONSOLIDATION (15 minutes) • Working in pairs, learners collect 3 containers, e.g. lunch boxes, pots, jars, tins, etc. Using their litre bottles, they estimate how much water the container will hold then measure it. They need to record the measure as accurately as possible as the bottles are marked in 100ml. intervals.	
ASSESSMENT	**Formal :** No formal, recorded Assessment **Informal :** Unrecorded assessment of learners oral responses and ability to participate

WEEK 5: Day 5

Notes to the teacher:
The learners have done a lot of practical work this week on capacity. Today you are going let them explore their understanding of the SI units used for measuring capacity through solving problems.

Resources:
Paper, pencils, workbooks, marbles, cereal boxes, blocks, sand.

ACTIVITIES FOR THE DAY

ORAL AND MENTAL ACTIVITY (10 minutes)

- Tell a story that allows learners to use their knowledge of SI units e.g.
- Mom went shopping. She bought 3 2litre bottles of milk, then she bought 2 340ml. cans of Coke. She also bought 2litres of dishwashing liquid and a 500ml. jar of honey. How many millilitres of liquid did Mom buy?

CONCEPT DEVELOPMENT (50 minutes)

- Divide the class into 4 groups. Rotate the groups every 10 to 12 minutes so that all groups have an opportunity to engage with all the activities. Allow learners to work in pairs and give each group one of the following problems to solve:
- **Group A :** Fill your litre bottle with water to the 500ml. mark. Add 5 marbles and record what happens. Take out the marbles, add 5 blocks and record what happens. Repeat using 5 small stones and 5 paper clips. Which object is the heaviest? How do you know?
- **Group B:** Use a cereal box. Fill it with cubes/blocks. Record how many blocks it takes. Find another container that uses the same number of blocks to fill. Do the containers have the same capacity? How do you know?
- **Group C:** Fill a cereal box/milk bottle with marbles. If there is empty space, fill it with sand. Take the marbles out and measure how much sand was used by pouring the sand into your 1 litre bottle. Now fill the same container with blocks. If there is empty space, fill it with sand. Take the blocks out and measure how much sand was used. What is the difference between using marbles and blocks? Which has the least empty space? Why?
- **Group D:** For this activity, let learners work independently and use the recording as a formal assessment activity e.g.
  - ✓ Jabu drank 8 glasses of water each day. Each glass holds 200ml. How much water did Jabu drink in 5 days?
  - ✓ The Smith family drinks $2\frac{1}{2}$ litres of milk every day. How much milk do they drink in April?
  - ✓ Granny made some lemonade. She bottled them in bottles containing 750ml. If she bottled 32 bottles, how many litres of lemonade did Granny make?

ASSESSMENT	**Formal :** • Estimates, measures, records, compares and orders 2D shapes and 3D objects using SI units with appropriate precision for: - Capacity (millilitres and litres) • Solves problems involving selecting, calculating with and converting between appropriate SI units • Investigates and approximates - Volume/capacity of 3D objects by packing or filling them in order to develop an understanding of cubic units

FOURTH TERM: WEEK 6 OVERVIEW

Hours: 5					**Number of Periods: 5**
Mathematics Learning Outcomes and Assessments: LO 1: AS 3, 5, 7 LO4 : AS 2			**Milestones:** • Solve problems involving rate, in the number range 1 to 10 000 • Solves problems involving equal sharing and measurement, involving fractions including halves, thirds, quarters, fifths, sixths, sevenths, eighths, ninths and tenths and mixed numbers involving these fractions, expressed in words and in the common and decimal notations (tenths only). • Recognise and use equivalent fractions. • Addition of fractions in context		
	Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 5**
Content Focus	Investigating rates, including informal understanding of time and distance. Multiplication and division in a practical context.	Calculate and apply rates, in the context of walking and earning. Convert between different time units in the context of solving problems	Consolidation and extension of learners' knowledge of fractions, and different equivalent ways of expressing fractional quantities. Looking at the relationship between equal sharing and fractions.	Consolidation and extension of learners' knowledge of fractions, and different equivalent ways of expressing fractional quantities.	Further consolidation of learners' knowledge of fractions and decimals.
Resources	A watch that shows seconds. Rulers. A whistle or a school bell, or some other instrument with which to make a loud sound.		Each learner needs a ruler for reference purposes. It will make more learning time available in class if you make copies of the six questions in activity 1, and the question in activity 2 beforehand, to hand out to learners.	Each learner needs a ruler for reference purposes. It will make more learning time available in class if you make copies of the two tables, and the questions in activity 2 beforehand, to hand out to learners.	

WEEK 6: DAY 1

Notes to the teacher:

- This lesson is about rates. It also provides for some strengthening of learners informal understandings of times and distances.
- At the same time, learners will practice multiplication and division in a practical context.

Resources:

- A watch that shows seconds.
- Rulers.
- A whistle or a school bell, or some other instrument with which to make a loud sound.

ACTIVITIES FOR THE DAY

ORAL, MENTAL AND CONCEPT DEVELOPMENT

Activity 1

Ask learners to estimate how many metres they can walk in one hour. Each learner has to write his/her estimate down. Say to learners that they will now do an experiment to check on their estimates. Tell them that they will go outside, and you will allow them to walk for 30 seconds. While they walk, they have to count the number of steps that they walk during this period of time. Before they go out, they each have to take one step and let a classmate measure the lenth of their step with a ruler, in centimetres. Let them do that now, and let them each write down how long their step was.

Activity 2

Tell learners that they will now go outside, where they must stand in a straight line on a place that you indicate to them. Choose a place where they can walk straight forward for half a minute Tell them that you will give a sign (for example by blowing a whistle) to indicate they have to start walking, and again to indicate that they should stop. After this they should come back to class immediately, but they should remember how many steps they took during the timed walk.

Activity 3

Back in class, each learner should now calculate how far, approximately, they walked during the 30 seconds. Ask them to first decide how they will do this, and to then talk to one or two classmates about their plan. Circulate and listen to and interact with learners, to ensure that they all realise they have to multiply their number of steps by the distance of their step, as it was measured before they went outside. Let them now do their calculations. While they work, write the questions for activity 4 on the board.

Activity 4

Learners now have to do the following questions which you have written on the board:

1. *Approximately how many metres did you walk in 30 seconds?*
2. *Approximately how many metres will you walk in 1 minute?*
3. *Approximately how many metres will you walk in 1 hour?*
4. *How many kilometres is that?*
5. *How does that compare to the estimate you made at the beginning of the lesson?*
6. *Approximately how many kilometres can you walk in 8 hours?*

WEEK 6: DAY 2

Notes to the teacher:

- In this lesson, learners will calculate and apply rates, in the context of walking and earning.
- Learners will also convert between different time units in the context of solving problems.

ACTIVITIES FOR THE DAY

PROBLEM SOLVING

Activity 1

Write these three problems on the board, and let learners do the work individually. :

1. *Manare can walk about 34 metres in one minute. How far can he walk in 1½ hours?*
2. *Lebogang walked 2,4 km in one hour. Approximately how far did she walk in each minute?*
3. *Bertha can walk about 42 metres in one minute. How long will she take to walk a distance of 840 metres?*

Circulate and observe learners' work. Some learners may find these problems quite challenging. You may assist learners who do not make progress by:

- asking them to tell you how they understand the question, and by clarifying the question if they are not clear about it
- pointing out that it may help them to convert from hours to minutes (questions 1 and 2) and from km to metres in question 2

ASSESSMENT

Activity 2

Give the following questions as an assessment task in the second half of the lesson period.

1. Trevor earns R24 per hour at a factory. How much will he earn in a week, if he works for 40 hours each week?
2. How many hours does Trevor have to work to earn R1000?
3. Mlungisi works 48 hours each week, and he earns R960 each week. How much does he earn in one hour?
4. Jeminah works 45 hours each week, and she earns R540 each week. How much does she earn in 8 hours?

WEEK 6: DAY 3

Notes to the teacher:

- This lesson provides for consolidation and extension of learners' knowledge of fractions, and different equivalent ways of expressing fractional quantities.
- The activities provide learners with opportunities to experience the relationship between equal sharing and fractions.

Resources:

- Each learner needs a ruler for reference purposes.
- It will make more learning time available in class if you make copies of the six questions in activity 1, and the question in activity 2 beforehand, to hand out to learners.

ACTIVITIES FOR THE DAY

ORAL, MENTAL AND CONCEPT DEVELOPMENT

Activity 1

Write the following questions on the board (or hand out copies you have made), for learners to do individually:

1. *A one metre length of string is divided into 4 equal pieces. How long is each piece?*
2. *A one metre length of string is divided into 5 equal pieces. How long is each piece?*
3. *A one metre length of string is divided into 5 equal pieces. How long are two of these pieces, added together?*
4. *A one metre length of string is divided into 10 equal pieces. How long is each piece?*
5. *A one metre length of string is divided into 10 equal pieces. How long are four of these pieces, added together?*
6. *A one metre length of string is divided into 10 equal pieces. How long are three of these pieces, added together?*

Allow learners to decide for themselves in what units to express their answers to the above questions. Different learners may make different decisions in this respect. There are the following possibilities:

- To express the answers in terms of fractions of a metre, for example "two fifths of a metre" or "$\frac{2}{5}$ metre" for question 3.
- To express the answers in terms of fractions of a metre, and to represent this in the decimal notation, for example "0,4 metre" for question 3.
- To express the answers in centimetres, for example "40 cm" for question 3.
- To express the answers in millimetres, for example "400 mm" for question 3.

Circulate between learners and observe how they express their answers. It is quite possible that all learners express their answers either in mm or in cm, or even that all learners express their answers in cm.

Identify learners who have finished with all the questions. If you find that different learners express their answers in different ways, assign them into groups of four or three learners who have expressed their answers in different ways, and let them compare their ways.

Activity 2

Write the following on the board (or hand out copies you have made), for learners to do individually:

Sarie, Tim, Essop, Miriam and Zweli gave these different answers for question 5:

Sarie: *4 tenths of a metre*

Tim: *40 cm*

Essop: $\frac{2}{5}$ *of a metre*

Miriam: *40 mm*

Zweli: *0,4 metre*

What do you think of these answers? Are some of them wrong and others are right?

Activity 3

Let learners join in groups of four or three learners. Ask them to compare their views, and to try to come to agreement.

Activity 4 (This may have to happen in the next lesson)

Explain what the different answers mean and how they are related. Try to ensure learners understand that all the answers are actually the same: they are just different ways to represent the same quantity. One way of doing this is have a thick piece of string, 40 cm long, or a piece of wood or carton, and to hold this up and ask:

- Is this 4 tenths of a metre long?
- Is this 40 cm long?
- Is this 2 fifths of a metre long?
- Is this 400 mm long?
- Is this 0,4 mm long?

WEEK 6: DAY 4

Notes to the teacher:

- This lesson provides for consolidation and extension of learners' knowledge of fractions, and different equivalent ways of expressing fractional quantities.

Resources:

- Each learner needs a ruler for reference purposes.
- It will make more learning time available in class if you make copies of the two tables, and the questions in activity 2 beforehand, to hand out to learners.

ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

Activity 1

Say to learners that you now want each of them to express their answers for activity 5 of the previous day in all the different ways in which it can possibly be expressed. Write the following table on the board, and ask learners to copy and complete it.

	Fraction of a metre	Fraction of a metre in decimal notation	Millimetres	Centimetres	Fraction in a different way, where it is possible
Question 1				25 cm	
Question 2				20 cm	
Question 3				40 cm	
Question 4				10 cm	
Question 5	4 tenths of a metre	0,4 m	400 mm	40 cm	2 fifths of a metre
Question 6				30 cm	

Circulate and provide assistance where necessary, without telling learners the answersL

PROBLEM SOLVING

Activity 2

Write the following questions on the board for discussion:

An amount of money is equally shared between 6 people.
How much money will each person get?

Ask learners to comment on this question. Some learners may say that one cannot say, because the amount is not given. Admit this, but ask whether we can still say something. Some learners may come up with the idea that one can at least say that each person will get one sixth of the amount. If no learner comes up with this, point out to them that one can at least say this.

Write the following questions on the board, for learners to do individually.

1. *An amount of money is equally shared between 8 people. How much money will each person get?*
2. *An amount of money is equally shared between 8 people. How much money will 3 of the people together person get?*
3. *An amount of money is equally shared between 5 people. How much money will each person get?*

4. *An amount of money is equally shared between 5 people. How much money will 3 of the people together get?*
5. *An amount of money is equally shared between 10 people. How much money will each person get?*
6. *An amount of money is equally shared between 10 people. How much money will 7 of the people together get?*
7. *An amount of money is equally shared between 10 people. How much money will 6 of the people together get?*

As learners finish, assign them to groups of four or three to compare and check their answers. In the meantime, write the question for activity 3 on the board.

Activity 3

Let learners answer the above questions for each of the following amounts (write these on the board): R120, R240, R160.

Activity 4

Let learners answer the above questions for each of the following amounts (write these on the board): R24, R12, R16.

WEEK 6: DAY 5

Notes to the teacher:

- This lesson provides for further consolidation of learners knowledge of fractions and decimals.

ACTIVITIES FOR THE DAY

ORAL AND MENTAL ACTIVITIES

Activity 1

Write following task on the board, and let learners tackle it individually:

1. *Arrange the following distances from shortest to longest:*
   $\frac{7}{10}$ *of 1,2 metres* $\frac{4}{5}$ *of 1,2 metres* $\frac{3}{4}$ *of 1,2 metres* $\frac{8}{10}$ *of 1,2 metres*
2. *Express each distance in millimetres, and use the answers to check your answer for question 1.*

CONCEPT DEVELOPMENT

Activity 2

Write the following table on the board. Learners have to copy and complete it. A few cells may be impossible for learners at this stage.

Distance in metres	Distance in kilometers using ordinary fraction notation	Distance in kilometers using fraction in words	Distance in kilometers using decimal notation	Distance in kilometers using a different fraction
2800 m				
	$3\frac{3}{10}$ km			$3\frac{3}{5}$ km
		1 and 2 fifths of a km		
			4.7 km	
2125 m				
	$3\frac{6}{8}$ km			

Take this work in for formal assessment purposes

ASSESSMENT	**Formal assessment task against the milestones:** • Recognises and represents numbers in order to describe and compare them: - common fractions with different denominators including halves, thirds, quarters, fifths, sixths, sevenths, eighths, ninths and tenths and mixed numbers involving these fractions

FOURTH TERM: WEEK 7 OVERVIEW

Hours: 5			**Number of Periods: 5**		
Mathematics Learning Outcomes and Assessments: LO 3: AS 5, 7			**Milestones:** • Describes changes in the view of a simple 3-dimensional object from different positions (top, side, front and back). • Makes two-dimensional shapes and patterns from geometric shapes (e.g. tangrams) with a focus on tiling (tessellation) and line symmetry.		
	Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 5**
Content Focus	Viewing the same object from different positions.	Viewing the same object from different positions.	Drawing some tiling's (tessellations).	Learners will tile (tessellate) with cut-out kites and other quadrilaterals.	Drawing some tiling's (tessellations).
Resources	The different prisms and pyramids that learners made in term 3.		Learners will need rulers and good (longer than 15 cm) sharp pencils.	Two pieces of cereal box carton (about 8 cm by 5 cm each) for each learner. Scissors. Copies of the first two pages of Term 4 Annexure H for each learner. Each learner must have three blank sheets of paper, preferably A4 or similar size, and a good pencil. A large kite made from thick carton, that you can use to demonstrate on the board.	Two pieces of cereal box carton (about 3 cm by 5 cm each) for each learner. Scissors. Copies of the third page of Term 4 Annexure H for each learner. Each learner must have three blank sheets of paper, preferably A4 or similar size, and a good pencil.

The lesson plans for days 1 and 2 are interchangeable with the lesson plans for days 4 and 5, to make the available scissors go round.

WEEK 7: DAY 1

Notes to the teacher:

- The lesson is about viewing the same object from different positions.

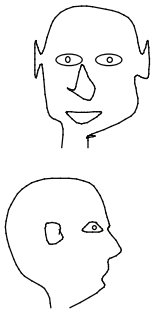
Resources:

- The different prisms and pyramids that learners made in term 3.

ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

Activity 1



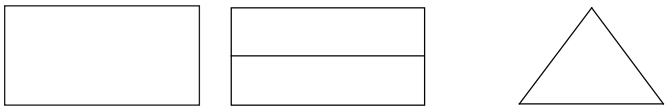
Look at the class from the front and ask learners to make a very rough drawing of your face, as they see it. Then turn sideways, and ask learners to now make a very rough drawing of what they see of your head and face. Move around so that all learners can have opportunity to see your head and face "straight from the side on". Now turn around so that learners can only see your back, and ask them to make a rough drawing of what they see of your head.

Ask learners which of their drawings would they call a "front view" of your face (write the words on the board), which drawing would they call a "side view' and which one a "back view".

Activity 2

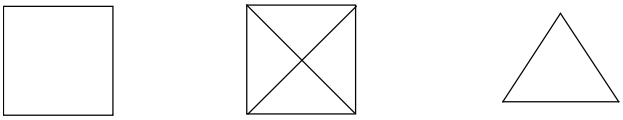
Ask learners to make very rough drawings of a side view of a shoe. Then ask them to make rough drawings of a "top view" and a "bottom view" of a shoe. While they do this, make sets of drawings like the following on the board.

Object A



View 1 View 2 View 3

Object B



View 1 View 2 View 3

Activity 3

Ask learners to look at all their paper prisms and pyramids, and to try to identify what objects A and B are. (Object A is a triangular prism, and object B is a square based pyramid.) Circulate between learners to check how well they manage. Allow them to compare their opinions in small groups. Ask them to decide which of the numbered views they would call a 'top view", which a "side view" and which a "bottom view". Finally ask learners to individually make drawings of a bottom view, two different side views and a top view of the truncated triangular prism that they made previously.

WEEK 7: DAY 2

Notes to the teacher:

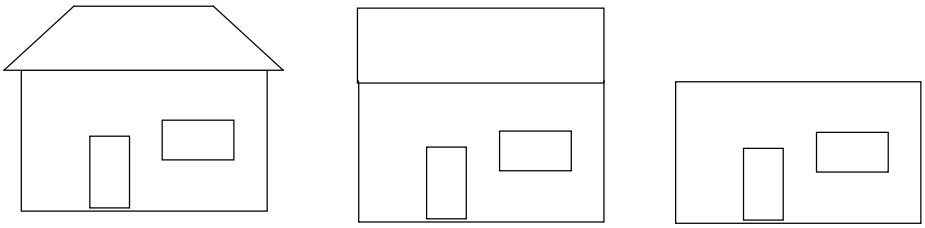
- In this lesson, learners will make more drawings of objects seen from different viewpoints.

ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

Activity 1

Ask learners to make drawings of the desk at which they work. One drawing should be of the desk as seen from the top, as a fly that hangs from the ceiling would see it. Another drawing should be as seen from one side, and another drawing as seen from another side. While they work on this, make the drawings below on the board. Also tell learners that when they have finished with their drawings of the desk, they should compare drawings with each other and make improvements if necessary.



House A House B House C

Activity 2

Ask learners to look at the drawings on the board, and to try to imagine what the three houses look like from above, as a bird flying over would see them. They should then make drawings of what one would see from the top, for each of the three houses.

Activity 3

Draw three squares, as similar as you can, on the board. Write the labels “top view”, side view”, “another side view” and “bottom view” below the four drawings. Ask learners to try to figure out what kind of object this is. While they work on this, also draw four equal circles, with the same labels.

Activity 4

Ask learners to make four drawings of an egg, as one would see the egg from four different positions.

WEEK 7: DAY 3

Notes to the teacher:

- Learners will draw some tilings (tessellations). An important purpose with the activities in this lesson is to allow learners with opportunities to sharpen their observation skills and attention to detail.

Resources:

- Learners will need rulers and good (longer than 15 cm) sharp pencils.

ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

Activity 1

Ask learners to make a drawing of a brick wall which has no windows or doors, on ruled paper. Ask them to utilize the lines printed on the paper, so that it does not take them too long to make the drawing. They should fill a full page with their drawings. Do not demonstrate at the beginning by making a drawing on the board (you will do this later). It is critically important that learners have an experience of expressing a mental image (a "picture" they have in their minds) by making a drawing.

Activity 2

Circulate and observe what learners do. Once all learners have made some progress, let them go outside, taking their drawings with them, to take a look at a brick walls and to reflect on their drawings critically. If there are no unplastered brick walls to be seen close to the classroom, make a rough but neat drawing of a brick wall on the board, or show a large picture or circulate some pictures of a brick wall.

Learners may now make new, better drawings of a brick wall. If they cannot find any fault with the drawings they have already started to make, they may continue with them. While learners work, hand out copies of the first sheet (drawings of brick walls).

Activity 3

Ask learners to (individually) consider the four drawings on the hand-out sheet, and to decide which one is the best drawing of a brick wall. Allow some time for learners to make judgments and then ask them to discuss it in small groups.

ASSESSMENT

Activity 4

Let each learner produce a written description of the differences he/she observes between the four drawings on the hand-out sheet. Take these in for assessment purposes.

WEEK 7: DAY 4

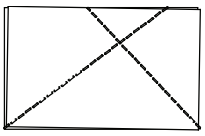
Notes to the teacher:
- Learners will tile (tessellate) with cut-out kites and other quadrilaterals.

Resources:
- Two pieces of cereal box carton (about 8 cm by 5 cm each) for each learner.
- Scissors.
- Copies of the first two pages of Term 4 Annexure G for each learner.
- Each learner must have three blank sheets of paper, preferably A4 or similar size, and a good pencil.
- A large kite made from thick carton, that you can use to demonstrate on the board.

