Foundations For Learning

Intermediate Phase
Mathematics
Lesson plans

Second term

Grade 5

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SECOND TERM OVERVIEW OF LESSON PLANS: GRADE 5 MATHEMATICS

	LO 1: NUMBERS, OERATIONS AND RELATIONSHIPS	LO2: PATTERNS, FUNCTIONS AND ALGEBRA	LO 3: SPACE AND SHAPE	LO 4: MEASUREMENT	LO 5: DATA HANDLING
	MENTAL STRATEGIES ARE DONE EVERY LESSON				
WEEK 1	Revision of First Term number work. AS 8a: Rounding off to the nearest 5, 10, 100 and 1 000			AS 1: Read, tell and write analogue, digital and 24-hour time to the nearest minute.	
WEEK 2	AS 3b: Common fractions to twelfths. AS 5a: Common fractions with denominators which are multiples of each other. AS 8b: Addition and Subtraction of Common Fractions				
WEEK 3	AS 8b: Addition and Subtraction of Common Fractions	AS 4: Write number sentences to describe a problem situation within a context.	AS 4: Recognise, describe and perform translations (slides) using geometric figures and solids.	AS 2: Solve problems involving calculation and conversion between appropriate time units including decades, centuries and millennia	
WEEK 4	AS 8f: Finding fractions of whole numbers which result in whole numbers AS 8e: Multiplication of a 3-digit by a 1-digit number AS 3c and 5b: Decimal fractions in the form of 0,5; 1,5; 2,5 in the context of measurement		AS 4: Recognise geometric shapes and solids using rotations.		
WEEK 5	AS 6b: Solve problems in context such as measurements in Natural Sciences and Technology AS 3f: Recognise and represent multiples of single-digit numbers to at least 100		AS 4a: Recognise and perform flips (reflections) using geometric shapes and solids.	AS 1: Read, tell and write analogue, digital and 24-hour time to the nearest minute and second	

WEEK 6	AS 4: Recognise place value of digits in whole numbers to a minimum of 5-digit numbers AS 8b:Estimate and calculate by selecting and using operations and techniques appropriate to solve problems that involve addition and subtraction of whole numbers with at least 5 digits			AS 6: Solve problems involving selecting, calculating with and converting between appropriate SI units (Mass and Capacity)	
WEEK 7	AS 6a: Solve problems in context such as financial (buying, selling, profit, loss, simple budgets)			AS 6: Solve problems involving selecting, calculating with and converting between appropriate SI units (Mass and Capacity)	
WEEK 8	AS 3d: Recognise and represent in order to compare 0 in terms of additive inverses			AS 6: Solve problems involving selecting, calculating with and converting between appropriate SI units (Length, Mass and Capacity)	Organise and record data using tallies and tables. Examine ungrouped numerical data to determine the most frequently occurring score (mode) of the data.
WEEK 9	AS 8d and 8e: Estimate and calculate by selecting and using operations and techniques appropriate to solve problems that involve: Multiplication of at least whole 2-digit by 2-digit numbers to at least 1 000 Division of a 3-digit by a 1-digit number AS 3b:Recognise and represent common fractions to twelfths AS 3e: Recognise and represent 1 in terms of its multiplicative inverse				
WEEK 10		AS 1c: Investigate and extend numeric and geometric patterns.	AS 5: Describe 2-D shapes and 3-D objects in terms of tessellations, line and rotational symmetry, movement including rotations, reflections and translations	AS 4: Describe and illustrate ways of representing time in different cultures throughout history	

THE ASESSMENT FRAMEWORK: GRADE 5 MATHEMATICS

	INFORMAL ASSESSMENT TAKES PLACE ON A REGULAR BASIS THROUGHOUT THE TERM					
FORMAL:	**MENTAL STRATEGIES**	**LO 1: NUMBERS, OERATIONS AND RELATIONSHIPS**	**LO2: PATTERNS, FUNCTIONS AND ALGEBRA**	**LO 3: SPACE AND SHAPE**	**LO 4: MEASUREMENT**	**LO 5: DATA HANDLING**
TERM 2						
WEEK 1		AS 8a: Rounding off to the nearest 5, 10, 100 and 1 000			AS 1: Read, tell and write analogue, digital and 24-hour time to the nearest minute.	
WEEK 2	NO FORMAL ASSESSMENT DONE DURING WEEK 2					
WEEK 3		AS 3b: Recognise common fractions to twelfths AS 5a: Common fractions with denominators which are multiples of each other AS 8c Addition and subtraction of common fractions with the same denominator	AS 4: Write number sentences to describe a problem situation within a context	AS 4: Recognise, describe and perform translations (slides) using geometric figures and solids.	AS 2:Solve problems involving calculation and conversion between appropriate time units including decades, centuries and millennia	
WEEK 4	Multiplication tables (for Assessment Task 2)	AS 8f: Finding fractions of whole numbers which result in whole numbers AS 8e Multiplication of a 3-digit by a 1-digit number AS 3c and 5 b: Decimal fractions in the form of 0,5; 1,5; 2,5 in the context of measurement		AS 4: Recognise geometric shapes and solids using rotations.		

WEEK 5		AS 6b: Solve problems in context such as measurements in Natural Sciences and Technology AS 3f: Recognise and represent multiples of single-digit numbers to at least 100		AS 4a: Recognise and perform flips (reflections) using geometric shapes and solids.	AS 1: Read, tell and write analogue, digital and 24-hour time to the nearest minute and second	
ASSESSMENT TASK 1 COMPLETED						
WEEK 6	Mental calculation: Addition and Subtraction Adding on to make 1 000					
WEEK 7		AS 4: Place value of digits in whole numbers to a minimum of 5-digit numbers AS 8b: Addition and subtraction of whole numbers with at least 5 digits. AS 6a: Solve problems in context such as financial (buying, selling, profit, loss)				
WEEK 8	Multiplication Tables Test Adding and Subtraction test.	AS 3d: Recognise and represent in order to compare 0 in terms of additive inverses			AS 6: Solve problems involving selecting, calculating with and converting between appropriate SI units (Length)	AS 3 :Organise and record data using tallies and tables. AS 4: Examine ungrouped numerical data to determine the most frequently occurring score (mode) of the data.

WEEK 9		AS 3f: Recognise and represent multiples of single-digit numbers to at least 100 AS 8d: Multiplication of whole 2-digit by 2-digit numbers to at least 1 000 Recognise and represent common fractions to twelfths Recognise and represent 1 in terms of its multiplicative inverse AS 8f: Division of a 3-digit by a 1-digit number				
ASSESSMENT TASK 2 COMPLETED						
WEEK 10	NO FORMAL ASSESSMENT DONE DURING WEEK 10					

Grade 5: Term 2 Week 1

Hours: 5	**Number of Periods: 5**
Mathematics LO 1; AS 8a **LO 4; AS 1,3**	**Milestones:** • Estimate and calculate by selecting and using operations and techniques appropriate to solve problems that involve: a) rounding off to the nearest 5, 10, 100 or 1 000 • Read, tell and write analogue, digital and 24-hour time to at least the nearest minute and second

Mental Strategies: Mental strategies are done with the whole class every day. The time should be used to develop skills and to build number sense.

	Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 5**
Content Focus:	Revision of Term 1 work – 4-digit numbers and place value	Rounding off Assessment Task	Reading analogue and digital time Assessment Task	Reading analogue and digital time with a.m. and p.m. times and converting to 24-hour time	Reading analogue and digital time with a.m. and p.m. times and converting to 24-hour time Assessment Task
Resources	Chalkboard Textbooks Worksheets	Chalkboard Textbooks Worksheets	Chalkboard, Textbooks Worksheets Real watches/clocks	Chalkboard, Textbooks Worksheets Cardboard Real watches/clocks	Chalkboard Textbooks Worksheets

WEEK 1: Day 1

Notes to the teacher:

- Learners must get plenty of practice reading numbers, writing them in words, and understanding the value of the digits that make up a number. They have had a holiday, so this lesson will focus on getting their "Maths minds" working again.

Resources: Chalkboard, textbooks.

DAILY ACTIVITIES

Oral and Mental Activity (10 minutes)

- Divide the class into two teams, either a boys' team and a girls' team, or by how they are sitting in the classroom. Ask each team in turn questions, keeping score on the board. Examples of questions you can ask:
  - What is the largest 3-digit number (999)
  - What number is exactly half way between 45 and 55? (50)
  - Using different digits, what is the largest 3-digit number you can make? (987)
  - What is the value of the 3 in the number 1 398? (Three hundred)
  - What number is 200 more than 1 356? (1 556)
  - What number is 10 times bigger than 11? (110)
  - Count in 4s from 98 to 122.
  - What number is 300 less than 5 698? (5 398)
  - Halve 420 (210)
  - Double 62 (124)
  - Round off 422 to the nearest 10 (420)

Concept Development (20 minutes)

- Write a 4-digit number, e.g. 5 231, on the board.
  - Ask the learners to say it in words. (5 thousand, two hundred and thirty one.)
  - Ask them the value of the 2, the 5, the 3, and the 1.
  - Let different learners count in 10s from 5 231 (one learner counts, until you say stop. Then another learner continues until you say stop.)
  - In the same way, ask different learners to count in 100s from 5 231. You can also make some learners count backwards from where another learner finishes counting.
  - Write the number in expanded notation. 5 231 = 5 000+200+30+1. Briefly revise this concept.
  - Round 5 231 off to the nearest 10, 100 and 1 000. Revise this.
  - Repeat the above two or three times with different 4-digit numbers.

Consolidation (20 minutes)

- Write work on the board for the learners to complete:
  - Write the following numbers in expanded notation: 3 458, 2 691, 3 248
  - Write the following numbers in words: 7 651, 5 378
  - Write in digits: One thousand, three hundred and forty five; Six thousand and one; Four thousand, five hundred and eight.

- Write the number that is 5 000+1+200+70; 7+2 000+60+800
- What is the value of the 5 in each of the following numbers: 2 345, 2 578, 5 872, 6 453
- Arrange from smallest to largest: 5 463, 4 563, 3 564, 3 456 and 6 345
- Arrange from largest to smallest: 1 234, 4 132, 4 123, 3 421, 3241

Problem Solving (10 minutes)

- Find problems in the textbook, or write a problem or two, such as the following, on the board:
  - Write down the largest 3-digit number you can make using 3 different digits. Write down the smallest 3-digit number you can make using 3 different digits. Find:

  (a) the sum of the two numbers you wrote down (987 + 102)

  (b) the difference between the two numbers you wrote down. (987-102)

ASSESSMENT	**Informal :** • Observe the learners to check that they understand the work. Sit with small groups of learners who are still struggling.

WEEK 1: Day 2

Notes to the teacher:

- Rounding off not a new concept, it was learnt in Grade 4. Hhowever, some learners do have difficulty with this concept. Rounding off will now include to the nearest 5
- Rounding off is important in every day life. For example, we do not always know exactly how much money we have in our purses or wallets, we have a rough idea. Also, as we go around the supermarket, we estimate the cost of what we buy so that when we get to the till, we know about how much our groceries will cost. . This should be explained to learners.

Resources: Chalkboard, textbooks, worksheets, number lines

DAILY ACTIVITIES

Oral and Mental Activity (10 minutes)

- Counting activities in preparation for rounding off. Count:
  - In 5s from 0 to 100
  - In 5s from 225 to 270
  - In 10s from 140 to 340
  - In 100s from 900 to 2 500
  - In 1 000s from 13 000 to 31 000
- Doubling and halving
- Ask questions about what number lies halfway between e.g. 20 and 30, 60 and 70, 100 and 200,

Concept Development (20 minutes)

- Start by revising rounding off to the nearest 10. On the chalkboard, draw a row of eleven houses with spaces between them. Number them from 0 to 100, in 10s (0, 10, 20 etc). The pizza delivery man has to deliver a pizza to a house in the street, e.g. house number 34, but he can only deliver to one of the *numbered* houses. Which is the closest house he can deliver to? (Number 30)
- Number 34 was rounded off to the nearest 10 because when we count in 10s, 34 is *nearer* to 30 than to 40. So, 34 ≈ 30. Stress the importance of the ≈ symbol. It means "is approximately equal to". One must *never* write 34 = 30.
- Repeat with more examples, rounding off to the nearest 10.
- Now draw a row of bags of sweets, containing 0 to 1 000 sweets, in hundreds (0, 100, 200, etc). Ask the children questions such as: If I have 468 sweets, do I have nearer to 400 or 500 sweets? 468 ≈ 500
- Do a similar exercise with numbers in thousands, from 1 to 10 000.
- Proceed to rounding off to the nearest 5. Draw a number line in intervals of 1, from 0 to 30 (or higher if you have space on your board). Ask the learners to count in fives, circle the multiples of 5 or write them in colour. Ask, "Is 3 nearer 0 or 5?" "Is 17 nearer 15 or 20?" Continue until the learners are able to round off to the nearest 5.

Problem Solving (15 minutes)

- Set problems, one or two to be done orally with the class as a whole, then some to be done in learners' workbooks, which entail rounding off to the most suitable number, i.e. 5, 10, 100 or 1 000. Examples:
  - It is 1 436 km from Cape Town to Johannesburg. Approximately how many kilometres is this? (It would be more meaningful to round this distance off to the nearest 100. 1 436≈1 400 km)
  - There are 37 learners in our class. Approximately how many is this? (Round off to the nearest 10. 37≈40). IF we round off to the nearest hundred how many learners is this? Is this reasonable?
  - Farmer Brown has two sheds containing hens. One shed has 568 hens, the other has 622 hens. About how many hens does Farmer Brown have altogether? (Round off to the nearest 100)
  - I have R27 in my purse. How much money do I have to the nearest R10?
  - A new car costs R123 456. Approximately how much does a new car cost? (Round off to the nearest 1 000)

Consolidation (15 minutes)

- Learners copy the following table from the board, or make photocopies of it if possible, and complete it:. Round the numbers off to the nearest 5; 10; 100; 1 000

	5	10	100	1 000
2 874				
7 856				
995				
1 876				
6 242				

Find examples in textbooks, make worksheets, or write more practice examples on the board.

ASSESSMENT	• **Informal :** - Observe learners while they are working to see if they understand the work.
ASSESSMENT	• **Formal, recorded Assessment Task 1:** - Mark the completed table (20 answers) and record learners' results - LO 1 AS 8a. Estimate and calculate by selecting and using operations and techniques appropriate to solve problems that involve rounding off to the nearest 5, 10, 100 and 1 000

WEEK 1: Day 3

Notes to the teacher:

- The focus is on reading and writing analogue and digital time.
- Reading analogue (and digital) time is sometimes difficult for learners. Although this work was covered in Grade 4, take it slowly and make sure the learners are able to read time.

Resources: Chalkboard, cardboard, Pres-stik, worksheets and textbooks

DAILY ACTIVITIES

Oral and Mental Activity (10 minutes)

- Counting in 5s from 0 to 60
- Count in 15s from 0 to 60
- Count in quarters (quarter, half, three quarters, one, one and a quarter, one and a half….)
- Ask the learners to write down answers to questions you pose about time, e.g. how many minutes in an hour, how many seconds in a minute, how many quarter hours in an hour, how many minutes in half an hour.

Concept Development (25 minutes)

- Draw a clock on the chalkboard. Have two cardboard "hands", one longer than the other.
- Using Pres-stik, place the cardboard hands of the clock at e.g. 1 o'clock. Ask the learners what the time is, and which hand shows us the hour and which one the minutes.
- Move the minute hand around the clock in 5 minute intervals, and let the learners repeat the time after you, saying the time in two different ways. (5 past 1 – 1.05; 10 past 1 – 1.10; *quarter* past 1 – 1.15; …. *half* past one – 1.30, 25 to 2 – 1.35 etc). When the minute hand reaches the 12, ask what now happens to the hour hand? It moves to the 2.
- Repeat this once or twice, gradually moving on to random, minute intervals (7 past 1, 1.07)
- Place the clock hands randomly, and get the learners to read the time to you.
- Give as many learners as time allows to place the clock hands correctly as you give them a time, always saying the time in the analogue and digital way..

Consolidation (25 minutes)

- Give the learners an exercise to do from their textbooks, or make a worksheet if you cannot find a suitable exercise in their textbooks.
  - The learners must place the clock hands correctly on 10 or more drawn clock faces to show different times given to them. Give the time in both analogue and digital ways.
  - The learners must be able to read different times from clocks.

ASSESSMENT	• **Formal, recorded Assessment Task 1:** - Mark 10 clock faces with clock hands correctly drawn to show the correct time. Record the results. This is part of the Assessment towards AT 1. - LO 4 AS 1 Read, tell and write analogue time.

WEEK 1: Day 4

Notes to the teacher:

- Today the focus will be on a.m. and p.m. times, and converting to 24-hour time.
- Note that a.m. and p.m. digital time is written e.g. 9.15 (a single digit for the hour with a dot between the hour and the minutes. This must be taught as you proceed with the lesson.
- 24-hour time is always written with two digits for the hour, so an a.m. time will be written with a zero at the beginning, e.g. 8.30 a.m. is written 08:30. The hours and minutes are separated by a colon (**:**) This must be drilled.
- Should explain that a.m. is *ante meridiem* which is 'before middle of the day' i.e. from midnight to noon; and p.m. is *post meridiem* i.e. 'after middle of the day', i.e. after noon until midnight.

Resources: Chalkboard, worksheets, textbooks.

DAILY ACTIVITIES

Oral and Mental Activity (10 minutes)

- Adding from 12 to 24
  - 12+1 12+2 12+3 12+4 12+5 ……. 12+12
  - Randomly: 12+5 12+8 12+12 12+7 etc
- Subtracting from 24 to 12
  - 24-1 24-2 24-3 24-4 ……. 24-12
  - Randomly: 24-5 24-9 24-8 24-11

Concept Development (25 minutes)

- Ask the learners at what time it becomes afternoon (12 noon)
- Explain that if we say a time that is in the morning, we use a.m. after the time, and if we say a time in the afternoon, it is p.m.
- Ask the learners to tell you whether the following (think of more examples) are a.m. or p.m.:
  - We have breakfast at 7.00 …….
  - School finishes at 2.15 ……..
  - We go to bed at 8 ……
- There is another way to show morning and afternoon times, without writing a.m. or p.m., this is called 24-hour time. After 12 noon, we count on, so 1 p.m. is 13:00 (say "13 hundred hours"), 2 p.m. is 14:00 (14 hundred hours). Practise and drill.
- Move onto reading 24-hour hours and minutes, e.g:
  - How do I write 20 to 7 p.m. in 24-hour time? 6.40 p.m. or 18:40
  - 9.35 p.m. is 21:35
  - Ask enough of this type of question to ensure the learners understand.

Consolidation (25 minutes)

- Find examples of converting from analogue to digital/24-hour time in the textbook or make suitable worksheets. Activities include:
  - Change these times to 24-hour times: (at least 5)
    a) 8.41 a.m. b) 3.10 p.m.
  - Change these times to a.m. or p.m. times (at least 5):
    a) 10:45 b) 14:07

- Make a train schedule like the following:

Station	Arrives	Departs
A	09:50	10:05
B	11:24	11:32
C	12:45	12:55
D	13:52	14:06
E	16:05	16:20
F	17:43	

- Using the schedule, pose questions such as:
  a) For how long does the train stop at Station A?
  b) What time does the train depart from Station E in a.m. or p.m. time?
  c) What time, in a.m. or p.m. time, does the train arrive at Station D?
  d) What happens at station F? (i.e. an open question)

ASSESSMENT	**Informal :** • From learners' responses to questions and from the way they do the written task, you will be able to assess whether they understand converting time from analogue to digital and to 24-hour time.

WEEK 1: Day 5

Notes to the teacher:

- There will most likely be learners who are unable to read analogue and digital time and convert to 24-hour time. Use this lesson to work with these learners in groups while those who understand it do more exercises.

Resources: Chalkboard, textbook, worksheets, television programme schedule

DAILY ACTIVITIES

Oral and Mental Activity (10 minutes)

- Individually, let the children write down the answers to sums such as the following:
  - 7x7
  - 38+14
  - 101-12
  - 56+44
  - 28÷4
  - Double 26
  - Half of 90
  - 25x4
  - 19+11-15
  - 15+16

  Go through the answers and see areas of weakness.

Concept Development (15 minutes)

- With the whole class, revise a.m. and p.m. times, and converting from these to 24-hour time:
  - Is 9.15 a.m. in the morning or the evening? (morning)
  - How would I say 9.15 in the evening? (9.15 p.m.) (Ask a few more questions like this)
- If you see a bus time table, or the TV guide, times are not given as a.m. or p.m. They are written e.g. 07:45, 16:20.
  - What do we call this way of writing time? (24-hour digital).
  - How do we know when the hours are in the morning? (The hour time is less than 12)
  - How do we know when the hours are in the afternoon or evening? (The hour time is more than 12).

- Now proceed to written work. Allow those learners who understand to work on their own, but work with small groups of learners who have not grasped the concept. You will know how to divide the learners from your assessment of the work done in the previous lesson and from their verbal responses.

Consolidation and Problem Solving (35 minutes)

- For the learners with whom you will be working in a small group, give them:
  - More clock faces on which they must draw in the hands to show given times
  - Clocks showing different times and they must write down the times shown

- A simple table to complete, converting a.m. and p.m. times to 24-hour times. Work with them to ensure they fill it in correctly. You can adapt this to suit your learners:

Morning			Afternoon		
We say	a.m. or p.m.	24-hour	We say	a.m. or p.m.	24-hour
1 o'clock	*1 a.m.*	*01:00*	1 o'clock	*1 p.m.*	*13:00*
2 o'clock			2 o'clock		
3 o'clock			3 o'clock		
4 o'clock			4 o'clock		
5 o'clock			5 o'clock		
6 o'clock			6 o'clock		
7 o'clock			7 o'clock		
8 o'clock			8 o'clock		
9 o'clock			9 o'clock		
10 o'clock			10 o'clock		
11 o'clock			11 o'clock		
12 o'clock			12 o'clock		

- Learners must complete in their books (still with your guidance), examples converting time using minutes from a.m. and p.m. times to 24-hour time:
  a) 5.15 a.m. b) 1.40 p.m. etc
- Then, still with your guidance, convert 24-hour times to a.m. or p.m:
  a) 20:20 b) 11:10 etc

• Give the learners who will be working on their own a copy of a TV schedule, such as the one below, and they must answer questions in their books about it:



133 **SABC 3**

Only available in South Africa

07:30 Sylvester and Tweety
08:00 AM Shopping
09:30 Debbie Travis Painted House
10:00 Cricket: SA vs Australia
12:00 News @ 1
13:00 Sport to Fill
13:10 Cricket: SA vs Australia continues
17:45 3 Talk with Noeleen
18:30 Isidingo
19:00 News @ 7
19:30 Aliens in America
20:00 Wondrous Oblivion
22:00 Dollars and White Pipes

- Examples of questions you can ask:
  a) Which programmes can you watch in the morning?
  b) What time does "Sport to Fill" start? Write this as a.m. or p.m. time.
  c) Which programme starts at 8 p.m.?
  d) How many minutes does the programme "Sylvester and Tweety" last?
  e) For how long is the cricket on? (This is a bit of a challenge)

- Give the learners a copy of a table to complete. They must fill in the missing times by converting, taking note to use the correct way of writing the time:

Time on my digital clock in a.m. and p.m.	Time in 24-hour notation	Time in words
5.23 a.m.		
	18:43	
		16 past 9 in the evening
		20 to 4 in the afternoon
7.30 a.m.		

- Find more examples in textbooks to practise reading analogue, digital and 24-hour time.
- Find time-related problems for the learners to solve, or set your own, e.g:
  - The time on my watch is 11.02 a.m. It is 6 minutes fast. What is the correct time?
  - I have to be at school in 40 minutes' time. It is now 07:05. At what time must I be at school.
  - The train takes 17 minutes to get from one station to the next. If it leaves the first station at 13:28, at what time will it arrive at the next station?
  - *Note: make the problems as easy or as difficult as your learners can manage. Avoid any problems that involve adding or subtracting hours and minutes, as they have not learnt this skill yet.*

ASSESSMENT	**Informal :** Check learners' books and their oral responses.
ASSESSMENT	• **Formal, recorded Assessment Task 1:** - 10 conversions (in the table, above) to be completed and assessed. - Mark 5 questions from the TV schedule for assessment. - AS 1. Read, tell and write analogue, digital and 24-hour time.

Grade 5: Term 2 Week 2

Hours: 5	**Number of Periods: 5**
Mathematics LO 1 AS 1, 3b, 3f, 5a, 8c **LO 4 AS 1, 4**	**Milestones:** • Count forward and backward in whole number intervals and fractions • Recognise and represent in order to compare: a) common fractions to twelfths b) multiples of single-digit numbers to at least 100 • Recognise and use equivalent forms of Common fractions with denominators that are multiples of each other • Addition and subtraction of common fractions with the same denominator.

Mental Strategies: Mental strategies are done with the whole class every day. The time should be used to develop skills and to build number sense.

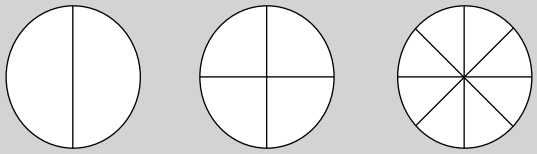
	Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 5**
Content Focus:	Recognise and represent common fractions to twelfths	Recognise and represent common fractions to twelfths	Recognise and use common fractions with denominators which are multiples of each other	Adding fractions with the same denominator	Subtracting fractions with the same denominators
Resources	Chalkboard, textbooks, worksheets,	Chalkboard, textbooks, worksheets	Chalkboard, textbooks, worksheets, fraction walls	Chalkboard, textbooks, worksheets,	Chalkboard, textbooks, worksheets

WEEK 2: Day 1

Notes to the teacher:

- The focus of today's lesson is to be able to recognise halves, quarters, eighths, twelfths.
- Learners often struggle with the concept of fractions, so it is important to take it slowly and use as many concrete examples as possible.
- Always emphasise that fractions are *equal* parts of a whole.
- Learners must know the words *numerator* (the top number in the fraction) and *denominator* (bottom number).
- Fractions must be written with a straight line: $\frac{1}{2}$ and not $\frac{1}{2}$

Resources: Textbooks, Chalkboard, cardboard or paper circles divided into halves, quarters, eighths and twelfths, e.g.:



DAILY ACTIVITIES

Oral and Mental Activity (10 minutes)

- Using the word *multiples,* the whole class together or groups of learners, count:
  - In multiples of 3 from 63 to 90 (63, 66, 69, 72 ……)
  - In multiples of 4 from 40 to 80
  - In multiples of 7 from 49 to 91
  - In multiples of 9 from 18 to 99
  - In multiples of 8 from 56 to 95

  Do as many variations as you can.
- Get the learners to write the answers to 10 questions involving multiples, e.g.
  - Write down the first 5 multiples of 9
  - Write down the multiples of 6 from 30 to 50
  - Is 35 a multiple of 7?
  - Write down the multiple of 5 that comes before 70
  - Write down the 2 multiples of 9 that come after 81

Concept Development (30 minutes)

- Ask the class, "I have an apple and I want to share it equally with my friend who has no lunch. Into how many equal parts will I cut it?" (Two). Draw a picture on the board (a circle is fine), then ask:
  - What do we call each piece (a half)
  - How do we write "a half" in numbers? (1 over 2 – this is called a common fraction)
  - What do we call the 2 at the bottom of the fraction? (The denominator)
  - What does the denominator tell us? (How many equal part there are)
  - What do we call the 1 at the top of the fraction? (numerator)

- What does the numerator tell us? (How many of the parts we are using.) Write the fraction $\frac{1}{2}$ (with a straight line) on each half of the circle.
- How many halves make a whole? (Two) Write on the board: $\frac{1}{2} + \frac{1}{2} = \frac{2}{2}$ = 1 whole.
- Hand out the circles which are divided into half. Learners must copy your circle (with $\frac{1}{2}$ written on each half), paste it into their books, and write next to it: $\frac{1}{2} + \frac{1}{2} = \frac{2}{2}$ = 1 whole.

• Repeat the same procedure with quarters (note, learners must say quarters, not "fourths"), then:
  - Ask the learners which fraction is bigger, a half or a quarter? (Half)
  - Shade in one quarter and ask, "What fraction is shaded?" (a quarter)
  - What fraction is not shaded (three quarters). Write this $\frac{3}{4}$
  - Count the quarters: one quarter, two quarters, three quarters, 1 (whole)
• Repeat the same with eights and twelfths.

Consolidation (20 minutes)

• Hand out a worksheet with circles, rectangles and/or squares (any shapes), divided into a variety of different equal parts, with different numbers of parts shaded. Learners must answer questions such as:
  - Into how many parts has this shape been divided?
  - What fraction is each part?
  - What fraction of the whole is shaded/unshaded?
• Find exercises in the textbook to practise recognizing and comparing fractions (bigger than, smaller than).

ASSESSMENT	**Informal:** • Assess the learners through their oral responses. Observe their ability to complete the work you set.

WEEK 2: Day 2

Notes to the teacher:

- Today's lesson is a repeat of yesterday's lesson, teaching the learners to recognise thirds, fifths, sixths, tenths.
- Although this may seem tedious, it is important to work slowly and methodically.

Resources: Chalkboard, textbook, worksheets, cardboard or paper circles divided into thirds, fifths, sixths, tenths.

DAILY ACTIVITIES

Oral and Mental Activity (10 minutes)

- Counting, either the whole class together, or around the class, or a mixture of both:
  - In multiples of 3 from 24 to 48
  - In 10s from 44 to 104
  - Backwards in 10s from 182 to 92
  - Forwards in twelfths from $\frac{1}{12}$ to $\frac{11}{12}$
  - Forwards in halves from 0 to 3
  - Do as many as you have time for.
- Ask the children to answer orally, or write down in their books, ten questions such as:
  - Which fraction (with denominator 8) comes between $\frac{5}{8}$ and $\frac{7}{8}$?
  - What fraction with denominator 12 comes before $\frac{5}{12}$?

Concept Development (20 minutes)

- Ask the class, "Three people buy a loaf of bread and want to share it equally. Into how many pieces must the loaf of bread be cut? (Three). Draw a picture on the board then ask:
  - What do we call each piece (a third)
  - How do we write a third in numbers? (1 over 3 ….. $\frac{1}{3}$)
  - What does the denominator tell us? (There are three equal parts)
  - What does the numerator tell us? (How many of the parts we are using.) Write the fraction $\frac{1}{3}$ on each third of your picture.
  - How many thirds make a whole? (Three) Write on the board: $\frac{1}{3}+\frac{1}{3}+\frac{1}{3}=\frac{3}{3}=1$ (one whole).
  - Count the thirds: one third, two thirds, 1 (one whole)
  - Hand out the circles which are divided into thirds. Learners must fill in $\frac{1}{3}$ on each third, and copy what you wrote.
- Repeat the same procedure with fifths.
  - Shade in one fifth and ask, "What fraction is shaded?" (a fifth) Write this $\frac{1}{5}$
  - What fraction is not shaded (four fifths). Write this $\frac{4}{5}$
  - Shade in two fifths and ask, "What fraction is shaded?" (two fifths)
- Repeat the same with sixths and tenths.

Consolidation (20 minutes)

- Hand out a worksheet with circles, rectangles and/or squares (any shapes), divided into a variety of different equal parts, with different numbers of parts shaded. Learners must answer questions such as:
  - Into how many parts has this shape been divided?
  - What fraction is each part?
  - What fraction of the whole is shaded/unshaded?
- Find exercises in the textbook to practise recognizing and comparing (bigger than, smaller than) fractions. You can include fractions with denominators of 2, 3, 4, 5, 6, 8, 10 and 12.

ASSESSMENT	**Informal:** • Assess the learners through their verbal responses and their participation in the question and answer session • Watch them do their written work.

WEEK 2: Day 3

Notes to the teacher:
- Today's lesson focuses on equivalent fractions with denominators that are multiples of each other.
- It is important to give as many concrete examples as possible.

Resources: Blank fraction walls, chalkboard, textbook, worksheets.

DAILY ACTIVITIES

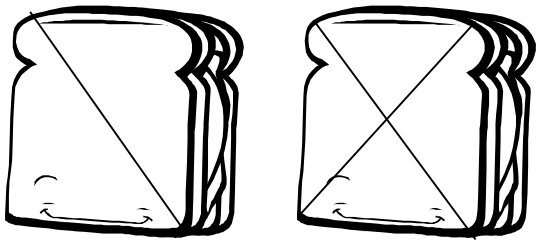
Oral and Mental Activity (10 minutes)

- Do some multiplication tables drilling today. Start with, e.g. the 6 times table.
  - Say it from 1x6 to 12x6, together as a class, maybe more than once.
  - Go around the class from group to group (or row to row, however your classroom is arranged) and each group in turn must say the answer to a 6x table sum. Do random questions, i.e. the first group gives the answer to 4x6, then next the answer to 7x6, the next to 3x6, and so on.
  - Do Clock multiplication (See Addendum)

Concept Development (30 minutes)

- Draw two sandwiches, as below, on the board.
  - Tell the class that two brothers, Thabo and S'nithemba, have sandwiches for school. However, they like them cut differently, like this:

Thabo *S'nithemb*



  - Into how many equal parts has Thabo's sandwich been cut? (two)
  - What fraction of the sandwich is each part? (a half)
  - Into how many equal pieces has S'nithemba's sandwich been cut?
  - What fraction of the sandwich is each part? (a quarter)
  - If Thabo eats one half of his sandwich and S'nithemba eats two quarters of his sandwich, who has eaten more? (They have both eaten the same).
  - So, $\frac{1}{2}=\frac{2}{4}$. These two fractions have the same value. We say they are *equivalent* fractions.
  - Practise saying the word *equivalent*.
- Give each learner a blank (no numbers filled in except the 1 [whole]) fraction wall like the one below. This must be pasted into their workbooks. Draw a similar one on the board.

1							
$\frac{1}{2}$				$\frac{2}{2}$			
$\frac{1}{4}$		$\frac{2}{4}$		$\frac{3}{4}$		$\frac{4}{4}$	
$\frac{1}{8}$	$\frac{2}{8}$	$\frac{3}{8}$	$\frac{4}{8}$	$\frac{5}{8}$	$\frac{6}{8}$	$\frac{7}{8}$	$\frac{8}{8}$

- Tell the learners to look at the two pieces (or bricks, if you like) of wall below the one whole. What fraction will you write in each of these? ($\frac{1}{2}$). Then fill in the row below. How many quarters are *equivalent* to a half? (2) Fill in the row of quarters.
- It is important that, by means of studying the fraction walls, the learners can see that whatever we do to the denominator, we do to the numerator to keep both parts of the fraction equivalent, e.g. $\frac{1}{2}$ is equivalent to $\frac{2}{4}$. In this case we multiplied the denominator by 2 (2x2=4), so we must also multiply the numerator by 2 (1x2=2). Keep telling the learners this as you work with the fraction walls. (Keep emphasising 'equivalent' wherever possible.)
- Fill in the row of eighths. Ask questions, which the learners answer orally, e.g. how many eights are equivalent to a half? How many eighths are equivalent to a quarter?

• Give the learners another fraction wall to be pasted into their workbooks.

1											
$\frac{1}{3}$				$\frac{2}{3}$				$\frac{3}{3}$			
$\frac{1}{6}$		$\frac{2}{6}$		$\frac{3}{6}$		$\frac{4}{6}$		$\frac{5}{6}$		$\frac{6}{6}$	
$\frac{1}{12}$	$\frac{2}{12}$	$\frac{3}{12}$	$\frac{4}{12}$	$\frac{5}{12}$	$\frac{6}{12}$	$\frac{7}{12}$	$\frac{8}{12}$	$\frac{9}{12}$	$\frac{10}{12}$	$\frac{11}{12}$	$\frac{12}{12}$

- This fraction wall is divided into thirds, sixths and twelfths. Fill in the fractions with them (you write them on a fraction wall on the board, they copy what you write on their fraction walls), asking questions, similar to the ones above, as you go. Keep asking the learners how to make equivalent fractions, i.e. do the same to the numerator and denominator.

• Repeat the same with two more fraction walls:

1											
$\frac{1}{2}$						$\frac{2}{2}$					
$\frac{1}{4}$			$\frac{2}{4}$			$\frac{3}{4}$			$\frac{4}{4}$		
$\frac{1}{12}$	$\frac{2}{12}$	$\frac{3}{12}$	$\frac{4}{12}$	$\frac{5}{12}$	$\frac{6}{12}$	$\frac{7}{12}$	$\frac{8}{12}$	$\frac{9}{12}$	$\frac{10}{12}$	$\frac{11}{12}$	$\frac{12}{12}$

1									
$\frac{1}{5}$		$\frac{2}{5}$		$\frac{3}{5}$		$\frac{4}{5}$		$\frac{5}{5}$	
$\frac{1}{10}$	$\frac{2}{10}$	$\frac{3}{10}$	$\frac{4}{10}$	$\frac{5}{10}$	$\frac{6}{10}$	$\frac{7}{10}$	$\frac{8}{10}$	$\frac{9}{10}$	$\frac{10}{10}$

Consolidation (20 minutes)

- Learners must use the fraction walls, and work on their own in their workbooks, to answer questions such as the following. Learners should answer 10 to 20 questions. *Note: you may have to guide them as to which fraction wall to use in each question.*

1. Write down two equivalent fractions for: a) $\frac{1}{2}$ b) $\frac{1}{3}$
2. Which is bigger: $\frac{3}{10}$ or $\frac{2}{5}$?
3. How many twelfths are equivalent to $\frac{3}{6}$?
4. Write the fraction, with denominator 4, which is equivalent to $\frac{6}{8}$.

ASSESSMENT	**Formal :** • Mark the learners' books to check that they understand the work..

WEEK 2: Day 4

Notes to the teacher:

- By the end of today's lesson, learners will be able to add fractions with the same denominator.
- At this stage, the answers will not exceed 1 (i.e. no Improper fractions or Mixed numbers will be included today)
- Learners often want to add the denominators, so emphasise from the beginning that it is only the numerators that are added.
- Do as many concrete examples as you can.

Resources: Chalkboard, textbooks, number lines, fractions walls.

DAILY ACTIVITIES

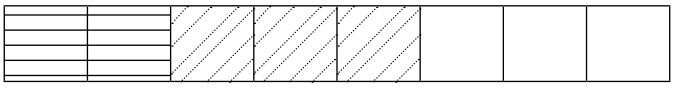
Oral and Mental Activity (10 minutes)

- Practise adding on to make 100. Say the questions and the learners can write the answers in their workbooks. Do at least 10 sums.

50+☐=100	52+☐=100	55+☐=100	58+☐=100	71+☐=100
75+☐=100	78+☐=100	89+☐=100	37+☐=100	46+☐=100

Concept Development (20 minutes)

- In groups, learners must discuss then tell you the answer to the following question as quickly as they can: I drank $\frac{1}{5}$ of my juice at break, then another $\frac{1}{5}$ at lunchtime. How many fifths of my juice have I had?
  - When the learners have come up with the correct answer, $\frac{2}{5}$, show them that this is correct by drawing a juice bottle on the board, and dividing it into fifths. Shade the $\frac{1}{5}$ I drank at break, then shade, in another colour, the $\frac{1}{5}$ I drank at lunch, then write the number sentence: $\frac{1}{5}+\frac{1}{5}=\frac{2}{5}$.
  - Emphasise that we do *not* add the fives in the denominators. The fifths of the juice cannot suddenly become tenths, which is what would happen if we added the denominators.
- Pose another similar question to the groups, e.g. My father ate $\frac{1}{8}$ of the loaf of bread, and my brother ate $\frac{1}{8}$ of the loaf of bread, *what fraction* of the bread have they eaten?
  - When the learners have come up with the correct answer, again show by means of a picture or a number line that they have eaten $\frac{2}{8}$ of the bread. Some learners should know that this is the same as $\frac{1}{4}$ so tell them that they are correct.
- Do similar examples but use numerators greater than 1, e.g. $\frac{2}{8}+\frac{3}{8}=\frac{5}{8}$
  - Use sketches to help the learners understand:



  - You can also use number lines or fraction walls to help explain the concept.

Consolidation (15 minutes)

- Find examples of addition of common fractions in textbooks, make worksheets or write sums on the board. Learners can do 20 such sums, individually in their books. Sums can include fractions with denominators of 2, 3, 4, 5, 6, 8, 10 and 12. Ensure that the fractions the learners must add have the same denominators. Work with groups of learners who need more time to understand this concept.

Problem Solving (15 minutes)

- The learners who have mastered addition of fractions can do some problem solving. While they are busy, the learners you were helping do the addition sums can do the task as described under the heading "Consolidation". Examples of problems you can set are:
  - $\frac{1}{8}$ of the learners in our class cycle to school. $\frac{5}{8}$ walk to school. Altogether, what fraction of the learners neither cycle or walk to school?
  - We watched $\frac{1}{5}$ of the DVD on Monday, and $\frac{3}{5}$ of the DVD on Tuesday. What fraction of the DVD had we watched altogether?

ASSESSMENT	**Formal :** • Learners did 20 addition of fractions sums. These should be checked. **Informal :** • Gauge the learners' responses to questions and their participation in class to see if they are grasping the concept.

WEEK 2: Day 5

Notes to the teacher:

- Today's lesson will focus on subtraction of fractions.
- If the learners have grasped the concept of addition of fractions, they should easily be able to understand subtraction of fractions.
- Only the numerators must be subtracted. The learners must be constantly reminded of this.
- Use as many pictures, number lines or fraction walls as necessary to help the learners understand this concept.
- The starting point will be subtracting a fraction from 1 whole. When 1 whole is written as a fraction, the numerator and denominator are always the same.

Resources: Chalkboard, textbooks, number lines, fractions walls

DAILY ACTIVITIES

Oral and Mental Activity (10 minutes)

- Practise adding on to make 1 000. Say the sums, and the learners can write the answers in their books. Do ten sums. The learners can then mark each others' books.

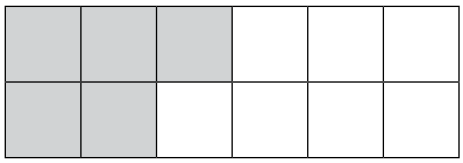
  300+☐=1 000 360+☐=1 000 475+☐=1 000 520+☐=1 000

Concept Development (20 minutes)

- Draw a chocolate slab, which has 12 squares on the board.



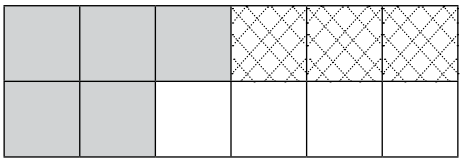
- Ask the learners how many squares the chocolate bar has? (12) What fraction is each square? ($\frac{1}{12}$) How do we write *one whole* in twelfths? ($\frac{12}{12}$)
- Ask learners in their groups to see who can come up with the answer to this question first: If I have a slab of chocolate like the one drawn on the board, and I eat $\frac{5}{12}$ of it, what fraction of the slab do I have left?
- When the learners have had time to think about it, and some may have given you the correct answer, i.e. $\frac{7}{12}$, show the class by means of shading how to arrive at the answer.
- Shade in the $\frac{5}{12}$ that you ate:



- How many twelfths did we have to start with? (12)
- How many twelfths did we eat? (Five)

- Our number sentence is: $\frac{12}{12} - \frac{5}{12} = \frac{7}{12}$ is left. (There are seven unshaded blocks in the diagram).

- Ask the learners in the groups to work out the following: I then gave my brother $\frac{3}{12}$. How much chocolate do I now have left?
- Again, let the groups of learners who have the answer tell you, and explain to the whole class by means of shading three squares of the ones that were left, how we know the answer ($\frac{4}{12}$) is correct:.



- Write the number sentence on the board: $\frac{7}{12} - \frac{3}{12} = \frac{4}{12}$ (there are four unshaded blocks on the diagram.)

• Repeat the above example, using tenths or eighths. You can draw a pizza, a loaf of bread, a cake or anything relevant to the learners.
• Establish the rule: *When we subtract fractions, we only subtract the numerators. The denominator stays the same.*

Consolidation (15 minutes)

• Find examples of subtraction of common fractions in textbooks, make worksheets or write sums on the board. Learners can do 20 such sums, individually in their books. Sums can include fractions with denominators of 2, 3, 4, 5, 6, 8, 10 and 12. Ensure that the fractions the learners must add have the same denominators. Work with groups of learners who need more time to understand this concept.

Problem Solving (15 minutes)

• The learners who have mastered addition of fractions can do some problem solving. While they are busy, the learners you were helping do the addition sums can do the task as described under the heading “Consolidation”. Examples of problems you can set are:

- My mother baked a cake. She cut it into 10 equal slices. We ate $\frac{4}{10}$ of it. What fraction was left?

- $\frac{7}{8}$ of a pie was on a plate. The dog stole $\frac{2}{8}$. What fraction of the pie was left?

ASSESSMENT	**Informal :** • Learners can swop books and you go through the answers to the 20 subtraction sums that were given. Check, by a show of hands, how many learners got them all correct, 19 correct, etc. (When you get to about 15 out of 20, just ask who got less than 15, so that the learners who made many mistakes do not feel embarrassed.)

Grade 5: Term 2 Week 3

Hours: 5	**Number of Periods: 5**
Mathematics LO 1 AS 1, 3b, 5a, 5b, 8c **LO 2 AS 4** **LO 4 AS 2** **LO 5 AS 4**	**Milestones:** • Counts forwards and backwards in whole number intervals and fractions • Write number sentences to describe a problem situation within a context • Solve problems involving calculation and conversion between appropriate time units including decades, centuries and millennia • Recognise, describe and perform translations (slides) using geometric figures and solids. • Recognise common fractions to twelfths • Recognise and use common fractions which are multiples of each other. • Adding and subtracting fractions with the same denominator

Mental Strategies: Mental strategies are done with the whole class every day. The time should be used to develop skills and to build number sense.

	Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 5**
Content Focus:	Consolidation of work done on fractions. Assessment Task	Write number sentences to describe a problem situation. Assessment Task	Solve problems involving time: seconds, minutes, hours, days, weeks.	Solve problems involving time: months, years, decades, centuries, millennia. Assessment Task	Slides using geometric shapes and solids Assessment Task
Resources	Prepared worksheets or work to write on the board.	Chalkboard, textbook, worksheets	Chalkboard, textbook, worksheets	Chalkboard, textbook, worksheets	Chalkboard, large cardboard squares and triangles. Worksheets. Cardboard templates of geometric shapes. Clay.

WEEK 3: Day 1

Notes to the teacher:

- Today's lesson will consolidate and enable you to assess what has been learnt in Common Fractions.
- You will assess three concepts, namely:
  - Recognising fractions up to twelfths
  - Comparing fractions with denominators that are multiples of each other
  - Addition and subtraction of fractions with the same denominators.
- Assess each concept separately. Give the learners enough time to complete the work set on each concept. Then tell them to start on the next section. This will ensure that the learners can be properly assessed on all the concepts and not spend the whole time working on the first set of exercises.

Resources: Prepared worksheets, or prepared work to write on the board.

DAILY ACTIVITIES

Oral and Mental Activity (10 minutes)

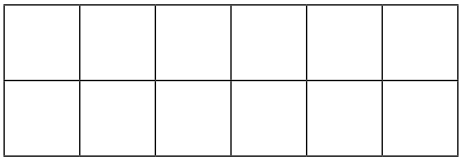
- Do some times table drilling.
  - You can focus on one table at a time, or do random tables.
  - Learners can answer in groups of 3-5 (how they are sitting, or in their rows, depending on how your classroom is arranged).
  - Select a learner to keep score.
  - Ask a group to answer as quickly as possible, 5x7, 6x3, 9x9 etc. When they give an incorrect answer, proceed to the next group and do the same. (Anyone in the group can answer.)
  - Make sure all the groups get a turn (or two turns, depending on time) and see which group got the highest score.

Concept Development (5 minutes)

- Explain to the learners that they are going to revise fractions today.
  - They must try their best to get as many exercises correct as they can.
  - When you tell them to stop working and go onto the next section, they must do that. (If possible, you could hand out three different worksheets, or write the work on the board in such a manner that you can cover up the sections that the learners are not busy with.)

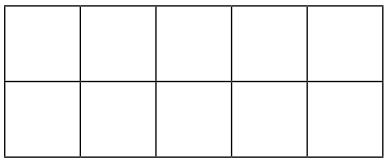
Consolidation (45 minutes)

- The first section will assess the learners' ability to recognise common fractions up to twelfths. Set 15 questions to be completed in 15 minutes. Examples:
  - On the diagram,



Use your red crayon, to colour in $\frac{1}{12}$ of the diagram. Using your blue crayon, colour in $\frac{3}{12}$ of the diagram.

- What fraction of the whole is each of the blocks in this diagram?



- Colour in 3 blocks and write down the fraction you have coloured in.
- Write in fraction form: three quarters, five eighths, seven tenths.
- Write a fraction with a numerator of 3 and a denominator of 5.
- Write a fraction with denominator of 4 that equals one whole.
- Which is bigger, $\frac{1}{8}$ or $\frac{1}{10}$?

• Now assess the learners' knowledge of equivalent fractions. Allow them 15 minutes, and ask 15 questions such as:

- Write fractions with denominator 12 that are equivalent to: $\frac{1}{4}$; $\frac{5}{6}$; $\frac{2}{3}$
- Write fractions with denominator 10 that are equivalent to $\frac{1}{2}$; $\frac{4}{5}$
- Fill in the missing numerator: $\frac{3}{4} = \frac{\ }{8}$; $\frac{4}{6} = \frac{\ }{3}$
- Fill in the missing denominator: $\frac{1}{5} = \frac{2}{\ }$; $\frac{1}{2} = \frac{4}{\ }$

• Give the learners 15 minutes to complete 15 additions and subtractions of fractions with the same denominator. Make sure that when the numerators are added together, they do not total more than the denominator, as this would be an improper fraction and the learners are not familiar with this.

ASSESSMENT	• **Formal, recorded Assessment Task 1:** - Mark the work and record the results as part of Assessment Task 1. - AS 3b: Recognise common fractions to twelfths - AS 8c: Addition and subtraction of common fractions with the same denominator

WEEK 3: Day 2

Notes to the teacher:

- Learners often have difficulty with problem solving.
- Learners must be taught to
  - Read the problem carefully and decide what is being asked
  - Decide which operation to use (or combination of operations)
  - After working out the problem, learners must ask themselves if their answer is realistic.
- Today's lesson will focus on writing open number sentences to solve problems. The learners are not required to solve the problems.
- Encourage the learners to use simple sketches to help them understand the problem.
- Another way to understand a problem is to substitute smaller numbers than those in the problem.
- Emphasise to the learners that a problem must always have a whole number as the answer, e.g. apples, Rand, people, depending on what the question asks.

Resources: Chalkboard, worksheet, textbooks.

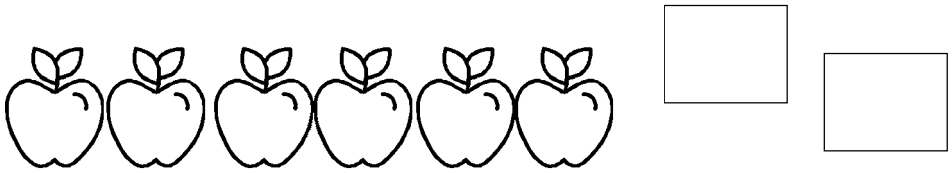
DAILY ACTIVITIES

Oral and Mental Activity (10 minutes)

- Do "running Maths". See Addendum

Concept Development (25 minutes)

- Write a problem ("word sum") on the board, e.g. A fruit farmer picks 5 360 apples from his orchard. He packs them into 28 boxes to send to the market. How many apples are in each box?
  - Read the problem through, once or twice, with the learners.
  - Ask the learners what the *key words* of the question are. What does the problem ask us? (How many apples in a box). Underline or circle these words.
  - Ask the learners what other information is important to enable them to solve the problem. 4 592 apples; 28 boxes.
  - Draw a simple sketch and use smaller numbers to help the learners decide which operation they will use:



6 apples, to put into 2 boxes. What operation do I use? I *divide* the 6 apples by 2 boxes.
The Open number sentence is 6÷2=☐ apples (in a box)

  - Ask the learners what the open number sentence is for the problem on the board. It is 4 592÷28=☐ apples (in a box)
- Write another problem, using a different operation, on the board and work through the problem with the learners in the same way as the previous example, e.g. A fruit farmer picks 4 592 apples from his orchard. He packs 28 apples in each box to send to the market. How many boxes are there?

- Write a third problem on the board, and ask learners in their groups to write an Open number sentence to solve the problem.
  - Go to each group to observe their method of working.
  - Guide any groups that are having difficulty.
  - When the groups have written their number sentence, ask each group in turn to tell you their number sentence and explain what method they used.

Problem Solving and Consolidation (25 minutes)

- Find problems in the textbook, use a worksheet, or write problems on the board. Remember that the learners do not have to give an answer; they only need to write an Open number sentence. Give the learners 10 problems to write open number sentences for.

ASSESSMENT	**Informal :** Listen to the learners' responses to questions and assess their participation in class.
ASSESSMENT	• **Formal, recorded Assessment Task 1:** - Mark the 10 open number sentences. Record the results. - LO 2 AS 4: Write number sentences to describe a problem situation within a context

WEEK 3: Day 3

Notes to the teacher:

- As follow-on to yesterday's lesson of writing number sentences, today's lesson will focus on solving problems using conversions and calculations between time units.
- As the learners have been reading analogue and digital time, today's lesson will start with conversions using seconds, minutes and hours, then continue to days and weeks.
- Use the abbreviations for the different units of time so that learners are fully conversant with them (hour – hr; minute – min; second – s; day – d; week – w)
- Emphasise that there are 24 hours in a day, and 7 days in a week, 5 days in a school week.

Resources: Chalkboard, Textbooks, Worksheets, calendars.

DAILY ACTIVITIES

Oral and Mental Activity (10 minutes)

- As a whole class, do some counting:
  - in 60s, from 0 to 720
  - in 30s from 60 to 600
  - in 15s from 90 to 210
- Learners must answer ten or more time-related questions individually in their workbooks. (You can write these on the board, or ask them orally). Examples:
  - How many hours in a day?
  - How many minutes in half an hour?
  - How many minutes in two and a half hours?
  - How many seconds in a minute?

Concept Development (30 minutes)

- Write units of time to be converted on the board. Learners can do this in groups:
  - 2 h = ……. min
  - 5 min = ……s
  - I min 28 s = …….s
  - 72 min = …….h……..min
  - 122 s = ……min…….s
  - When the learners have had enough time to complete this activity, go through the answers with them, discussing how they arrived at their answers.
- Now proceed to converting hours to days, days to weeks and vice-versa. Repeat group work as above, using these units of time.

Problem Solving (20 minutes)

- Here are some problems you can use as examples. These must be completed by individual learners in their workbooks.
  a) The doctor sees each patient for 15 minutes. How many patients can he see in 2 and a half hours?
  b) We went on a trip which lasted 17 days. How many weeks and days were we away?
  c) A new world record was set for non-stop dancing. The dancing lasted 5 days 10 hours. How many hours was this?

d) I run 1km in 4min 13s. How many seconds is this? e) It takes 82min for my bread dough to rise, then 45 min to bake the bread. How many hours and minutes is this altogether?	
ASSESSMENT	**Informal :** Check the learners' workbooks to make sure they are able to convert between the different units of time.

WEEK 3: Day 4

Notes to the teacher:

- Today's' lesson is a follow-on to yesterday's lesson of solving problems using conversions and calculations between time units, this will now be extended to include months, years, decades, centuries and millennia.
- The learners will need to know the vocabulary, i.e. a decade is ten years, a century is 100 years and millennium is 1 000 years.
- There are many learners who do not know how many days in a week, weeks in a year, how many days in each month of the year, so these must be taught to the learners.

Resources: Chalkboard, Textbooks, Worksheets, calendars.

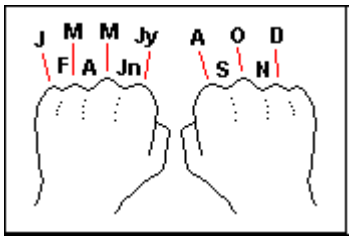
DAILY ACTIVITIES

Oral and Mental Activity (10 minutes)

- Learners must answer ten or more time-related questions individually in their workbooks. (You can write these on the board, or ask them orally). Examples:
  - How many hours in 3 days?
  - How many minutes in half an hour?
  - How many minutes in two and a half hours?
  - How many years in a century?
  - What century are we in?
  - How many weeks in a year?

Concept Development (25 minutes)

- Together with the whole class, say the 12 months of the year.
  - Make sure they know the correct order.
  - Ask if they can tell you how many days in each month. Some may be uncertain. Show them they can use their hands – the months on the knuckles have 31 days, the ones in the "valleys" have 30 days, except for February which has 28 days (29 in a leap year).



  - Ask the learners how many days in a year (365)
  - Check to see that the learners know what a leap year is. Every fourth year – in years that are multiples of 4 - we have an extra day in February, and therefore 366 days in the year, e.g. 2004 can be divided by 4, so 2004 was a leap year.

- Explain to the learners that a decade is 10 years, a century is 100 years. They can remember this because of the "cent" part – there are 100 cents in a Rand. Then explain that a millennium is 1 000 years.
  - If we are in the year *20*11, what century is this? (21st). Compare this to a new born baby who is 0 years old, but is in his first year of life. Give further examples, e.g. the 1678 is in the 17th century.
- Work with a small group and set other learners, in groups, a few problems to solve, such as:
  - How many days altogether in the months that start with the letter J?
  - I was born in 1990. How many years old will I be in 2010? How many decades is this?
  - How many years in 7 decades?
  - Which of the following years were leap years? 2001, 2003, 2008, 2009?
  - In 2000, I was away from the 26th February until the 8th March. How many days was I away for?
  - How many decades are there in two centuries?
- Give time for each group to report back on their answers.

Problem Solving and Consolidation (25 minutes)

- Find problems involving time and calculations involving conversions between the different units of time in textbooks. If there are not enough suitable examples, make a worksheet, or write sums on the board. Learners must complete these in their workbooks, on their own. Be sure to include units of time that were taught in yesterday's lesson. Examples:
  - Convert: 18 days to weeks and days
    4½ decades to years
    2 centuries to years
    4 millennia to centuries
    5 minutes to seconds
    18 months to years and months
  - There are 555 days until the start of the World Cup Soccer. How many years and days is this?
  - My two children are 21 months apart. How many years and months is this?
  - My granny is 66 years old. How many decades and years has she been alive?

ASSESSMENT	**Informal :** Observe the learners working and check some of their books.
ASSESSMENT	• **Formal, recorded Assessment Task 1:** - Mark ten problems done over the past two days and record the results. - AS 2: Solve problems involving calculation and conversion between appropriate time units including decades, centuries and millennia

WEEK 3: Day 5

Notes to the teacher:

- Today the learners will investigate shapes and solids by translations (slides)
- They must be able to complete a table in which they observe whether the shape or solid (a) *looks* different when it translated, and (b) whether same shapes or solids can be placed next to the each other without any gaps or overlaps.
- The learners can slide the shape in any direction, but they must not rotate (turn) or reflect (flip) the shape. These movements will be dealt with in the next lesson.
- If the learners do not complete the investigation today, they can continue during the next lesson when other movements of shapes and solids will be investigated.

Resources: Chalkboard. Two large cardboard squares. Two large cardboard triangles. Cardboard shapes: squares, rectangles, triangles with all sides equal, triangles with only two equal sides, hexagons, pentagons, rhombuses, trapeziums. (You can use cardboard from old boxes to make the shapes. Keep these for future use). Modelling clay (or small boxes, tin cans, tennis balls). Worksheets.

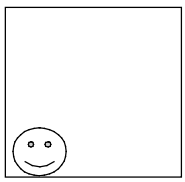
DAILY ACTIVITIES

Oral and Mental Activity (10 minutes)

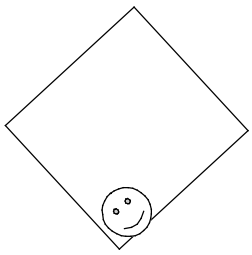
- Do some adding on to make 100. You can do a few orally, asking a few individual learners to give you the answers, then give the learners *ten* sums to complete in their workbooks:
  - 20+☐=100 25+☐=100 30+☐=100 45+☐=100 48+☐=100
  - Let the learners swop books and mark each others' work.

Concept Development (25 minutes)

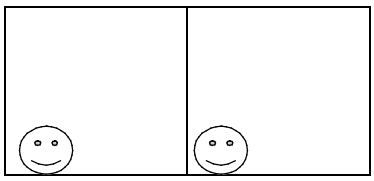
- Tell the learners that today and next week they are going to investigate what happens when they move shapes and solids in different manners. Today's lesson will investigate moving shapes and solids by sliding them ("translation").
  - Hold one of the large squares you have made, on the board. Make a smiley face in of the corners:



  - Ask the learners questions about it, e.g. what it is called, its properties (It has 4 equal sides and its angles are right angles). It is always good to revise concepts that have been taught earlier on.
  - Tell the learners you are now going to slide the square. You can slide it sideways, diagonally, up and down. The mark you have made in the corner must stay in the same position. Each time you slide the square, ask the learners if it still looks the same.

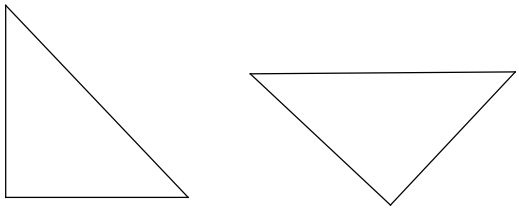


- Then rotate the square.
- Ask the learners if it still looks the same. They must understand that it does not, because you did not slide it. The square now looks like a diamond, and the smiley face is more on its side.
- You can repeat this again to ensure the learners understand what sliding means.
- Take your second square, place it over the first square to cover the first square, then tell the learners that you are going to move the square by sliding it.

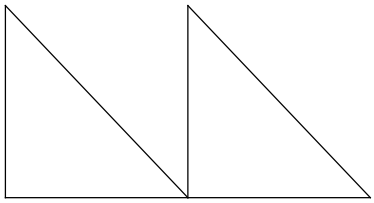


- Ask the learners if there is a gap between the squares if you slide one next to the other so that they are touching? They should see that there is not a gap.

• Do the same as above with the triangles you have made. The learners will observe that (a) the triangle does not look the same if you turn it, and



(b) there will be a gap between two triangles if you slide them next to each other.



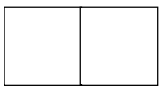
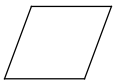
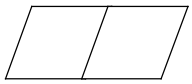
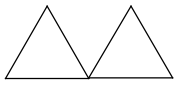
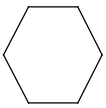
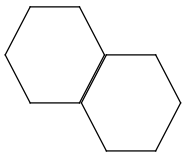
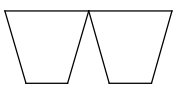
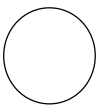
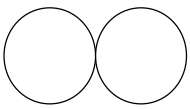
• Briefly revise the names and properties of geometric solids (e.g. how many faces, edges, vertices.)

- Give each group of learners enough modeling clay to make two of each of the following geometric solids: cube, triangular prism, square based pyramid, cylinder, sphere. The sphere should be about half the size of a golf ball, and the other solids similar in size.

- They do not have to be perfectly made, and they can be kept for the next lesson. (If you do not have modeling clay, try to find small boxes, tennis balls and tin cans.) Do not give them more than about three minutes to make the solids.
- Repeat the explanation about sliding squares, using one of the solids, e.g. the cube. Keep emphasizing that the learners can only *slide* the solid.

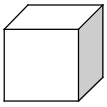
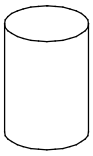
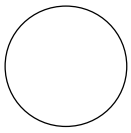
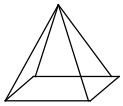
Investigation (25 minutes)

- The learners must now investigate what happens when you slide different shapes.
  - They will each need a worksheet like the one below. *Note that this table has been filled in for you. You must give it to the learners with only the first column, i.e. the column with the drawings of the different shapes, filled in.*
  - Give the learners the cardboard shapes that you have made. They can have one or two of each shape per group of learners. They must use the shapes to investigate what happens when they *slide* the shape and complete the table.

Picture of shape	Name of shape	Does the shape *look* the same when I slide it	What I see when I ***slide*** two shapes so they touch	Are there any gaps or overlaps?
	*Square*	*Yes*		*No*
	*Rhombus*	*Yes*		*No*
	*Triangle*	*Yes*		*Yes, gaps*
	*Hexagon*	*Yes*		*No, but I slid it a bit down too*
	*Trapezium*	*Yes*		*Gaps*
	*Circle*	*Yes*		*Gaps*

- Using the solids that the learners have made, they can investigate what happens to the solids when we slide them.

- Each learner must get a table, such as the one below, to complete. You can add other solids if you wish. *Note that this table has been filled in for you. You must give it to the learners with only the first column, i.e. the column with the drawings of the different shapes, filled in.*

Drawing of solid	Name	Does the solid *look* the same when I slide it?	If I slide solids so that they are touching, are there any gaps between them?
	*Triangular prism*	*Yes*	*Yes*
	*Cube*	*Yes*	*No*
	*Cylinder*	*Yes*	*Yes if I move the cylinder sideways. If I move it up or down, there will not be gaps.*
	*Sphere*	*Yes*	*Yes*
	*Square based pyramid*	*Yes*	*Yes*

- Collect in all the solids made of clay and the cardboard shapes, as these will be used again.

ASSESSMENT	**Informal :** • Observe how the learners respond to your questions and how they participate in class. Also see who is co-operative in their group.
ASSESSMENT	• **Formal, recorded Assessment Task 1:** - Today's investigation will be used with the next two investigations regarding movement of shapes and solids for Assessment Task 1. - LO 3 AS 4: Recognise, describe and perform translations (slides) using geometric figures and solids.

Grade 5: Week 4

Hours: 5	**Number of Periods: 5**
Mathematics LO 1 AS 1, 3c, 8e, 8g **LO 3 AS 4**	**Milestones:** • Count forwards and backwards in whole number intervals and fractions • Finding fractions of whole numbers which result in whole numbers • Multiplication of a 3-digit by a 1-digit number • Recognise and represent in order to compare decimal fractions in the form of 0,5; 1,5; 2,5 in the context of measurement • Recognise, describe and perform rotations (turns) and using geometric figures and solids.

Mental Strategies: Mental strategies are done with the whole class every day. The time should be used to develop skills and to build number sense.

	Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 5**
Content Focus:	Finding fractions of whole numbers which result in whole numbers	Finding fractions of whole numbers which result in whole numbers. Assessment Task	Multiplication of a 3-digit by a 1-digit number Assessment Task and Mental: Assessment Task 2	Decimal fractions in the form of 0,5; 1,5; 2,5 in the context of measurement Assessment Task	Recognise geometric shapes and solids using rotations. Assessment Task
Resources	Chalkboard, worksheets, textbook. Coins, counters or small cardboard squares	Chalkboard, worksheets, textbook	Chalkboard, worksheets, textbook	Chalkboard, worksheets, textbook	Chalkboard, Cardboard geometric shapes, modeling clay. Blank A4 paper, a sheet for each learner.

WEEK 4: Day 1

Notes to the teacher:

- Finding a fraction of a whole number is often confusing for learners as they want to write the answer as fraction and not a whole number.
- Although this is a milestone for Term 3, it is a natural progression from other work on fractions.
- Do as many concrete examples as you can, before moving on to the mathematical process.

Resources: Chalkboard, worksheets, textbooks, plastic counters, coins or small cardboard squares.

DAILY ACTIVITIES

Oral and Mental Activity (10 minutes)

- Count backwards and forwards in whole numbers and fractions:
  - Count around the class (learner by learner), group by group or the whole class together.
  - Do not always start at 0
  - Do not always count in multiples of whole numbers, e.g. the learners can count in 7s from 30 to 80.

Concept Development (20 minutes)

- Ask 6 learners to come and stand in front of the class.
  - Tell the class that here are six learners. Half of them enjoy Maths. How many enjoy Maths? How many do not enjoy maths?
  - Ask the learners at the front of the class to move into two groups (halves). The class can see that 3 learners enjoy Maths and 3 learners don't.
- Using the same group of learners at the front of the class, tell the class that one third of them like pizza. Ask how many groups the learners must get into.
  - The learners in front of the class must move into three groups.
  - So, two learners like pizza.
- The learners will now work in groups. Give each group 24 plastic counters, coins, small cardboard squares, bottle tops – anything you have enough of.
  - Tell the learners you want to share the 24 counters equally between two learners. How many counters will each learner get?
  - Walk around and observe how the groups work.
  - After enough time, ask different groups what the answer is? 12 counters.
  - Ask the class as a whole if anybody can think of a mathematical way to work out the problem?
  - Write the fraction $\frac{1}{2}$ on the board. The denominator is 2, so we divide the counters by 2 to find half.
  - Now repeat the procedure a few times, asking the learners to find $\frac{1}{3}$ of the counters, then $\frac{1}{4}$ of the counters, then $\frac{1}{8}$, $\frac{1}{6}$, $\frac{1}{12}$ of the counters.
- Each time emphasise that the mathematical process to find a fraction of a whole number is to divide by the denominator.

- Collect in the counters.

• Draw 9 apples on the board.

- Tell the learners that $\frac{1}{3}$ of the apples are bad. How many apples are bad? (3)
- Ask the learners how many are *not* bad? (9-3=6. 6 apples are not bad)
- Do another example with the learners.

Problem Solving (15 minutes)

• Let the learners work in groups to solve problems. They can work for ten minutes, then allow 5 minutes for discussion and feedback. Examples of problems you can set them if you cannot find any suitable problems in the textbook.

a) There are 124 learners in Grade 5. A quarter of them come to school by bus. How many learners come to school by bus?

b) The apple farmer had 48 boxes of apples. He sold $\frac{1}{3}$ of these to Fruit and Veg City. How many boxes did he sell to Fruit and Veg City?

c) Sipho's dad has 64 cows. $\frac{1}{8}$ of them are brown. How many are *not* brown?

Consolidation (15 minutes)

• Give the learners at least 10 exercises to do in their workbooks. Examples:
Find:

a) $\frac{1}{5}$ of 25 b) $\frac{1}{4}$ of 32 c) $\frac{1}{6}$ of 48 d) $\frac{1}{10}$ of 100

Learners can complete the work for homework.

ASSESSMENT	**Formal :** • Mark the work the learners did to ensure they understand finding fractions of a whole number. **Informal :** • Assess the learners in terms of their oral responses to questions, their participation in class and their enthusiasm.

WEEK 4: Day 2

Notes to the teacher:

- Today's lesson is a continuation of yesterday's lesson.
- We will proceed to fractions of a number where the numerator in the fraction is greater than 1.
- It is important that the learners *first* divide by the denominator, *then* multiply by the numerator. Some learners multiply first, and, although they will get the same answer, it means they are working with larger numbers which could lead to errors.

Resources: Chalkboard, textbooks, plastic counters.

DAILY ACTIVITIES

Oral and Mental Activity (10 minutes)

- Give the learners 10 division exercises to do. They must work on their own and write down the answers only:

  a) 48÷6 b) 32÷4 c) 28÷7 d) 18÷3 e) 44÷11

  f) 36÷1 g) 16÷4 h) 50÷10 i) 54÷9 j) 24÷6

Concept Development (20 minutes)

- Briefly revise what was taught yesterday. Use an example ("What is a quarter of 16?") and remind the learners of the rule: to find a fraction of a whole number we divide by the denominator of that fraction.
- Learners can now work in groups. Give each group 24 plastic counters.
  - Ask them to find *two* thirds of the counters.
  - After enough time, get feedback from the groups. Ask them how they found the answer. They probably divided the counters into three groups (=8 in a group) then added 8+8=16 counters.
  - Now ask them to find $\frac{5}{8}$ of the counters. Watch how they work.
  - Again, ask for feedback from the groups. They probably divided the counters into 8 groups (3 counters in a group), then counted how many counters were in 5 groups or added 3+3+3+3+3=15 counters.
  - Ask the learners if they know a shorter way of adding the same number a few times. Tell them they can multiply. So, instead of adding 3+3+3+3+3, they can multiply 3x5.
- With the class as a whole, establish the rule (by doing a number of examples) for finding a fraction e.g. $\frac{5}{8}$ of a number: You divide by the denominator, then multiply by the numerator. (If it is easier for the learners, you can tell them to divide by the bottom, then multiply by the top).
- Let the learners, in their groups, practise by doing two or three more examples with the 24 counters, e.g. $\frac{3}{4}$ of 24, $\frac{5}{6}$ of 24. Each time, reinforce the mathematical method and rule.
- Collect in the counters.

Problem Solving (15 minutes)

- Give the learners about 5 problems to solve in their groups, and allow time for feedback.

  a) 30 people are in the shop. $\frac{5}{6}$ of them are adults. How many adults are there?

b) In a box of 32 eggs, $\frac{3}{8}$ are jumbo size. How many jumbo size eggs are there?

c) 40 people live in our road. $\frac{4}{5}$ of them do not have dogs. How many do not have dogs?

d) $\frac{3}{5}$ of the 35 learners in our class have white bread for lunch. How many do not have white bread? (Be careful with this one!)

Consolidation (15 minutes)

- Give the learners 15 exercises to do (similar to yesterday's work). Include asking some fractions of a whole number where the numerator is 1.

ASSESSMENT	**Informal :** • Observe the learners working to see that they are dividing by the denominator, then multiplying by the numerator.
ASSESSMENT	• **Formal, recorded Assessment Task 1:** - The 15 exercises they did at the end of this lesson must be marked and the results recorded. - LO 1 AS 8f: Finding fractions of whole numbers which result in whole numbers

WEEK 4: Day 3

Notes to the teacher:

- Today's focus is on multiplying a 3-digit by 1-dgit number.
- This was learnt in the first term, so is not a new concept.
- Learners probably have their own methods, and as long as these methods are used correctly, **do not force** a particular method onto them. **Do not** let learners multiply in columns – this is only introduced in Grade 6.

Resources: Chalkboard, textbooks, worksheets.

DAILY ACTIVITIES

Oral and Mental Activity (10 minutes)

- Give learners the following to fill in the answers only. (Write the sums on the board or photocopy):

5x3=	3x5=	8x6=	6x8=
2x7=	7x2=	3x2=	2x3=
6x5=	5x6=	10x9=	9x10=
4x9=	9x4=	8x7=	7x8=
7x5=	5x7=	4x8=	8x4=

- Let the learners swop papers and mark each others' work.
- Point out that it doesn't matter if we change the order of the numbers when we multiply, we get the same answer i.e. 5x3 is the same as 3x5
- Record the learners' marks out of 20 for Assessment Task 2

Concept Development (20 minutes)

- Give each group of learners a different problem, which needs a 3-digit number multiplied by a 1-digit number, to solve. Each problem must be written on a piece of paper for the groups. Examples:
  a) There are 7 grades in our school. In each grade there are 246 learners. How many learners in our school?
  b) I have 8 boxes which each contain 125 packets of chips. How many packets of chips are there?
  c) The farmer has 4 fields. In each field he has 235 sheep. How many sheep does the farmer have?
- Before the learners start, tell them they must estimate their answers.
- Each group must discuss what operation to use, write a number sentence and do the calculation.
- After sufficient time, ask each group to read their problem to the class, and show their method of working out the answer.
- Most learners will probably have broken the number up:
  e.g. the first problem: 246x7 = 200x7 + 40x7 + 6x7
  = 1 400 + 280 + 42
  = 1 722 learners.

- Set work for the class while you work with small groups of learners who might be having difficulty with this work.

Problem Solving (15 minutes)

- Learners do problems from their textbooks (or from a worksheet or the board). They can work in groups to solve between 3 and 5 problems similar to the ones above.

Consolidation (15 minutes)

- Give the learners 5 examples for Formal Assessment. Examples:
  a) 239x5 b) 913x7 c) 318x4 d) 533x6 e) 472x8

Give the learners 5 more examples for homework.

ASSESSMENT	**Informal:** • Mark the learners' books to see that they grasp this work.
ASSESSMENT	• **Formal, recorded Assessment Task 2:** - Record how many examples out of 5, the learners got correct. - LO1 AS 8e: Multiplication of a 3-digit by a 1-digit number

WEEK 4: Day 4

Notes to the teacher:

- Today you will familiarise the learners with decimal fractions such as 0,5; 1,5; 2,5 in the context of measurement.
- Learners use decimal fractions every day without realising it. When we talk about Rands and cents, we use decimal terminology. Decimals can be said to be a calculator's way of writing a fraction.

Resources: Chalkboard, worksheets, Assessment Task

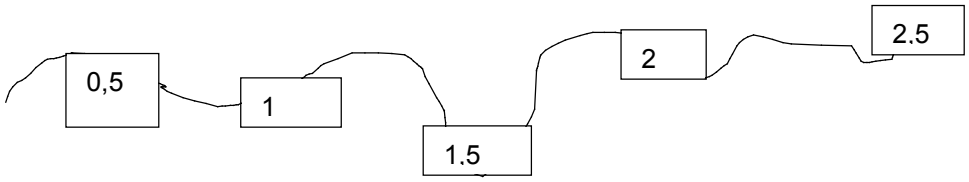
DAILY ACTIVITIES

Oral and Mental Activity (10 minutes)

- Do division drill using a clock face drawn on the board (Clock Division, see Addendum).

Concept Development (20 minutes)

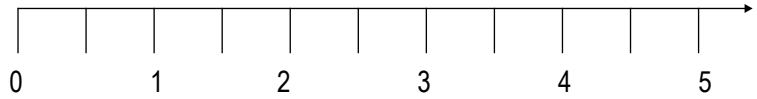
- Draw a "path' on the board, marked as below:



- Tell the class that you went for a walk along a path in the forest, and you noticed numbers written on boards at regular intervals. You wondered what they meant. Can any of the learners perhaps tell you what they meant?
- Have some discussion, unless a learner immediately comes up with the correct answer, which is that they are markers placed every half kilometre. Explain why we know they are half kilometres and not half metres or any other units of measuring length – because when we walk through the forest, we will measure the distance in kilometres.
- Ask the learners what two ways do we have of writing "half a kilometre"? We *can* write $\frac{1}{2}$ km, but the proper way is to write 0,5 kilometres.
- The 0.5 is the calculator's way of writing $\frac{1}{2}$. It is called a decimal fraction.
- In South Africa it has been decreed that when writing decimal fractions we will use a decimal comma (i.e. 0,5) not a decimal point (i.e. 0.5).
- Whole numbers are written on the left of the decimal comma, and the fraction part comes after the comma. For example, if I have R12,50, it means I have 12 whole Rands, and 50 cents = half a Rand.

- Talk to the learners about money. How do we write, using the R abbreviation for Rand, 50 cents? R0,50. Explain that we always have two digits after the decimal comma when we are talking about money, but the zero at the end does not change the value of the fraction.
- Refer back to the path you drew on the board. Get the whole class to read the numbers to you (starting at zero). Then let them – or all the girls then all the boys – read them to you in common fraction form (half, one, one and a half… etc). Read them again in decimal form.

- Draw a number line on the board:



  - Ask the learners what number is missing between the 0 and 1? (0,5)
  - Let different groups of learners, e.g. all the girls, all the boys, the eleven-year-olds, read the number line to you, saying the missing numbers as they count. They can read it backwards as well. Keep asking what the ..,5 means.

Problem Solving (10 minutes)

- Set a few problems for the learners to solve in groups.
  - I saw an ant on my ruler. It was on the 0,5 cm mark. When I finished my sum, I saw it was now on the 1,5 cm mark. How far had the ant crawled?
  - My mother noticed that the bottle of orange juice was exactly half way between the 1-litre and 2-litre marks. How much orange juice was in the bottle?
  - Auntie May took a full 2-litre tub of ice cream out of the freezer. She used 0,5 litres to make milkshakes for us. How much ice cream was left in the tub?

Consolidation (20 minutes)

- Make a worksheet comprising 15 examples that the learners must complete for assessment. Include examples such as:

♦ Fill in the missing numbers, e.g.
  - 0,5; 1; ……..; 2; 2,5; …….
  - 5,5; 4,5; ……..; 2,5; ……..; ……

♦ How many:
  - kilograms come exactly half way between 2,5kg and 1,5 kg?
  - metres come exactly half way between 11 km and 12 km?

ASSESSMENT	• **Formal, recorded Assessment Task 1:** - The 15 sums you set will be marked and recorded for Assessment. - LO 1 AS 3c and 5e: Decimal fractions in the form of 0,5; 1.5; 2,5 in the context of measurement.

WEEK 4: Day 5

Notes to the teacher:

- Today's lesson is nearly the same as Week 3 Day 5's, but today the learners will investigate shapes and solids by rotations (turns).
- They must be able to complete a table in which they observe whether the shape or solid (a) *looks* different when it is rotated, and (b) whether same shapes or solids can be rotated and placed next to the each other without any gaps or overlaps.
- The learners can rotate (turn) the shape in clockwise or anti-clockwise through a complete revolution.
- Today less time will be spent on Concept Development than last week so the learners who did not finish last week's investigation will have time to do so today.

Resources: Chalkboard. Two large cardboard squares. Two large cardboard triangles. Cardboard shapes: squares, rectangles, triangles with all sides equal, triangles with only two equal sides, hexagons, pentagons, rhombuses, trapeziums. (Keep these for future use). Modelling clay (or small boxes, tin cans, tennis balls). Worksheets.

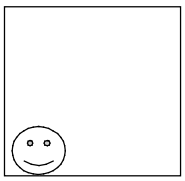
DAILY ACTIVITIES

Oral and Mental Activity (10 minutes)

- Ask the learners ten questions. You can ask the questions orally; each group can briefly discuss the sum and write down the answer as a group.
  - Double 26
  - Halve 38
  - 58+☐=100
  - I have R20. I go to the shops and buy two Cokes which each cost R6,55. How much money do I have left?
  - There are 32 learners in the class. How many eyes and noses are there altogether?
  - How many edges does a cube have?
  - 101-12
  - Liesel brought 48 sweets to school to share equally among her 8 friends. How many sweets did each friend receive?
  - 25x4
  - 150+☐=500

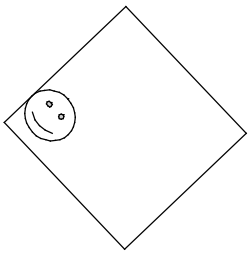
Concept Development (15 minutes)

- Briefly revise what was taught last week, i.e. the learners translated (slid) shapes to investigate what happened. Tell the learners that today they are going to move shapes in another way, i.e. by rotation (turning).
  - Hold one of the large squares you have made, on the board. Make a smiley face in of the corners:

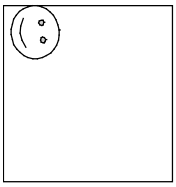


  - Briefly show the learners how you slid the square last week. The mark (smiley face) you made in the corner stays in the same position.

- Rotate the square clockwise. Make sure the learners know what clockwise and anti-clockwise mean.

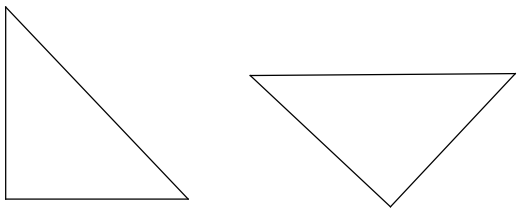


- Ask the learners if it still looks the same. It does not. The square now looks like a diamond, and the smiley face is more on its side.
- Rotate the square again:

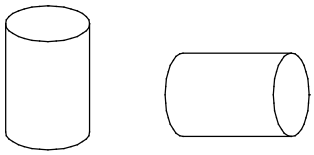


- Now it looks like a square again. We can see it has been rotated because of the position of the mark you made in the corner of the square.
- Continue rotating the square until it is back in its original position.

• Do the same as above with the triangles you have made. The learners will observe that the triangle does not look the same when you rotate it.

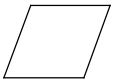
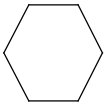
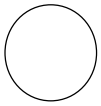


• Repeat the explanation about sliding squares, using one of the solids, e.g. the cylinder.

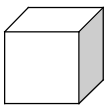
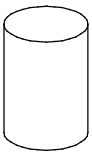
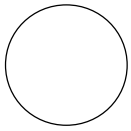
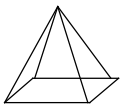


Investigation (40 minutes)

- The learners must now investigate what happens when you rotate different shapes.
  - They will each need a worksheet like the one below. Give the learners the cardboard shapes that you have made. They can have one or two of each shape per group of learners. They must use the shapes to investigate what happens when they *rotate* the shape and complete the table.

Picture of shape	Name of shape	Does the shape *look* the same when I rotate it	What I see when I *rotate* the shape
			
			
			
			
			
			

- Using the solids that the learners have made, they can investigate what happens to the solids when they rotate them.
  - Each learner must get a table, such as the one below, to complete. You can add other solids if you wish.

Drawing of solid	Name	Does the solid *look* the same when I slide it?
		
		
		
		
		

- Collect in all the solids made of clay and the cardboard shapes, as these will be used again.

ASSESSMENT	**Informal :** - Observe how the learners respond to your questions and how they participate in class. Also see who is co-operative in their group.
ASSESSMENT	• **Formal, recorded Assessment Task 1:** - Today's investigation will be used with the previous and the next investigation regarding movement of shapes and solids for Assessment Task 1. - LO3 AS 4: Recognise geometric shapes and solids using rotations.

Grade 5: Term 2 Week 5

Hours: 5	**Number of Periods: 5**
Mathematics LO 1 AS 3f, 6b **LO 3 AS 4** **LO 4 AS 4a**	**Milestones:** • Recognise and represent in order to compare multiples of single-digit numbers to at least 100 • Solve problems in context such as measurements in Natural Sciences and Technology • Recognise and perform flips (reflections) using geometric shapes and solids. • Telling time to the nearest second

Mental Strategies: Mental strategies are done with the whole class every day. The time should be used to develop skills and to build number sense.

	Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 5**
Content Focus:	Problem solving in context	Problem solving in context. Assessment Task	Telling time in intervals of seconds. Assessment Task	Multiples of single digit numbers Assessment Task	Recognise and perform flips in geometric shapes and solids. Assessment Task
Resources	Chalkboard, worksheets, textbooks.	Chalkboard, worksheets, textbooks.	Chalkboard, worksheets, textbooks. Stopwatches	Chalkboard, worksheets, textbooks.	Chalkboard, worksheets. Cardboard shapes and modeling clay solids.

WEEK 5: Day 1

Notes to the teacher:

- The learners have been taught some problem solving techniques this term.
- Today's lesson is an opportunity to practise solving problems using different techniques and to practise skills such as multiplying 3-digit by 1-digit numbers, adding and subtracting 4-digit numbers, finding fractions of whole numbers, converting between units of time. Make sure your problems include as many of these skills as possible.
- Learners must also write Open number sentences to practise that skill.
- Problems will use vocabulary, terminology and concepts that are in the natural Sciences and Technology curricula, so will integrate Mathematics with those subjects.

Resources: Worksheets, textbooks and chalkboard.

DAILY ACTIVITIES

Oral and Mental Activity (10 minutes)

- Do some Clock multiplication tables drill. (See addendum)

Concept Development (15 minutes)

- Write this problem on the board: I planted six tomatoes. After three months, each tomato had grown into a bush. Each bush had 124 tomatoes on it. How many tomatoes are there altogether on the bushes?
  - Ask the learners what the question is asking. (how many tomatoes – underline in colour)
  - *Substitute* small numbers to help the learners see the problem more clearly: I have 2 bushes with 3 tomatoes on each, how many tomatoes do I have? (3x2=6 tomatoes). *Draw* a sketch if necessary – substituting numbers and drawing pictures are both good problem-solving techniques.
  - Establish, by asking the learners for their ideas, what operation will be used, and write an open number sentence: 124x6=☐ tomatoes.
  - Let the learners in their groups solve the problem – see which group finishes first (learners always enjoy competition) with the correct answer.
  - Remember when solving a problem, the answer must always have a word or very short sentence as part of the answer.

Problem Solving (35 minutes)

- Give the learners a worksheet with a variety of problems to solve. They can work in groups to discuss the problems, but each learner must write the open number sentence, do the operation and have a complete answer in his/her workbook. While they are busy, work with small groups of learners to help them understand the problems.

- Examples of problems you could ask:
  - My two hens together laid 48 eggs last week. Three quarters of them hatched. How many eggs hatched?
  - The residents of Lwandle were building a new community centre. A truck delivered 2 346 bricks on Monday and 3 127 on Tuesday. How many bricks were delivered?

- A family living in a rural community needs 84 litres of water a day. If they carry the water from the river in buckets which hold 7 litres, how many buckets full of water will they have to carry?
- In town, people have 1 500 litres of free water a month. Last month, the Smith family used 9 432 litres. For how many litres will they have to pay?
- The earth rotates on its own axis every 24 hours. When it has rotated for 60 hours, how many days and hours has it rotated?
- There has been a bad drought in the Free State. The farmer's small dam contained 3 546 litres of water, and now only contains 1 678 litres of water due to evaporation and lack of rain. How many litres of water have evaporated?
- The gestation period of a horse is 340 days. How many weeks and days is this?
- 5 231 flamingoes (birds) live in the wetlands outside Kimberley. Because of pollution, 1 784 died. How many flamingoes were left?
- My bean seed germinated and grew 123 mm in a week. If it grew the same amount every week, how tall would my bean plant be after 5 weeks?
- I planted 56 tomato seeds. $^{7}/_{8}$ of these germinated. How many did not germinate?

ASSESSMENT	**Informal :** • Assess the learners on the basis of their oral responses to questions and participation in class. Watch to see how they co-operate in a group situation.

WEEK 5: Day 2

Notes to the teacher:

- Today's lesson will continue from yesterday's lesson to give the learners more practice in problem solving.
- Always stress to the learners that they can use pictures or smaller numbers to help them solve problems.
- Learners must also ask themselves, when they have completed the problems, whether the answer is realistic and if they have answered the question that was asked.
- You can spend time helping learners who need your help, in small groups, while others work on their own.

Resources: Chalkboard, textbooks, worksheets.

DAILY ACTIVITIES

Oral and Mental Activity (10 minutes)

- Teach the learners the game called "Tables King". It is a competition that they enjoy. You can keep a note on the wall or somewhere on the chalkboard with the heading "Tables King" and each time you play the game, write the winner's name on the paper. See Addendum for full instructions.

Concept Development (15 minutes)

- Briefly go through the steps in solving a problem with the learners. Write a problem on the board to use as an example.
  - Use question and answer technique to keep the learners participating and alert.
  - Read the problem, use colour to underline the question being asked.
  - Draw a sketch or substitute smaller numbers.
  - Write a number sentence.
  - Do the calculation.
  - Ask yourself, is my answer realistic? Have I answered the question?
  - Make sure your answer is complete, i.e. sheep, learners, poles.

Problem Solving (35 minutes)

- Yesterday the learners could work in groups to write a number sentence. Today they must work on their own so that you can assess them. They must complete eight problems on their own. Examples of problems you can add to yesterday's examples:
  - The town council wants to pave 7 equal sized areas of the public park to build braai areas. If each area needs 452 bricks, how many bricks will be needed altogether?
  - If we shower, we use 25 litres of water. To fill a bath uses 48 litres. How much less wqter do we use if we shower?
  - The wood from 4 trees can be made into enough paper for 1 000 Maths books. How many trees are needed to produce (a) 2 000 Maths books? (b) 500 Maths books?
  - The farmer takes 15 minutes to milk a cow. How many cows can he milk in 2 hours?
  - My car's petrol tank holds 65 litres of petrol. I went to the petrol station and filled up. 39 litres were put in. How much petrol was already in the tank?

ASSESSMENT	• Informal **:** - Observe the learners to see who settles down well to their work, and who works quietly and methodically.

ASSESSMENT	• **Formal, recorded Assessment Task 2:** - Mark eight problems and record the results. - LO 1 AS 6b: Solve problems in context such as measurements in Natural Sciences and Technology

WEEK 5: Day 3

Notes to the teacher:
- The learners have had practice in reading analogue and digital time in hours and minutes.
- Today, they will learn to read time in seconds.
- We need to be able to read time in seconds (abbreviation 's') particularly in sport.

Resources: Chalkboard, worksheets with clocks drawn on them, textbooks.

DAILY ACTIVITIES

Oral and Mental Activity (10 minutes)
- Play "Tables King" again.

Concept Development (20 minutes)
- Draw an analogue clock on the board showing a particular time, e.g. 7.55.
  - Ask the learners to put their hands up if they can read the time on the clock. Get responses showing that they know how to read the time in two different ways, i.e. "5 to 8" and "seven fifty five".
  - Ask them if was in the evening, how would you say and write the digital, 24-hour time? (19:55).
  - Now draw another hand on the clock. Use colour. Draw this hand pointing to the 3. Ask the learners what this hand is for? It is for reading seconds. If you have a stopwatch, give learners time to read the seconds off the stopwatch.
  - What is a second? There are sixty seconds in a minute, just as there are 60 minutes in an hour. Let the learners say again, "There are sixty seconds in a minute."
  - Point to the clock and count in 5-second intervals with the class …. 5 seconds, 10 seconds, 15 seconds….. 55 seconds, 1 minute. Repeat.
  - See if anyone can tell you the time on the clock you have drawn. Give a few learners a chance to try, even if the first one gets it correct. They should say, it is "It is 15 seconds after 5 to 8" (OR, "It is 4 minutes and 45 seconds to 8" – do not expect learners to be able to say it this way, only the brighter learners will see it straight away.)
  - Write the time in 24-hour digital time on the board: 07:55:15. The 07 is the hour, the 55 is the minutes, the 15 is the seconds, all separated by a colon.
  - Erase the seconds hand, and redraw it pointing to another number. Again, ask the learners to read the time both how they would say it, and write it in 24-hour time.
  - Erase and redraw the seconds hand again. Repeat the above.
  - Ask the learners what happens when the seconds hand reaches the 12. Draw it on the board. The minute hand moves, so the time will now be *four* minutes to 8, or 7.56
  - Ask the learners when the minute hand will move again? It will move when the seconds hand has gone around the clock once more.

Consolidation (15 minutes)
- The learners can work in groups to say and write the time, in hours, minutes and seconds, that they read from 10 clocks you have drawn for them on a worksheet or on the board.

- While they are busy, you can work with a group of learners who are not sure of how to read the time with seconds.
- After about 12 minutes, get each group to report back and they can see how well they managed to read the time.

Further Consolidation (15 minutes)

- The learners must now work individually.
  - Give them 8 drawings of clocks showing the time in hours, minutes and seconds, and they must write the time down in digital, 24-hour time. (You will have to indicate somewhere beneath or next to each clock whether it is a.m. or p.m.)
  - Give the learners 8 drawings of clocks without any hands. They must draw in the hands to show different times: e.g. 05:45:10; 20:30:45.

ASSESSMENT	• **Informal :** - Observe the learners' participation and enthusiasm in the question and answer session.
ASSESSMENT	• **Formal, recorded Assessment Task 1:** - Mark the 8 times that the learners read from the clocks. - Mark the clocks on which the learners drew in the hands showing hours, minutes and seconds. - Include this assessment with the previous two assessments on Time. - LO4 AS 1: Read, tell and write analogue, digital and 24-hour time to the nearest minute.

WEEK 5: Day 4

Notes to the teacher:

- The focus of today's lesson is on multiples.
- It is important that learners understand what multiples are and learn to recognise them, as they play an important role later on in Maths, e.g. when the learners have to add fractions with different denominators and in high school Algebra.

Resources: Chalkboard, textbooks and worksheets.

DAILY ACTIVITIES

Oral and Mental Activity (10 minutes)

- Practise counting forwards and backwards in multiples. You can do this group by groups, learner by learner, all the girls, then all the boys, just to make it interesting and to ensure that all learners participate.
  - Count in 3s from 0 to 30
  - Count in 6s from 36 to 72.
  - Count backwards in 4s from 100 to 60.
  - Count in 7s from 42 to 91
  - Count in 9s from 36 to 99
  - Count backwards in 5s from 90 to 45

Concept Development (20 minutes)

- Tell the learners that they have just been counting in 3s, 4s, 5s etc. See if any of them know, if we count in 3s for example, what we call those numbers 3, 6, 9, 12, 15, etc.
  - Revise with the learners what a multiple is. A multiple of 3 in the above example is any number that 3 will divide into without a remainder: 3, 6, 9, 12, 15.
  - Ask them if the word multiple reminds them of another word we use in Maths. It is almost the same as multiply, which means "times", so multiples are the answers we will obtain when we multiply a number by another number. For example, 3x5=15. 15 is a multiple of 3 and it is a multiple of 5. 6x4=24. 24 is a multiple of 6 and it is a multiple of 4. Give a few more examples.
  - Stress that 3 is the first multiple of 3 because 3x1=3. Ask the learners to tell you the first multiple of 9, 4 and 5.
- Give learners in groups a few questions to answer. Ask the questions one at a time. Each time, see which group obtains the answer first. Discuss each answer to ensure the whole class is in agreement and understands.
  - Is 55 a multiple of 5? (Yes)
  - Is 32 a multiple of 8? (Yes)
  - 24 is a multiple of many numbers. Find three of them. (1, 2, 3, 4, 6, 8, 12, 24)
  - One multiple of 22 is 2. What is another multiple of 22? (1, 11, 22)
  - What is the largest multiple of 7 that is smaller than 100? (98 – a bit of a challenge!)
- Write several rows of multiples (of single-digit numbers) on the board (one row at a time), then ask the learners (the class as a whole) what the numbers you have written are multiples of. Do not start with the first multiple of the number (i.e. the number itself):

- 18, 24, 30, 36, 42, …….. (multiples of 2, 3, 6)
- 49, 56, 63, 70, …… (7)
- 81, 72, 63, 54, ……..(3, 9)
- It is worth pointing out to the learners that if we add the digits of a number and the answer is 9, then that number is a multiple of 9. e.g. 72. 7+2=9, so 72 is a multiple of 9. However, if the weaker learners do not grasp this, do not spend too much time on it.

• Write two or three rows of multiples on the board, but this time leave out one or two multiples. Ask the learners what the numbers are multiples of, and what numbers are missing, e.g.
  - 72, 64, …., 48, 40, ….., 24 (multiples of 8. Missing numbers are 56 and 32)

Consolidation (20 minutes)

• Give the learners a photocopied grid and instructions like the examples below. They must to follow the instructions to complete the task. (If you cannot make and copy a grid like this, give the learners square paper and they can fill in the numbers, or they can neatly write the numbers from 1 to 100 in rows of 10).

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

  - <u>Instructions</u>
  - Using a red crayon, outline the squares containing multiples of 2.
  - Using a blue crayon, colour in the squares which contain multiples of 3.
  - Draw a yellow circle around the multiples of 5.
  - Colour over the numbers that are multiples of 8, using your purple crayon.
  - NOTE: Some squares will have more than one colour. These are called *common multiples*. You can mention this to the learners, but they do not need to know common multiples at this stage.

Further consolidation (10 minutes)

• Learners can answer a few questions such as the following in their books.
  - Write down the multiples of 2, smaller than 20.
  - Write down the multiples of 3 between 28 and 55
  - Write down the numbers, between 20 and 40, that are multiples of 2 and 3

- Which is the largest multiple of 9 on the grid? - What multiple of 6 lies between 78 and 90?	
ASSESSMENT	• **Informal :** - Observe how the learners work in their groups and respond to questions. Also take note of how they follow instructions when completing the grid.
ASSESSMENT	• **Formal, recorded Assessment Task 1:** - Mark the completed grid and the answers to the questions for assessment. - LO 1 AS 3f: Recognise and represent multiples of single-digit numbers to at least 100

WEEK 5: Day 5

Notes to the teacher:

- Today's lesson is nearly the same as Week 4 Day 5's, but today the learners will investigate shapes and solids by reflections (flips)
- When a shape is reflected or flipped, it makes a mirror image of the original shape.
- They must be able to complete a table in which they observe whether the shape or solid (a) *looks* different when it is flipped.
- The learners can flip the shape in different directions.
- All three investigation worksheets (translation, rotation and reflection) must be completed today for assessment.

Resources: Chalkboard. Two large cardboard squares. Two large cardboard triangles. Cardboard shapes: squares, rectangles, triangles with all sides equal, triangles with only two equal sides, hexagons, pentagons, rhombuses, trapeziums. (Keep these for future use). Modelling clay (or small boxes, tin cans, tennis balls). Worksheets.

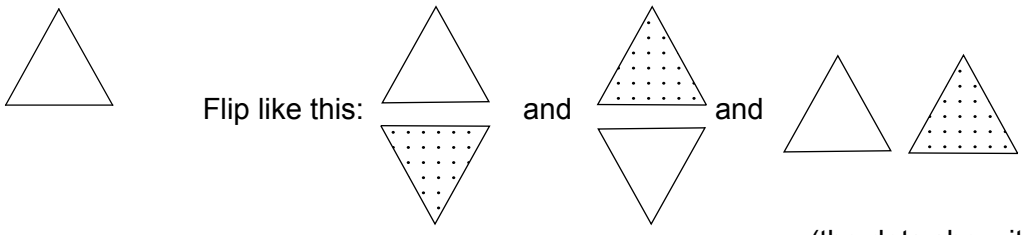
DAILY ACTIVITIES

Oral and Mental Activity (10 minutes)

- Play the game "Fizz-bang" with the learners. It requires the learners to concentrate; it helps reinforce multiples of 3 and 5, and is fun. See the addendum for instructions

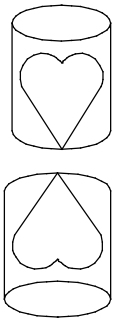
Concept Development (15 minutes)

- Briefly revise what was taught last two weeks, i.e. the learners translated (slid) shapes and rotated shapes to investigate what happened. Tell the learners that today they are going to move shapes in another way, i.e. by reflection (flipping)
  - Explain the meaning of the word *reflect* to the learners. When we look in a mirror, our image is reflected. A reflection is a mirror image.
  - Explain what the word *flip* means. It means to turn something over. Some people like to flip their fried eggs. The yolk (yellow) is then at the bottom of the egg, not on the top. If a person flips, they will not be standing on their feet, but on their hands.
  - Use your large triangle to demonstrate the different ways we can flip a shape:



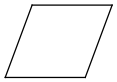
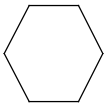
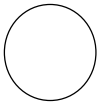
(the dots show it is the back of the triangle)

  - Ask the learners if they can see the line of symmetry when they flip the shape. It is always advisable to revise previously learnt concepts.
- Repeat the explanation about sliding squares, using a cylinder with some sort of mark on it. A Coke or other tin with a label would be perfect.



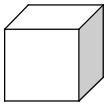
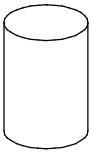
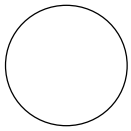
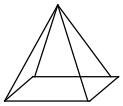
Investigation (40 minutes)

- The learners must now investigate what happens when they flip different shapes.
  - They will each need a worksheet like the one below. Give the learners the cardboard shapes that you have made. They can have one or two of each shape per group of learners. They must use the shapes to investigate what happens when they *reflect or flip* the shape and complete the table.
  - Make sure that the learners have completed the previous investigation before starting this. All three investigations must be complete.

Picture of shape	Name of shape	Does the shape *look* the same when I flip it	What I see when I ***flip*** the shape
			
			
			
			
			
			

- Using the solids that the learners have made, they can investigate what happens to the solids when they flip them. Remind learners that when something is flipped, it moves around a axis.

- Each learner must get a table, such as the one below, to complete. You can add other solids if you wish.

Drawing of solid	Name	Does the solid *look* the same when I flip it?
		
		
		
		
		

- Collect in all the solids made of clay and the cardboard shapes, as these will be used again.

ASSESSMENT	**Informal :** - Observe how the learners respond to your questions and how they participate in class. Also see who is co-operative in their group.
ASSESSMENT	• **Formal, recorded Assessment Task 1:** - Today's investigation will be used with the previous two investigations regarding movement of shapes and solids for Assessment Task 1. - LO 3 AS 4a: Recognise and perform flips (reflections) using geometric shapes and solids.

Grade 5: Term 2 Week 6

Hours: 5	**Number of Periods: 5**
Mathematics LO 1 AS 4,8b **LO 4 AS 6**	**Milestones:** • Recognise place value of digits in whole numbers to a minimum of 5-digit numbers • Estimate and calculate by selecting and using operations and techniques appropriate to solve problems that involve: - Addition and subtraction of whole numbers with at least 5 digits. • Solve problems involving selecting, calculating with and converting between appropriate SI units (Mass and Capacity)

Mental Strategies: Mental strategies are done with the whole class every day. The time should be used to develop skills and to build number sense.

	Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 5**
Content Focus:	Place value of digits in 5-digit numbers	Addition of 5-digit numbers	Subtraction of 5-digit numbers	Measurement: Capacity Converting between litres and millilitres. Mental Assessment Task	Measurement: Mass. Converting between grams and kilograms
Resources	Chalkboard, textbook, worksheets	Chalkboard, textbook, worksheets	Chalkboard, textbook, worksheets	Orange, orange squeezer, measuring jug, measuring spoons, worksheet, textbook, chalkboard. Supermarket advertising brochure.	A 1kg and a 250 or 200 g packet of sugar (or something similar)

WEEK 6: Day 1

Notes to the teacher:

- Learners were taught Place Value (up to 4 digits) in the First Term. Now this must be extended to 5 digits. Although this particular Milestone will only be formally assessed in the second formal assessment, it is a vital concept for the learners to grasp, as if they do not understand it, they will not be able to add or subtract.

Resources: Chalkboard, textbooks, worksheets

DAILY ACTIVITIES

Oral and Mental Activity (10 minutes)

- Counting activities. These can be done as a whole class, row by row (or group by group, depending on how your classroom is arranged), or going around the class. Examples:
  - Count in threes. Start at 5, stop at a whole number just below 40 (5, 8, 11, 14, 17, 20, 23, 26, 29, 32, 35, 38)
  - Count in fours. Start at 188, end at a whole number just below 240
  - Count in fives from 2 085 to 3 125
  - Count in hundreds from 90 to 1 290
  - Count in thousands from 6 100 to 25 100
  - Count backwards in tens from 180 to 0

Concept Development (25 minutes)

- Revise place value with the following type of exercise:
  - Fill in the following numbers in the correct columns below.
    a) 4 857 (this has been done for you)
    b) 6 254
    c) 654
    d) 8 784
    e) 2 543

	Th	H	T	U
a	4	8	5	7
b				
c				
d				
e				

- Ask the learners if there are numbers larger than the numbers completed above.
- Ask the learners what e.g. the number 7 represents, what the 57 represents,, and what does the 8 represent?
- Ask, “what is happening to the digits as you work from left to right?”
- On the board, do another set of columns, this time including T Th (Ten thousands). Ask learners to help complete the table on the board, e.g.

- a) 12 385 (filled in for you)
- b) 11 763
- c) 19 784
- d) 1 587
- e) 16 598

	T Th	Th	H	T	U
a	1	2	3	8	5
b					
c					
d					
e					

- Do as many examples as you feel are necessary.
- Each time, ask the learners to say the numbers in words, e.g. (a) above is said Twelve thousand, three hundred and eighty five. Emphasise that we say the T Th and Th digits together as thousands.
- Write some 5-digit numbers on the board and explain how to rewrite them in expanded notation, e.g.
  - 12 987 = (!x10 000) + (2x1 000) + (9x100) + (8x10) + (5x1)
  - OR: 12 987 = 10 000 + 2 000 + 900 + 80 + 5 *Note: this is very important and must be thoroughly understood by the learners.*
- Now work in reverse, i.e. What is the number that is:
  - (5x10 000) + (2x1 000) + (8x100) + (1x10) + (7x1) Answer = 52 817
- Each time the learners must read the number correctly
- Each time, emphasise where the space is when writing the number (between the Th and H)
- For extension, if the learners have grasped this, you could do a few examples in which you vary the order of the expanded number and ask the learners to give you the number, e.g.
  - 5 units + 3 Thousands + 8 Ten Thousands + 4 Hundreds + 1 Ten (= 83 415)
- Write five different 5-digit numbers on the board. Then ask the learners the value of a digit: e.g.
  - 12 345 31 467 85 238 23 589 61 513 Ask, “What is the value of the 3 in each of the numbers?” Learners must be able to tell you: 300 (or hundreds) , 30 000 (or ten thousands, 30 (or tens) , 3 000 (or thousands) , 3
  - Do as many examples as necessary, always asking the learners to read the complete number correctly.

Consolidation (25 minutes)

Learners must do written work, based on the concepts that have just been taught, in their books. Exercises can be found in textbooks. If these are not appropriate, you must make worksheets. If this is not possible, write examples on the board.

ASSESSMENT	• **Formal :** No formal assessment • **Informal :** - Check the learners' workbooks to ensure they understand the concept of place value.

WEEK 6: Day 2

Notes to the teacher:

- Addition of 4-digit numbers was taught in the first term.
- Today's focus is on adding 5-digit numbers.
- It is important that learners estimate their answer. This skill will have to be taught and drilled, until it becomes automatic.
- To make examples more meaningful, try to put them in word problems. This will also give the learners more experience and confidence in solving problems.

Resources: Textbooks, chalkboard, worksheets.

DAILY ACTIVITIES

Oral and Mental Activity (10 minutes)

- Running Maths (addition only). See Addendum
- Hand out prepared "Speed Tests", using number bonds. Learners must write down the answers as quickly as possible. If you cannot give the learners papers, write the sums on the board and learners can write the answers down, but keep the questions covered so that everyone can start at the same time. Examples of sums are:
  - 37+63=
  - 48+52=
  - 12+18=
  - 165+35=
  - 16+14=

Concept Development (20 minutes)

- Pose a problem to the class, such as: There are 14 879 people in Durban and 11 568 people in Pietermaritzburg. How many people live in these two towns altogether? (You can say the problem, but write the numbers on the board)
  - Firstly, round off the two numbers to the nearest thousand. 14 879 ≈15 000 11 568 ≈12 000. 15 000+12 000=27 000
  - Involve the learners in the actual addition. They can work in groups, discussing their methods, then discuss their methods and answers after a few minutes. If learners still have different addition methods, let them explain them to you, and you explain the method to the class. Or, you can do it with the class as a whole, working step by step through the problem.
  - Through whatever method the learners prefer, the answer 26 447 will be obtained.
  - Check your answer compared to the estimated answer. 27 000 ≈ 26 447.
- Do at least two more examples together with the class, or in groups with feedback to the class.

Problem Solving (15 minutes)

- Solve the following problems by first rounding off (do more similar problems if time permits):
  - In a stadium at the Soccer World Cup, there are 13 135 German supporters and 10 347 Italian supporters. How many Germans and Italians are there altogether?

- King Pie baked 12 324 chicken pies and 16 880 steak pies last week. How many pies did they bake altogether?

Consolidation (15 minutes)

- Find suitable examples in a text book to practice adding 5-digit numbers. Otherwise write some on the board. Learners must round off first, and then do the actual sum.

  a) 23 456+19 345 b) 15 239+32 841 c) 22 851+25 678

Extension for stronger learners

- Give the learners some addition exercises which contain a variety of numbers of digits, e.g.:

a) 23 456+ 5 224 b) 23 569+ 8 369 c) 17 562 + 665

ASSESSMENT	• **Informal :** - Take note of which learners are having difficulty and work with them in a small group.

WEEK 6: Day 3

Notes to the teacher:

- In the first term, the learners did subtraction of 4-digit numbers. The focus of today's lesson is subtraction of 5-digit numbers.
- Although the learners were introduced to the column method in the first term, it is not necessary that they understand it at this stage, so do not make them use a particular method.
- The learners must know the different terminology involved in subtraction: minus, take away, less than, fewer. Make sure you use all these words, especially in problems.

Resources: Chalkboard and textbooks.

DAILY ACTIVITIES

Oral and Mental Activity (10 minutes)

- Write a 5-digit number on the board, e.g. 23 860. Tell the learners they must count backwards in 100's. Which is the 100's? (8 – underline it or point to it)) Ask them if any of the other numbers will change as they count (No). Then, count backwards in 100s to 22 660. Repeat counting backwards in 1 000s, 10s and units.
- Counting backwards in 1 000s, 100s, 10s and units. Do this as a whole class counting together, and also give individual learners turns to count. Always write the starting number on the board. Examples:
  - Start at 123, count backwards in 10s to 53
  - Count backwards in 100s from 3 560 to 2 660
  - Count backwards in 1 000s from 21 200 to 13 200

Concept Development (15 minutes)

- Write a problem on the board which needs to be solved by subtraction, e.g.
  - Last year there were 25 346 new houses built in Mpumalanga and 22 655 new houses built in the Western Cape. How many more houses were built in Mpumalanga than in the Western Cape? (You can say the problem, but write the numbers on the board).
  - Let the children solve the problem in their groups. Tell them to first estimate their answers by rounding off.
  - Most of them will probably work it out by breaking down the second number and counting backwards:

    25 346-(22 000+600+50+5)
    25 346-22 000=3 346 (Count backwards in 1 000s)
    3 346-600=2 346 (Count backwards in 100s)
    2 346-50=2 396 (Count backwards in 10s)
    2 396-5=2 391 (Count backwards in ones)
    2 691 more houses were built.
  - While the groups are working, walk around to see who is struggling so that you can work with them later.
  - Give each group a chance to state its answer and discuss different methods that might have been used.
  - Encourage learners always to check their answers by comparing with their estimated answer.

Problem Solving (20 minutes)

- Find problems in the textbook, or make your own (on a worksheet or write on the board) using 5-digit subtraction. Work with small groups of learners who have not grasped subtraction. Examples of problems you can set:
  - In a week, 42 564 workers used taxis to get to work, and 38 547 used buses. How many fewer people used buses?
  - 33 882 people live in Alberton. There are 12 437 fewer people who live in Roodepoort. How many people live in Roodepoort?
  - Subtract 12 976 from 15 469
  - 52 712 minus 38 975

Consolidation (15 minutes)

- Set 6 to 10 sums using 5-digit subtraction. Continue working with groups of learners who are struggling with this work.
- More sums can be set for homework.

ASSESSMENT	• **Informal :** - Walk around the class and watch the learners solving problems and doing their work. Check their workbooks.

WEEK 6: Day 4

Notes to the teacher:

- Do not expect the learners at this stage to convert millilitres to litres (i.e. 1 ml = 0,001 litres). This involves dividing by 1 000 and decimal fractions, and they have not been taught these skills yet.
- It is a good idea, when working with SI units, to start with capacity, as there are only two units that learners use at this stage, namely millilitres and litres.

Resources: Orange, orange squeezer, measuring jug, measuring spoons, supermarket advertising brochure.

DAILY ACTIVITIES

Oral and Mental Activity (10 minutes)

- Give the learners a total of 10 to 20 addition and subtraction sums to be worked out mentally. They must work silently and alone to write down the answers. Record the results for Assessment Task 2.

Concept Development (20 minutes)

- Show the learners the lovely, juicy orange that you have. Tell them that you are going to squeeze it because you want to drink its juice.
  - Ask them what *unit* we use to measure the juice we squeeze out of the orange. We would use millilitres. We use millilitres and litres to measure capacity. There are 1 000 millilitres (ml) in 1 litre (l). Repeat this and write it on the board. Let a few learners repeat it. Check that the learners know the abbreviations for millilitres and litres.
  - Show the learners the measuring cup (250ml) and different size measuring spoons. Ask the learners to estimate how much juice you will be able to squeeze out of the orange. Squeeze the orange, and see how many millilitres of juice you got out of it.



  - Give all the learners the chance to check the level in the measuring cup. (Tip: if you can't squeeze an orange, tell the learners you squeezed one at home, and continue with the estimation. If you don't have a proper measuring jug, use a mug or tea cup, each holds about 250ml).
- Let the learners work in groups. Hand each group a page from a supermarket advertising brochure. Ask them to write down all the products and their capacities that are measured in litres or millilitres, e.g. tomato sauce, 750ml.
  - Give each group a few minutes to do this task. Then ask each group what they circled, and how many litres or millilitres the product is.
  - Ask them to arrange the products they have circled in ascending order (from the smallest quantity to the largest quantity).

- Using the products the learners have circled, ask questions such as, “The Oros is 2 litres. How many millilitres is this?” “I need a litre of tomato sauce. Will the 750 ml bottle be enough? If it is, how much will I have over? If it isn’t, how much more tomato sauce do I need to make a litre?” How many 250 ml cartons of cream can I pour into an empty 2 litre ice cream container?” “The orange juice is 4 litres. If I pour out 250 ml, how much will I have left?” Think of as many questions as you can. Make it a competition between groups to see which group can get the most correct answers.

Consolidation (15 minutes)

- Find questions about capacity in the textbook. If there are no suitable questions, write your own on the board or on a worksheet. Let the learners complete between 10 and 20 questions. Examples of the type of questions the learners could answer:
  - 1 litre = 250 ml + ……ml
  - Which is greater, 2 litres or 1 800 ml.
  - Approximately how much petrol does a car’s petrol tank hold: 5 ml, 50 ml, 500 ml, 5 litres, 50 litres.
  - Approximately how much does a can of Coke hold: 1 litre, 200 ml, 20 ml, 350 ml, 350 litres.
  - Convert 1 litre 400 ml to millilitres

Problem Solving (15 minutes)

- Find suitable problems in the textbook, or make your own, such as:
  - At a party, there was a 2 litre bottle of Coke. How many cups, each containing 200 ml, could be filled?
  - I went on a hike and drank 750 ml of water every kilometre. How much water had I had after 2 km, 4 km, and 6 km?
  - My mother bought a 4 litre bottle of orange juice. It lasted 8 days. How many millilitres of juice did we drink every day?

> *Tip: Encourage learners to use the problem solving techniques they have been taught. In many problems involving SI units, drawings are useful to help solve the problem.*

Homework

- The learners must complete the exercises and problems for homework.

ASSESSMENT	• **Formal :** - Mental addition and subtraction

WEEK 6: Day 5

Notes to the teacher:

- Learners have been doing measuring activities for many years, but it is always easier to start at the beginning in case some learners didn't grasp concepts in the past.
- Use as many practical, realistic examples as you can.
- Today's lesson will be a basic introduction to grams and kilograms.

Resources: Chalkboard, worksheets, supermarket advertising brochures, two packets of sugar, one with a mass of 1 kg, one with a mass of 250g (or 200g), kitchen scale

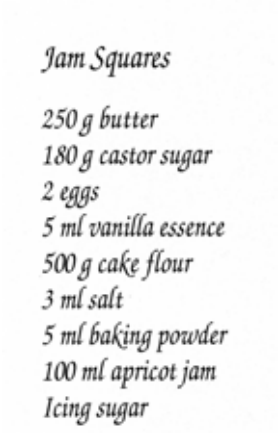
DAILY ACTIVITIES

Oral and Mental Activity (10 minutes)

- Adding on to make 1 000. Do 2 or 3 orally with the whole class. Give the learners 10 to 15 sums to work on in pairs and write down the answers, e.g.
  - 235+□=1 000 520+□= 1 000 578+□=1 000
  - The written part of this activity can be used for Assessment Task 2.

Concept Development (20 minutes)

- Show the learners the 1 kg packet of sugar, and ask different learners to read what they see written on the packet.
  - They will give you the brand name, what it is (sugar) and tell you it says 1kg.
  - Ask them what 1kg means. It means 1 kilogram. 1 kilogram is the mass of the packet of sugar. Ensure that the learners know we use a scale to measure mass. Put the packet of sugar on the kitchen scale and let the learners see how the needle points to 1 kg.
  - Let the learners hold the packet of sugar to be able to judge 1 kg.
  - Hold up the 250 g packet of sugar, and ask the learners what they notice. What does the 250 g mean? How many grams in a kilogram? How many of these small packets would I need to equal the 1 kilogram packet?
- In groups, tell the learners they must now estimate the mass of several items such as a school bag, a Maths text book, a pencil case, a chair or stool, board duster. Try to give them as many items of varying masses as possible.
  - They can first estimate whether the items are less than or more than 1 kg.
  - They can arrange them in order from lightest to heaviest.
  - Using the kitchen scale, measure the actual mass of the items under 1kg to see how accurate the learners were.
- Write a recipe such as the following on the board. (Ensure that the recipe has a mixture of measurements in grams and ml).



Jam Squares

250 g butter
180 g castor sugar
2 eggs
5 ml vanilla essence
500 g cake flour
3 ml salt
5 ml baking powder
100 ml apricot jam
Icing sugar

- Ask the learners in their groups to write down all the things they can see that are measured according to their mass (i.e. in grams or kilograms)
- For revision, also ask why some items are written with ml – what does the ml mean?
- Give them questions to discuss and answer in their groups, such as:
  a) If I double the recipe, how much cake flour will I need (answer in kilograms)
  b) I bought a 1 kg pack of butter. How many grams is this? How much butter did I have left after measuring the quantity needed for the Jam Squares?
  c) Castor sugar comes in packets of 250g. How much castor sugar did I have left in the packet?
  d) If I want to halve the recipe, how many grams of castor sugar will I use?
  e) How much more or how much less than 1kg is the total mass of all the ingredients measured in grams?
- See if the groups can think of any problems to ask the other groups.

Problem Solving (15 minutes)

- Briefly remind learners about problem solving techniques. Find examples of problems in text books, or make your own, for the learners to solve. Keep the problems fairly simple like the ones asked about the recipe.

Consolidation (15 minutes)

- Give the learners 10 to 15 sums involving the relationship between units of measuring mass. Examples could include:
  - 245g+□=1kg How many 200g in1kg? 1 345g=□kg+□g

ASSESSMENT	• **Informal :** - Help learners who you see are struggling with the work.

Grade 5: Week 7

Hours: 5	**Number of Periods: 5**
Mathematics LO 1 AS 6a **LO 1 AS 4** **LO 1 AS 8b, 8c,** **LO 4 AS 6**	**Milestones:** • Solve problems in context such as financial (buying, selling, profit, loss, simple budgets) • Recognise the place value of digits in whole numbers to a minimum of 5-digit numbers (Assessment Task) • Estimate and calculate by selecting and using operations and techniques appropriate to solve problems that involve: - Addition and subtraction of whole numbers with at least 5 digits. (Assessment task) - Financial (profit and loss) (Assessment Task) • Solve problems involving selecting, calculating with and converting between appropriate SI units (Mass and Capacity)

Mental Strategies: Mental strategies are done with the whole class every day. The time should be used to develop skills and to build number sense.

	Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 5**
Content Focus:	Financial problems in context: Budgets	Financial problems in context Profit and Loss	Assessment Task: Place value to 5 digits Problem solving involving addition and subtraction of 5-digit numbers and profit and loss	Measurement: Mass. Converting between grams and kilograms	Measurement: Capacity Converting between litres and millilitres
Resources	Chalkboard, worksheets, supermarket advertising brochure	Chalkboard, worksheets, supermarket advertising brochure	Prepared Assessment Task Problems	Textbooks, chalkboard, worksheet, bathroom scale.	Textbooks, chalkboard, worksheet.

WEEK 7: Day 1

Notes to the teacher:

- Understanding and dealing with money affects everyone.
- Today, the learners will learn about simple budgets. A budget means planning how to spend money available to you. Budgets are made in the home, in businesses, schools, clubs, municipalities, provinces and at central government level.
- It is important to have a budget to avoid getting into debt.

Resources: Chalkboard, Mrs Khumalo's shopping list, supermarket brochure.

DAILY ACTIVITIES

Oral and Mental Activity (10 minutes)

- Do a multiplication and division test. Ask the learners 10 questions on multiplication and division. They must work out the answers in their heads and write the answers down. Ask about 5 of each multiplication and division in random order. Try to use different vocabulary, e.g. 7 *times* 8; 6 *multiplied by* 4; 24 *divided by* 4; how many 5s in 35; what is the *product* of 8 and 8; what is the *quotient* of 16 and 4. Let the learners mark each others' work as you say the answers. See by a show of hands who obtained 10, 9, 8, 7 then less than 7.

Concept Development (20 minutes)

- Explain to the learners what a budget is, who has a budget and why it is important to have a budget. Give an example, making the figures relevant and realistic to the learners in your class. Ask them for ideas about what needs to be paid for in their homes. Example:
  - Dad earns R500 a week. What does he need to pay for? (Food, clothing, transport, water, electricity, rent).
  - Explain that it is important to buy the essential things first – briefly discuss needs and wants. Ask questions such as, "What would happen if Dad spent all his wages on clothing?" There would be no money for food.
- Tell learners, in their groups, their household income is R1 000 and write on the board the following list of possible items, with their costs, that need to be or could be paid for. They must discuss what they can afford, according to their income.

<u>The list</u>:

Food	R300	Make-up and jewellery	R40
CD's	R100	Movie tickets	R20
Clothes	R100	New Nokia cellphone	
Rent	R300	and accessories	R100
Electricity	R50	DSTV installation	R120
Transport	R50	Water	R30
		McDonald's meals	R40

  - Discuss each group's decisions, and see which groups managed to stay within their budgets and who perhaps bought unnecessary items before paying for essentials.

- Point out that if they are within their budget, they can save the money towards something special or for a time when they might be out of work.
- It is also relevant to explain to the learners about debt, and how easy it is for people to get into debt if they do not budget carefully. Also explain that once a person is in debt, it is difficult to get out of debt.

• Tell the learners that each town also has a budget. Explain to them that the money comes from taxes that the people pay.
- Let them brainstorm in groups, the things that a town (municipality) has to pay for.

• Briefly discuss with a class the country's budget, e.g. where the country gets money from (income tax, VAT, other taxes) and what it needs to pay for (education, health care, police, etc)

Investigation (30 minutes)

• The learners can work in groups for this investigation. Tell them that Mrs Khumalo buys food for her family once a week. She budgets R300 for her shopping. She makes a list of what she needs to buy.
- Write Mrs Khumalo's shopping list on the board, or, if possible, have a photocopied list. The list should have at least 10 to 15 items on it. She will not only buy one of everything, e.g. she might buy 3 loaves of bread, 4x2 litres of milk, etc.
- Provide the learners with the prices of the items that Mrs Khumalo needs (or have a supermarket advertisement brochure for each group). Keep the prices rounded off to 50 cents, i.e. do not have prices like R3,99, R4,79 etc.
- The learners must write down the costs of everything on Mrs Khumalo's list, and see if she will be within her budget. If she is not, they must work out how she can still buy everything and stay within her budget. For example, she might only be able to buy 2 loaves of bread, and not 3.

ASSESSMENT	**Informal :** Observe the learners working in their groups to see who is co-operative and contributing to the investigation.

WEEK 7: Day 2

Notes to the teacher:

- The focus of today's lesson is on Profit and Loss.
- People work to earn a living. Some people earn a salary (teachers, supermarket staff, and bank employees). Some people have their own businesses and they take their salaries out of the profit they make.
- Shops buy products from factories or suppliers, and then sell the products to customers. The difference between the cost price (how much the shop pays for the products) and the selling price (how much the shop sells the products for) is the profit. (In real life there are many costs involved, e.g. rent, insurance, salaries, but this is too complicated for learners at this age.)
- If the shop sells something for less than it paid for the product, the shop is making a loss on that product.
- Learners can often not understand that a shop buys things, as they only experience a shop selling things.

Resources: Chalkboard, textbooks, an item purchased from a shop (e.g. a loaf of bread), advertising brochures from a shop or supermarket.

DAILY ACTIVITIES

Oral and Mental Activity (10 minutes)

- Practise the 9 times table. The whole class can say it, or do it in rows.
- Show the learners a quick way to add on 9. For example, 28+9. 9 is one less than 10, so we can add 10, then subtract 1. 28+10=38. 38-1=37. Do five or six more examples, and then ask individual learners to add 9 onto numbers you give them. Each time they must do it step by step, i.e. add 10 then subtract 1.

Concept Development (20 minutes)

- Hold the loaf of bread up. Tell the learners you bought this at the local shop this morning. It cost you R8,50.
  - Ask the learners where the shop got the bread from. Did they bake it? Was it given to them? It came from the bakery.
  - Ask the learners if they think the shop had to pay the bakery for the bread, and, if so, how much would they have paid the bakery. Let the learners discuss this with a partner for less than a minute.
  - Get some feedback from the learners. After some discussion, agree on a price that the shop would have paid the bakery, say R6,00, for the bread.
  - The shop bought the bread from the bakery for R6,00. They sold it for R8,50. That is R2,50 difference. We call this difference (R2,50) a *profit*.
  - Tell the learners to imagine the shop has too much bread at the end of the day. It goes stale, but the shopkeeper doesn't want to just throw it away. He will probably sell the bread cheaply. If he sells it for R5,50, people will buy it, even though it isn't so fresh. But, the shopkeeper had to pay the bakery R6,00, he is selling it for 50 cents less than he paid for it. He is making a *loss* of 50 cents.
- Draw a table on the board with about *ten* items on it. Ask the learners in their groups to work out in each case whether there was a profit or a loss, and how much the profit or loss was.

Item	The shop bought it for:	The shop sold it for:	Profit or loss of how much?
Milk	R5,00	R6,50	
pencil	R1,80	R1,50	
newspaper	R4,20	R,450	
apple	50 cents	45 cents	

Problem Solving (30 minutes)

- Give learners in their groups a page from a shop or supermarket advertising brochure. There is an example in the Addendum, and examples of problems are based on that sample.
  - Learners must write down a list of all the items they see on the page, and their prices.
  - They must round off all the prices to the nearest Rand. This is the same as rounding off to the nearest hundred, e.g. the Medium Fat Spread is R5,99 = 599 cents ≈ 600 cents = R6,00.
  - In their groups, the learners must discuss and answer questions, using the rounded off prices, such as:
    a) The shop bought tins of Mixed Vegetables for R5,20. How much profit or loss are they making on one tin?
    b) The shop is selling a 2kg packet of Rice for double what they paid for it. How much did they pay for it? How much profit are they making on it?
    c) The shop bought the Corned Meat for R2 less than they are selling it. How much profit are they making on one tin? How much profit are they making on ten tins?
    d) If the shop is making R3 profit on a 500g packet of Peanuts and Raisins, how much profit will they make on 1kg of Peanuts and Raisins?
    e) The shop bought the milk for R6 per litre. It has reached its sell by date so they are offering it on special to their customers for R5 a litre. How much loss is the shop making on 1 litre of milk? How much loss will the shop make on 20 litres of milk?

ASSESSMENT	**Informal :** Observe the learners working in their groups. See who is contributing and being enthusiastic and understands the work.

WEEK 7: Day 3

Notes to the teacher:

- Read the Holistic rubric and Assessment Task 2 Milestones to ensure that the problems you set for the learners comply with the requirements for this Assessment Task.

Resources: Prepared work to be assessed. This can be written on the chalkboard, but it is preferable to give the learners their own photocopied page to work from.

DAILY ACTIVITIES

Oral and Mental Activity (10 minutes)

- Finding pairs that add up to 50. Write 10 rows of 5 (or more) numbers on the board. Learners must write down (individually or in groups, whatever you prefer) the two numbers in each row that add up to 50. Give them an example, showing them how to write their answers.
  - 27; 31; 23; 25; 39. Learners write down 27+23=50
  - 17; 23; 44; 33; 16
  - 32; 28; 22; 19; 21

Concept Development (15 minutes)

- Before the learners start the Assessment Task, it will be beneficial to them if you briefly revise and discuss:
  - Problem solving techniques: drawing pictures or substituting smaller numbers to help decide what operation to use. Ensure that the answer is realistic and complete (e.g. horses, boxes, etc)
  - Recognising place value in 5-digit numbers
  - What is meant by a profit and a loss

Problem Solving (35 minutes)

- The learners must work on their own to complete the problems.

ASSESSMENT	• **Formal, recorded Assessment Task 2:** - LO 1 AS 4: Recognise the place value of digits in whole numbers to a minimum of 5-digit numbers - LO 1 AS 8b: Estimate and calculate by selecting and using operations and techniques appropriate to solve problems that involve addition and subtraction of whole numbers with at least 5 digits. - LO 1 AS 6a: Solve problems in context such as financial (buying, selling, profit, loss)

WEEK 7: Day 4

Notes to the teacher:

- Today's lesson continues with converting between units of measurement of Mass.
- Converting larger units of Mass will be dealt with today.
- The learners will also add and subtract units of mass after converting. This is good revision of adding and subtracting 5-digit numbers.
- It will also include rounding off to the nearest kilogram.

Resources: Bathroom scale, chalkboard, worksheets, textbook.

DAILY ACTIVITIES

Oral and Mental Activity (10 minutes)

- Give learners in their groups the following kinds of problems to complete. See which group finishes first:
  - $\frac{1}{2}$ kg = ☐ grams
  - $\frac{1}{4}$ kg=☐ g
  - 1 235 g = ☐ kg and ☐ g
  - How many thousands in the number 12 897? How much is left over?
  - Round off 2 765 to the nearest 1 000
  - Round off 3 245 grams to the nearest 1 000 grams
  - Round off 3 245 grams to the nearest kilogram
  - How many grams must I add to 3 450 grams to make 4 kg?

Concept Development (20 minutes)

- Ask the learners what unit of measurement they would use to measure their mass. They would use kilograms. If they used grams, the number would be too big. We use kilograms to measure the mass of larger things.
  - Ask a few learners what they estimate their mass to be. Let the same learners come and accurately measure their mass on the bathroom scale. (Choose learners who will not be worried to get on the bathroom scale – some learners do not want to do this).
  - Arrange the learners' masses from lightest to heaviest.
  - Convert a learner's mass to grams. If a learner's mass was 32 kg, say: 32 kilograms is 32 thousand grams. How do I write this? Write the number on the board. 32 000
  - Repeat this with the masses of two or three other learners.
  - Tell the learners to imagine you have a very accurate scale which can measure in grams and kilograms. If a learner's mass is 32 kg 566 g, how many grams is this? It is 32 000 plus 566 which equals 32 566 grams.
  - Repeat this a few times with other masses.
- Tell the learners you are now going to convert the other way, from grams to kilograms. If a learner's mass is 41 566 grams, how many kg and grams is this? Read the number: 41 thousand five hundred and sixty six. After which digit do we say the word "thousand"? After the 1. The number which we say before the word thousand is how many kilograms we have.

- In this example, we said 41, so we have 41 kilograms. Write it on the board like this: 41/ 566. The / shows where we separate the kilograms from the grams. The 566 is the grams. Do several more examples with the learners.
- Do some rounding off of grams to the nearest kilogram. Start with numbers such as 1 234 grams. How much is this rounded off to the nearest kilogram?
  - Firstly, round this off to the nearest 1 000 grams. 1 234≈1 000. 1 000 grams = 1 kilogram. So 1 234g≈1 kg.
  - Do a few more examples, and then move to bigger numbers. Give as many examples as necessary for the learners to understand.

Consolidation (20 minutes)

- Work with a small group of learners who need more explanation and practice, while the rest of the class does work from the textbook. Work must include:
  - Converting from kilograms and grams to grams (e.g. 5kg123g = ☐ g)
  - Converting from grams to kilograms and grams (e.g. 18 654 g =☐ kg ☐ g)
  - Rounding off to the nearest kilogram.

Problem Solving (10 minutes)

- Find problems that include converting between units then adding and/or subtracting, e.g.
  - The restaurant bought 15kg780g of mince meat, and 7kg450g of beef. Convert these two amounts to grams, then find the total mass of the meat the restaurant bought. Change your answer back to kilograms.
  - A wheelbarrow can carry a mass of 12kg500g. It is loaded with bricks with a mass of 8kg750g. How much more can be loaded onto the wheelbarrow.
- Learners can complete the work for homework.

ASSESSMENT	• **Formal, recorded Assessment Task 2:** - Recognise the place value of digits in whole numbers to a minimum of 5-digit numbers Estimate and calculate by selecting and using operations and techniques appropriate to solve problems that involve Addition and subtraction of whole numbers with at least 5 digits and Financial (profit and loss)

WEEK 7 : Day 5

Notes to the teacher:

- Today's lesson is largely a repeat of yesterday's lesson, but will focus on larger units of Capacity. Do not presume that because you have covered this work with units of mass, the learners will automatically be able to apply their knowledge to Capacity. It is always a good idea to keep revising.
- Converting larger units of Capacity will be dealt with today.
- The learners will also add and subtract units of capacity after converting. This is good revision of adding and subtracting 5-digit numbers.
- It will also include rounding off to the nearest litre.

Resources: Chalkboard, textbook, worksheets.

DAILY ACTIVITIES

Oral and Mental Activity (10 minutes)

- Give learners in their groups the following kinds of problems to complete. See which group finishes first:
  - 1litre = ☐ millilitres
  - 1 cup = 250 ml = ($\frac{1}{4}$; $\frac{1}{2}$; $\frac{3}{4}$) of a litre
  - 4 025 ml = ☐ litres and ☐ millilitres
  - How many thousands in the number 9 522? How much is left over?
  - Round off 8 456 to the nearest 1 000
  - Round off 5 499 millilitres to the nearest 1 000 millilitres
  - Round off 3 245 ml to the nearest litre

Concept Development (15 minutes)

- Tell the learners you have a motor car, and you need to fill it up with petrol. Ask them to estimate how much petrol you can put in if the tank is empty – i.e. the capacity of the tank. Most cars' petrol tank capacity is around 65 litres, so work on this number.
  - Repeat the steps you followed yesterday but use litres and millilitres instead of grams and kilograms. The learners must be able to convert between litres and millilitres.
  - You could use as examples the capacity of a bath or the capacity of a rock pool. Think of examples that are relevant to your learners' knowledge.

Consolidation (15 minutes)

- Work with a small group of learners who need more explanation and practice, while the rest of the class does work from the textbook. Work must include:
  - Converting from litres and millilitres to millilitres (e.g. 5 litres 455 ml = ☐ ml)
  - Converting from millilitres to litres and millilitres (e.g. 15 345 ml = ☐ litres ☐ml)
  - Rounding off to the nearest litre

Problem Solving (20 minutes) • Find problems in the textbook, or make a worksheet, with problems that use the concepts taught in converting between units of capacity. These problems must also include adding and subtracting of 5-digit numbers (i.e. converting from litres and millilitres to millilitres, then adding the millilitres.)	
ASSESSMENT	• **Informal :** Assess the learners' understanding of the work by observing their participation in class, group work and how they complete their written work.

Grade 5: Week 8

Hours: 5	**Number of Periods: 5**
Mathematics LO 1, AS 3d **LO 4, AS 6** **LO 5 AS 3, 4**	**Milestones:** • Recognise and represent in order to compare 0 in terms of additive inverses • Solve problems involving selecting, calculating with and converting between appropriate SI units (Length) • Organise and record data using tallies and tables. • Examine ungrouped numerical data to determine the most frequently occurring score (mode) of the data.

Mental Strategies: Mental strategies are done with the whole class every day. The time should be used to develop skills and to build number sense.

	Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 5**
Content Focus:	Measurement: length. The units of measurement and estimation	Measurement: length. Converting between mm and cm and between cm and m.	Measurement: length. Converting between m and km Assessment task: Mental tables	0 in terms of the additive inverse	Tally tables and finding the mode of ungrouped data. Assessment task: Mental adding and subtraction
Resources	Rulers, tape measures, trundle wheels. Chalkboard, textbooks, worksheets.	Rulers, tape measures, trundle wheels. Chalkboard, textbooks, worksheets.	Chalkboard, worksheets, textbooks Assessment Task	Chalkboard, worksheets, number lines Assessment Task	Chalkboard, worksheets, textbooks. Assessment Task

WEEK 8: Day 2

Notes to the teacher:

- Today conversion of units of length between mm, cm and m will be taught.
- Length is the only SI unit in which we convert using 10s (mm and cm) and 100s (cm an m), so it can be confusing for the learners. However, they always have their rulers in front of them, and it is perfectly acceptable for them to constantly use their rulers to help them. They will eventually not need this aid.

Resources: Rulers and tape measures. Chalkboard, textbooks, worksheets.

DAILY ACTIVITIES

Oral and Mental Activity (10 minutes)

- Practise times tables. You can do this any way you wish – the clock way, Tables King, Tables Challenge (see Addendum for instructions on these drills). You can start by focusing on one times table, for example learners often have difficulty with the 7x table so you could practise this one first, before moving on to random tables drill.

Concept Development (10 minutes)

- Tell all the learners to take out their rulers. They must look at the edge measured in millimetres. They will see where the longer lines are, the numbers 10, 20, 30 etc are written. These are millimetres. Now look at the other edge of the ruler where the markings are in 1, 2, 3 etc. These are centimetres. Revise: how many millimetres are in one centimetre? (10.) The learners can use the edge marked in millimetres to answer questions you ask them orally, first converting mm to cm, then cm and mm to mm. Each time you ask a question, see which group has a person whose hand goes up first, and keep score of which group correctly answers the most.
  - How many centimetres and millimetres in: 13mm, 32mm, 54mm, 82mm, 223 mm, etc. (Ask at least 15)
  - Establish a "rule", e.g. 13mm = ☐cm and ☐mm. How many 10s in 13? One. How many left over? Three. So we have 1 cm and 3 mm. 1/3. We split the 13 after the digit (the 1) that tells us how many tens we have. Another example: 223 mm. 22/3. So we have 22 cm and 3 mm.
  - How many millimetres in: 2cm 5mm, 5cm 7mm, (ask about 15)
  - Establish a rule. 2cm 5mm: 2 cm x 10 = 20 mm. 20mm + 5 mm = 25 mm.

Consolidation (10 minutes)

- Give the learners some examples to complete in their workbooks. They can work in groups or individually, but walk around to ensure that all learners understand, or work with a small group of learners who are unsure of this concept.

Concept Development (10 minutes)

- Now move on to converting between centimetres and metres. Using the same ideas as converting mm to cm and a tape measure per group for the learners to look at, ask similar questions to above. Then establish the rule, e.g., 125cm = ☐ m ☐ cm. Say, one *hundred* and twenty five, so divide the number after the one hundred: 1/25. So there is 1 metre and 25 cm in 125 cm.

Consolidation (10 minutes)

- Give the learners some examples of converting between units to complete in their workbooks.
  - They can work in groups or individually, but walk around to ensure that all learners understand, or work with a small group of learners who are unsure of this concept.
  - Include some sums which entail converting to a unit then adding or subtracting (refer to the lessons on Mass and Capacity)
  - Include some rounding off to the nearest centimetre (e.g. 18mm≈☐cm)
  - Let the learners complete the work for homework.

ASSESSMENT	• **Formal :** Mark the learners' work to see that they understand. • **Informal :** Help the learners, in small groups, who are having difficulty

WEEK 8: Day 3

Notes to the teacher:

- Today the learners will convert between metres and kilometres. This should not take too long, as they have had practice with units of Mass and Capacity. However, still be thorough.
- Today's lesson will include an Assessment Task for AT2.

Resources: Chalkboard, worksheets, prepared Assessment Task

DAILY ACTIVITIES

Oral and Mental Activity (10 minutes)

- Give the learners an addition and subtraction mental test. They must complete this silently, on their own, as part of Assessment Task 2. Give them 10 random addition and subtraction exercises.

Concept Development (15 minutes)

- Check that the learners know that there are 1 000 metres in a kilometre. In groups, give them the following problems, written on work cards, to solve. Give them a time limit of about five minutes, then discuss the problems and answers:
  - I have to walk 1 km to the shops. My friend's house is 455 metres from my house. I stop there so he can walk to the shops with me. How far do we walk from his house to the shops?
  - Ben and Jacob went on a hike. They saw markers which read: 1 240m; 2 680m, 5 330m. How many kilometres and metres had they walked when they saw each of the markers? Round off these distances to the nearest kilometre.
  - There is a relay race of 1km. 4 runners take part in the race. How far does each one run?
- Adapt what you taught converting units of Mass and Capacity (refer to those lessons in converting between kilometres and metres). The concept is identical, just the units have different names.

Consolidation (10 minutes)

- In groups, learners can practise a few examples including rounding off, converting e.g. 3 456 m to km and metres, 5 km 443 m to metres, converting then adding or subtracting.

Problem Solving (25 minutes)

- Use this time for Formal Assessment. Check the Assessment Standard to ensure that you have a sufficient cross-section of work.

ASSESSMENT	• **Formal, recorded Assessment Task 2:** - LO 4 AS 6 Solve problems involving selecting, calculating with and converting between appropriate SI units

WEEK 8: Day 4

Notes to the teacher:

- Today's lesson focuses on 0 in terms of the additive inverse.
- The additive inverse means the opposite of a number, what must be added to a number to make zero, so it is an introduction to negative numbers.
- The additive inverse of 3 is -3 because if we add 3 and -3 we get zero.
- Do not get too complicated, as the concept of negative numbers is dealt with at depth in higher grades, but learners should be aware that our number system does not start at zero. We can extend a number line for ever below zero. The numbers below zero are called negative numbers.
- We use negative numbers every day, e.g. in cold countries, the temperature goes below zero degrees; we talk of heights above sea level and below sea level; if we owe someone money, we have a negative amount of money.
- Use as many concrete, practical examples as possible and do not get too involved in terminology.

Resources: Chalkboard, number lines.

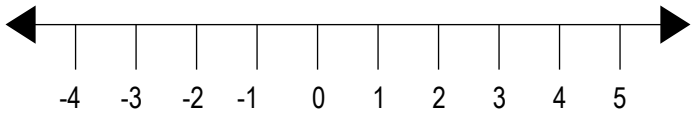
DAILY ACTIVITIES

Oral and Mental Activity (10 minutes)

- Do some drilling of number bonds.
  - Draw a square on the board, and write about 15 random numbers, smaller than 50, in the square. Outside the square, write the number 50.
  - Point to one number at a time, and the learners, individually or in groups, must answer as quickly as possible what must be added to the number you pointed to, to make 50. For example, you point to 28, the learners must answer 22.
  - Erase the 50, write another number, and repeat the procedure.

Concept Development (20 minutes)

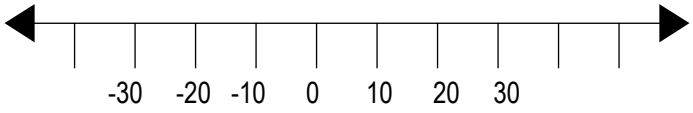
- Explain to the learners that we have numbers below zero. We call them negative numbers, and say "negative 1, negative 2" etc. We can extend the number line forever in both directions. Give the learners a couple of examples of when we use numbers below zero. Draw a number line on the board, and practise counting:



  - Start at 0 and count forwards.
  - Start at 1 and count backwards.
  - Start at -4 and count forwards.
- Explain to the learners that 0 is not a positive or negative number. It is like the fence between positive and negative numbers. Every number on the number line has a number that is its opposite, called its inverse or the 'additive inverse'. The inverse of 1 is -1. Drill this concept by asking the learners questions such as:
  - What is the additive inverse of 5?
  - What is the additive inverse of -2?
  - What is the additive inverse of -7?

(Later learners will learn what a 'multiplicative inverse' is, therefore they need to be familiar with the terms.)

- Tell the learners you have not stayed within your budget this month and you have –R30 (negative R30) in the bank. This means you owe the bank R30. How much money must you pay into the bank so that you do not owe them anything?



  - Look at the number line to help work it out. The number line is counting in tens. Start at -30, count in 10s until you reach 0. So you have to pay in R30. The inverse of -30 is 30. In a number sentence, we could write -30+30=0

Consolidation (15 minutes)

- Set the learners work to do, individually, in their workbooks, to be formally assessed. This work could include:
  - Draw a number line; put a cross on the number 5. The learners must write down the inverse of 5. (Do about 5 like this).
  - Multiple choice: What number must I add to 6 to make 0? -3; 6; -6; 0; 10. (Do about 5 like this).
  - What number on a number line is the additive inverse of 9?

Problem Solving (15 minutes)

- Give the learners two problems to solve, one that entails adding of 5-digit numbers, and one that entails subtraction of 5-digit numbers. For each problem, they must first estimate the answer by rounding off to the nearest 1 000, write a number sentence, and make sure their answers are complete (people, sheep, cars.)

ASSESSMENT	**Informal :** Take note of how well the learners participated in class
ASSESSMENT	• **Formal, recorded Assessment Task 2:** Mark 15 exercises the learners completed and record the results. - LO 1 AS 3d: 0 in terms of additive inverses

WEEK 8 : Day 5

Notes to the teacher:

- The learners were taught to read tally tables in the first term. This will be revised.
- Collection and analysis of data (numerical information) is an important facet of life. It enables people to make decisions on trends. A couple of examples are:
  - Every few years there is a census in our country. Data is collected about how many people in each house, how many people live in flats, houses, shacks, monthly income per household, how many babies have been born. Based on these figures, the authorities can plan for the future. If many babies are being born in an area, they can budget to build facilities to look after babies, such as crèches and clinics.
  - Data is collected about what consumers use, for example types of bread. If most of the people in a particular area buy white bread, then the bakers will supply mostly white bread to shops in that area. If, in another area, people buy whole-wheat bread, then more whole-wheat bread will be supplied.
- Three important ways in which data is analysed is by finding the mean, the median and the mode of the data. Today the learners will learn to find the mode. However, later when learners have to find the mean and median as well, they can get confused between the three. It is useful to tell them that *mode* means *most*, and both these words start with the letters *mo*.

Resources: Chalkboard.

DAILY ACTIVITIES

Oral and Mental Activity (10 minutes)

- Give the learners a mixture of addition and subtraction exercises to work out alone, writing the answers only. You can call out the exercises and let them write the answers. Try to give the learners 20 exercises. This is part of Formal Assessment Task 2.

Concept Development (20 minutes)

- Tell the class that the school principal is collecting data at the school entrance. He wants to find out what time *most* of the learners arrive at school. Ask the learners to discuss in their groups how they think the principal can accurately count the learners arriving at school.
  - Listen to each group's ideas. They may have come up with the idea that the principal uses a tally chart to count learners arriving in each minute, each 2 minutes, each 3 minutes, etc. Discuss which would be the most practical.
  - Remind the learners how to make a tally chart. You make one mark for each item counted up to 4. The fifth item counted is shown by a line through the first four marks: IIII means 5. IIII means 4. Explain that we do it like this because it is easy to count in 5s to find the total items counted.
  - Make "the principal's" tally chart on the board. Decide that he counted the learners in 5-minute intervals. Ask questions to keep the learners involved in making the tally chart, e.g. in the first five minutes, he counted 23 learners. What did this look like on his tally chart?
  - Ascertain during which 5-minute period the most learners arrived at school. Tell the class that we call this the mode of the data. Repeat *mode means most* a few times.
- The next day, the principal wanted to find out how *most* of the learners get to school. He didn't have time to stand at the gate, so asked a learner to stand there for him. As each learner walked through the gate, the learner asked them how they got to school, and in the first minute, he wrote down the following:

- bus, bus, taxi, walk, taxi, walk, bicycle, car, bus, bus, taxi, walk, taxi, walk, walk, bicycle, car, taxi, taxi, bicycle, taxi, taxi, walk, bicycle, walk, taxi, bus, bus, bus, bus, walk, bicycle, car, bus, walk, taxi, taxi, walk, taxi.
- This is called ungrouped data. To make sense of it or interpret it accurately, we have to group it.
- Ask the learners in their groups to use the above information to find the mode of the data.
- The learners might just count each method of getting to school, but walk around to each group and ensure that they make a tally table. This is important, especially when there is a large amount of data.
- The mode is taxi. Make sure all the learners understand this. Most learners (13) come to school by taxi.

Consolidation (30 minutes)

- Give the learners two different sets of ungrouped data. Note, these are made up; they are not as a result of a survey (anyone being asked questions). Each group of data must contain at least 30-40 *randomly* written items, which will fit into 4 to 5 categories in the range of data. The learners must, individually, make a tally table to organise the data, then find the *mode* of each set of data. Try to make the data meaningful to your learners and their environment. Data you could use includes:
  - Heights of learners to the nearest 10 cm: 1,7m, 1.5m, 1,4m, 1,7m, etc.
  - Shoe sizes in the class: 5, 6, 3, 7, 3, 5 etc
  - Favourite school subject: English, Maths, English, Natural Sciences, EMS, English etc
  - Most popular flavour crisps: salt and vinegar, plain, cheese and onion, plain, biltong, etc.

ASSESSMENT	• **Formal, recorded Assessment Task 2:** - Mark the two tally tables and ensure that the learners have given the correct mode of the data. - LO 5 AS 3 AS 4: Record data using tallies and tables; examine ungrouped numerical data to determine the mode of the data.

Grade 5: Week 9

Hours: 5	**Number of Periods: 5**
Mathematics LO 1 AS 3b, 3e, 8d, 8e	**Milestones:** • Recognise and represent common fractions to twelfths • Recognise and represent 1 in terms of its multiplicative inverse • Estimate and calculate by selecting and using operations and techniques appropriate to solve problems that involve - Multiplication of at least whole 2-digit by 2-digit numbers to at least 1 000 - Division of at least a whole 3-digit by 1-digit number

Mental Strategies: Mental strategies are done with the whole class every day. The time should be used to develop skills and to build number sense.

	Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 5**
Content Focus:	Multiplying a 2-digit by a 2-digit number	Multiplying a 2-digit by a 2-digit number Assessment Task	Recognising fractions to twelfths and 1 in terms of the multiplicative inverse Assessment Task	Division of a 3-digit by a 1-digit number	Division of a 3-digit by a 1-digit number Assessment Task
Resources	Chalkboard, textbooks, worksheets	Chalkboard, textbooks, worksheets	Chalkboard, textbooks, worksheets	Chalkboard, textbooks, worksheets, playing cards or counters	Chalkboard, textbooks, worksheets, playing cards or counters

WEEK 9: Day 1

Notes to the teacher:

- In the first term, multiplication of a 3-digit number by a 1-digit number as well as multiplication of a 2-digit by a 2-digit number was taught.
- Earlier this term, multiplication of a 3-digit by a 1-digit number was taught again. Today's lesson will prepare learners for multiplying a 2-digit by a 2-digit number by letting them see the pattern when a single-digit number or a multiple of 10 is multiplied by a multiple of 10.
- It is important that they discover the shortcut by investigating. Do not merely tell them a rule.
- During any lessons on multiplication, it is important to bring into your lesson that when we multiply any number by zero, the answer is zero, and that when we multiply a number by 1, the number stays the same.
- Remind the learners regularly that multiplication is a shorter way of repeated addition.
- Multiples of single digit numbers was assessed for Assessment Task 1. This has to be re-visited and assessed for Assessment Task 2. The lesson will begin with a brief review of multiples.

Resources: Chalkboard, worksheets, textbooks.

DAILY ACTIVITIES

Oral and Mental Activity (10 minutes)

- Count in multiples of single-digit numbers. Do this activity however you like, e.g. around the class, in groups, in rows, girls and then boys, 10-year olds, then 11-year olds, then 12-year olds. Try to vary this activity but make sure all the learners actively participate. Do not start with the first multiple of a number each time. Use the word multiple each time you give an instruction. Examples:
  - Count in multiples of 6 from 18 to 72
  - Count in multiples of 8 from 32 to 96
  - Count backwards in multiples of 3 from 48 to 18

Concept Development (20 minutes)

- As multiplying 2-digit by 2-digit numbers entails multiplying by multiples of 10, it is important that learners understand what happens to a number when they multiply a number by 10. In groups, give the learners the following table (or draw it on the board). They must complete Column 1, multiplying each number you give by 10.

	Column 1 x 10	Column 2 x 20	Column 3 x 60	Column 4 x 30
2				
6				
7				
4				
8				

  - Discuss their answers and see if they noticed what happened each time. They must be able to tell you that all you have to do, when multiplying by 10, is to add a zero onto the end of the number.

- Tell them to complete Column 2, multiplying each number by 20. Discuss their answers, and establish a "shortcut" way to do the sum: you double the number and then write a zero after the number. 2x20=40. Double 2 to make 4, then add a zero to the end of the 4: 40
- In their groups, learners can complete Column 3. Afterwards discuss and see that they all worked out the answers by multiplying the number by 6, then adding a zero to the end of the number.
- Repeat with Column 4.
- Now give them the following table to complete column by column, as with the previous table. You can draw the table on the board.

	Column 1 x 10	Column 2 x 20	Column 3x 60	Column 4 x 30
20				
60				
70				
40				
80				

- After the learners have completed the first column, discuss their answers. They will notice that there are two zero's in all the answers. The shortcut to multiply 20x10 is to say 2x1, then add two zero's to the answer. 2x1=2. Add on two zero's = 200.
- Let the learners complete the second column. They should be able to see that to multiply 20x20, they can say 2x2=4, then add on two zero's = 400.
- Repeat the same with Columns 3 and 4, ensuring that the learners can see the pattern when multiplying multiples of 10 by multiples of 10.

Consolidation (15 minutes)

- Work with learners who have not yet properly grasped the concept taught today. The rest of the learners must work individually in their workbooks to do as many examples as you can give them to practise multiplying:
  - Single-digit numbers by multiples of 10: 5x30; 4x40; 6x80; 8x30 etc.
  - Multiples of 10 by multiples of 10: 20x80; 40x30; 50x60, etc.
  - They can finish the work for homework.

Assessment (15 minutes)

- Make a task for Assessment Task 2 to test the learners' ability to recognise multiples of single-digit numbers up to 100. You could include:
  - Filling in missing multiples
  - Completing a pattern of multiples by writing the next 3 multiples of a number
  - Asking questions such as "What multiples of 7 are between 40 and 50?" "What number between 40 and 50 is a multiple of both 6 and 8?"

ASSESSMENT	**Formal :** **Informal :**
ASSESSMENT	• **Formal, recorded Assessment Task 2:** LO 1 AS 3f: Recognise and represent multiples of single-digit numbers to at least 100

WEEK 9: Day 2

Notes to the teacher:

- Hopefully the learners can now multiply single digit numbers and multiples of 10 by multiples of 10.
- Today's lesson focuses on multiplying 2-digit numbers by 2-digit numbers.
- During any lessons on multiplication, it is important to bring into your lesson that when we multiply any number by zero, the answer is zero, and that when we multiply a number by 1, the number stays the same.
- Remind the learners regularly that multiplication is a shorter way of repeated addition.
- Do not be prescriptive about which method the learners use. It is important that they understand the method they use and that they obtain the correct answer. They do not have to be taught the column method before Grade 6.
- Remind the learners that they must always estimate the answer by rounding off.

Resources: Chalkboard, textbooks, worksheets.

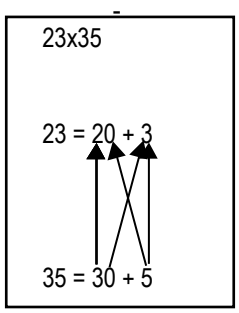
DAILY ACTIVITIES

Oral and Mental Activity (10 minutes)

- Do some times table drilling. Do Clock Multiplication (see Addendum). This time put a zero as one of the numbers around the clock to drill the concept that any number times zero equals zero.

Concept Development (20 minutes)

- In groups, the learners must discuss and solve the following problem. They must first estimate the answer by rounding off: *There are 32 learners in the class. Each learner has a Maths workbook which has 48 pages. How many pages are there altogether?* After a few minutes, during which time you must walk around and observe what the groups are doing, ask each group to give their estimated answer (32x48≈30x50. 30x50=1 500), their actual answer, and explain the method they used. Methods could include:
  - Breaking up the two numbers: 32=30+2
    48=40+8 then multiplying each number:
    40x30=1 200
    40x2=80
    8x30=240
    8x2=16 then adding 1 200+80+240+16=1 536 pages.
  - Repeated addition, e.g.: 32x48
    10x48 (480)
    10x48 (480)
    10x48 (480)
    2x48 (96) then adding 480+480+480+96=1 536 pages.
  - After giving each group that used different methods a chance to show their method, ask the learners whether they saw a new method that they find quicker and easier than the method they have been using. Also ensure that all the methods worked, and, if they did not, see where the mistake was made. Often in the breaking-up method, learners forget to multiply all the numbers. Give them the following rule: *If there are four digits altogether, you have to do four multiplications.* Show them by doing an example on the board, using coloured chalk for the arrows:



Problem Solving (15 minutes)

- Find examples in textbooks, make a worksheet, or write problems on the board, which entail multiplying 2-digit by 2-digit numbers. Learners can discuss these and work in groups, while you work with learners who need help. Examples of problems:
  - The farmer planted 23 rows of cabbages. There are 54 cabbages in each row. How many cabbages are there altogether?
  - There are 18 classes in the school. Each class has 34 learners. How many learners are there altogether in the school?

Consolidation (15 minutes)

- Give the learners multiplication exercises (2-digit by 2-digit) to do individually in their workbooks. These can be completed for homework. Give them about 10 exercises, challenge them to see who can complete them all and get them correct. However, insist that all learners complete at least five. You can include some multiplication of 3-digit by 1-digit numbers as well as it is always good to revise previously taught concepts.

ASSESSMENT	• **Formal, recorded Assessment Task 2:** - Mark the problems you set above. - LO 1 AS 8d: Multiplication of at least whole 2-digit by 2-digit numbers to at least 1 000

WEEK 9: Day 3

Notes to the teacher:

- Earlier this term a great deal of time was spent working on fractions. It is a requirement for Assessment Task 1 and 2 that the learners are able to recognise fractions to twelfths, so this will be briefly revisited and formally assessed today.
- Today's lesson will also incorporate 1 in terms of the multiplicative inverse. What this means is that what must I multiply a number by to obtain 1? This is the multiplicative inverse. The multiplicative inverse of 2 is $\frac{1}{2}$ because $2x\frac{1}{2}=1$ whole.
- The learners do not need to know the terminology, but must be able to recognise the inverse.

Resources:

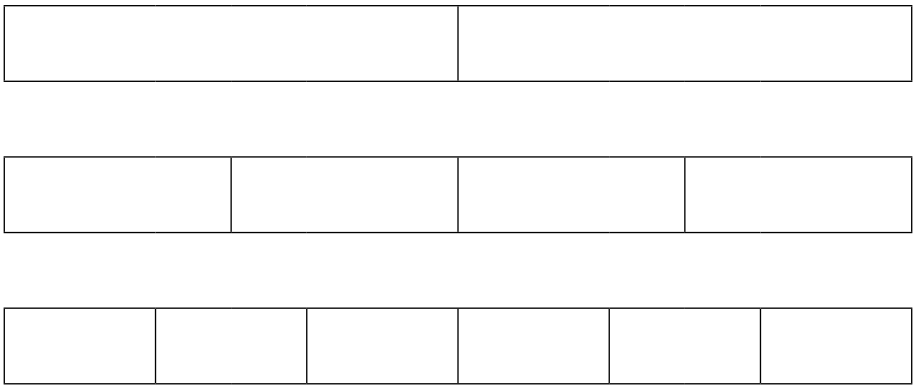
DAILY ACTIVITIES

Oral and Mental Activity (10 minutes)

- Finding pairs to multiply together to equal a given number. Write 10 rows of 5 (or more) numbers on the board. In groups, or individually, learners must write down the two numbers that, when multiplied together, equal the number you give. Give them an example of how to write it down:
  - **32**: 12; 8; 5; 2; 4 Learners write 8x4=32
  - If there is time afterwards, use the rest of the numbers to add together or multiply together, e.g. you did not use the numbers 12, 5 and 2. You can ask questions such as "How many 2s in 12?" "12+5+2=?" "12x5=?"

Concept Development (20 minutes)

- Give pairs of learner paper strips (or squares) that have been divided into equal parts. Make enough for each pair of learners to have at least 6 and divide them into fractional parts with which the learners are familiar (up to twelfths)



  - Ask the learners what we call the *equal* parts that each strip of paper has been divided into. Fractions. Remind the learners how to write fractions: $\frac{1}{2}$. See if they all remember the name of the top part of the fraction (numerator) and the bottom part (denominator). See if they can tell you the function of the denominator (tells us how many equal parts something has been divided into) and the numerator (how many of those equal parts we are using or talking about).

- Tell the learners to quickly write the correct fractions on their strips (according to how many equal parts there are). Walk around and check that they are doing this correctly:

$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$

- Ask learners in their groups questions such as "Which fraction is bigger, a third or a half?" "What fraction, with denominator 6, is equivalent to $\frac{2}{12}$?" (General revision of work covered earlier).
- Tell the learners to cut their strip divided in half, into 2.
- Ask them to tell you as quickly as possible, how many of these halves will make a whole (2 halves). Then write the number sentence on the board: $2x\frac{1}{2}=1$ (whole). Tell the learners that the fraction $\frac{1}{2}$ is the opposite of 12 when we multiply.
- Do the same with thirds. Conclude that $3x\frac{1}{3}=1$
- Repeat with two or more fractions.
- Ask the learners if they can give a rule. What must we multiply a whole number by to obtain 1 as our answer? We must multiply it by a fraction. The denominator of the fraction and the whole number must be made up of the same digits.

Consolidation and Assessment Task (30 minutes)

- Give the learners work on fractions to complete, e.g.:
  - Which fraction is larger (out of two fractions)
  - Give an equivalent fraction, with denominator 6, for $\frac{8}{12}$
  - They must do about 10 exercises.
- Give the learners work to assess their ability to recognise 1 in terms of the multiplicative inverse (they do not need to know the vocabulary) , e.g.:
  - What must I multiply 3 by to obtain an answer of 1?
  - $\frac{1}{5}x\square=1$

ASSESSMENT	• **Formal, recorded Assessment Task 2:** - Mark the work and record the learners' results - LO 1 AS 3b: Recognise and represent common fractions to twelfths - LO 1 AS 3be: Recognise and represent 1 in terms of its multiplicative inverse

WEEK 9: Day 4

Notes to the teacher:

- Learners were taught division in the first term. They can be reminded that division is an operation where items are shared.
- Division can also be regarded as repeated subtraction. The larger the numbers one can subtract from the dividend (the number being divided into) the more quickly an answer can be obtained. Encourage learners to look for the largest number that they can subtract from the dividend.
- Do not force them to use a particular method; just try to refine the method that they are used to and are comfortable with.
- Division is the opposite operation of multiplication. Division is separating sets, while multiplication is combining sets. This is actually a different concept from the sharing one mentioned above.
- Only give exercises or problems with no remainders today.

Resources: Pack of playing cards per group of 4 learners (or any 52 items to be shared), chalkboard, worksheet, textbook.

DAILY ACTIVITIES

Oral and Mental Activity (10 minutes)

- Counting forwards and backwards in 25s, 50s and 250s and 500s. It is useful for the learners to be able to recognise these. Count around the class, in groups, pairs, all the girls or all the boys. Make counting activities as varied as possible. Examples:
  - Start at zero, count in 25s to 500
  - Start at 450, count backwards in 25s to 100
  - Count backwards in 50s from 1 000 to 400
  - Count in 250s from 0 to 2 500
  - Count backwards in 250s from 5 000 to 3 000
  - Count backwards in 500s from 9 000 to 3 000.

Concept Development (20 minutes)

- Put learners in groups of 4. (If there are left-over learners, let them sit with a group but not get cards this time. Make sure you include them next time!) Give each group a pack of playing cards (52 cards). Tell them they must share the cards evenly and as quickly as possible. Observe the groups as they do this.
  - Once all the groups have finished sharing the cards, ask one or two learners from each group how many cards they have. They should all have 13.
  - You will have noticed which group finished first. Ask them how they shared the cards. They might have let one learner hand out the cards. This learner might have given each learner in turn 3-4 cards, then 3-4 cards again, then, when there were only a few cards left, he or she would probably have given the cards out one at a time.
  - The groups which finished more slowly probably gave the cards out one at a time. Explain to the learners that it is quicker to give more cards out at a time.
  - Ask the learners what we are doing when we divide? We are actually subtracting repeatedly until we reach zero. Each time the learners took a card or cards off the pile to share out, they were subtracting (taking away) from the pile of cards, until there were no cards left to share out.

- Let the learners in their groups, have a race to see which group can divide the pack of cards first. Again, check that learners all receive 13 cards.

• With participation from the learners, write on the board how you would divide without actually using the cards. Learners might come up with ideas like:
  - 52-4 (48) – 4 (44) -4 (40) …….. until they get to zero, then they count how many times they subtracted 4. It will be 13 times. Discuss this method. Perhaps it is too long, especially when you get to bigger numbers.
  - They might remember and use the method taught in the first term, using columns.
• All methods will have involved repeated subtraction. However, it is important that the learners subtract as big a number as possible each time. A method you could show them is using a "clue board" where they write down some multiples of 4, using doubling and halving:

Clue board
1x4=4
2x4=8 (double)
10x4=40
5x4=20 (halving)

  - Ask the learners which is the largest multiple of 4 (on the clue board) that is less than 52.
  - Write down **10**x4=40

    52-40=12. We have 12 left to share. Now look at the clue board or know from

    your tables, what number times 4=12 (or smaller) **3**x4=12.

    12-12=0. We have no more to share. Now add the **10** and the **3** =13
  - Write a number sentence on the board to show what you have done. 52÷4=13. Say this in words, "52 divided by 4 equals 13".
  - Explain to the learners that we cannot write 4÷52=13. Division is not commutative like multiplication (they do not need to know these words.)
• Give the learners a problem involving larger numbers. Do it with the whole class, using the "Clue Board" methods (the clue board is a good exercise in doubling and halving). Problem: There are 846 learners in the school. The principal wants to put them into 9 groups. How many learners will be in each group?
  - Our number sentence is 846÷9=□ learners
  - With the help of the learners, do a clue board (write this on the board):

Clue board
1x9=9
2x9=18 (double)
10x9=90
20x9=180 (double 90)
40x9=360 (double 180)
80x9=720 (double 360)
5x9=45 (tables or halve 90)

- Which is the largest number on the clue board that is less than 846? It is 720.
- 846-720=126. This means that *80* (9x80=720) learners are in groups so far, we still have to put the other 126 learners in groups.
- Which is the largest number on the clue board that is less than 126? It is 90.
- 126-90=36. This means another *10* (9x10=90) learners have been put into each group. We still have to put 36 learners into groups.
- How many 9s in 36 (we know from our tables)? 4. So each group gets another 4 learners.
- Add all the learners that have been put into groups together. It is 80+10+4=94 learners in each group. Written down, it could look something like this:

		(Thinking)
846-**720**=126	80	80x9=**720** from clue board
126-**90**=36	10	10x9=**90** from clue board
36-**36**=0	4	4x9=**36** (tables)
80+10+4=94		
846÷9=94		
learners		

Problem Solving (15 minutes)

- There will be learners who have grasped the concept and can do some work on their own. Let them work alone, in 2's, or groups, to solve the following problems (or similar examples found in a textbook). Do NOT be prescriptive about their methods; just guide them to refine their methods by taking away as large a number as possible each time. While they are working, do more examples with small groups of learners who are struggling. Remember, that there must be no remainders in the exercises today.
  - There are 520 apples in a box. I want to pack them into 8 packets. How many apples will be in each packet?
  - There are 6 queues of people waiting to go into the soccer stadium. Altogether there are 558 people. How many people in each queue?

- 9 learners brought 666 kgs of newspaper to the school. If each learner brought the same weight of newspaper to the school, how many kg did each learner bring?

Consolidation (15 minutes)

- Give the learners 5 or 6 division exercises to be completed at home if necessary. Make sure there are no remainders.

ASSESSMENT	• **Informal :** - Walk around the class and observe the learners' methods. Help them to streamline their methods. Assist small groups of learners who are having difficulty.

WEEK 9 : Day 5

Notes to the teacher:
- Today's lesson continues on from the last lesson on division of a 3-digit number by a 2-digit number.
- Today's answers will include remainders.

Resources: Pack of (52) playing cards, chalkboard, textbooks, worksheets. Assessment task

DAILY ACTIVITIES

Oral and Mental Activity (10 minutes)

- Adding 19. When one wants to add 19 to a number, it is easier if we first add 20 then subtract 1 (19 is 20-1). Example: 45+19. Think 45+20=65. 65-1=64. Do several examples orally. Give the learners 10 to complete in their books. They must do this as quickly as possible without writing down anything except the answers.

Concept Development (10 minutes)

- Divide the learners into groups of 6. Give each group a pack of cards to divide evenly among the 6. Hopefully this will go quickly, as the learners should have learnt to give more than one card at a time to each learner in the group.
  - After the groups have finished sharing (dividing) the cards, ask each group how many cards each learner in the group received. They should each have received 8 cards, but there are 4 left.
  - Ask the learners if there is any way we can equally share the 4 cards between the 6 learners in the group? No, by doing so we would destroy the cards (by cutting or tearing them). These cards are left over. They cannot be shared. In maths language, they are called the *remainder*.
- Give the learners a sum to work out in their groups. Let them use any method with which they are comfortable, but always encourage them to subtract as big a number as possible each time. A suitable problem would be: *368 learners from our school are going on an outing. 7 buses have been booked to transport the learners. How many learners can go on each bus?*
  - Walk around and observe how the learners are doing the division, guiding them where necessary.
  - After enough time, discuss the answer with the learners. Then write the answer, in number sentence form, on the board. 368÷7=<u>52 rem. 4 learners</u> (rem is short for remainder). So what about the 4 learners who could not go on the bus? Perhaps some were absent that day, so it was fine. Otherwise, they would go in the teacher's car. Have a short discussion to keep the learners' attention.

Consolidation (15 minutes)

- Give the class two to three division exercises to complete, individually in their books, while you help a small group of learners.

Further Problem Solving (15 minutes) • Give the learners 3 problems to solve as an Assessment Task. The problems can, but need not, have remainders.	
ASSESSMENT	• **Formal, recorded Assessment Task 2:** - Mark the above work. - LO 1 AS 8f: Division of a 3-digit by a 1-digit number

Grade 5: Week 10

Hours: 5	**Number of Periods: 5**
Mathematics LO 2 AS 1c **LO 4 AS 4** **LO3 AS 5**	**Milestones:** • Investigate and extend numeric and geometric patterns looking for general rules or a relationship, including patterns found in natural and cultural contexts. • Describe and illustrate ways of representing time in different cultures throughout history • Make 2-D shapes and 3-D objects and patterns from geometric shapes and describe these in terms of - Tessellations - Line and rotational symmetry - Movement including rotations, reflections and translations

Mental Strategies: Mental strategies are done with the whole class every day. The time should be used to develop skills and to build number sense.

	Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 5**
Content Focus:	Investigate and extend numeric and geometric patterns	Time through history	Line and rotational symmetry	Tessellations using (translation) slides	Tessellations using rotation and reflection (turns and flips)
Resources	Chalkboard, worksheets, textbooks	Times table flash cards for mental activity. Internet websites and books for research.	Times table flash cards for mental activity. Large cardboard cut-out shapes, worksheets, pins, small mirrors	A4 blank paper, templates of shapes, chalkboard.	A4 blank paper, templates of shapes, chalkboard

WEEK 10: Day 1

Notes to the teacher:

- Learners must be able to recognise patterns in numbers and geometric shapes.
- They must also be able to describe (explain) the number pattern or geometric pattern.
- A pattern is something that we repeat and can continue for ever in the same way.
- As each number or geometric pattern is different, you cannot teach the learners a rule for all patterns. They have to be taught strategies to help them see what the pattern is, and continue the pattern.
- Learners must look at the first two numbers of a pattern, and work out the relationship between them. They must then ascertain if the same relationship exists between the second and third numbers. If it does, they have found the rule for that pattern.
- In geometric patterns, the learners will use the same strategy as for numeric patterns.

Resources: Chalkboard, textbooks, worksheets.

DAILY ACTIVITIES

Oral and Mental Activity (10 minutes)

- Count orally following a pattern. Go around the class, or have a competition between the boys and the girls. Say the first three numbers, let the learners continue the pattern by counting:
  - Starting from 13, you say 13, 15, 17, and then the learners continue. Stop them when they get to about 45. Ask them what they were counting in. Odd numbers.
  - Starting at 45, you say 45, 50, 55, and then the learners continue until you say stop. Ask what they were counting in. 5s.
  - Repeat the above, counting forwards and backwards in different multiples.

Concept Development (20 minutes)

- After completing the oral counting activity, tell the learners they have been counting in patterns. Explain what we mean by a pattern. They must understand that it is something that is repeated continually, and can go on for ever.
- Write 5 to 8 rows of numbers such as the following on the board, and ask the learners to say the next 5 numbers in each pattern. Each time, they must also describe the pattern in words.
  - 1; 4; 9; 1; 4; 9; 1; ……
  - 2; 4; 6; 8; 6; 4; 2; 4; …….
  - 19; 15; 11; 7; 11; 15; 19; ……..
- Explain to the learners that we can also have geometric patterns. Draw a few patterns such as the following on the board, and ask learners to take turns to come and draw the next shape in the pattern on the board. Each time they must describe the pattern in words.
  - ✧□❍❍✧□ ……
  - ⊗⊗□□◇◇◇⊙⊗⊗ ……..
  - Tell the learners we can also make a pattern by moving the shape (flipping, sliding and rotating, as they learnt earlier in the term); draw a pattern on the board and let learners take turns to draw the next shape: 
  - We can also add on or take off. Let the learners take turns to continue the patterns on the board: ●● ●●●● ●●●●●● ●●●●●●●● ……..

Consolidation (20 minutes)

- Find examples in the textbook, make worksheets or use your chalkboard to give learners practice in:
  - Writing the next five numbers in a number pattern
  - Drawing the next shapes in geometric patterns.
  - Describing number patterns in words.
  - Making their own patterns. They can give their own patterns to a friend to continue and describe.

Problem Solving (10 minutes)

- Set three problems involving subtraction of 5-digit numbers. These, and the number pattern work, can be completed for homework if the learners cannot complete them during class time.

ASSESSMENT	**Informal :** Walk around the class while the learners are working to observe how they can continue patterns.

WEEK 10 : Day 2

Notes to the teacher:

- During the term, the learners have learnt to convert units of time. The learners must appreciate and understand that telling the time was not always so easy. Centuries ago men relied on the sun and the changing seasons to give a not very accurate indication of the time. Eventually different devices were developed to enable man to tell the time. These devices were improved on and were perfected to enable us to tell the time absolutely accurately.
- Today the learners will be put into groups to research the topic of telling time through history. It is important that you put them into groups so that each group has strong, average and weak learners.
- Do not just give information directly from the internet to the learners. The language will be too advanced for this age group. You will need to simplify it.

Resources: Books, information from the Internet. See the addendum, some websites are supplied.

DAILY ACTIVITIES

Oral and Mental Activity (10 minutes)

- Take the learners outside and play "Flash Card Circle". This game is explained in the Addendum.

Concept Development (15 minutes)

- Tell the learners they are able to tell the time by looking at watches or clocks. What do they think people did before they had watches and clocks? Let them discuss their ideas in groups and present their ideas to the class.
- Tell them that they are going to do a bit of research. You are going to divide them into groups.
  - Each group will be given a topic. Topics can include The Sundial, The Water clock, The Calendar, The Hourglass, where the names of the days originated, where the names of our months originated. (Write the topics on paper, fold the papers and put them in a container, and let each group take out a paper. They must not change the topic they chose.)
  - Each group must prepare a short talk (2 minutes should be more than enough) on their topic. This must be a talk, not just read. They must produce some sort of visual aid, e.g. a poster, or a drawing of their topic. They must have a brief concluding activity for the class. This can be done orally, e.g. asking questions for the learners to answer, or in the form of a word search, crossword puzzle or simple worksheet.
  - The talks will be presented next term. They do not have to work on their research in the holidays, they can work on it during this lesson, and for homework this week. On the first day of next term, you will give them the lesson to go through their information and finalise their talk and poster. They will present their talks on the second day of next term.
  - Write the basic instructions on the board, and repeat them to make sure all the learners understand what is required of them.
- Divide the learners into groups, let them find a place to sit together, and let one member from each group come and choose a topic.

Investigation (35 minutes) • Learners must work in their groups. You will have to spend time with each group to guide them. Ensure that they read the information about their topic. Each learner must contribute. If a learner is good at speaking in front of the class, he can present the oral. If another learner is artistic, he can draw the picture, etc.	
ASSESSMENT	**Informal :** Observe the learners as they work in their groups, making sure everyone participates.

WEEK 10 : Day 3

Notes to the teacher:

- Today's lesson focuses on symmetry.
- A line of symmetry divides a shape into two identical halves. Some shapes have no lines of symmetry, others have an infinite (cannot count how many) amount, e.g. the circle.
- Learners have been exposed to lines of symmetry every year since Grade 2, so this is not a new concept. However, some learners still struggle with seeing symmetry in certain shapes. For those learners, it helps if they place a small mirror ()or something that will reflect) on where they think there is a line of symmetry. They will see that the reflected image is not the same as the original shape.
- After a brief review of lines of symmetry, the lesson will focus on rotational symmetry. The learners are familiar with the movement of rotating (turning) a shape.
- A shape has rotational symmetry if it can be rotated to fit exactly on itself. Some shapes have to be rotated through 360 degrees before they fit on themselves again.

Resources: Textbook or worksheet with shapes on it. Two worksheets with identical shapes (See addendum). Pins. Chalkboard. Small mirrors. Large cut-out cardboard shapes.

DAILY ACTIVITIES

Oral and Mental Activity (10 minutes)

- Take the learners outside and play "Flash Card Circle". This game is explained in the Addendum. Today you can divide the learners into groups with one learner showing the flash cards.

Concept Development (10 minutes)

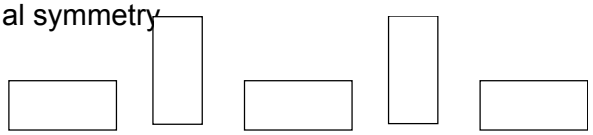
- Briefly discuss what is meant by line symmetry. If we can fold a shape in half so that each half is identical, that shape has symmetry. If we cannot cut the shape out and fold it, we can draw in a line where we would fold the shape if we could. This is the line of symmetry. See if the learners can give you any examples of things in the world that have line symmetry. They might come up with things like butterflies, masks, starfish, and crabs. There are many examples.
  - Draw a square on the board, and ask learners in turn to come and draw in the lines of symmetry. There are four. Repeat with a shape that has two lines of symmetry, e.g. a rhombus. Then draw a triangle that has no equal sides on the board. Ask the learners if it has any lines of symmetry – it does not.

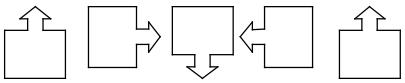
Investigation (10 minutes)

- Find examples in the textbook for learners to identify the lines of symmetry of the different shapes. If there are no suitable textbook exercises, give the learners a worksheet containing about 10 to 12 shapes. They can work in groups to complete it. While they are busy, you can work with a group of learners who are not sure of where to draw lines of symmetry (help them with a small mirror or something that can reflect). After enough time, go through the answers with the learners, then start to discuss rotational symmetry.

Concept Development (15 minutes)

- Using a large cut-out cardboard square trace around it on the chalkboard. Take the cardboard shape away so that the learners can see the square you have traced around on the board.

- Tell the learners there is another kind of symmetry called rotational symmetry. This means turning a shape until it fits on itself (looks identical) again.
- Put the cardboard square to fit on top of the square on the chalkboard, and, imagining there is a pin holding it in place at the centre, turn it clockwise, asking the learners to tell you to stop turning when the cardboard shape can fit exactly on the chalk shape. Start ☐ turn 90 degrees, the square fits on top of the original square ☐ ... turn another 90 degrees, it again fits on top of the original square ☐ ... turn another 90 degrees it again fits on top of the original square ☐. The square fitted exactly on top of itself three times, so it does have rotational symmetry.
- Repeat the same using a rectangle.  The rectangle will fit exactly on top of itself twice so it has rotational symmetry.
- Repeat using a large cut-out cardboard shape such as this.



- This shape has to be turned through a full circle (360 degrees) before it looks the same, so there is no rotational symmetry.

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Investigation (15 minutes)

- Give the learners in their groups two worksheets with the same shapes on each worksheet. Each group must also have a pin.
  - The learners must cut out all the shapes on one of the worksheets. The centre of each shape must be marked. This can be done by folding the shape along two lines of symmetry.
  - Before continuing, they must predict whether the shape has rotational symmetry and how many times it can be placed exactly on top of the other shape.
  - They must take the cut-out shape and place it on top of the same shape on the worksheet that hasn't been cut up.
  - They must put the pin gently through the centre point of the top shape. Using the pin to hold the top shape in place and as a pivot point, they must rotate the top shape until it has done a full rotation.
  - They must record on the worksheet whether the shape has rotational symmetry, and, if so, how many times it can be placed exactly on top of the other shape in one full rotation.

ASSESSMENT	**Informal :** Informally assess learners as they participate.

WEEK 10: Day 4

Notes to the teacher:

- Doing tessellations, the focus of today's lesson, is fun and integrates Art with Maths.
- There are three ways to tessellate, i.e. rotations (turns), reflections (flips) and translations (slides).
- Today the learners will only do tessellations using translations.
- The completed tessellations can be displayed in the classroom.

Resources:

Chalkboard.

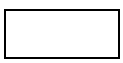
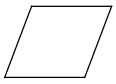
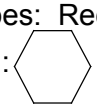
Enough cardboard templates of squares (5cmx5cm), rectangles (5cmx3cm), hexagons (sides of 5cm) and rhombuses (5cmx5cm) so that each learner has a template to use. (Have sufficient that learners can choose which shape they would like to use). A white sheet of A-4 paper for each learner. An example of a completed tessellation.

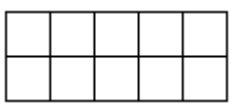
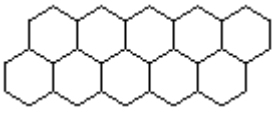
DAILY ACTIVITIES

Oral and Mental Activity (10 minutes)

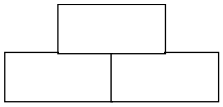
- Counting backwards and forwards in whole numbers and fractions. This can be done going around the class, or as a class as a whole. Do as many as you can. Examples are:
  - Start at 501, count backwards in 10s to 351
  - Count in twelfths from $5\frac{1}{12}$ to 7
  - Count in 11s from 110 to 200
  - Count backwards in 7s from 84 to 14
  - Count in eighths from $2\frac{5}{8}$ to $4\frac{1}{8}$

Concept Development (25 minutes)

- Explain to the learners that today they are going to do tessellations.
  - A tessellation is a *repeated pattern* using one or more shapes. Ask the learners to see if they can see any examples of repeated patterns in the room, or think of any at home or in nature. Examples are: tiling on a floor, tiling on a bathroom or kitchen wall, and a beehive in nature. Tessellations are sometimes called tiling.
  - Tessellations do *not have gaps or overlaps*. Therefore, we cannot tessellate circles, as there would be gaps between the circles. Discuss what other shapes will not tessellate
  - Tessellations can continue forever on a plane. This means that if e.g. a room went on beyond the walls, we could tile the floor with the same pattern to the end of the floor.
- Show the learners the templates of the shapes that you have made out of cardboard.
  - Revise the names of the shapes: Rectangle:  Square: 
    Rhombus:  Hexagon: 
- Explain that you are going to give each learner one of these shapes and a piece of A-4 white paper.
  - They will use the chosen shape to tessellate using translation (sliding).
  - Show them examples of tessellations:

 squares  hexagons

- Starting in the top left corner of the page, they must use their pencils to carefully trace around the template.
- Then they must slide the cardboard template across the shape they have just traced around, place the template so that it is touching the first drawn shape, and carefully trace around the template again. This movement of the template to repeat the shape is called *translation (slide)*.
- They must continue in this manner until the whole page is covered. Remember, no gaps or overlaps!
- If a whole shape cannot be traced at the edge of the page, it is fine; the learners can have part of the shape.
- Squares and rectangles do not have to line up vertically like in the example above. The tessellation can be like bricks in a wall.



Consolidation (25 minutes)

- Learners do their patterns on white paper.
  - When they have completed drawing the shapes in pencil, they can colour it in. Their colouring in must also follow a pattern. They can even draw the same picture, e.g. a smiling face, in each shape.
  - If they do not finish during class, they can finish it for homework.

ASSESSMENT	**Informal:** Note how the learners follow multi-step instructions and how well they trace and colour in (manual dexterity).

WEEK 10: Day 5

Notes to the teacher:

- Yesterday the learners did tessellations using translations (slides).
- Today they will tessellate using an equilateral triangle. This will not tessellate unless it is *rotated* (turned) or *reflected* (flipped).
- An equilateral triangle has three sides the same length, and each angle the same size, i.e. 60°.

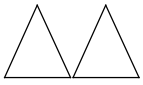
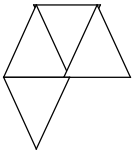
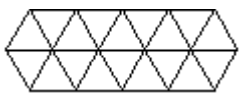
Resources: Chalkboard, cardboard templates of equilateral triangles, each side measuring 5 to 6 cm. (Use cardboard from old cereal boxes.) A blank sheet of A4 paper for each learner.

DAILY ACTIVITIES

Oral and Mental Activity (10 minutes)

- Count backwards and forwards in whole numbers and fractions:
  - Count around the class (learner by learner), group by group or the whole class together.
  - Do not always start at 0
  - Do not always count in multiples of whole numbers, e.g. the learners can count backwards in 10s from 117 to 7, or backwards in 11s from 201 to 145.

Concept Development (15 minutes)

- Talk to the class about the tessellations they did last week using squares, rectangles or hexagons.
  - What does tessellate mean? (A repeated pattern of shapes, covering a surface with no gaps, no overlaps.)
  - What did they do to the shape each time before tracing around it? (Slid it)
- Explain that today they are going to use an equilateral triangle to tessellate. Draw one on the board. 
-
  – Draw another triangle next to the first triangle – using translation (sliding the shape). 
  - Ask the learners whether, if we continue like this, we will be able to tessellate? They should be able to see that we won't. So we will have to use other movements, a combination of flips (mirror image)  and rotation (turning) 
  until a repeated pattern is made: 
  - Ask the learners if they can see the hexagon that six triangles together can make.

Consolidation (35 minutes)

- Hand out the cardboard templates and A4 paper. The learners must tessellate the whole page then colour it in. Remind them that their colouring in must also follow a pattern.

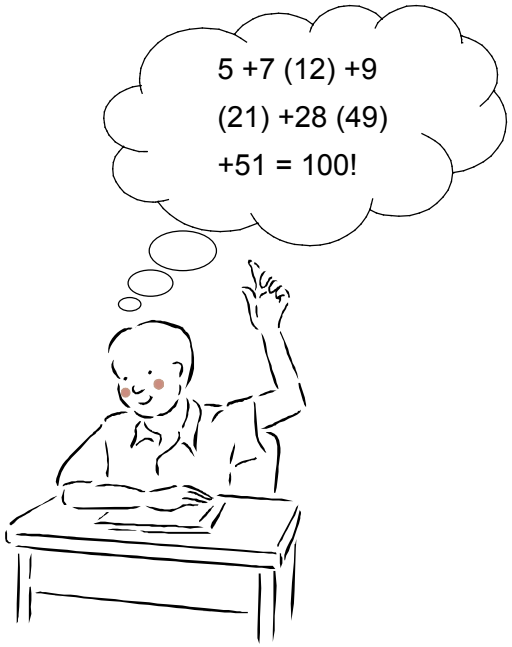
ASSESSMENT	**Informal :** Note how well learners are able to manipulate shapes to make patterns

ANNEXURE 1
ORAL AND MENTAL ACTIVITIES
GRADE 5 SECOND TERM

Note:
The Lesson Plans refer to these activities.
All these activities will require explanation the first time you use them, but after a bit of practice, the learners will know what you mean when you tell them what activity you are going to do.

Running Maths

- This can be adapted to suit your needs. You can start with only doing addition. Later you can move on to mixed operations, doubling, halving and fractions of the number.
- Tell the class you are going to do "Running Maths". You give the learners a few calculations to do, with time between each calculation. They must keep each answer in their heads, until you ask for the final answer.
  - 5+7 (pause) +9 (pause) + 28 (pause) +51 = ? Learners who know the answer put up their hands. Ask a few learners in turn what their answer is, then say the correct answer (= 100)



  - 101-12…..+3……halve that number ….. +4 ……÷2 ….. minus 1….. ÷4 = (final answer) (6)

Tables King

- This is a "knock-out" times-table competition. The winner is the "Tables King". It is a good idea to keep a chart (an A4 paper is fine) on the wall with the title "Tables King", and each time you play, write the winner's name on the chart. At first, ask only times-tables. Later you can ask division, addition and subtraction.
  - Choose any learner in the class and ask him (or her) to stand up. He must choose another learner to challenge. That learner also stands up. Make sure they are looking at you. Ask

them a multiplication table exercise, e.g. 5x6. The first learner to answer correctly comes and stands at the front of the class. The other learner sits down.
- Repeat until all the learners have been asked a sum. Half the class will now be at the front of the class.
- The ones at the front of the class must form a line. Ask the first two in the line an exercise. The one who answers it correctly goes to the back of the line, the other one goes and sits down.
- Repeat this until there are only two learners left. The winner will be the one who gets 2 exercises correct (i.e. the best of 3) and is Tables King.
- If there is time, the learners who were knocked out in the first round can come and line up, so that you can find a winner out of the "first round losers".

Tables Challenge

- This is similar to Tables King, but each learner has two "lives".
  - Choose any learner in the class and ask him (or her) to stand up. He must choose another learner to challenge. That learner also stands up. Make sure they are looking at you. Ask them a multiplication table exercise, e.g. 5x6. The first learner to answer correctly remains standing, the other learner sits *on* his desk.
  - The learner who is standing then chooses a learner to challenge. You ask an exercise. The one who answers correctly remains standing, the other one sits on his/her desk.
  - Continue until all but two learners are sitting in their chairs.
  - Ask these learners the "best of 3" exercises. The first learner to correctly answer 2 is the winner!

Tables clock (or division clock)

- Draw a large, round clock face on the board, with the numbers 1 to 12 around the inside of the circle. Choose a times table to drill, and write that number in the middle of the circle, e.g. x7.
  - Using a stick or a ruler, point to one of the numbers, 1 to 12. The learners must multiply the number you have pointed to by 7 and say the answer as quickly as possible.
  - Point randomly to the numbers around the inside of the circle.
  - This drill works best with an individual learner giving the answers. If he or she manages to answer all the tables correctly, he or she can come and use the pointer while another learner answers.
  - You can use this drill for division as well. In the middle of the circle, write, e.g. ÷5, and write the multiples of 5 (5, 10, 15, 20, 25…..60) around the inside of the clock.

Flash Card Circle

- This is an outdoors activity, as it requires enough space for the whole class to sit in a circle. Once the learners have mastered the game, you can let them play in groups of about 10 learners, with one of the learners being the "teacher". You need multiplication flash cards with the answers written on the back for you to see.

- Choose a learner to stand up. He stands up directly behind the learner to the left of him. Show these two learners a flashcard. The challenge is to see who first answers correctly. If the learner who is standing up answers correctly, he moves to his left (clockwise) to stand behind the next learner in the circle. If the learner who is sitting answers correctly, he stands up behind the learner to his left, and the learner who was standing, sits down in his place.
- *The object of the game is for a learner to try to go all the way round the circle and back to his place. Reward any learner who manages to do this!*

Fizz Bang

- This game practises multiples of 3 and 5. It requires a good deal of concentration on the part of the learners, and they have fun.
  - Tell the learners they are going to count in 1s, going round the class. Make sure that they know which learner follows whom.
  - Count around the class until every learner has said a number.
  - Remind the learners what a multiple of 3 is (3, 6, 9, etc) and what a multiple of 5 is (5, 10, 15 etc).
  - Tell them that they are now going to count again, but this time, if the learner is supposed to say a number that is a multiple of 3, he must say “Fizz” instead. If he is meant to say a multiple of 5, he must say “Bang” instead. If the number is a multiple of both 3 and 5, he must say “Fizz-bang”.
  - The counting will go like this: 1, 2, fizz, 4, bang, fizz, 7, 8, fizz, bang, 11, fizz, 13, 14, fizz-bang, 16, 17, fizz, 19 bang (this is up to 20)
  - See how far the learners can go before making a mistake (usually not very far at first!)
- You could initially count by only replacing the multiples of 3 with “Fizz”, then count again replacing the multiples of 5 with “Bang” and later count as explained above.
- Once the learners have the knack of the game, you could “eliminate” a learner who makes a mistake. This increases concentration, as the other learners have to remember who is out of the counting.

Speed tests

- Have prepared Speed tests consisting of 10 or 15 multiplication tables sums. Hand these out face down, and when you tell the learners to start, they must complete the test as quickly as possible. You can have a stopwatch and say the lapsed time, perhaps in 15 second intervals, so they know for instance that they completed the test after you said 1 minute and before you said 1 minute 15 seconds. They must try to improve both their speed and their accuracy. *If you do not have facilities for copying speed tests, write 10-15 sums on the board but keep this covered until everyone is ready to begin.*

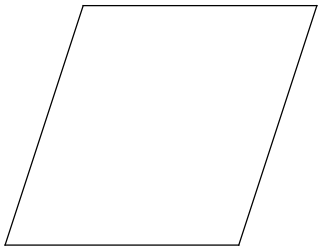
Playing cards

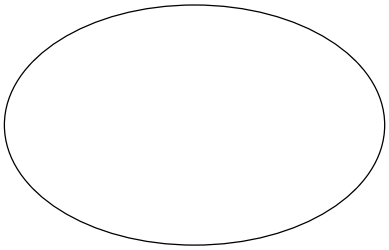
- These are an invaluable aid in the Maths classroom.
  - Two learners can play times-table challenge. They must take out all the jacks, queens and kings. Ace is worth 1. Each learner gets half the cards. They must each take the top card

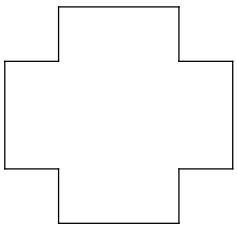
off their pile, place it face up on the table, and then multiply the two numbers together. The learner who gets the sum correct takes the two cards and puts them at the bottom of his pile. The winner is the one who ends up with the most cards.

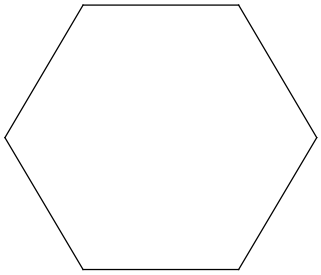
- Two learners play the same game, but this time keep the jacks, queens and kings in the pack, and tell them that these are worth zero. This practises the multiplication fact that any number times zero equals zero.
- Both the above can be played with more than two learners, just make sure the learners divide the pack of cards equally. Sometimes one can have a learner who knows his tables well to act as "judge", especially with learners who do not know their tables so well.

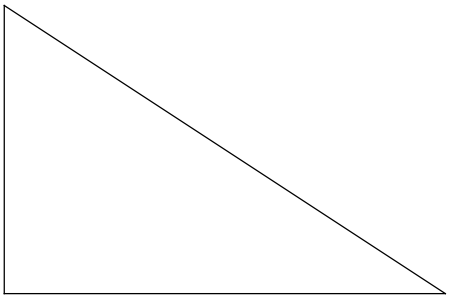
ANNEXURE 2 – SHAPES FOR ROTATIONAL SYMMETRY.

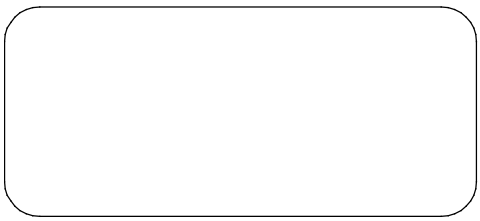


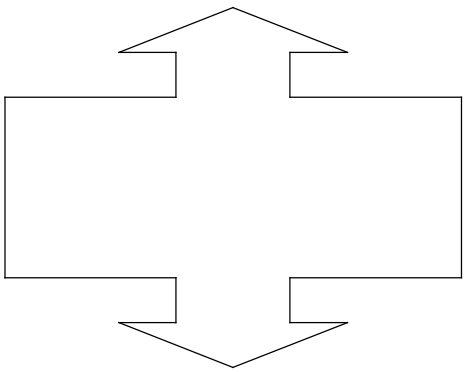


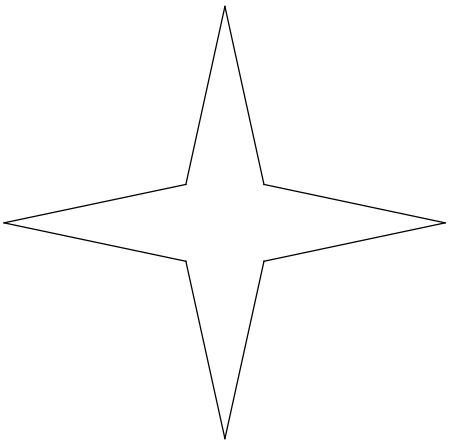


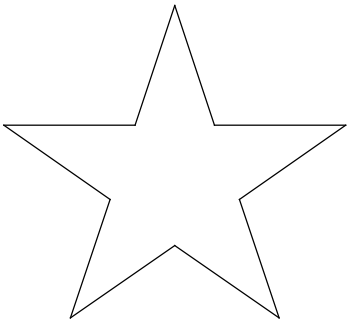












Notes: