

FOREWORD BY THE MINISTER OF BASIC EDUCATION TO THE MULTI-GRADE TOOLKIT AND TRAINING MANUALS

Initiatives to improve rural schooling need to extend beyond just fixing schools in rural areas, by also contributing to improving the quality of teaching and learning. The need to improve and advance the quality of education in all our schools, including all multi-grade schools, is articulated in the 27 national goals of *Action Plan TO 2014, Towards the Realisation of Schooling 2025*. This includes ensuring that the learner performance is drastically improved in all subjects.

Teachers in rural schools often face unique challenges and therefore have specific developmental needs, one of which is to deal effectively with multi-grade classrooms and a curriculum that is based on a single grade structure. The Report of the Task Team for the Review of the Implementation of the National Curriculum Statement (2009) highlights the fact that no specific training has been provided for teachers teaching multi-grade classes, and there is a lack of support and guidance for these teachers. Many teachers consequently have limited skills in managing different content at different levels and the implementation of the curriculum is therefore largely compromised in these schools.

A large number of children access education through multi-grade schools. In 2011 approximately 26% of schools were reported to have multi-grade classes. Multi-grade schools often have a negative impact on the quality of learning and teaching and learner performance due to the challenges that teachers encounter in the implementation of the curriculum. The Department has made a pledge that as long as multi-grade schools exist in the system focused dedicated service and support must be provided to these schools at all levels.

The Department has launched a number of initiatives in supporting multi-grade schools, such as the following:

- The Training of Teachers in Multi-grade Teaching**

In 2010 the Department appointed the Centre for Multi-grade Education of the Cape Peninsula University of Technology to train teachers and subject advisors in multi-grade teaching. The training helped to capacitate a total of 679 teachers and subject advisors with the requisite skills and knowledge that they needed to effectively and efficiently manage multi-grade classes.

- The Multi-Disciplinary Support Initiatives**

A multi-disciplinary Committee for multi-grade schools was established within the Department of Basic Education to provide a multi-disciplinary approach to effectively address the multi-faceted challenges that are experienced by multi-grade schools throughout the system. The purpose of this committee is to



leverage all initiatives and interventions that are aimed at improving the quality of teaching and learning to benefit all multi-grade schools.

- **Infrastructure Improvement**

The Accelerated Schools Infrastructure Delivery Initiative (ASIDI) is an ongoing programme to implement basic safety norms and standards in school infrastructure in the democratic and modern era of South Africa.

To date the programme has built and completed 99 schools; provided water to 381 schools for the first time; sanitation to 371 schools; connected 289 schools to electricity for the first time; and drew and approved prototypes of small, medium and large rural schools.

The Department of Basic Education has also, in its endeavour to support multi-grade teachers and strengthen the implementation of the curriculum in multi-grade schools, developed the following:

- Training manuals that will be used in the training of teachers in multi-grade teaching. The training will ensure that teachers are capacitated with the requisite skills and knowledge that will enable them to teach effectively and efficiently in multi-grade schools; and
- A multi-grade toolkit wherein General Education and Training curriculum in all subjects is repacked into a format that will be more user friendly to multi-grade teachers.

The multi-grade Toolkit will, amongst others:

- Strengthen the implementation of the curriculum in multi-grade classes;
- Give guidance to teachers on how to approach curriculum delivery in multi-grade settings;
- Enable teachers to plan lessons with ease; and
- Provide teachers with exemplar lesson plans, formal and informal assessment tasks and worksheets in all subjects in the Foundation, Intermediate and Senior Phases.

With the envisaged training of teachers in multi-grade teaching and the implementation of the toolkit in multi-grade schools, improving learner performance in the schools that practice multi-grade teaching is the expected outcome.



Special recognition and acknowledgment is hereby given to all the national and provincial subject specialists and subject advisors who championed the process to develop the multi-grade toolkit and the training manuals.

I invite all provinces to support the multi-grade schools by:

- Training all teachers in multi-grade schools in multi-grade teaching;
- Orientating the teachers on the multi-grade toolkit;
- Implementing the multi-grade toolkit in multi-grade schools; and
- Monitoring the training of the teachers and the implementation of the multi-grade toolkit.

Motshekga
MRS AM MOTSHEKGA, MP
MINISTER
DATE: 12.04.2015



MULTIGRADE TOOLKIT MATHEMATICS INTERMEDIATE PHASE

Mathematics: Intermediate Phase

Preamble

The Multi-grade toolkit for Mathematics is designed to assist teachers in multi-grade schools to teach effectively and cover the curriculum adequately. In the past, teachers in the multi-grade schools were expected to use the mono-grade curriculum and adapt it to meet the needs and demands of learners in a multi-grade class. Some teachers did not have the requisite skills to carry out this demanding task and it resulted in content being either too scantily covered or completely ignored, thus compromising the content knowledge and skills that learners needed to acquire at all levels of schooling. To obviate such situations in our multi-grade schools and ensure that learners in the multi-grade schools receive quality education, the Department of Basic Education developed a multi-grade toolkit for teachers.

The toolkit compromises of the following documents:

- A generic manual which provides literature about multi-grade teaching, methodologies, management, etc.
- A Multi-grade Annual Teaching Plan (MATP) informed by and aligned to the Curriculum and Assessment Policy Statement (CAPS) to support teachers with lesson planning;
- Exemplar lesson plans to assist teachers in developing, managing and adapting lessons to suit their own individual context. The activities in the lesson plans were taken from the
 - **DBE workbooks for Grades 4 to 9** (the same worksheets numbers are used in the lesson plans).
 - **Sasol-Inzalo workbooks for Grades 7 – 9** (chapters were cited).

More activities can be added by the individual teacher using a book of his or her own choice.

- Exemplar Assessment tasks to assist teachers in designing their own individual tasks to suit their own specific context.

The MATP was developed and designed according to topics that could lend themselves for robust discussion in the Mathematics class without compromising the content thereof. Each topic was carefully chosen and linked to each other in each grade. A common thread was carefully identified across the topics before they were aligned together, for example the topic ***Numeric and Geometric Patterns cuts across all the grades in the Intermediate Phase***. A teacher can introduce a concept to all the learners and then pitch to different levels as dictated to by CAPS. .

Through the “Whole Class” teaching methodology, the teacher can easily introduce each topic and engage learners in discussion before embarking on teaching specific grades in a multi-grade class through small group teaching.



MULTI-GRADE ANNUAL TEACHING PLAN

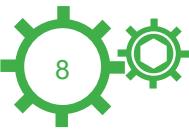


MULTIGRADE TOOLKIT MATHEMATICS INTERMEDIATE PHASE

TERM 1

TIME (HOURS)	GRADE 4	GRADE 5	GRADE 6
	Whole numbers: <ul style="list-style-type: none"> Counting Order, compare and represent numbers; Odd and even numbers; Place value; Multiples ; Rounding off; 	Whole numbers: <ul style="list-style-type: none"> Counting Order, compare and represent numbers; Odd and even numbers; Place value; Multiples ; Factors; Rounding off; 	Whole numbers: <ul style="list-style-type: none"> Counting Order, compare and represent numbers; Prime numbers; Place value; Multiples ; Factors; Rounding off
5			
1	Informal assessment	Informal assessment	Informal assessment
6	Number sentences	Number sentences	Number sentences
7	Addition and subtraction of whole numbers	Addition and subtraction of whole numbers	Addition and subtraction of whole numbers
1	Informal assessment	Informal assessment	Informal assessment
3	Numeric and geometric patterns <ul style="list-style-type: none"> Investigate and extend patterns Input and output values Equivalent forms 	Numeric and geometric patterns <ul style="list-style-type: none"> Investigate and extend patterns Input and output values Equivalent forms 	Numeric and geometric patterns <ul style="list-style-type: none"> Investigate and extend patterns Input and output values Equivalent forms
9	Multiplication and division of whole numbers	Multiplication and division of whole numbers	Multiplication and division of whole numbers
6	Time <ul style="list-style-type: none"> Measuring instruments Reading time Calculation and problem solving involving time History of time 	Time and temperature <ul style="list-style-type: none"> Measuring instruments Reading time and temperature Calculation and problem solving involving time and temperature History of time 	Time and temperature <ul style="list-style-type: none"> Measuring instruments Reading time and temperature Calculation and problem solving involving time and temperature History of time

IMPORTANT NOTE: Always consult the CAPS to establish a detailed progression across the grades and the depths within the grade regarding topics, concepts and skills.



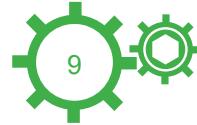
TIME (HOURS)	GRADE 4	GRADE 5	GRADE 6
6	Data handling <ul style="list-style-type: none"> Collecting and organizing data Representing data Analysing, interpreting and reporting data Probability 	Data handling <ul style="list-style-type: none"> Collecting and organizing data Representing data Analysing, interpreting and reporting data Probability 	Data handling <ul style="list-style-type: none"> Collecting and organizing data Representing data Analysing, interpreting and reporting data Probability
1	Formal SBA Task: Assignment	Formal SBA Task: Assignment	Formal SBA Task: Assignment
6	2-D shapes, Recognize, visualize and name 2-D shapes in regular and irregular polygons – triangles, squares, rectangles, other quadrilaterals, pentagons, hexagons and circles	2 - D shapes, Recognize, visualize and name 2-D shapes in regular and irregular polygons – triangles, squares, rectangles, other quadrilaterals, pentagons, hexagons, heptagons and circles	2 - D shapes, Recognize, visualize and name 2-D shapes in regular and irregular polygons - triangles, squares, rectangles, parallelograms, other quadrilaterals, pentagons, hexagons, heptagons, octagons
1	Formal SBA Task: Test	Formal SBA Task: Test	Formal SBA Task: Test
4	Revision	Revision	Revision
56			

IMPORTANT NOTE: Always consult the CAPS to establish a detailed progression across the grades and the depths within the grade regarding topics, concepts and skills.

TERM 2

TIME (HOURS)	GRADE 4	GRADE 5	GRADE 6
	Whole numbers: <ul style="list-style-type: none">• Counting• Order, compare and represent numbers;• Odd and even numbers;• Place value;• Multiples ;• Factors;• Rounding off;	Whole numbers: <ul style="list-style-type: none">• Counting• Order, compare and represent numbers;• Odd and even numbers;• Place value;• Multiples ;• Factors;• Rounding off;	Whole numbers: <ul style="list-style-type: none">• Counting• Order, compare and represent numbers;• Prime numbers;• Place value;• Multiples ;• Factors;• Rounding off;
3			
1	Informal assessment	Informal assessment	Informal assessment
6	Addition and subtraction of whole numbers	Addition and subtraction of whole numbers	Addition and subtraction of whole numbers
3	Multiplication of whole numbers	Multiplication of whole numbers	Multiplication of whole numbers
3	Division of whole numbers	Division of whole numbers	Division of whole numbers
1	Formal SBA Task: Test	Formal SBA Task: Test	Formal SBA Task: Test
9			
2	Symmetry <ul style="list-style-type: none">• Recognize, draw and describe line(s) of symmetry in 2-D shapes.	Symmetry <ul style="list-style-type: none">• Recognize, draw and describe line(s) of symmetry in 2-D shapes.	Symmetry <ul style="list-style-type: none">• Recognize, draw and describe line(s) of symmetry in 2-D shapes.

IMPORTANT NOTE: Always consult the CAPS to establish a detailed progression across the grades and the depths within the grade regarding topics, concepts and skills.



TIME (HOURS)	GRADE 4	GRADE 5	GRADE 6
	Length Practical measuring of 2-D shapes and 3-D objects Measuring instruments Units Calculations and problem solving involving length	Length Practical measuring of 2-D shapes and 3-D objects Measuring instruments Units Calculations and problem solving involving length	Length Practical measuring of 2-D shapes and 3-D objects Measuring instruments Units Calculations and problem solving involving length
5			
	Mass Practical measuring of 2-D shapes and 3-D objects Measuring instruments Units Calculations and problem solving involving mass	Mass Practical measuring of 2-D shapes and 3-D objects Measuring instruments Units Calculations and problem solving involving mass	Mass Practical measuring of 2-D shapes and 3-D objects Measuring instruments Units Calculations and problem solving involving mass
5			
1	Informal assessment	Informal assessment	Informal assessment
	Capacity/Volume Practical measuring of 2-D shapes and 3-D objects Measuring instruments Units Calculations and problem solving involving capacity/volume	Capacity/Volume Practical measuring of 2-D shapes and 3-D objects Measuring instruments Units Calculations and problem solving involving capacity/volume	Capacity/Volume Practical measuring of 2-D shapes and 3-D objects Measuring instruments Units Calculations and problem solving involving capacity/volume
5			

IMPORTANT NOTE: Always consult the CAPS to establish a detailed progression across the grades and the depths within the grade regarding topics, concepts and skills.



TIME (HOURS)	GRADE 4	GRADE 5	GRADE 6
	3-D objects Range of Objects: <ul style="list-style-type: none"> – rectangular prisms, – spheres – cylinders – pyramids 	3-D objects Range of Objects: <ul style="list-style-type: none"> – rectangular prisms and other prisms – cubes – cylinders – cones – pyramids – similarities and differences between cubes and rectangular prisms 	3-D objects Range of Objects: <ul style="list-style-type: none"> – rectangular prisms – cubes – tetrahedrons – pyramids – similarities and differences between tetrahedrons and other pyramids
5	Characteristics of objects <ul style="list-style-type: none"> – shapes of faces – flat and curved surfaces Further activities <ul style="list-style-type: none"> • Make 3-D models using cut out polygons 	Characteristics of objects <ul style="list-style-type: none"> – shape of faces – number of faces – flat and curved surfaces Further activities <ul style="list-style-type: none"> • Make 3-D models using <ul style="list-style-type: none"> – cut out polygons – nets 	Characteristics of objects <ul style="list-style-type: none"> – number and shape of faces – number of vertices – number of edges Further activities <ul style="list-style-type: none"> • Make 3-D models using: <ul style="list-style-type: none"> – drinking straws, toothpicks etc – nets
1	Formal SBA Task: Examination	Formal SBA Task: Examination	Formal SBA Task: Examination
6	Revision	Revision	Revision
56	TOTAL HOURS		

IMPORTANT NOTE: Always consult the CAPS to establish a detailed progression across the grades and the depths within the grade regarding topics, concepts and skills.

TERM 3

TIME (HOURS)	GRADE 4	GRADE 5	GRADE 6
3	Whole numbers: <ul style="list-style-type: none"> Counting Order, compare and represent numbers; Odd and even numbers; Place value; Multiples ; Rounding off; 	Whole numbers: <ul style="list-style-type: none"> Counting Order, compare and represent numbers; Odd and even numbers; Place value; Multiples; Factors; Rounding off; 	Whole numbers: <ul style="list-style-type: none"> Counting Order, compare and represent numbers; Prime numbers; Place value; Multiples ; Factors; Rounding off
1	Informal assessment	Informal assessment	Informal assessment
8	Addition and subtraction of whole numbers	Addition and subtraction of whole numbers	Addition and subtraction of whole numbers
7	Multiplication and division of whole numbers	Multiplication and division of whole numbers	Multiplication and division of whole numbers
1	Formal SBA Task: Project	Formal SBA Task: Project	Formal SBA Task: Project
<p>IMPORTANT NOTE: Always consult the CAPS to establish a detailed progression across the grades and the depths within the grade regarding topics, concepts and skills.</p>			
6	Geometric Patterns Investigate and extend patterns for relationships or rules of patterns.	Geometric Patterns Investigate and extend patterns for relationships or rules of patterns.	Geometric Patterns Investigate and extend patterns for relationships or rules of patterns.
<p>IMPORTANT NOTE: Always consult the CAPS to establish a detailed progression across the grades and the depths within the grade regarding topics concepts and skills.</p>			



TIME (HOURS)	GRADE 4	GRADE 5	GRADE 6
8	<p>2 - D shapes, Recognize, visualize and name 2-D shapes in</p> <ul style="list-style-type: none"> • regular and irregular polygons – triangles, squares, rectangles, other quadrilaterals, pentagons, hexagons and circles • similarities and differences between squares and rectangles <p>Characteristics of shapes</p> <ul style="list-style-type: none"> • straight sides • curved sides • number of sides • angles in shape <p>Draw 2-D shapes on grid paper Involving angles</p> <p>Recognize and describe angles in 2-D shapes</p> <p>Transformations</p> <ul style="list-style-type: none"> • Build composite shapes • Tessellations • Describe patterns <p>Position and views</p> <p>Location and directions</p>	<p>2 - D shapes, Recognize, visualize and name 2-D shapes in</p> <ul style="list-style-type: none"> • regular and irregular polygons - triangles, squares, rectangles, parallelograms, other quadrilaterals, pentagons, hexagons, heptagons, octagons • similarities and differences between rectangles and parallelograms <p>Characteristics of shapes</p> <ul style="list-style-type: none"> • number of sides • lengths in sides • sizes of angles <p>Draw 2-D shapes on grid paper Involving angles</p> <p>Recognize and describe angles in 2-D shapes</p> <p>Transformations</p> <ul style="list-style-type: none"> • Use transformations to make composite shapes • Use transformations to make tessellations • Describe patterns <p>Position and views</p> <p>Location and directions</p>	<p>2 - D shapes, Recognize, visualize and name 2-D shapes in</p> <ul style="list-style-type: none"> • regular and irregular polygons - triangles, squares, rectangles, parallelograms, other quadrilaterals, pentagons, hexagons, heptagons, octagons • similarities and differences between rectangles and parallelograms <p>Characteristics of shapes</p> <ul style="list-style-type: none"> • number of sides • lengths in sides • sizes of angles <p>Draw 2-D shapes on grid paper Involving angles</p> <p>Recognize and describe angles in 2-D shapes</p> <p>Transformations</p> <ul style="list-style-type: none"> • Use transformations to make composite shapes • Enlarge and reduce • Describe patterns <p>Position and views</p> <p>Location and directions</p>

IMPORTANT NOTE: Always consult the CAPS to establish a detailed progression across the grades and the depths within the grade regarding topics, concepts and skills.

TIME (HOURS)	GRADE 4	GRADE 5	GRADE 6
4	Length <ul style="list-style-type: none"> Practical measuring of 2-D shapes and 3-D objects Measuring instruments Units Calculations and problem solving involving length 	Length <ul style="list-style-type: none"> Practical measuring of 2-D shapes and 3-D objects Measuring instruments Units Calculations and problem solving involving length 	Length <ul style="list-style-type: none"> Practical measuring of 2-D shapes and 3-D objects Measuring instruments Units Calculations and problem solving involving length
	Mass <ul style="list-style-type: none"> Practical measuring of 2-D shapes and 3-D objects Measuring instruments Units ((millilitres, litres)) Calculations and problem solving involving mass 	Mass <ul style="list-style-type: none"> Practical measuring of 2-D shapes and 3-D objects Measuring instruments Units (millilitres, litres) Calculations and problem solving involving mass 	Mass <ul style="list-style-type: none"> Practical measuring of 2-D shapes and 3-D objects Measuring instruments Units(millilitres, litres, kililitres) Calculations and problem solving involving mass (include fraction and decimal forms to 2 decimal places)
	Capacity/Volume <ul style="list-style-type: none"> Practical measuring of 2-D shapes and 3-D objects Measuring instruments Units Calculations and problem solving involving capacity/volume 	Capacity/Volume <ul style="list-style-type: none"> Practical measuring of 2-D shapes and 3-D objects Measuring instruments Units Calculations and problem solving involving capacity/volume 	Capacity/Volume <ul style="list-style-type: none"> Practical measuring of 2-D shapes and 3-D objects Measuring instruments Units Calculations and problem solving involving capacity/volume

IMPORTANT NOTE: Always consult the CAPS to establish a detailed progression across the grades and the depths within the grade regarding topics, concepts and skills.



TIME (HOURS)	GRADE 4	GRADE 5	GRADE 6
	Common fractions	Common fractions	Common fractions, decimal fractions and percentages
	Describing and ordering fractions: <ul style="list-style-type: none"> • Compare and order (halves; thirds, quarters; fifths; sixths; sevenths; eighths) • Common fractions in diagram form Calculations with fractions: <ul style="list-style-type: none"> • Addition of common fractions with the same denominators • Equivalence of division and fractions 	Describing and ordering fractions: <ul style="list-style-type: none"> • Count forwards and backwards • Compare and order common fractions to at least twelfths Calculations with fractions: <ul style="list-style-type: none"> • Addition and subtraction of common fractions with the same denominators • Addition and subtraction of mixed numbers • Fractions of whole numbers • Equivalence of division and fractions 	Calculations with fractions: <ul style="list-style-type: none"> • Compare and order common fractions, including tenths and hundredths <p>Solving problems</p> <ul style="list-style-type: none"> • Solve problems in contexts involving common fractions, including grouping and sharing <p>Equivalent forms:</p> <p>Solving problems</p> <ul style="list-style-type: none"> • Solve problems in contexts involving common fractions, including grouping and sharing <p>Equivalent forms:</p> <p>Percentages</p> <ul style="list-style-type: none"> • Find percentages of whole numbers
12			
1	Formal SBA Task: Test	Formal SBA Task: Test	Formal SBA Task: Test
4	Revision	Revision	Revision
56			

IMPORTANT NOTE: Always consult the CAPS to establish a detailed progression across the grades and the depths within the grade regarding topics, concepts and skills.

TERM 4

TIME (HOURS)	GRADE 4	GRADE 5	GRADE 6
	Whole numbers: <ul style="list-style-type: none">• Counting• Order, compare and represent numbers;• Odd and even numbers;• Place value;• Multiples ;• Factors;• Rounding off;	Whole numbers: <ul style="list-style-type: none">• Counting• Order, compare and represent numbers;• Odd and even numbers;• Place value;• Multiples;• Factors;• Rounding off;	Whole numbers: <ul style="list-style-type: none">• Counting• Order, compare and represent numbers;• Prime numbers;• Place value;• Multiples ;• Factors;• Rounding off
3			
1	Informal assessment	Informal assessment	Informal assessment
6	Addition and subtraction of whole numbers	Addition and subtraction of whole numbers	Addition and subtraction of whole numbers
6	Multiplication and division of whole numbers	Multiplication and division of whole numbers	Multiplication and division of whole numbers
6	3-D objects Range of Objects: <ul style="list-style-type: none">– rectangular prisms,– spheres– cylinders– pyramids	3-D objects Range of Objects: <ul style="list-style-type: none">– rectangular prisms and other prisms– cubes– cylinders– cones– pyramids– similarities and differences between cubes and rectangular prisms	3-D objects Range of Objects: <ul style="list-style-type: none">– rectangular prisms– cubes– tetrahedrons– pyramids– similarities and differences between tetrahedrons and other pyramids–
1	Informal assessment	Informal assessment	Informal assessment

IMPORTANT NOTE: Always consult the CAPS to establish a detailed progression across the grades and the depths within the grade regarding topics, concepts and skills.



TIME (HOURS)	GRADE 4	GRADE 5	GRADE 6
	characteristics of objects <ul style="list-style-type: none"> - shapes of faces - flat and curved surfaces Further activities <ul style="list-style-type: none"> • Make 3-D models using cut out polygons 	characteristics of objects <ul style="list-style-type: none"> - shape of faces - number of faces - flat and curved surfaces Further activities <ul style="list-style-type: none"> • Make 3-D models using: <ul style="list-style-type: none"> - cut out polygons - nets 	characteristics of objects <ul style="list-style-type: none"> - number and shape of faces - number of vertices - number of edges Further activities <ul style="list-style-type: none"> • Make 3-D models using: <ul style="list-style-type: none"> - drinking straws, toothpicks etc - nets
1	Formal SBA Task: Investigation <small>IMPORTANT NOTE: Always consult the CAPS to establish a detailed progression across the grades and the depths within the grade regarding topics, concepts and skills.</small>	Formal SBA Task: Investigation	Formal SBA Task: Investigation
8	<p>Perimeter Measure perimeter using rulers or measuring tapes</p> <p>Measurement of area Find areas of regular and irregular shapes by counting squares on grids in order to develop an understanding of square units</p>	<p>Perimeter Measure perimeter using rulers or measuring tapes</p> <p>Measurement of area Find areas of regular and irregular shapes by counting squares on grids in order to develop an understanding of square units</p>	<p>Perimeter Measure perimeter using rulers or measuring tapes</p> <p>Measurement of area Find areas of regular and irregular shapes by counting squares on grids in order to develop an understanding of square units</p> <p>Measurement of volume Find volume/capacity of objects by packing or filling them in order to develop an understanding of cubic units</p>

TIME (HOURS)	GRADE 4	GRADE 5	GRADE 6
6	Data handling <ul style="list-style-type: none"> Collecting and organizing data Representing data Analysing, interpreting and reporting data 	Data handling <ul style="list-style-type: none"> Collecting and organizing data Representing data Analysing, interpreting and reporting data <ul style="list-style-type: none"> – including double bar graphs – central tendencies – (mode and median) Ungrouped data Probability <ul style="list-style-type: none"> – Tossing a coin & rolling a die – spinning a spinner 	Data handling <ul style="list-style-type: none"> Collecting and organizing data Representing data Analysing, interpreting and reporting data <ul style="list-style-type: none"> – including double bar graphs – central tendencies – (mode and median) Ungrouped data Probability <ul style="list-style-type: none"> – Tossing a coin & rolling a die – spinning a spinner
4	Common fractions <p>Describing and ordering fractions:</p> <ul style="list-style-type: none"> Compare and order(halves; thirds, quarters; fifths; sixths; sevenths; eighths) Common fractions in diagram form <p>Calculations with fractions:</p> <ul style="list-style-type: none"> Addition of common fractions with the same denominators Equivalence of division and fractions <p>Solving problems</p> <ul style="list-style-type: none"> Solve problems in contexts involving fractions, including grouping and sharing <p>Equivalent forms:</p>	Common fractions <p>Describing and ordering fractions:</p> <ul style="list-style-type: none"> Count forwards and backwards Compare and order common fractions to at least twelfths <p>Calculations with fractions:</p> <ul style="list-style-type: none"> Addition and subtraction of common fractions with the same denominators Addition and subtraction of mixed numbers Fractions of whole numbers Equivalence of division and fractions <p>Solving problems</p> <ul style="list-style-type: none"> Solve problems in contexts involving common fractions, including grouping and sharing <p>Equivalent forms:</p>	Common fractions, decimal fractions and percentages <p>Calculations with fractions:</p> <ul style="list-style-type: none"> Addition and subtraction of common fractions in which one denominator is a multiple of another Addition and subtraction of mixed numbers Fractions of whole numbers <p>Solving problems</p> <ul style="list-style-type: none"> Solve problems in contexts involving common fractions, including grouping and sharing <p>Equivalent forms:</p> <ul style="list-style-type: none"> Find percentages of whole numbers

IMPORTANT NOTE: Always consult the CAPS to establish a detailed progression across the grades and the depths within the grade regarding topics, concepts and skills.



TIME (HOURS)	GRADE 4	GRADE 5	GRADE 6
	Number sentences	Number sentences	Number sentences
3	<ul style="list-style-type: none"> - number sentences describing problem situations - Solve and complete number sentences by inspection, -trial and improvement, check solution by substitution 	<ul style="list-style-type: none"> - number sentences describing problem situations - solve and complete number sentences by inspection, trial and improvement, check solution by substitution 	<ul style="list-style-type: none"> - number sentences describing problem situations - Solve and complete number sentences by inspection, trial and improvement, check solution by substitution
1	Formal SBA Task: Assignment	Formal SBA Task: Assignment	Formal SBA Task: Assignment
	End of year exam	End of year exam	End of year exam
6	Revision	Revision	Revision
52	TOTAL HOURS		

IMPORTANT NOTE: Always consult the CAPS to establish a detailed progression across the grades and the depths within the grade regarding topics, concepts and skills.

LESSON PLANS: TERM 1



MULTIGRADE TOOLKIT MATHEMATICS INTERMEDIATE PHASE

MATHEMATICS INTERMEDIATE PHASE
MULTI GRADE LESSON PLAN 1

EDUCATOR:
 TERM 1

GRADE	DATE: from to	4 CAPS pp. 37 - 38	5 CAPS pp. 125 -126 Whole numbers	6 CAPS pp. 215 – 216	Time: 5 HOURS
TOPIC					
Concepts, Skills and knowledge	<ul style="list-style-type: none"> Count forwards and backwards in 2s, 3s, 5s, 10s, 25s, 50s, 100s between 0 and at least 1 000 Order, compare and represent numbers to at least 0 - 999. Represent odd and even numbers to at least 1 000 Recognize the place value of digits in whole numbers to at least 3-digit numbers Round off to the nearest 10, 100 and 1 000 	<ul style="list-style-type: none"> Count forwards and backwards in whole number intervals up to at least 10 000 Order, compare and represent numbers to at least 4-digit numbers Represent odd and even numbers to at least 1 000. Recognize the place value of digits in whole numbers to at least 6 digit numbers. Round off to the nearest 5, 10, 100 and 1 000 	<ul style="list-style-type: none"> Count forwards and backwards in whole number intervals up to at least 10 000 Order, compare and represent numbers to at least 9-digit numbers Represent prime numbers to at least 100 Recognizing the place value of digits in whole numbers to at least 9-digit numbers Round off to the nearest 5, 10, 100, 1 000, 100 000, and 1 000 000 		



SUGGESTED METHODOLOGY

Explain from known (low number range); work with concrete LTSM

Counting, ordering, comparing, representing of digits

- Start with 2-digit numbers and build up to 3-digit numbers

Note: According to CAPS number range per grade per term as in content clarification

- Read, say and write up to at least 4-digit numbers, (Learners can write numbers with fingers in the air while they are reading / saying the words.) e.g. Twenty-nine
- Convert from words to numbers and numbers to words
- Write the number that is equivalent to:
- Arrange the numbers below from the smallest to the biggest: 111; 1 101; 1 110; 1 011
- Make the biggest/smallest number you can with these digits: 3, 2, 5, 4, 0.

Odd and even numbers:

- Explore practically by working with numbers to be able to describe the pattern e.g. all odd numbers end in 1, 3, 5, 7 or 9 therefore 201, 203, 205, 207, 209 are all odd numbers

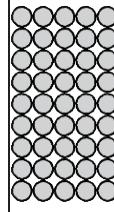
Prime numbers introduced to Grade 6

- Use number chart to isolate prime numbers from composite numbers

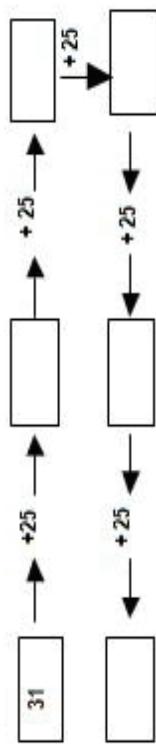
Multiples:

- If you count in multiples of 3, up to 100.
 - Will you count the number 13? Why?
 - Will you count the number 42? Why?

	<p>Place value:</p> <ul style="list-style-type: none"> • Distinguish between numeric value and place value • Use place value cards to build up and break down numbers <p>What is different to Grade 3?</p> <ul style="list-style-type: none"> • Rounding off to the nearest <p>Rounding off:</p> <ul style="list-style-type: none"> • Round off to the nearest ten, hundred and thousand (use base ten blocks, number lines, place value) • Place value Table • Use the concept of rounding off in problem solving context <p>Grade 4 and 5:</p> <p>In Term 1, learners should revise and consolidate work done in Grade 3. Recommended specifications are provided below.</p> <p>Counting</p> <ul style="list-style-type: none"> • Count forwards and backwards in 2s, 3s, 5s, 10s, 25s, 50s, 100s between 0 and at least 1 000 • Counting should not only be thought of as verbal counting. Learners should count using apparatus such as <ul style="list-style-type: none"> ○ Counters ○ counting beads ○ number grids ○ structured, semi-structured and empty number lines ○ pictures of objects, especially pictures of large numbers of objects that are presented in a grouped or structured way. An example of a picture of objects suitable for counting is provided at the end of the Grade 4 section of Numbers, Operations and Relationships. ○ arrays or diagrams of arrays e.g.
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- other diagrams for counting e.g.



- Counting should not always start on the first multiple, nor should it always start on any other multiple e.g. counting in 2s can start from 5 or 27 or 348.

Place value (number range 0 to 999)

- Learners should be able to break up numbers into hundreds, tens and units using
 - the number names (number words)
 - place value or flash cards
 - expanded notation
- Recommended apparatus: place value/flash cards; Dienes blocks

Compare and order (number range 0 to 999)

- Learners should be given a range of exercises such as:
 - Arrange the given numbers below from the smallest to the biggest or biggest to smallest
 - Fill in missing numbers in
 - a sequence
 - on a number grid

- Show a given number on a structured or semi-structured number line, e.g. show which number is halfway between 340 and 350 on a number line
- Indicate which of two numbers is greater or smaller e.g. 5 431 or 5 413
- Replace * with <, = or > **Example:** $89 * 98$, $109 * 190$
- All work developed here can be practised throughout the year in the Mental Mathematics programme.

Grade 6:

Place value (number range 0 to 999 999)

- Learners should be able to break up numbers into hundreds, tens and units using
 - the number names (number words)
 - place value or flash cards
 - expanded notation
- Recommended apparatus: place value, flash cards, Dienes blocks

Compare and order

Here learners should be given a range of exercises

- Arrange the given numbers below from the smallest to the biggest: or biggest to smallest
- Fill in missing numbers in
 - a sequence
 - on a number grid
- Show a given number on a number line – structured or semi-structured e.g. show on a number line which number is halfway between 471 340 and 471 350.
- Indicate which of two numbers is greater or smaller: 395431 or 395413?
- Fill in <, = or >
 - a) 247 889 * 247 898



	b) $784 \cdot 109 = 85190$ All work developed here can be practised throughout the year in the Mental Mathematics programme.
LTS M	
Resources	Number lines: 0 – 120, Structured - , semi- structured - , unstructured number lines; Counters, Pictures, arrays/ diagrams, Flash cards, Base 10 blocks, 100 charts, multiplication table, abacus , beads
	Grade 4
Workbook reference	WB 1: pp. 2 – 7 Activities: 1a&b; 2
DBE Textbook reference	Term 1: Unit 1: Whole Numbers p. 3
HOMEWORK	
ASSESSMENT	
E.g. Informal assessment – Test	



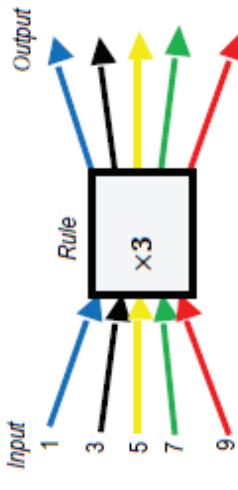
MATHEMATICS INTERMEDIATE PHASE

MULTI GRADE LESSON PLAN 2

EDUCATOR:
TERM 1

DATE : from to	GRADE	TOPIC	Time: 6 HOURS						
		Concepts, Skills and knowledge <ul style="list-style-type: none"> • Write number sentences to describe problem situations • Solve and complete number sentences by <ul style="list-style-type: none"> - inspection - trial and improvement • Check solution by substitution 	CAPS pp. 39 – 42 5 CAPS pp. 127 -131 Number sentences 6 CAPS pp. 217 – 222						
		SUGGESTED METHODOLOGY <ul style="list-style-type: none"> • Use number sentences to describe problem situations. <p>Example: Problem situation: I bought 750g of sweets and divided them among 25 children. Number sentence: $750 \div 25$</p> <ul style="list-style-type: none"> • Use number sentences as equivalent form of expression to sections of flow diagram or tables. <p>Example: Table</p> <table border="1"> <tr> <td>$\times 3$</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td></td> </tr> </table>	$\times 3$	1	2	3	4		
$\times 3$	1	2	3	4					

Flow diagram



Equivalent representation of the table and the flow diagram: $\square \times 3$

- Using number sentences to help learners understand and use the fact that addition and subtraction are inverse operations

Example: $37 - 4 + 4 = \Delta$

- Use number sentences helps learners develop addition and subtraction techniques

Example: $36+13 = \square$ therefore $49 - 13 = \square$

- Commutative property of addition
Numbers can be added in any order.

Example: $29 + 19 = 19 + 26$

Therefore $13 + 49 = \square$ or $49 + 13 = \square$

- Associative property of addition
The associative property allows numbers to be grouped in different ways when adding more than two numbers, without it affecting the answer.

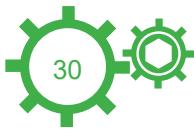
Example: $(31 + 26) + 19 = \square$ is the same as $31 + (26 + 19) = \square$

- Use number sentences to help learners see and use patterns in addition and subtraction number bonds for:
 - 10
 - multiples of 10
 - multiples of 100



	Examples:	- Ten $3 + 7 = \square$ $4 + 6 = \square$ $2 + 8 = \square$ $5 + 5 = \square$	- Multiples of 10 $13 + 7 = \square$ $14 + 6 = \square$ $12 + 8 = \square$ $15 + 5 = \square$	- Multiples of 100
		Similar examples can be given for multiples of 100 such as 200; 300; 400; 500; 600; 700; 800; 900 [See CAPS at the indicated pages for more example / details]		

LTSM				
Resources	Number lines, Structured -, semi- structured -, unstructured number lines; Counters, Abacus, Pictures, arrays/ diagrams, flow diagrams, maths video clips, E learning resources online, Maths games			
	Grade 4	Grade 5	Grade 6	
Workbook reference	WB 1: pp. 14 - 16 Activities: 6 a & b; 29	WB 1: pp. 10 – 12 Activities: 4 and 5	WB 1: pp. 73 -74 Activity: 4	
DBE Textbook reference	Term 1: Unit 2: Number Sentences p. 18	Term 1: Unit 2: Number sentences p. 13	Term 1: Unit 2: Number sentences p. 18	Term 1: Unit 2: Number sentences p.
HOMEWORK				
ASSESSMENT				
	E.g. Informal assessment – Test			



MATHEMATICS INTERMEDIATE PHASE

MULTI GRADE LESSON PLAN 3

EDUCATOR:

TERM 1

DATE: from to	GRADE	TOPIC	Time: 7 HOURS
	4 CAPS pp. 43 – 45	Addition and subtraction of whole numbers of at least 4 digits Concepts, Skills and knowledge	5 CAPS pp. 132 -135 Addition and subtraction of whole numbers <ul style="list-style-type: none">• Addition and subtraction of whole numbers of at least 5 digits• Multiple operations on whole numbers with or without brackets
		Calculation techniques Use a range of techniques to perform and check written and mental calculations of whole numbers including: <ul style="list-style-type: none">• estimation• building up and breaking down numbers• rounding off and compensating• doubling and halving• using a number line• using addition and subtraction as inverse operations	6 CAPS pp. 222 – 225 Calculation techniques Using a range of techniques to perform and check written and mental calculations with whole numbers including: <ul style="list-style-type: none">• estimation• adding and subtracting in columns• building up and breaking down numbers• rounding off and compensating• doubling and halving• using a number line• using addition and subtraction as inverse operations

	<p>Properties of whole numbers</p> <p>Recognize and use the commutative and associative properties of whole numbers</p>	<p>Properties of whole numbers</p> <ul style="list-style-type: none"> Recognize and use the commutative, associative and distributive properties with whole numbers 0 in terms of its additive property 1 in terms of its multiplicative property 	<p>Properties of whole numbers</p> <ul style="list-style-type: none"> Recognize and use the commutative; associative; distributive properties of whole numbers 0 in terms of its additive property
	<p>Solving problems</p> <p>Solve problems in contexts involving whole numbers, including financial contexts</p>	<p>Solving problems</p> <ul style="list-style-type: none"> Solve problems involving whole numbers, including <ul style="list-style-type: none"> financial contexts measurement contexts 	<p>Solving problems</p> <ul style="list-style-type: none"> Solve problems involving whole numbers and decimal fractions, including <ul style="list-style-type: none"> financial contexts measurement contexts Solve problems involving whole numbers, including comparing two or more quantities of the same kind (ratio)
SUGGESTED METHODOLOGY	<ul style="list-style-type: none"> Revise and consolidate work done in Grade 3. Learners should solve problems in contexts and do context free calculations. Learners should be trained to judge the reasonableness of solutions. Learners should know that they can: <ul style="list-style-type: none"> check an addition calculation by subtraction. Example: If $96 + 48 = 144$, then $144 - 48 = 96$ check a subtraction calculation by adding. Example: $144 - 48 = 96$, then $96 + 48 = 144$ 		





Calculation techniques

- **Breaking down all numbers according to place value parts to add.**

Example: Calculate $362 + 486$

$$\begin{aligned}362 + 486 &= 300 + 60 + 2 + 400 + 80 + 6 & 2 + 6 &= 8 \\&= 300 + 400 + 60 + 80 + 2 + 6 \quad \text{or} \quad \text{and} & 60 + 80 &= 14 \\&= 700 + 140 + 8 \quad \text{and} \quad 300 + 400 = 700 \\&= 848 \quad \text{means } 362 + 486 = 848\end{aligned}$$

- **Adding on (by breaking down the number to be added)**

Example: Calculate $362 + 486$

$$362 + 400 \rightarrow 762 + 80 \rightarrow 842 + 6 \rightarrow 848$$

- **Filling up tens (by breaking down the number to be added).** This can also be called rounding off and compensating.

Example: Calculate $96 + 48$

$$96 + 48 = 96 + 4 - 4 + 48 = 100 + 48 - 4 = 100 + 44 = 144$$

- **Breaking down both numbers according to place value parts to subtract.**

Example: Calculate $687 - 143$

$$\begin{aligned}687 - 143 &= 600 + 80 + 7 - 100 - 40 - 3 & 7 - 3 &= 4 \\&= 600 - 100 + 80 - 40 + 7 - 3 \quad \text{or} \quad \text{and} & 80 - 40 &= 40 \\&= 500 + 40 + 4 \quad \text{and} \quad 600 - 100 = 500 \\&= 544 \quad \text{means } 687 - 143 = 544\end{aligned}$$

- **Breaking down all numbers according to place value parts to add using compensation (counterbalance)**

Learners cannot subtract 4 from 3 or 80 from 40. Instead of breaking down 743 into 700 + 40 + 3 they will break down 743 into 600 + 130 + 13. Then they can subtract 4 from 13 and 80 from 130.

Example: Calculate: $743 - 684$

$$\begin{aligned}743 - 684 &= 700 + 40 + 3 - 600 - 80 - 4 & (\text{Break up } 743 \text{ into } 600 + 130 + 13) \\&= 600 + 130 + 13 - 600 - 80 - 4 \\&= 600 - 600 + 130 - 80 + 13 - 4 \\&= 50 + 9 \\&= 59\end{aligned}$$

- Subtracting by breaking down the number to be subtracted example:**

Calculate $687 - 143$

$$687 - 100 \rightarrow 587 - 40 \rightarrow 547 - 3 = 544$$

or

$$687 - 140 - 3 = 547 - 3 = 544$$

- Column method for adding**

By Grade 6 learners should have had enough experience with breaking up numbers to add and subtract them. The horizontal method of expanding numbers before adding them can get unwieldy when more than two 5-digit numbers are added. Term 1 learners can revisit the expanded vertical method, and then move on to the traditional column method

- Expanded vertical column method to add**

$$\begin{array}{r}
 56\ 423 = 50\ 000 + 6\ 000 + 400 + 20 + 3 \\
 +7\ 581 = 7\ 000 + 500 + 80 + 1 \\
 +21\ 479 = 20\ 000 + 1\ 000 + 400 + 70 + 9 \\
 \hline
 \text{Total} = 70\ 000 + 14\ 000 + 1\ 300 + 170 + 13
 \end{array}$$

This can be written as $70\ 000 + 10\ 000 + 5\ 000 + 400 + 80 + 3 = 85\ 483$

- The vertical column method to add.**

$$\begin{array}{r}
 1\ 1\ 1\ 1 \\
 56\ 423 \\
 +21\ 479 \\
 +\underline{7\ 581} \\
 \hline
 85483
 \end{array}$$

- Expanded vertical column method to subtract example:** Calculate: $98\ 743 - 45\ 684$

$$\begin{array}{r}
 98\ 743 = 90\ 000 + 8\ 000 + 700 + 40 + 3 \\
 -45\ 684 = 40\ 000 + 5\ 000 + 600 + 80 + 4 \\
 \hline
 \text{Total} = 50\ 000 + 3\ 000 + 0 + 50 + 9
 \end{array}$$

Therefore $50\ 000 + 3\ 000 + 0 + 50 + 9 = 53\ 059$

	<ul style="list-style-type: none"> The vertical column method to subtract $\begin{array}{r} 6\ 1\ 3\ 1\ 3 \\ 9\ 8\ 7\ 4\ 3 \\ -4\ 5\ 6\ 8\ 4 \\ \hline 5\ 3\ 0\ 5\ 9 \end{array}$ 												
	<p>Working with calculators</p> <ul style="list-style-type: none"> The mental mathematics programme contains work on number concept, number facts and mental calculation techniques. Daily work on mental Mathematics combined with daily written calculations will prevent learners from becoming dependent on calculators and not knowing how to calculate without them. Calculators are a useful way for learners to explore number patterns and when working with very large numbers. Learners should be taught how to use calculators including how to clear an incorrectly entered number. Learners should always estimate answers before doing a calculation on a calculator. Learners should estimate whether their answers will be in tens, hundreds, thousands, ten thousands, hundred thousands or millions. For example when adding 12 345 and 87 654 they should estimate that the answer will be between 90 and 100 thousand. 												
	<p>Kinds of problems</p> <ul style="list-style-type: none"> Summation, increase and decrease, comparison by difference See the description of problem types at the end of the grade notes 												
	<p>LTSMS</p>												
Resources	<p>Number lines: 0 – 120, Structured -, semi- structured -, unstructured number lines; Counters, Pictures, arrays/ diagrams, Flash cards, Base 10 blocks, 100 charts, maths video clips, E learning resources online, Maths games</p>												
	<table border="1"> <thead> <tr> <th>Grade 4</th> <th>Grade 5</th> <th>Grade 6</th> </tr> </thead> <tbody> <tr> <td>Workbook reference</td><td> WB 1: pp. 18 – 38 Activities: 7 a&b – 11 a&b; 12 DBE Textbook reference Term 1: Unit 3: Addition and subtraction, p. 26 </td><td> WB 1: pp. 14 -28 Activities: 6 a&b; 7 a&b; 8 a&b; 9 a&b Activity: 31 Term 1: Unit 3: Addition and subtraction, p. 21 </td></tr> <tr> <td>HOMEWORK</td><td></td><td>Term 1: Unit 3: Addition and subtraction, p. 25</td></tr> <tr> <td>ASSESSMENT</td><td></td><td>E.g. Informal assessment – Test</td></tr> </tbody> </table>	Grade 4	Grade 5	Grade 6	Workbook reference	WB 1: pp. 18 – 38 Activities: 7 a&b – 11 a&b; 12 DBE Textbook reference Term 1: Unit 3: Addition and subtraction, p. 26	WB 1: pp. 14 -28 Activities: 6 a&b; 7 a&b; 8 a&b; 9 a&b Activity: 31 Term 1: Unit 3: Addition and subtraction, p. 21	HOMEWORK		Term 1: Unit 3: Addition and subtraction, p. 25	ASSESSMENT		E.g. Informal assessment – Test
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HOMEWORK		Term 1: Unit 3: Addition and subtraction, p. 25											
ASSESSMENT		E.g. Informal assessment – Test											



MATHEMATICS INTERMEDIATE PHASE

MULTI GRADE LESSON PLAN 4

EDUCATOR:
TERM 1

DATE : from to GRADE	TOPIC	Time: 3 HOURS
	Investigate and extend patterns <ul style="list-style-type: none"> Investigate and extend numeric patterns looking for relationships or rules of patterns: <ul style="list-style-type: none"> - sequences involving a constant difference or ratio - of learner's own creation Describe observed relationships or rules in learner's own words Input and output values <p>Determine input values, output values and rules for patterns and relationships using flow diagrams</p>	CAPS pp. 46 – 51 5 CAPS pp. 136 -139 6 CAPS pp. 235 – 238
	Investigate and extend patterns <ul style="list-style-type: none"> Investigate and extend numeric patterns looking for relationships or rules of patterns <ul style="list-style-type: none"> - sequences involving a constant difference or ratio - of learner's own creation Describe observed relationships or rules in learner's own words Input and output values <p>Determine input values, output values and rules for patterns and relationships using flow diagrams</p> Equivalent forms <p>Determine equivalence of different descriptions of the same relationship or rule presented:</p> <ul style="list-style-type: none"> verbally in a flow diagram by a number sentence 	Numeric and geometric patterns Investigate and extend patterns <ul style="list-style-type: none"> Investigate and extend numeric patterns looking for relationships or rules of patterns <ul style="list-style-type: none"> - sequences involving a constant difference or ratio - of learner's own creation Describe observed relationships or rules in learner's own words Input and output values <p>Determine input values, output values and rules for patterns and relationships using flow diagrams</p> Equivalent forms <p>Determine equivalence of different descriptions of the same relationship or rule presented</p> <ul style="list-style-type: none"> verbally in a flow diagram by a number sentence





SUGGESTED METHODOLOGY

Numeric patterns:

All grades:

Remember that progression is taking place in the respective grades as indicated in the CAPS document.

Sequences of numbers:

Examples of the above are illustrated in Term 3. For Term 1 the recommendation is to focus on using input-output diagrams, with a focus on developing multiplication tables and the properties of operations.

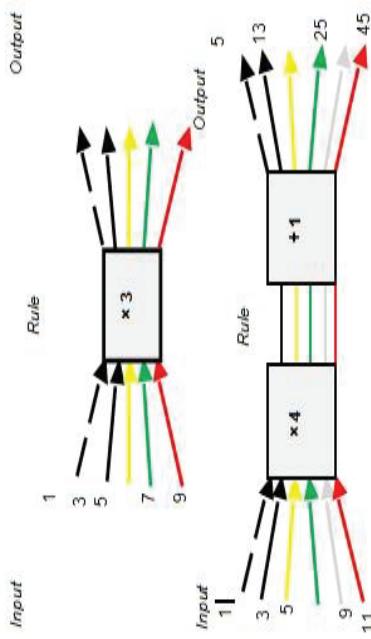
Patterns given in input-output diagrams

Input-output diagrams are sometimes called function diagrams, function machines or flow diagrams because they are a way of introducing learners to functional relationships diagrammatically. Functional relationships become very important in the Senior Phase and FET Mathematics.

The forms of input-output diagrams that learners use in the Intermediate Phase most often are flow diagrams or spidergrams.

When using flow diagrams, the correspondence between input and output values should be clear in its representational form i.e. the first input produces the first output, the second input produces the second output, etc.

Example



- An input-output diagram can allow learners to see or work out the
- input values, if the rule and a corresponding output value are given
 - output values, if the rule and a corresponding input values are given
 - rule, if the rule works for every given input value and its corresponding output value

Tables are a useful way to record patterns in Grades 4 & 5. In Grade 4 it is useful to sometimes include the rule in a table.

Example:

	1	2	3	4	5	6	7	8	9	10
$\times 6$	6	12	18		30					60

In Term 1 it is recommended that number patterns be used to develop concepts and skills that will be used in multiplication and division. The focus can be on input-output flow diagrams that help learners to understand and learn about

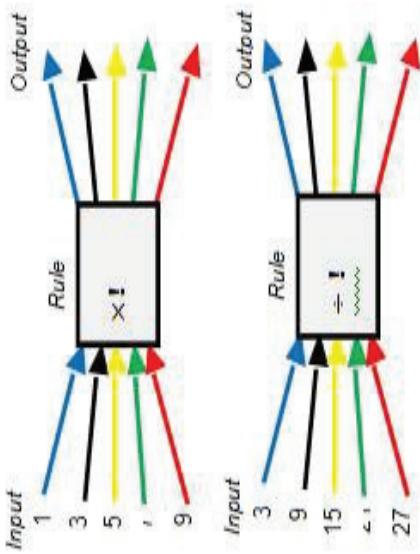
- the inverse operation between multiplication and division
- the multiplication of units by multiples of ten
- the associative property with whole numbers and how we can use this property when we multiply by multiples of 10

Using flow diagrams help learners to understand and use the fact that multiplication and division are inverse operations

Learners are not expected to use the expression “inverse operations”. They are expected to know that

- they can use multiplication to check division calculations
- they can use division to check multiplication calculations

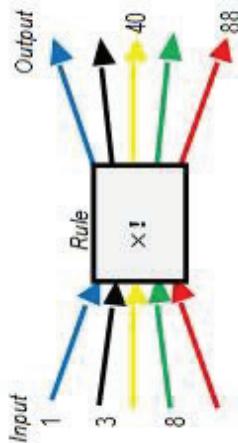




After completing a number of similar examples, learners can be asked to explain what they notice in their own words. If learners write pairs of matching number sentences based on the input and output values in the flow diagrams, they can discuss using multiplication to check division and using division to check multiplication.

Further example

Learners can use the above knowledge to indicate how they could complete the missing input numbers in a flow diagram

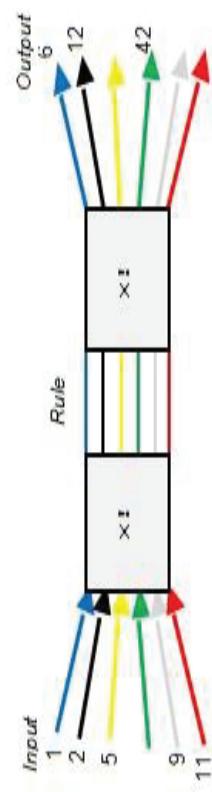
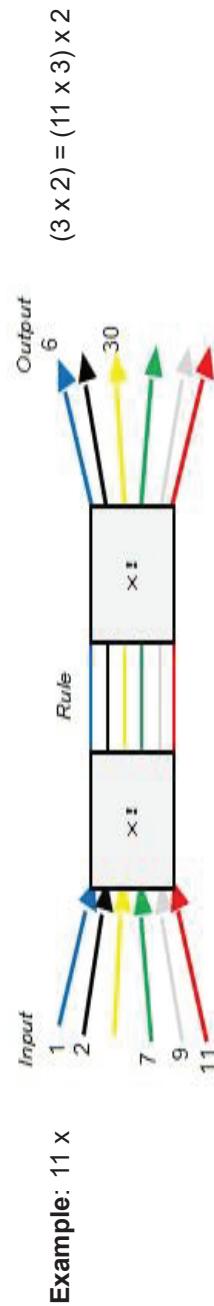


Once learners have completed the flow diagram, they can discuss how they found the missing input values from the corresponding output values and rule.

Using flow diagrams to help learners develop multiplication and division techniques

Associative property

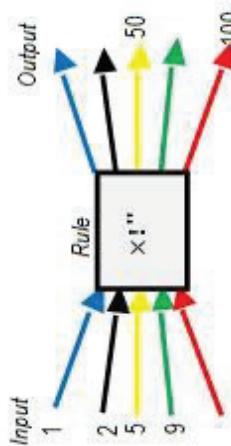
Numbers can be multiplied in any order.

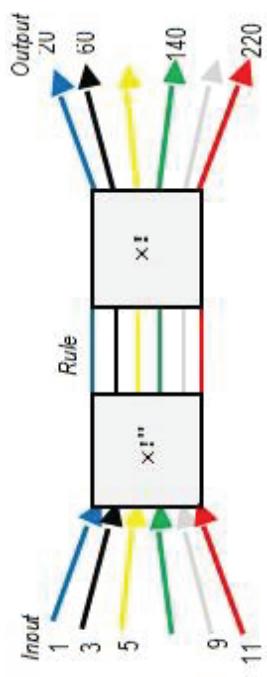


Learners can discuss what they notice when they compare the examples. Learners are not required to know the names of the properties. They are only expected to use them to make calculations easier or use equivalent number sentences.

Using flow diagrams to help learners think about and use techniques for multiplying by 10

Learners complete a flow diagram like the one below. They then explain using their own words what they notice about the input and output value





Learners can then be asked: "What is another way to multiply by 6?"

Learners can develop fast mental and written **techniques** based on this.

All concepts and calculating techniques developed here can be practised throughout the year in the mental Mathematics programme.

Grade 6:

Commutative property

Numbers can be multiplied in any order.

Example: $13 \times 5 \times 2 = 13 \times 2 \times 5..$



	<p>Learners can discuss what they notice when they compare the examples. Learners are not required to know the name of the commutative property. They are only expected to be able to use it to simplify calculations or to use equivalent statements.</p>							
LTS	Geometric patterns							
Resources	Number lines: 0 – 120, Structured - , semi- structured - , unstructured number lines; Counters, Pictures, arrays/ diagrams, Flash cards, Base 10 blocks, 100 charts, multiplication table, maths video clips, E learning online resources, Maths games							
Workbook reference	<table border="1"> <thead> <tr> <th style="background-color: black; color: white;">Grade 4</th> <th style="background-color: black; color: white;">Grade 5</th> <th style="background-color: black; color: white;">Grade 6</th> </tr> </thead> <tbody> <tr> <td>WB 1: pp. 40 – 42 Activities: 13 & 14</td><td>WB 1: pp. 34 - 40 Activities 11; 12; 13 & 14 pp. 136 – 138 Activities: 51, 52</td><td>WB 1: pp. 72 – 74 ; 98 - 102 Activities: 24 a&b); 35 - 37</td></tr> </tbody> </table>	Grade 4	Grade 5	Grade 6	WB 1: pp. 40 – 42 Activities: 13 & 14	WB 1: pp. 34 - 40 Activities 11; 12; 13 & 14 pp. 136 – 138 Activities: 51, 52	WB 1: pp. 72 – 74 ; 98 - 102 Activities: 24 a&b); 35 - 37	
Grade 4	Grade 5	Grade 6						
WB 1: pp. 40 – 42 Activities: 13 & 14	WB 1: pp. 34 - 40 Activities 11; 12; 13 & 14 pp. 136 – 138 Activities: 51, 52	WB 1: pp. 72 – 74 ; 98 - 102 Activities: 24 a&b); 35 - 37						
DBE Textbook reference	<p>Term 1: Unit 4: Numeric Patterns, p. 51 Term 2: Unit 7: Geometric Patterns, p. 181</p>	<p>Term 1: Unit 4: Numeric Patterns, p. 4 Term 2: Unit 7: Geometric Patterns, p. 176</p>						
HOMEWORK								
ASSESSMENT	E.g. Informal assessment – Test							



MATHEMATICS INTERMEDIATE PHASE

MULTI GRADE LESSON PLAN 5

EDUCATOR:
TERM 1

DATE : from to	GRADE	4 CAPS pp. 52 – 55	5 Multiplication and division of whole numbers CAPS pp. 140 -143	Time: 5 HOURS
	TOPIC Concepts, Skills and knowledge	<ul style="list-style-type: none">Multiplication of at least whole 2-digit by 2-digit numbersDivision of at least whole 3-digit by 1-digit numbers	<ul style="list-style-type: none">Multiplication of at least whole 3-digit by 2-digit numbersDivision of at least whole 3-digit by 2-digit numbers	<p>Calculation techniques include</p> <p>Using a range of techniques to perform and check written and mental calculations of whole numbers including:</p> <ul style="list-style-type: none">estimationbuilding up and breaking down numbersrounding off and compensatingdoubling and halvingusing a number lineusing addition and subtraction as inverse operationsusing multiplication and division as inverse operations <p>Calculation techniques</p> <p>Use a range of techniques to perform and check written and mental calculations of whole numbers including:</p> <ul style="list-style-type: none">estimationbuilding up and breaking down 3-digit by 2-digit numbersdivision of at least whole 4-digit by 3-digit numbersmultiple operations on whole numbers with or without brackets <p>Calculation techniques include</p> <p>Using a range of techniques to perform and check written and mental calculations of whole numbers including:</p> <ul style="list-style-type: none">estimationmultiplying in columnsbuilding up and breaking down numbersrounding off and compensatingdoubling and halvingusing addition and subtraction as inverse operationsusing multiplication and division as long division

Number range for multiples and factors Multiples of 1-digit numbers to at least 100	Number range for multiples and factors • Multiples of 2-digit whole numbers to at least 100 • Factors of 2-digit whole numbers to at least 100	Number range for multiples and factors • Multiples of 2-digit and 3-digit numbers • Factors of 2-digit and 3-digit whole numbers • Prime factors of numbers to at least 100
	<p>Properties of whole numbers Recognize and use the commutative; associative; and distributive properties of whole numbers</p> <ul style="list-style-type: none"> Properties of whole numbers <ul style="list-style-type: none"> Recognize and use the commutative; associative; distributive properties of whole numbers 0 in terms of its additive property 1 in terms of its multiplicative property <p>Solving problems</p> <ul style="list-style-type: none"> Solve problems in contexts involving whole numbers: <ul style="list-style-type: none"> - financial contexts - measurement contexts Solve problems involving whole numbers, including: <ul style="list-style-type: none"> - comparing two or more quantities of the same kind (ratio) - comparing two quantities of different kinds (rate) - grouping and equal sharing with remainders 	<p>Properties of whole numbers Recognize and use the commutative; associative; distributive properties of whole numbers</p> <ul style="list-style-type: none"> Properties of whole numbers <ul style="list-style-type: none"> Recognize and use the commutative; associative; distributive properties of whole numbers 0 in terms of its additive property 1 in terms of its multiplicative property <p>Solving problems</p> <ul style="list-style-type: none"> Solve problems involving whole numbers and decimal fractions, including <ul style="list-style-type: none"> - financial contexts - measurement contexts Solve problems involving whole numbers, including: <ul style="list-style-type: none"> - comparing two or more quantities of the same kind (ratio) - comparing two quantities of different kinds (rate) - grouping and equal sharing with remainders



SUGGESTED METHODOLOGY

	<ul style="list-style-type: none">• Learners should do rounding off to the nearest 10, to estimate answers.• Learners should do context free calculations and solve problems in contexts <p>Judging reasonableness of solutions</p> <ul style="list-style-type: none">• Learners should estimate their answers before calculating. They could round off the numbers involved in the calculations.• Learners can round off to the nearest 10 when multiplying or dividing with 2-digit numbers <p>Checking solutions</p> <ul style="list-style-type: none">• Learners should know that they can check a division calculation by multiplying• Example: If $69 \div 3 = 23$; then $23 \times 3 = 69$• Learners should know that to check a division calculation with a remainder, they should first multiply dividend by the divisor and then add the remainder <p>Example: If $70 \div 3 = 23$ remainder 1; then $23 \times 3 = 69$ therefore $69 + 1 = 70$</p> <p>Using the inverse operation to check solutions is one reason for teaching multiplication and division together. Another reason for looking at multiplication and division together is that we almost always use multiplication to solve division.</p> <p>In Grade 4 learners break up numbers to multiply. There are different ways of doing this. Sometimes the numbers involved in the calculation make different methods easier or more difficult. Learners have already seen how to use the associative and commutative properties to make multiplication easier.</p> <p>Multiplication and the distributive property of multiplication over addition/subtraction</p> <p>One way for learners to understand how and why the distributive property works, is to break up arrays and write number sentences to describe the arrays.</p> <p>Example</p> $9 \times 5 = 5 \times 5 + 4 \times 5$
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The distributive law allows learners to split the number and then multiply each part separately.

Using factors to multiply

Example:

$$\begin{aligned} \text{Calculate } 47 \times 6 \\ 47 \times 6 &= 47 \times 2 \times 3 \\ &= 94 \times 3 \\ &= (90 + 4) \times 3 \\ &= 90 \times 3 + 4 \times 3 \\ &= 270 + 12 \\ &= 282 \end{aligned}$$

Using the distributive property to multiply

Example:

$$\begin{aligned} 47 \times 5 &= 40 \times 5 + 7 \times 5 && (\text{using the distributive property}) \\ &= 4 \times 10 \times 5 + 35 \\ &= 4 \times 5 \times 10 + 35 \\ &= 200 + 35 \\ &= 235 \end{aligned}$$

or

$$\begin{aligned} 47 \times 5 &= (50 - 3) \times 5 && (\text{using the distributive property}) \\ &= (50 \times 5) - (3 \times 5) \\ &= 5 \times 5 \times 10 - 15 \\ &= 250 - 15 \\ &= 235 \end{aligned}$$

Dividing

Learners use what they know about multiplication to do division.

Example

$$75 \div 4$$





	<p>Learners can write out a “clue board” of what they know about multiplying by 4</p> <p>Example: $4 \times 10 = 40$ $4 \times 20 = 80$ (doubling the first statement) $4 \times 5 = 20$ (halving the first statement) $4 \times 4 = 16$ $4 \times 3 = 12$</p> <p>75 could be written as $40 + 20 + 12 + 3 = 4 \times 10 + 4 \times 5 + 4 \times 3 + 3$ Therefore, $75 \div 4 = 40 \div 4 + 20 \div 4 + 12 \div 4 + \text{the remainder of } 3 = 10 + 5 + 3 + \text{remainder } 3 = 18 \text{ remainder } 3$</p> <p>Learners should check their calculations by multiplying and adding the remainder: $18 \times 4 = 72$ and $72 + 3 = 75$.</p> <p>Kinds of problems</p> <p>Sharing, grouping, treating groups as units, rate,</p> <p>See the description of problem types at the end of the grade notes</p>	
LTS		
Resources	Number lines: 0 – 120, Structured -, semi- structured -, unstructured number lines; Counters, Pictures, arrays/ diagrams, Flash cards, Base 10 blocks, 100 charts, multiplication table, maths video clips, E learning online resources, Maths games, calculators	Grade 4 Grade 5 Grade 6
Workbook reference	<p>WB 1: pp. 118 – 124 Activities: 44a&b; 45a&b</p> <p>pp. 158 – 160 Activities: 62, 63</p>	<p>WB 1: pp. 42 – 48 Activities: 15a&b, 16 a&b</p> <p>pp. 128 Activities: 44a&b</p> <p>Term 1: Unit 5: Multiplication and division of whole numbers, p. 60 Term 1: Unit 9: Whole Number: Multiplication and division, p. 104</p>
DBE Textbook reference	Term 1: Unit 5: Multiplication and division of whole numbers, p. 60 Term 1: Unit 9: Whole Number: Multiplication and division, p. 104	Term 1: Unit 5: Multiplication and division of whole numbers, p. 55 Term 2: Unit 6: Division of whole numbers, p. 165
HOMEWORK		
ASSESSMENT	E.g. Informal assessment – Test	

MATHEMATICS INTERMEDIATE PHASE

MULTIGRADE LESSON PLAN 6

TERM 1

EDUCATOR:

DATE: from to	GRADE	TOPIC	Time	Time: 6 HOURS
		Reading time and time instruments Read, tell and write time in 12-hour and 24-hour formats on both analogue and digital instruments in: <ul style="list-style-type: none">• hours• minutes• seconds Instruments include clocks and watches and stopwatches	CAPS p. 55 5 CAPS pp. 144 & 186	6 CAPS pp. 228 & 266
		Reading time and time instruments Read, tell and write time in 12-hour and 24-hour formats on both analogue and digital instruments in: <ul style="list-style-type: none">• hours• minutes• seconds Instruments include clocks, watches and stopwatches		Reading time and time instruments Read, tell and write time in 12-hour and 24-hour formats on both analogue and digital instruments in: <ul style="list-style-type: none">• hours• minutes• seconds Instruments include clocks, watches and stopwatches
		Reading calendars		Reading calendars
		Calculations and problem solving with time include <ul style="list-style-type: none">• Calculation of the number of days between any two dates within the same or consecutive years• Calculation of time intervals where time is given in minutes or hours only		Calculations and problem-solving related to time <ul style="list-style-type: none">• Solve problems in contexts involving time• Read time zone maps and calculating time differences based on time zones• Calculation of time intervals where time is given in<ul style="list-style-type: none">• seconds and/or minutes



	<ul style="list-style-type: none"> • minutes and/or hours • hours and/or days • days and/or weeks and/or months • months and/or years • years and/or decades <p>History of time</p> <p>Knows how time was measured and represented in ancient times</p>	<ul style="list-style-type: none"> • minutes and/or hours • hours and/or days • days and/or weeks and/or months • years and/or decades • centuries, decades and years <p>History of time</p> <p>Know some ways in which time was measured and represented in the past.</p>	<p>Practical measuring of temperature by</p> <p>estimating, measuring, recording, comparing and ordering</p> <p>Measuring instruments:</p> <p>thermometers</p> <p>Units</p> <p>degrees Celsius ($^{\circ}\text{C}$)</p> <p>Calculations and problem-solving related to temperature</p> <ul style="list-style-type: none"> • Solve problems in contexts involving temperature • Calculate temperature differences limited to positive whole numbers 	<p>Measuring instruments</p> <p>thermometers (analogue and digital)</p> <p>Units</p> <p>degrees Celsius ($^{\circ}\text{C}$)</p> <p>Calculations and problem-solving related to temperature</p> <p>Solving problems in contexts related to temperatures</p>
SUGGESTED METHODOLOGY	<p>Time:</p> <p>Learners should continue to read clocks and tell the time at frequent intervals during the entire year. This can be done during the Mental Mathematics time or just before or after break time or before learners go home, or when they come in from a class in another venue.</p>		All grades	In Grade 3 learners work with analogue and digital clocks using 12-hour format. In Grade 4 learners move onto digital 24-hour format.



	<p>Once learners have been learnt to tell the time, further practise can take place during mental mathematics time.</p> <p>Learners continue to read calendars.</p> <p>Calculations and problem-solving with time include</p> <ul style="list-style-type: none"> • calculation of the number of days between any two dates within the same or consecutive years • calculation of time intervals where time is given in minutes and/or hours only • calculations should be limited to whole numbers and common fractions <p>Learners should continue to read clocks and tell the time at frequent intervals during the entire year. This can be done during the mental Mathematics time or just before or after break time or before learners go home, or when they come in from a class in another venue.</p> <p>Grades 5 and 6:</p> <p>Stopwatches are introduced.</p> <p>Learners can either use stopwatches that occur as single instruments, or stopwatches on cell phones or wrist watches.</p> <p>Learners continue to read, record and calculate time in 12-hour and 24-hour formats and to work with analogue and digital instruments.</p> <p>This is practised regularly. Once learners have been taught to tell the time, it can be practised during the mental mathematics section of the lesson, and frequently at other times during the day.</p> <p>Learners continue to read calendars</p> <p>Calculations and problem-solving related to time</p> <p>Decades are introduced.</p> <p>Calculations should be limited to whole numbers and fractions.</p> <p>Grade 6:</p> <p>What is different to Grade 5?</p> <ul style="list-style-type: none"> • Time zones are introduced.
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	<ul style="list-style-type: none"> • Centuries are introduced <p>Once learners have been taught to tell the time, this can be practised during the mental Mathematics section of the lesson.</p> <p>Learners continue to read calendars, and do calculations based on dates.</p> <p>Calculations and problem-solving related to time include</p> <p>Calculations with and conversions between all the units mentioned in the column on the left.</p>
	<p>Time zones</p> <p>Learners should be able to:</p> <ul style="list-style-type: none"> • read time zone maps and do calculations using zoned maps. Help learners to understand why there are time zone differences between different places in the world • calculate time differences when given clock faces showing the times in different places. <p>Temperature:</p> <p>Introduce decades in Grade 5. Calculations should be limited to whole numbers and fractions.</p> <p>Grade 5 and 6 learners should also use common temperature referents e.g.</p> <ul style="list-style-type: none"> • the freezing point of pure water is 0°C • the boiling point of pure water is 100°C • the average normal human body temperature is 37°C • the daily environmental temperatures. <p>Learners should read temperatures on pictures of thermometers. Where possible learners should read temperatures on real thermometers.</p> <p>Reading analogue thermometers requires learners to read the temperature on numbered and un-numbered gradation lines. In thermometers designed to read the environmental temperatures the unnumbered gradation lines often refer to whole degrees. In thermometers designed to read human body temperature the unnumbered gradation lines often refer to fractions of degrees.</p> <p>Recording and reporting on temperature measurements</p>



	<p>Learners should record and report on temperature measurements they have read off thermometers in whole numbers. This may involve rounding up or down. They can also record and report temperatures by using fraction notion.</p> <p>Grade 6 learners should do calculations with and conversions between time zones. They should be able to:</p> <ul style="list-style-type: none"> • read time zone maps and do calculations using zoned maps. Help learners to understand why there are time zone differences between different places in the world • calculate time differences when given clock faces showing the times in different places. 															
	<p>Calculations and problem-solving with time and temperature include</p> <ul style="list-style-type: none"> • calculation of the number of days between any two dates within the same or consecutive years • calculation of time intervals where time is given in minutes and/or hours only • calculations limited to whole numbers and common fractions for Grade 4 and 5 (Grade 6 should do problems that involve decimal fractions). 															
LTSM																
Resources	Analogue and digital clocks, calendar, stopwatch, cellphone, world time zone charts, thermometer, newspaper weather reports, video clips, E learning online resources, Maths games,															
Workbook reference	<table border="1"> <thead> <tr> <th>Grade 4</th> <th>Grade 5</th> <th>Grade 6</th> </tr> </thead> <tbody> <tr> <td>WB 1: pp 50 – 56 Activities: 18a&b, 19a&b</td> <td>WB 1: pp. 60 -64 Activities: (20a&b; 21)</td> <td>WB 1: pp. 46 - 52 ; 144 Activities: 16a&b; 17a&b, 54</td> </tr> <tr> <td></td> <td>WB 2: pp. 68 - 70 Activities: 94, 95</td> <td>WB 2: pp. 62 – 66 Activity: 85a&b, 86</td> </tr> <tr> <td></td> <td></td> <td>Term 1: Unit 6: Time, p. 69 Term 3: Unit 8: Temperature, p. 252</td> </tr> <tr> <td></td> <td></td> <td>Term 1: Unit 5: Time, p. 72 Term 3: Unit 7: Temperature, p. 258</td> </tr> </tbody> </table>	Grade 4	Grade 5	Grade 6	WB 1: pp 50 – 56 Activities: 18a&b, 19a&b	WB 1: pp. 60 -64 Activities: (20a&b; 21)	WB 1: pp. 46 - 52 ; 144 Activities: 16a&b; 17a&b, 54		WB 2: pp. 68 - 70 Activities: 94, 95	WB 2: pp. 62 – 66 Activity: 85a&b, 86			Term 1: Unit 6: Time, p. 69 Term 3: Unit 8: Temperature, p. 252			Term 1: Unit 5: Time, p. 72 Term 3: Unit 7: Temperature, p. 258
Grade 4	Grade 5	Grade 6														
WB 1: pp 50 – 56 Activities: 18a&b, 19a&b	WB 1: pp. 60 -64 Activities: (20a&b; 21)	WB 1: pp. 46 - 52 ; 144 Activities: 16a&b; 17a&b, 54														
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		Term 1: Unit 6: Time, p. 69 Term 3: Unit 8: Temperature, p. 252														
		Term 1: Unit 5: Time, p. 72 Term 3: Unit 7: Temperature, p. 258														
DBE Textbook reference	Term 1: Unit 6: Time, p. 73															
HOMEWORK																
ASSESSMENT	E.g. Informal assessment – Test															



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MATHEMATICS INTERMEDIATE PHASE**MULTI GRADE LESSON PLAN 7**

EDUCATOR:

TERM 1

TOPIC	GRADE	DATE : from to	Time: 6 HOURS
Concepts, Skills and knowledge	4 CAPS pp. 57 - 58	5 CAPS pp. 145 -146	6 CAPS pp. 233

	<ul style="list-style-type: none"> Analyse data by answering questions related to data categories 	<ul style="list-style-type: none"> Analyse data by answering questions related to <ul style="list-style-type: none"> - data categories - data sources and contexts <ul style="list-style-type: none"> Summarise data verbally and in short written paragraphs that include <ul style="list-style-type: none"> - drawing conclusions about the data - making predictions based on the data Examine ungrouped numerical data to determine the most frequently occurring score in the data set (mode) 	<ul style="list-style-type: none"> Analyse data by answering questions related to <ul style="list-style-type: none"> - data categories, including data intervals - data sources and contexts - central tendencies – (mode and median) <ul style="list-style-type: none"> Summarise data verbally and in short written paragraphs that include <ul style="list-style-type: none"> - drawing conclusions about the data - making predictions based on the data
LTS			
Resources	Exemplars of pictographs, bar graphs, pie charts – (context sensitive), ICT – Excel worksheets with graphs, video clips, E learning online resources, Maths games,		
Workbook reference	Grade 4 WB 1: pp. 58 -62 Activities: 20; 21a&b	Grade 5 WB 1: pp. 66 – 68 Activities: 22a&b	Grade 6 WB 1: pp. 78 – 88 Activities: 92a&b, 93, 94, 95, 95
DBE Textbook reference	Term 1: Unit 7: Data handling, p. 86	Term 1: Unit 7: Data handling, p. 81	Term 1: Unit 7: Data handling, p. 97
HOMEWORK			
ASSESSMENT	E.g. Informal assessment – Test		



MATHEMATICS INTERMEDIATE PHASE

MULTI GRADE LESSON PLAN 8

EDUCATOR:
TERM 1

DATE : from to	GRADE	TOPIC	Time: 6 HOURS
		Shapes learners need to know and name <ul style="list-style-type: none"> Regular and irregular polygons: <ul style="list-style-type: none"> - triangles - squares, rectangles - other quadrilaterals - pentagons - hexagons Circles 	CAPS pp. 59 - 61 Properties of 2D shapes CAPS pp. 147 -149
		Shapes learners need to know and name <ul style="list-style-type: none"> Regular and irregular polygons - triangles, squares, rectangles, other quadrilaterals, pentagons, hexagons, heptagons, octagons Circles Similarities and differences between squares and rectangles 	Shapes learners need to know and name <ul style="list-style-type: none"> Regular and irregular polygons - triangles, squares, rectangles, other quadrilaterals, pentagons, hexagons, heptagons, octagons