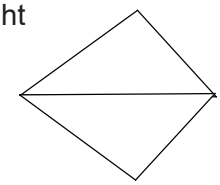
ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

Activity 1



Hand out the pieces of carton, and scissors. Ask learners to fold their pieces of paper in half, and to sharpen the crease a bit. Demonstrate to learners how they can cut a (double) triangle from the folded sheet of carton, with two straight cuts. They should cut their triangles as big as possible. They should then fold their cut-out pieces open, to each form a kite as shown here.



Activity 2

Hand out the sheet with the kite “string” and kite “block”. Tell learners that they will soon make their own drawings like this, but that you will take the sheets back before they do that. So, they have to make a plan to remember what the drawings look like. Tell them they have 10 minutes to prepare themselves. Suggest that they make rough drawings, which you will allow them to keep.

Activity 3

Take in the sheets with the kite tilings. Make sure that each learner has a clean sheet of paper to work on. Use the large kite that you prepared to demonstrate on the board how one may use it as a template to draw a kite. Then ask learners to use their carton kites to draw a kite in the middle of the page. Go round and check that they get this right. As you walk around, ask learners to continue drawing kites with the template, so as to make a block of kites as they have seen on the hand-out sheets during activity 2. Continue to circulate, and make sure that learners understand that they should not leave openings between the kites. In cases where learners have made a mess of it, give them new clean sheets to start afresh.

Activity 4

Let learners cut their kites into two triangles. They should then try to draw the kite block just by using one triangle as a template.

WEEK 7: DAY 5

Notes to the teacher:

- Learners will draw more tilings.

Resources:

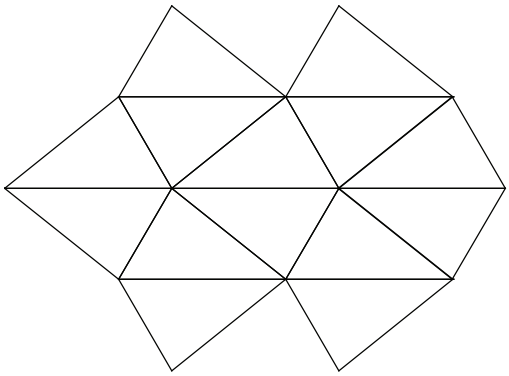
- Two pieces of cereal box carton (about 3 cm by 5 cm each) for each learner.
- Scissors.
- Copies of the third page of Term 4 Annexure G for each learner.
- Each learner must have three blank sheets of paper, preferably A4 or similar size, and a good pencil.

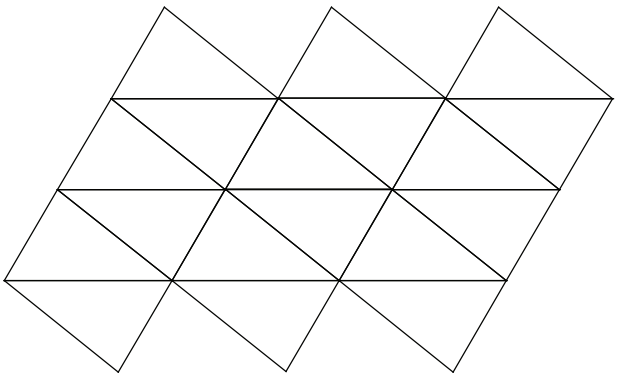
ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

Activity 1

Each learner needs two blank sheets, and one of the triangles they cut on the previous day. Challenge learners to make two different tilings with the same triangle. Do not show the following drawings of the two different types of tiling one can make with triangles to them.



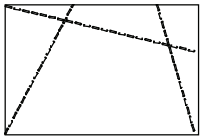


Activity 2

Hand out a copy of page 3 of the tiling sheets to each learner, Tell them that like on the previous day, they have some time to look at the tiling you have given them, and then they will have to draw such a tiling themselves. Again give them about 10 minutes to study the tiling, and to make rough drawings if they want to. Then take the sheets in.

Activity 3

Hand out one piece of carton to each learner, and scissors. Make a drawing like this on the board, to show learners how to cut the quadrilateral template with no equal sides. Learners then have to use their templates to draw a tiling with quadrilaterals, like the one they saw on the hand-out sheets.



FOURTH TERM: WEEK 8 OVERVIEW

Hours: 5				**Number of Periods: 5**	
Mathematics Learning Outcomes and Assessments: LO 1: AS 8, 10, 11 LO 2: AS 2, 3, 4, 5 LO 4: AS 5, 6			**Milestones:** • Describe relationships between varying quantities in own words • Solve or complete number sentences by trying different numbers and checking the solutions by substitution • Solve problems that involve more than one operation in the number range 1 to 10 000		
	Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 5**
Content Focus	Solving problems that require more than one operation. Describe a relationship between two variable quantities in words. Learners will become aware that a relationship between two variable quantities can also be described with a flow diagram.	Describe a relationship between two variable quantities with a verbal formula.	Learners will make verbal formulas to solve problems involving more than one operation.	Solve number sentences, both by trying different numbers and checking the solutions by calculation, and by direct calculation.	Solve number sentences, both by trying different numbers and checking the solutions by calculation, and by direct calculation.
Resources		The written explanations of how the total mass of the cement truck and its load was calculated, produced on the previous day.	To have more learning time in class, you may make copies of the four situation descriptions and of the table to hand out to learners.	To have more learning time in class, you may make copies of the table to hand out to learners	To have more learning time in class, you may make copies of the table to hand out to learners

WEEK 8: DAY 1

Notes to the teacher:

- In activities 1 and 2, learners will solve problems that require more than one operation.
- In activity 3, learners will describe a relationship between two variable quantities in words
- In activities 4 and 5, learners will become aware that a relationship between two variable quantities can also be described with a flow diagram.

ACTIVITIES FOR THE DAY

PROBLEM SOLVING

Activity 1

Tell learners about a truck that is used to transport cement to building sites. The mass of the empty truck, with no people inside, is 2300 kg. Each pocket of cement has a mass of 90 kg. Ask learners to calculate the mass of the truck and the load, if there are 40 pockets of cement on the truck. Circulate among learners to check whether they get this right.

Activity 2

Write the following table on the board, and ask learners to copy and complete it.

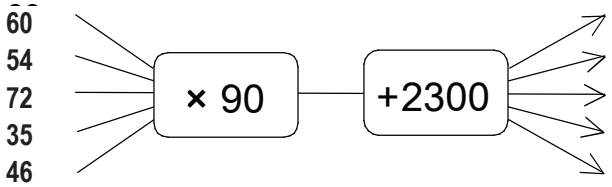
Mass of empty truck	Mass of one pocket of cement.	Number of pockets loaded	Total mass of truck and load
2300 kg	90 kg	60	
2300 kg	90 kg	54	
2300 kg	90 kg	72	
2300 kg	90 kg	35	
2300 kg	90 kg	46	
2300 kg	90 kg	57	

Activity 3

Ask learners how they would explain to someone else, in words, without giving an example how they calculate the total mass of the cement truck and its load, for any number of pockets of cement. They have to write their explanations down. Take this in for assessment purposes.

Activity 4

Let learners copy and complete this flow diagram:



Activity 5

Ask learners whether the flow diagram provides any information about the cement truck situation. Let them discuss this in small groups.

WEEK 8: DAY 2

Notes to the teacher:

- In this lesson, learners will learn to describe a relationship between two variable quantities with a verbal formula.

Resources:

- The written explanations of how they calculated the total mass of the cement truck and its load, that learners produced on the previous day.

ACTIVITIES FOR THE DAY

ORAL, MENTAL AND CONCEPT DEVELOPMENT

Activity 1

Hand back learners' written work that they produced in activity 3 on the previous day. Ask them to compare their explanations, and to produce a joint explanation in each group. While they work, write the following verbal formula on the board:

mass of truck and its load = 90 × the number of pockets of cement

Ask learners to discuss, in their groups, whether they agree that one may also describe the calculations like you have written on the board. Tell them that this is called a "formula".

Circulate and listen to their discussions. Hopefully, learners will notice that the formula is not correct, because one also has to add the mass of the empty truck, namely 2300. If learners do not notice this, ask them to do what the formula says for 60 pockets of cement, and to compare the answer with the answer they obtained on the previous day.

Activity 2

Let learners work individually again. Ask them to each write down a better formula for the cement truck situation. Circulate to check, and finally write the correct formula on the board:

mass of truck and its load = 90 × the number of pockets of cement + 2300

Then tell learners about another truck that is also used to transport cement. Tell them that the following formula is used to calculate the total mass of the second truck and its load (write the formula on the board):

mass of truck and its load = 90 × the number of pockets of cement + 2450

Ask learners to think about how this truck is different from the first truck. They have to do this individually. Circulate and talk to individual learners, especially those that normally perform less well than others. Ask them to tell you what they think the difference between the two trucks is. If you find that some learners do not correctly identify that the second truck has an empty mass of 2450 kg compared to the 2300 kg of the first truck, ask all learners in the class to calculate the total mass of the second truck and a load of 60 pockets of cement, and to compare this to the first truck. Give them some time to do this, then leave it at that and continue with activity 3.

Wipe the formula *mass of truck and its load = 90 × the number of pockets of cement + 2450* off the board, but leave the formula *mass of truck and its load = 90 × the number of pockets of cement + 2300.*

Activity 3

Tell learners about yet another truck that is used to transport potatoes from farms to Johannesburg. The mass of this truck, when it is empty, is 1700 kg, and the mass of one pocket of potatoes is 40 kg. Write this on the board. Tell them that we want to calculate the total mass of this truck with a load of 60 pockets of potatoes. Then point to the formula

mass of truck and its load = 90 × the number of pockets of cement + 2300

that is still on the board, and ask learners whether one can use this formula to do the calculation for the potato truck. Let them think about this for about 4 minutes, then let them form small groups to discuss it. Circulate and listen to the discussions. Allow about 5 minutes for discussion, then do activity 4.

Activity 4

Tell learners that they will work individually again. Ask them to write a formula that can be used to calculate the total mass of the potato truck with a load of potatoes. Tell them that if they find this difficult, they may first complete the following table without a formula, and then try again to write a formula.

Mass of empty truck	Mass of one pocket of potatoes	Number of pockets loaded	Total mass of truck and load
1700 kg	40 kg	65	
1700 kg	40 kg	83	
1700 kg	40 kg	42	
1700 kg	40 kg	94	
1700 kg	40 kg	75	

Activity 5

Ask learners to make and complete a flow diagram that contains the information of activity 4.

WEEK 8: DAY 3

Notes to the teacher:
- Learners will make verbal formulas to solve problems involving more than one operation.

Resources:
- To have more learning time in class, you may make copies of the four situation descriptions and of the table to hand out to learners.

ACTIVITIES FOR THE DAY

PROBLEM SOLVING

Activity 1

Write the following on the board:

1. *A truck with an empty mass of 1850 kg is used to transport onions in pockets with a mass of 32 kg each.*
2. *A truck with an empty mass of 2140 kg is used to transport apples in boxes with a mass of 36 kg each.*
3. *A bakkie with an empty mass of 1180 kg is used to transport large bricks with a mass of 8 kg each.*
4. *A panel van with an empty mass of 1640 kg is used to transport bread in large baskets with a mass of 42 kg each.*

Ask learners to make formulas that can be used to calculate the total mass of the onion truck, the apple truck, the brick bakkie and the bread van, with different loads. Ask learners to also write flow diagrams that provide the same information than their formulas. Take this in for formal assessment purposes.

Activity 2

Let learners copy and complete this table, as far as they can.

Mass of empty truck	Mass of one bag (pocket) of load.	Number of bags loaded	Total mass of truck and load
1850 kg	32 kg	65	
1850 kg	32 kg	46	
2140 kg	36 kg	37	
2140 kg	36 kg	55	
1180 kg	8 kg	213	
1180 kg	8 kg	360	
1640 kg	42 kg	22	
1640 kg	42 kg	28	
1640 kg	42 kg		4202 kg

WEEK 8: DAY 4

Notes to the teacher:

- Learners will in effect solve number sentences, both by trying different numbers and checking the solutions by calculation, and by direct calculation.

Resources:

- To have more learning time in class, you may make copies of the table to hand out to learners.

ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

Activity 1

Let learners do the problem in the last row of the the table in activity 2 of the previous day. Circulate and observe how they do it. There are two different methods that they may use.

The one method is subtract the 1640 kg from 4202 kg, and then to divide the answer by 42 in some way or another. The other method is to estimate the number of bags, and to calculate the total mass for this number of bags. When the majority of learners have done, demonstrate both methods on the board.

Activity 2

Write the following table on the board for learners to copy and complete.

Mass of empty truck in kg	Mass of one bag (pocket) of load in kg	Number of bags loaded	Total mass of truck and load in kg
1850	32		2970
2140	36		4408
1180	8		1404
1640	42		3530

Activity 3

Write the following table on the board for learners to copy and complete, but to now use the other method than the one they used in activity 2.

Mass of empty truck in kg	Mass of one bag (pocket) of load in kg	Number of bags loaded	Total mass of truck and load in kg
1850	32		3258
2140	36		3148
1180	8		1484
1640	42		2984

Take the work in for formal assessment.

If some learners finish with time in the period left, let them start with activity 1 of the next day.

WEEK 8: DAY 5

Notes to the teacher:

- Learners will in effect solve number sentences, both by trying different numbers and checking the solutions by calculation, and by direct calculation.

Resources:

- To have more learning time in class, you may make copies of the table to hand out to learners.

ACTIVITIES FOR THE DAY

MENTAL ACTIVITY

Activity 1

Let learners copy and complete this table, as far as they can.

Mass of empty truck in kg	Mass of one bag (pocket) of load in kg	Number of bags loaded	Total mass of truck and load in kg
1750		35	3185
2380		63	5215
3200	72		5216
2340	56	45	
	55	39	5925
	64	63	6312
3125		46	7587
2848		38	5204
	78	42	6561

If you notice that some learners progress fast, write the question for activity 2 on the board, so that they can tackle it once they are finished with activity 1.

Tip: Use Activity 1 towards Assessment Task 2

PROBLEM SOLVING

Activity 2

The onion truck that you worked with a few days ago cannot carry a load bigger than 4000 kg.

What is the biggest number of bags of onions that can be loaded on this truck?

What is the biggest number of boxes of apples that can be loaded on this truck?

What is the biggest number of bricks that can be loaded on this truck?

What is the biggest number of baskets of bread that can be loaded on this truck?

ASSESSMENT	**Formal written assessment task to assess the milestones:** • Estimates and calculates by selecting and using operations appropriate to solve problems that involve: - addition and subtraction of whole numbers with at least 4 digits - multiplication of at least whole 3-digit by 1-digit numbers to 200 - Multiplication of 2-digit by 2- digit numbers with answers to at least 10 000 – *new milestones* - division of at least whole 3-digit by 1-digit numbers • Recognises, describes and uses: - the reciprocal relationship between multiplication and division • Knows or quickly determines multiples of 10, 20, 30, 40, 50, 60, 70, 80, 90, 100 up to at least - 0 000, e.g. 90 × 70. - In the number range 1 to 10 000 – new milestones

FOURTH TERM: WEEK 9 OVERVIEW

Hours: 5	**Number of Periods: 5**
Mathematics Learning Outcomes and Assessments: LO 5: AS 1,2,3,4,5	**Milestones:** • Collects data (alone and/or as a member of a group or team) in the classroom and school environment to answer questions posed by the teacher and the class. • Organises, records and interprets data by using/drawing: - bar graphs. • Critically reads and interprets data presented in own representations (tallies, pictographs, bar graphs) and representations in the media (both words and graphs) to draw conclusions and make predictions sensitive to the role of: - context (e.g. rural or urban); - other human rights issues.

	Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 5**
Content Focus	Estimate how many of each of three kinds of bean there are in a container. Check estimates by actually counting the beans. Learners will learn to make bar graphs.	Bar graphs about a population based on samples they have taken.	Calculations in a data-analysis context. Draw bar graphs that require scaling.	Learners will design a simple questionnaire about food preferences, and use it to gather data about other learners in the school.	Learners will complete the investigation that they started on the previous day.
Resources	A small container, like a match box, for each learner. All the containers must be the same. Packets of three different kinds of small dry beans: 4 packets of light-colored beans (like sugar beans), 3 packets of red/brown-colored beans and 3 packets of dark-colored beans. The three kinds of beans should be of roughly the same size. A copy of the coded sheet B (Term 3 Annexure E) for each learner. A blank A4 sheet for each learner	Learners' records (coded sheets with bar graphs) of the beans they counted on the previous day.		Permission for your class to visit other classes in the last 15 minutes of this lesson, to make a survey of the popularity of different forms of starch and protein.	

WEEK 9: DAY 1

Notes to the teacher:

- Learners will estimate how many of each of three kinds of beans there are in a container, and will (in a later lesson) check their estimates by actually counting the beans.
- Learners will learn to make bar graphs.

Resources:

- A small container, like a match box or a small pill bottle or film container, for each learner. All the containers must be the same.
- Packets of three different kinds of small dry beans: 4 packets of light-colored beans (like sugar beans), 3 packets of red/brown-colored beans and 3 packets of dark-colored beans. The three kinds of beans should be of roughly the same size. Mix the contents of the 10 packets well. Fill one small container with beans for each learner in the class, and put these beans into a large container like a salad bowl or cooking vessel. Take some extra beans to the class.
- A copy of the coded sheet B (Term 3 Annexure E) for each learner.
- A blank A4 sheet for each learner.

ACTIVITIES FOR THE DAY

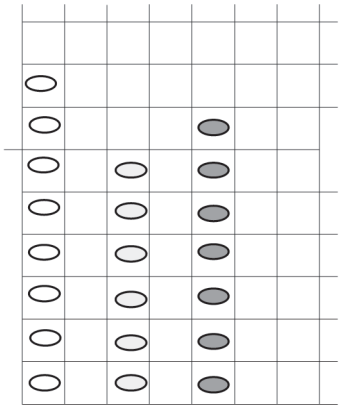
CONCEPT DEVELOPMENT

Activity 1

Show the container with beans to the learners. Walk round the class with container so that all learners can see that there are three kinds of beans. Tell learners that they should estimate how many beans of each kind there are in the container. They should write their estimates down. Tell them that they will later count the beans, so they will have opportunity to test their estimates.

Activity 2

Fill the small containers with beans from the container, and let each learner collect a container filled with beans from you, as well as a copy of the coded sheet. When all the learners are seated again, ask them to arrange each kind of bean in column on the coded sheet, light-colored on the left, red in the middle and blackish on the right, like on the right, with open columns in between (make a rough drawing on the board). The three rows should all start at the same height at the bottom, and the beans should be placed about the same distance apart. When learners have finished packing the beans, they should write the number of beans in each column in the cell just above the highest bean in each column.



Activity 3

Ask learners to think about what should be done next. Each of them should think about individually, and should write a short note to you, on a loose piece of paper, to make a proposal about what should be done next. They should also give reasons for their proposals. Give them 10 minutes to do this. While they do this, make a drawing of one learner's bean display on the board.

Activity 4

Collect learner's notes. Ask learners to now take the beans off their coded grids and put them back into the small containers so that you can collect them. Then instruct learners to shade all the cells on which they had placed beans earlier, right up to the top cell just below the cell where they wrote the total number of beans of that kind. Demonstrate this on the drawing that you have earlier made on the board.

While learners work, remove any beans that may have been left over when you distributed beans to the learners in activity 2, from the large container. Then collect the small containers from learners and empty them into the large container.

When learners have finished, tell them that the representation they made is called a bar graph. Write the term *bar graph* on the board, next to the bar graph that you have drawn.

Activity 4

Hand out a blank A4 sheet to each learner and make sure each learner has a ruler. Write the following information on the board and ask learners to draw a bar graph for it, like the bar graph they have drawn for the beans they have counted. They have to do this on a blank sheet of paper (no lines).

215 white beans, 183 red beans, 122 green beans, 256 black beans, 145 spotted beans.

Note that while this may come spontaneously to some learners, it may be quite a breakthrough for other learners to realize that they may represent a number (e.g. the 215 white beans) with a line (bar) of a certain length, e.g. 215 mm.

Note to the teacher:

- *Use the notes that you have collected from learners to assess their level of engagement with the activity. Also prepare a brief report that you will present to learners in the next lesson. Try to categorise the proposals into different groups. If at all possible, try to determine what the most popular proposal is, the second most popular proposal, etc. Prepare yourself to present your report to the class, including a bar graph.*

WEEK 9: DAY 2

Notes to the teacher:

- Learners will make more bar graphs.
- Learners will make new bar graph about a population based on samples they have taken.

Resources:

- Learners' records (coded sheets with bar graphs) of the beans they counted on the previous day.

ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

Activity 1

Hand out a blank A4 sheet to each learner and make sure each learner has a ruler. Write the following information on the board and ask learners to draw a bar graph for it, like the bar graphs they have drawn on the previous day. They have to do this on a blank sheet of paper (no lines).

420 white beans, 560 red beans, 288 green beans, 236 black beans, 496 spotted beans.

Learners will face the problem that this bar graph cannot fit it on an A4 page of 1 mm of bar length is used to represent one bean. Let learners start working individually and circulate between them talk. Ask them to talk to you about the difficulty they may experience. Assign them to small groups to discuss the obstacle they face and to try to jointly find a solution. Circulate and listen to them. Allow them to talk for about 8 minutes, then suggest that they use half a millimeter to represent each bean.

Let them then return to individual work again to make the bar graph, using rulers.

Activity 2

Ask learners to consult their records of the beans they counted on the previous day, and the estimates they made at the beginning of the previous lesson. Tell them that they will now have an opportunity to revise their estimates, based on the counting of beans they did on the previous day. Tell the class how many they are, inform them that they all received almost the same number of beans, and ask them to show their bar graphs to each other in small groups.

Then ask them to think of a way in which they can possibly make better estimates (than on the previous day) of the number of each kind of beans in the large container. By doing this you are providing learners with an opportunity to engage in one major form of "statistical thinking", namely to use available information about a sample drawn from a large collection of objects, to form estimates or hypotheses about the whole collection of objects (the "population").

Let them work individually. Give learners about three minutes to engage with the task then start circulating. Look out for learners who seem not be getting anywhere and talk to them. One way in which you may help without telling them what to do, is to ask if they think it would be possible to calculate the total number of beans in the large container, if all learners have received exactly the same number of beans in the small containers on the previous day. If learners grasp that this may be done by multiplying the number of learners by the number of beans to get the exact total, you may suggest that it should be possible to get close to the actual total in a similar way.

Activity 3

Present your report on learners' proposals of the previous day to the class. Tell them how you went about to make sense of the pack of proposals that you received. Specifically tell them that you looked for proposals which were similar, and then grouped them together. Show them the bar graph you have drawn of this, either on the board or on a handout that you have prepared.

Also tell the class that you had to make a decision on how they will proceed with the investigation into the beans, and tell them that this is what you have decided:

The class should find out how many beans of each kind there are in the container, by adding up all the numbers collected by the learners. To do so, they should join in small groups of four or five, and add up their numbers of the three kinds of beans, as they have counted them on the previous day. The information is on the bar graphs that they have drawn on the previous day. Each group must then give its totals to you. You will write it on the board, so that everybody can copy it, and calculate how many beans of each kind there are in the big container. When they have done that, they will be able to check the estimates they made at the beginning of the lesson on the previous day.

Activity 4

Let learners join in groups of 4 or 5. Ask them to tell each other how many beans of each of the three kinds the counted on the previous day. Each learner should enter this information a table like below (draw a blank table on the board). Then each learner should work out the totals, and the learners in each group should compare their totals to check, and correct if necessary:

Light-colored beans	Red/brown colored beans	Dark/black colored beans
Learner 1		
Learner 2		
Learner 3		
Learner 4		
Learner 5		
Total		

If there is time available, you may continue with activity 1 of the next lesson.

WEEK 9: DAY 3

Notes to the teacher:

- Learners will do calculations in a data-analysis context, will draw bar graphs that require scaling, bar graphs,

ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

Activity 1

Go round and collect the tables learners completed during activity 4 on the previous day. in the groups. Enter the group totals in a table like this on the board:

Light-colored beans	Red/brown colored beans	Dark/black colored beans
Group 1		
Group 2		
Group 3		
Group 4		
Group 5		
etc. . .	. . . . .	. . . . .

Activity 2

When you have entered all the group totals on the board, let each learner calculate the class totals for each type of bean individually. They may then compare this with the estimates they made on day 2 and also on day 1.

Activity 3

Let each learner draw a bar graph of the composition of the bean collection in the large container. Note that this will be challenging again, since they will have to decide on a suitable scale to fit the bar graph onto a single page, for example 5 beans to 1 mm. It is important that learners experience this problem, do not offer a solution too quickly.

Activity 4

If there is still time left, tell learners that later in this week, they will do an investigation to find out what foods are most popular with learners in the school. Conduct a discussion about different types of starch, for example bread, rice, potatoes, porridge and protein, for example chicken, beans, egg, fish, pork, beef, goat and lamb.

WEEK 9: DAY 4

Notes to the teacher:

- Learners will design a simple questionnaire about food preferences, and use it to gather data about other learners in the school.
- This lesson was designed with the specific purpose of allowing learners to actively experience a pursuit of information, and the collection of data that will provide the sought information when it is interpreted.

Resources:

- You need to previously arrange, possibly with the help of the school principal, that delegations from your class will visit other classes in the last 15 minutes of this lesson period, to make a survey of the popularity of different forms of starch and protein. These arrangements will have to be coordinated between the different grade 4 classes in the school (if there are more than one) so that each other class (the other grades) is visited by only one delegation, so as not to take too much learning time away from the other grades.

ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

Activity 1

If activity 4 of the previous lesson was not done, do it now.

Write the names of all the starches (bread etc) that learners mention on the board, and the names of all the proteins they mention. Ask learners to each indicate, by raising their hands when you call out the name of the food, their favorite starch and their favorite protein. Count the number of hands for each food, and write it on the board.

Activity 2

Say to learners that they, together with the other grade 4 classes in the school (if there are), they will now conduct a survey to find out what is the favorite starch and favorite protein for learners in the school. Explain to learners that they will form groups, and that each group will visit another class and do a voting survey in the same way that you did with them in activity 1, with one difference: they will only give the other learners three starches to choose from, and three proteins, namely those that were most popular in their own class. Assign learners to as many groups as the number of other classes in the school that they will visit. Tell them that they will only be allowed to stay for five minutes in the class that they will visit. Therefore the need to plan carefully, now, what information they want to get and what actions they will take to get it.

Circulate between the groups and listen to their discussions. After no more than 5 minutes, conduct a brief whole class discussion, taking some feedback from the groups. Conclude this by writing the following plan of action on the board:

1. Tell the other class that you want to find out what is the most popular of the . . . . , ... and . . . . . (the three starches), and the most popular . . . . , ... and . . . . . (the three proteins).
2. While one person talks to the other class, other members of the team will write the names of the three starches and the three proteins on the board.
3. One member of the team then asks those learners who prefer the first starch to put their hand up, and other team members count the hands, and write the number down. This is then repeated for the other two starches, and for the three proteins.

Activity 3

Before the teams depart to the other classes, let them spend at least ten minutes discussing the following two questions:

A. What do they expect would be the most popular, the second most popular and the least popular of the three starches, in the other class?

B. What do they expect would be the most popular, the second most popular and the least popular of the three proteins, in the other class?

C. Do they expect that the different classes that will be visited, will have the same sequence of preferences for starches, and for proteins, or do they expect different sequences of preferences in the different classes (you will need to use language appropriate for your class in formulating this question).

Each team has to write down its agreed answers to the three questions, so that it can be checked when they come back from the other classes. Let them hand it in to you for safekeeping.

Activity 4

The different teams go on their excursions to the other classes. When they return, let them give their results to you for safekeeping until the next day.

WEEK 9: DAY 5

Notes to the teacher:

- Learners will complete the investigation that they started on the previous day.
- In the first part of activity 4 learners will have the opportunity to use bar graphs they have made themselves to investigate a situation, and to articulate their findings. They will also have experience, in a very simple way, with a fundament form of statistical thinking, namely to compare distributions.

ACTIVITIES FOR THE DAY

CONCEPT DEVELOPMENT

Activity 1

Let learners be seated in their groups of the previous day. Hand back the predictions they made in activity 3 the previous day, as well as the data they collected in activity 4. Ask each group to check their predictions A and B.

Activity 2

Learners work individually. Decide, and tell the class which starch must be on the left of their bar graphs, which one in the middle and which one on the right. Do similarly for the proteins. Each learner must now make bar graphs of the voting results for the starches and the proteins given by the class they visited, on blank sheets.

Activity 3

Let learners join in their groups again. Let them check each other's bar graphs. Then ask that one learner from each group should stand up. These learners should now form a new group. Then a second learner from each group should stand up, and these learners should form another new group. Continue like this until new groups have been formed. The last group may have more than one member from some original groups, but should have at least one member from each of the original groups.

Activity 4

Ask the new groups to each perform the following tasks:

- Investigate the prediction C they made in activity 3 of the previous day, using the information they now have.
- Combine the data collected in the different classrooms into one data set, and to each make bar graphs of this.

Circulate among the groups and ask each group to tell you what they found with respect to hypothesis C they made on the previous day. An important aspect of this activity is that learners may learn that different samples (the different classes) drawn from the same population (all the learners in the school) may differ, but that there may also be enough correspondence between samples to allow one to make conclusions about the population from the information you have about the sample.

Activity 5 If there is time available, let each group meet with a group from another grade 4 class, to compare their findings about the popularity of different kinds of starch and protein in the school..	
ASSESSMENT	**Formal written assessment task to assess the milestones:** • Organises, records and interprets data by using/drawing: - bar graphs.

FOURTH TERM: WEEK 10 OVERVIEW

Hours: 5	**Number of Periods: 5**
Mathematics Learning Outcomes and Assessments: LO 1: AS 3, 8, 9, 10, 11, 12 LO 3: AS 5	**Milestones:** • Investigate and extend number (to at least 10 000) and geometric patterns looking for general rules or a relationship, including patterns represented in physical and diagrammatic form, and patterns of learners own creation. • Determine through discussion and comparison the equivalence of different descriptions of the same relationship or rule represented: - Verbally - In flow diagrams - By verbal formulas • Makes two-dimensional shapes and patterns from geometric shapes (e.g. tangrams) with a focus on tiling (tessellation) and line symmetry.

	Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 5**
Content Focus	Addition Draw non-symmetric tilings with triangles	Number concept to 10 000	Investigate whether addition and subtraction is commutative and associative Draw symmetric tiling's with triangles.	Investigate whether multiplication is distributive over addition Draw symmetric tiling's with triangles.	Estimation, addition and subtraction.
Resources	A set of the strips with 3-digit numbers (Term 2 Annexure I). Empty cereal boxes and scissors. Blank sheets of A4 paper.	The sets of 4-digit number cards that learners made in Week 1 of this term A set of the strips with 4-digit numbers (Term 2 Annexure P).	A set of the strips with 3-digit numbers (Term 2 Annexure I). A set of the strips with 4-digit numbers (Term 2 Annexure P).	Empty cereal boxes and scissors. Blank sheets of A4 paper. A set of the strips with 3-digit numbers (Term 2 Annexure I).	A set of the strips with 4-digit numbers (Term 2 Annexure P).

WEEK 10: DAY 1

Notes to the teacher:

- Learners will practice addition, and draw non-symmetric tilings with triangles. If there is a shortage of scissors, some learners may start with activities 2 and 3, and do activity 1 in the later part of the lesson period.

Resources:

- A set of the strips with 3-digit numbers (Term 2 Annexure I).
- Empty cereal boxes, and scissors.
- Blank sheets of A4 paper.

ACTIVITIES FOR THE DAY

ORAL AND MENTAL ACTIVITY

Activity 1

Give each learner two strips of 3-digit numbers. They have to write all the numbers in expanded notation. Then they have to add all ten numbers on the two strips. When a learner has finished, he/she has to exchange with another learner. When both learners have finished both pairs of strips, they should compare their results and methods. If they differ, they have to find and correct mistakes.

CONCEPT DEVELOPMENT

Activity 2

Let each learner cut a triangle with sides longer than 2 cm from cereal box carton, and tell them to use this as a template to draw a tiling **without any lines of symmetry** with triangular tiles.

Activity 3

Let each learner cut a parallelogram with sides longer than 2 cm from cereal box carton, and tell them to use this as a template to draw a tiling.

WEEK 10: DAY 2

Notes to the teacher:
- Learners will strengthen their number concept up to 10 000, and practice addition.

Resources:
- The sets of 4-digit number cards that learners made in Week 1 of this term
- A set of the strips with 4-digit numbers (Term 2 Annexure P).

ACTIVITIES FOR THE DAY

ORAL AND MENTAL ACTIVITY

Activity 1

Learners play the number placing game as described in the lesson plan for Term 2, Week 2 Day 1, with the 4-digit number cards they made in Week 1 of this term, with the additional rule that a number card can only be placed if it differs by less than 100 from the card next to which it is placed.

CONCEPT DEVELOPMENT

Activity 2

Give each learner one strip of 4-digit numbers. They have to write all the numbers in expanded notation. Then they have to add all five numbers on the strip. When a learner has finished, he/she has to exchange with another learner. When both learners have finished both strips, they should compare their results and methods. If they differ, they have to find and correct mistakes.

Activity 3

Each learner has to find the difference between the smallest and largest numbers on his/her strip with 4-digit numbers.

WEEK 10: DAY 3

Notes to the teacher:

- Learners will practice addition and subtraction while investigating whether addition and subtraction is commutative and associative, and draw symmetric tilings with triangles.

Resources:

- A set of the strips with 3-digit numbers (Term 2 Annexure I).
- A set of the strips with 4-digit numbers (Term 2 Annexure P).

ACTIVITIES FOR THE DAY

PROBLEM SOLVING

Give each learner one strip of 4-digit numbers, and one strip of 3-digit numbers. Write the following on the board, or hand out printed copies:

Sammy will find the differences between:

- *the first 4-digit number and the first 3-digit number*
- *the second 4-digit number and the second 3-digit number*
- *the third 4-digit number and the third 3-digit number*
- *the fourth 4-digit number and the fourth 3-digit number*
- *the fifth 4-digit number and the fifth 3-digit number*

Sammy will then add the five differences.

Caroline will add the five 3-digit numbers and she will add the five 4-digit numbers. Then she will find the difference between the two totals.

Mpho will find the differences between:

- *the first 4-digit number and the fifth 3-digit number*
- *the second 4-digit number and the fourth 3-digit number*
- *the third 4-digit number and the third 3-digit number*
- *the fourth 4-digit number and the second 3-digit number*
- *the fifth 4-digit number and the first 3-digit number*

Mpho will then add the five differences.

Put this question to the class: ***Will Sammy, Caroline and Mpho get different answers or the same answer. If you think they will get different answers, who will get the biggest answer and who will get the smallest answer?***

Let learners discuss this in small groups for about 4 minutes. Then they should individually investigate the matter, each learner for the numbers on the strip you have given him/her.

WEEK 10: DAY 4

Notes to the teacher:

- Learners will practice multiplication while investigating whether multiplication is distributive over addition, and draw symmetric tilings with triangles.

Resources:

- Empty cereal boxes, and scissors.
- Blank sheets of A4 paper.
- A set of the strips with 3-digit numbers (Term 2 Annexure I).

Activities for the day

PROBLEM SOLVING

Activity 1

Give each learner one strip of 3-digit numbers. Write the following on the board:

Temba will multiply each number by 7 and then add the answers.

Lerato will add the five numbers and then multiply the answer by 7.

Put this question to the class: ***Will Temba and Lerato get the same answer, or will they get different answers? If you think they will get different answers, who will get the biggest answer and who will get the smallest answer?***

Let learners discuss this in small groups for about 4 minutes. Then they should individually investigate the matter, each learner for the numbers on the strip you have given him/her.

Activity 2

Let each learner cut a triangle with sides longer than 2 cm from cereal box carton, and tell them to use this as a template to draw a tiling **with lines of symmetry** with triangular tiles.

WEEK 10: DAY 5
Notes to the teacher: • Learners will practice estimation, addition and subtraction. **Resources:** • A set of the strips with 4-digit numbers (Term 2 Annexure P).
ACTIVITIES FOR THE DAY
ORAL, MENTAL AND CONCEPT DEVELOPMENT **Activity 1** Give each learner a strip with five 4-digit numbers. Ask learners to estimate what the total of the five numbers will be, and to write the estimate down. Then they have to calculate the total, and also calculate how much their estimate differs from the actual total. **Activity 2** Let learners join in groups of four or three, and discuss how they thought to make their estimates. **Activity 3** Give each learner a different strip with five 4-digit numbers. Ask learners to estimate what the total of the five numbers will be, and to write the estimate down. Then they have to calculate the total, and also calculate how much their estimate differs from the actual total. Challenge learners to now make better estimates than they have made when they did activity 1. **Activity 4** Give each learner a different strip with five 4-digit numbers. Ask learners to estimate what the total of the five numbers will be, and to write the estimate down. Then they have to calculate the total, and also calculate how much their estimate differs from the actual total. Challenge learners to now make estimates that differ by less than 200 from the actual totals.

9899	7723	5844	9821	7298
7968	5626	9321	7285	7082
8425	6328	9709	8373	8993
7383	6249	9460	6016	8720
9156	7861	6951	8988	5407

7500	6518	9609	9499	9028
7069	7475	8210	6818	7262
9529	9374	8496	9848	5576
7514	7570	8768	8843	9589
9963	9421	7864	5230	8713

9889	7727	6414	8975	8181
5574	5397	7290	5068	9929
8023	9495	7003	5699	5387
5106	5789	7176	5122	6076
5058	8267	7044	7831	7105

9939	5936	6376	6335	5836
5649	8345	5188	7104	5876
7339	9029	7059	7243	5140
8178	7237	5611	6441	6182
5509	5876	7955	9523	8271

6910	5494	8291	6896	8034
6460	8228	6024	8975	7868
9182	7272	9932	8466	7483
6494	7225	7053	7602	7298
5071	8815	5899	5613	9135

Term 4 Annexure A (Many four-digit numbers)

9400	7250	8900	9785	7914
5921	5268	8574	9304	7328
8844	7209	9109	5546	9070
5653	6431	8467	9786	7648
8530	9047	8059	6382	9050

5449	8653	5277	5251	7139
5591	9482	5144	5396	7107
8704	5019	6586	8230	8684
8256	7985	6059	7631	6060
9004	6262	6182	8180	6820

9003	8886	7014	6479	5203
9207	5368	5808	6141	5341
7278	9557	6919	8346	8785
9257	9781	8159	9074	5011
6606	7005	8405	6959	7230

5121	9645	5732	9431	8069
8735	6421	7010	9035	9407
8549	5881	8619	7280	7924
6547	9179	5911	9910	8218
8032	7339	6314	8306	6371

5444	9287	7720	5451	7346
9798	5393	8533	5106	9641
5838	8869	9680	9036	8388
6521	6376	6999	7607	9400
9522	7019	7231	6555	8109

Term 4 Annexure A (Many four-digit numbers)

Money A

National Bank of R100 Ukuqonda One hundred Rand

National Bank of R5 Ukuqonda Fifty Rand

National Bank of R500 Ukuqonda Five hundred Rand

National Bank of R80 Ukuqonda Eighty Rand

National Bank of R2 Ukuqonda Two Rand

National Bank of R5000 Ukuqonda Five thousand Rand

National Bank of R70 Ukuqonda Seventy Rand

National Bank of R1 Ukuqonda One Rand

Money B

National Bank of R30 Ukuqonda Thirty Rand

National Bank of R5 Ukuqonda Five Rand

National Bank of R80 Ukuqonda Eighty Rand

National Bank of R5000 Ukuqonda Five thousand Rand

National Bank of R500 Ukuqonda Five hundred Rand

National Bank of R2000 Ukuqonda Two thousand Rand

National Bank of R300 Ukuqonda Three hundred Rand

National Bank of R1 Ukuqonda One Rand

Money C

National Bank of R5 Ukuqonda Five Rand

National Bank of R600 Ukuqonda Six hundred Rand

National Bank of R6000 Ukuqonda Six thousand Rand

National Bank of R60 Ukuqonda Sixty Rand

National Bank of R2000 Ukuqonda Two thousand Rand

National Bank of R7 Ukuqonda Seven Rand

National Bank of R800 Ukuqonda Eight hundred Rand

National Bank of R70 Ukuqonda Seventy Rand

Money D

National Bank of R9 Ukuqonda Nine Rand

National Bank of R4000 Ukuqonda Four thousand Rand

National Bank of R800 Ukuqonda Eight hundred Rand

National Bank of R60 Ukuqonda Sixty Rand

National Bank of R500 Ukuqonda Five hundred Rand

National Bank of R4 Ukuqonda Four Rand

National Bank of R3000 Ukuqonda Three thousand Rand

National Bank of R80 Ukuqonda Eighty Rand

Term 4 Annexure B (amounts of money)

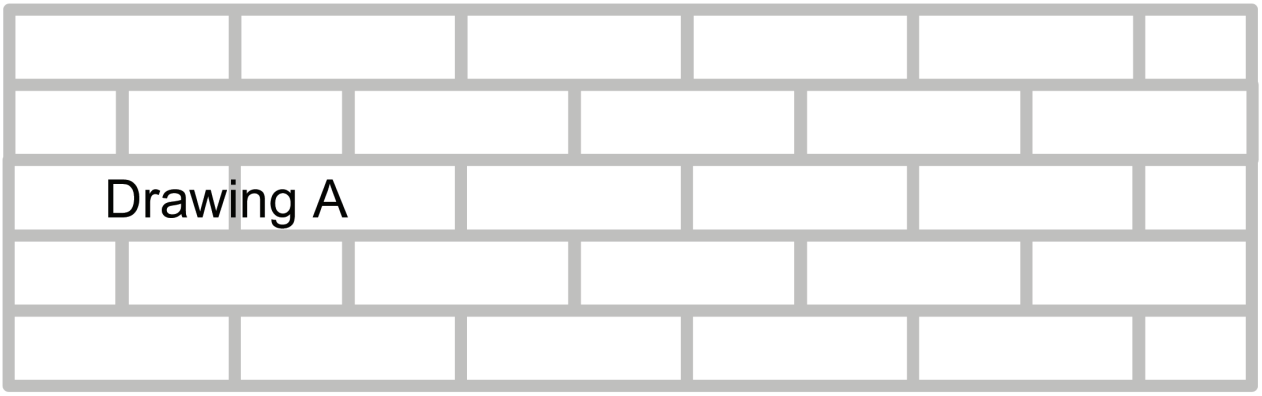
90×20	90×30
90×40	90×50
90×60	90×70
90×80	90×90
80×80	70×70
80×40	80×50
80×60	80×70
80×80	80×90

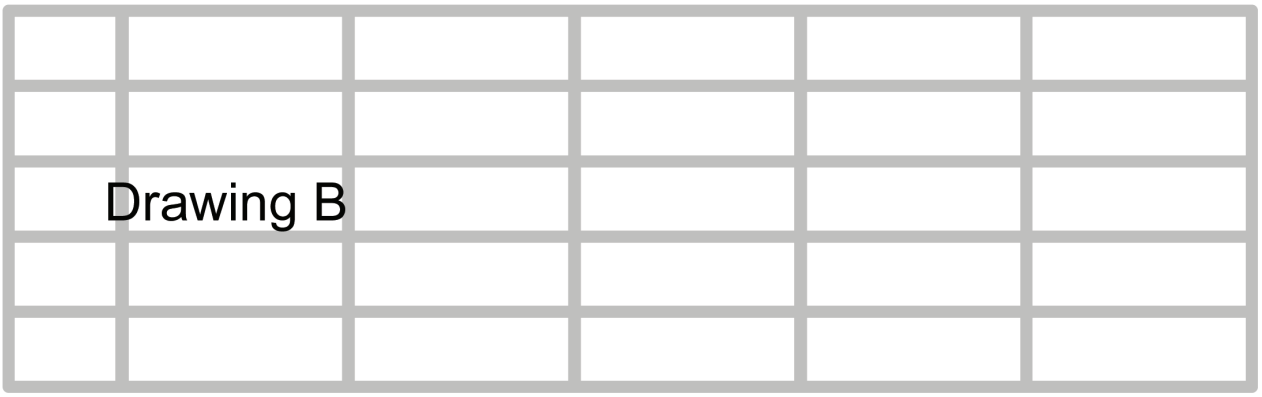
Term 4 Annexure C (More multiplication fact cards)

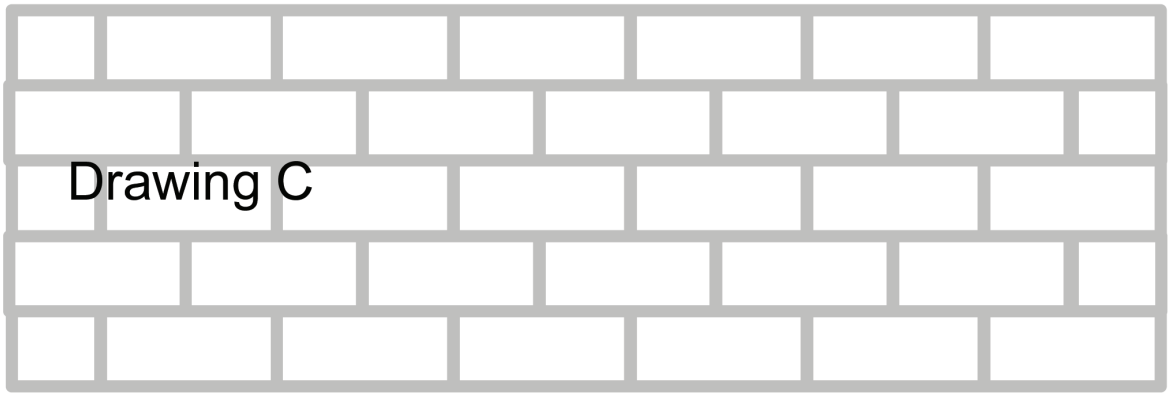
70×40	70×50
70×60	60×60
40×60	60×50
40×90	50×50
50×90	50×80
50×70	70×80
80×70	100×60
70×100	100×100

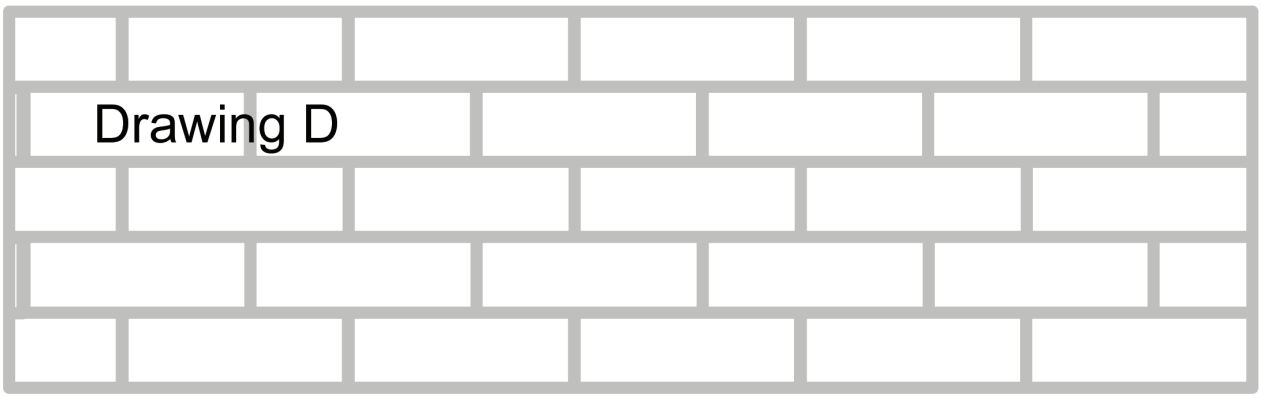
Term 4 Annexure C (More multiplication fact cards)

Term 4 Annexure D



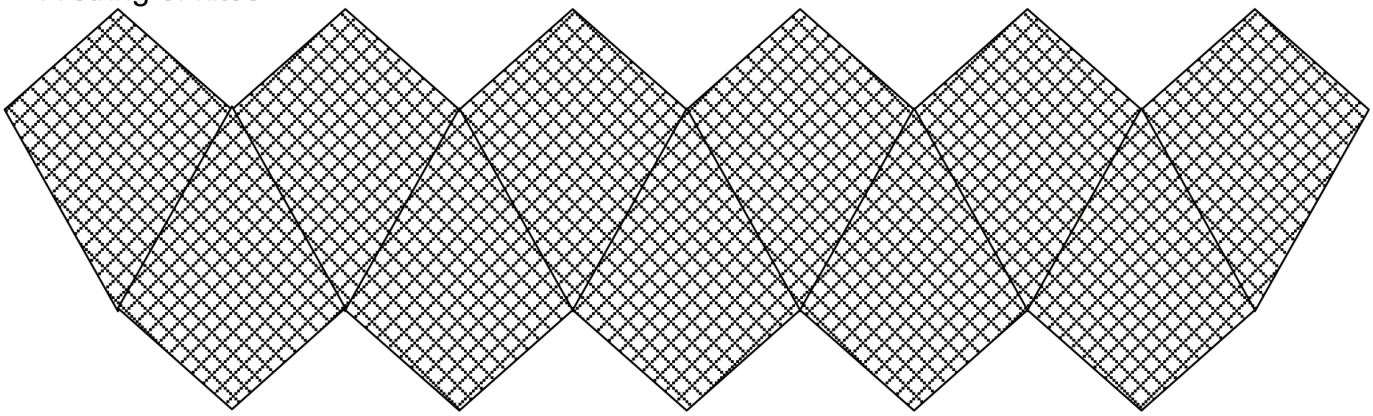




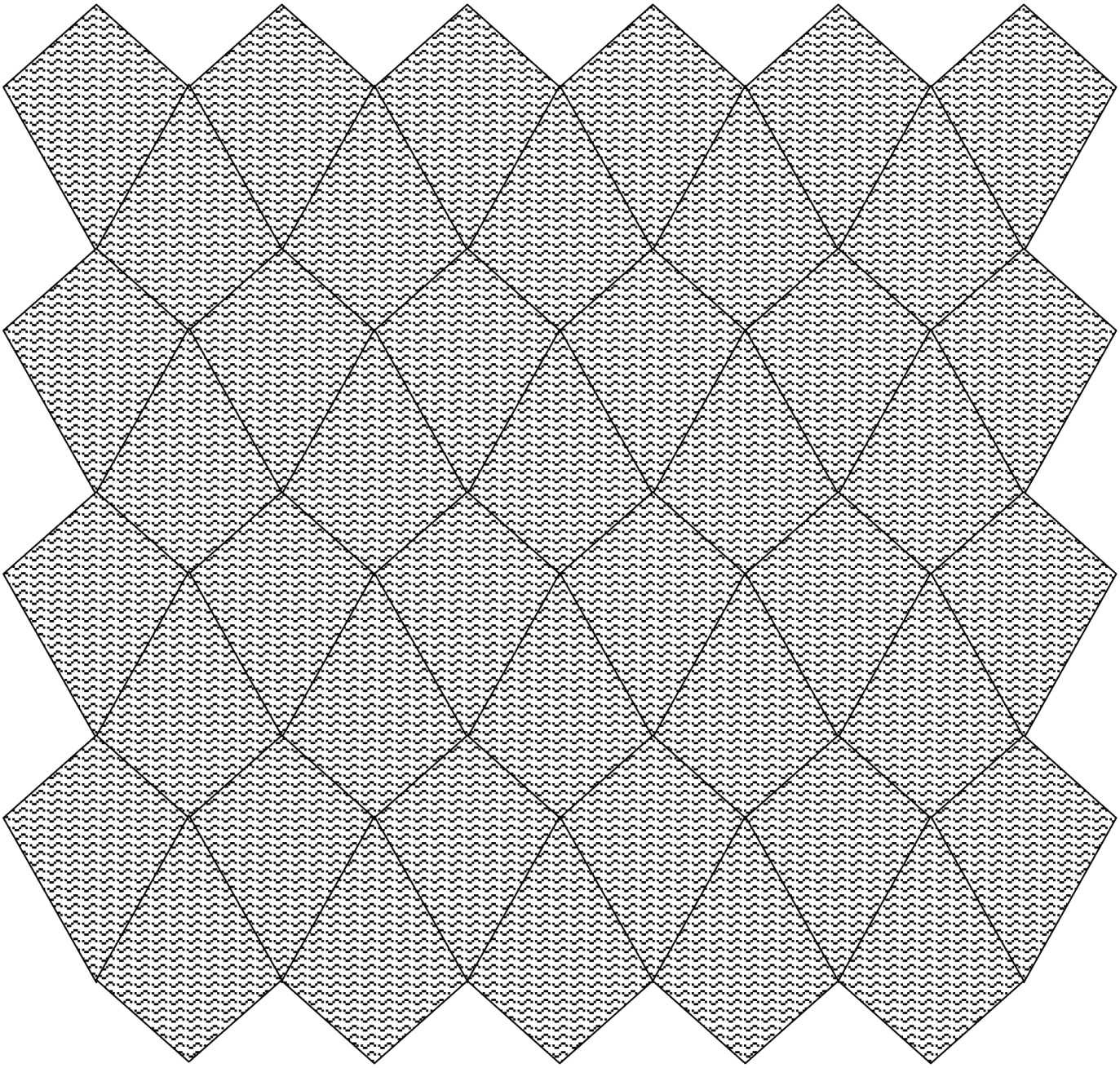


Term 4 Annexure G (Tilings)

A string of kites

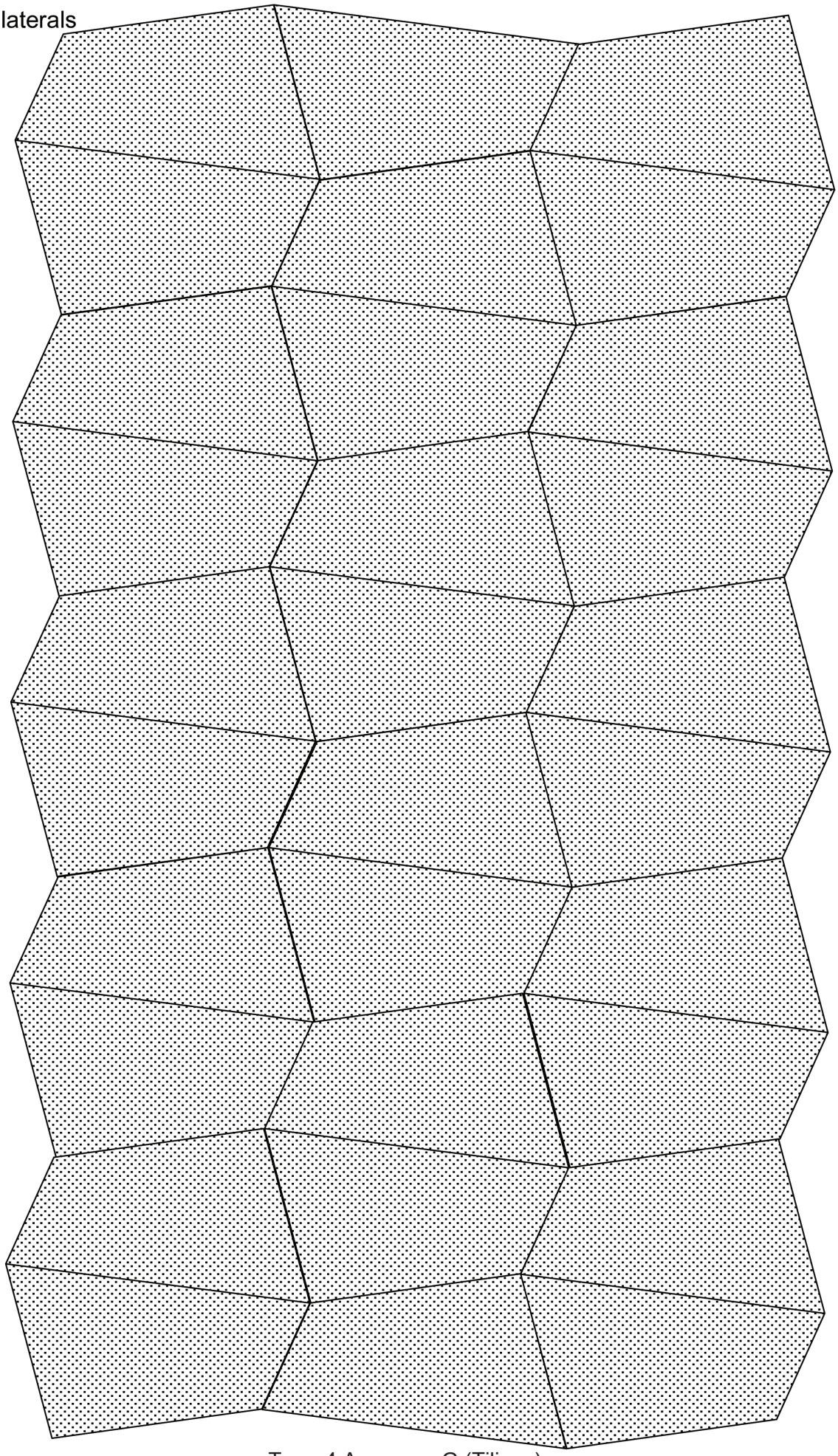


A block of kites

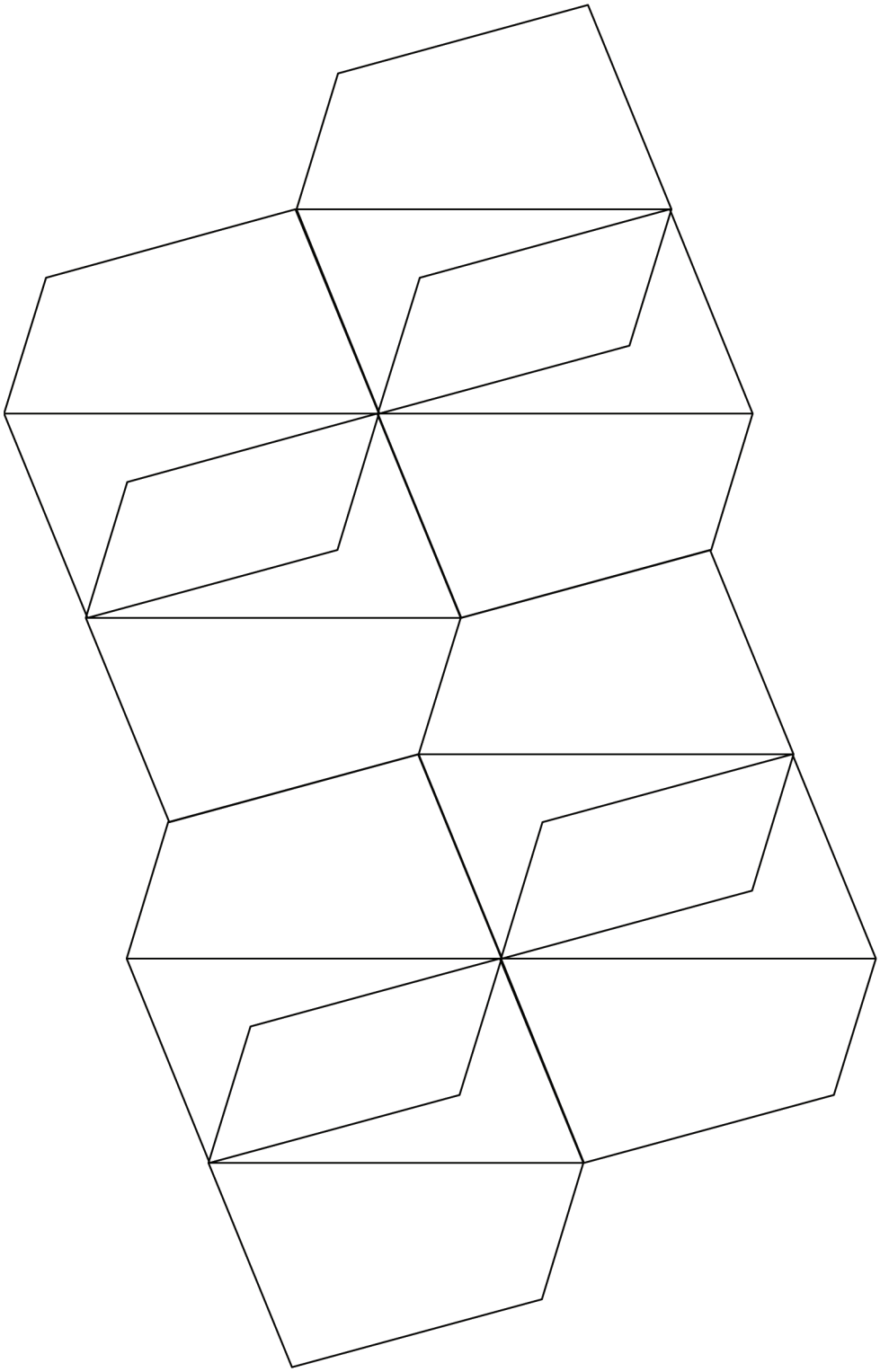


Term 4 Annexure G (Tilings)

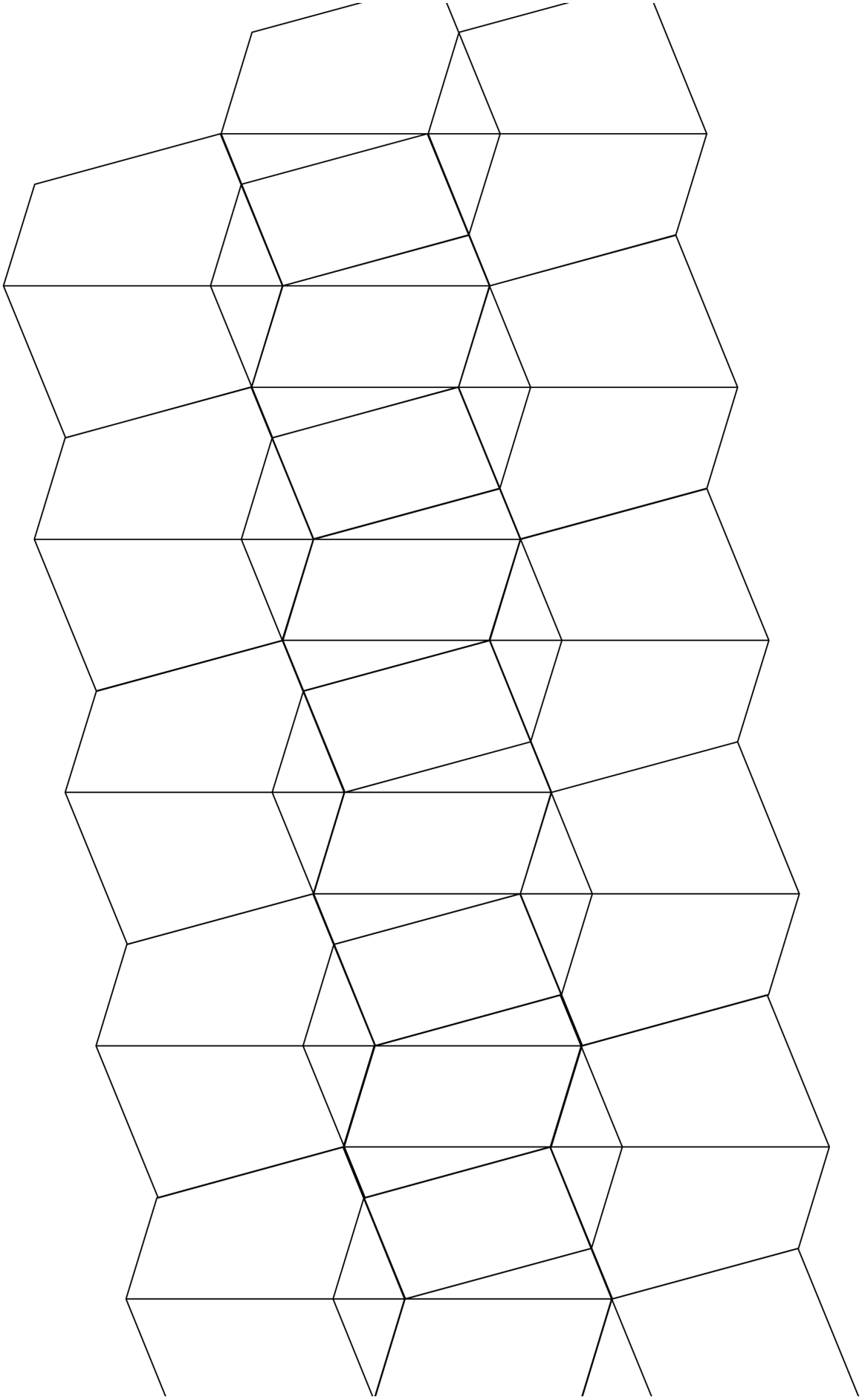
Quadrilaterals



Term 4 Annexure G (Tilings)



Term 4 Annexure G (Tilings)



Term 4 Annexure G (Tilings)

Notes: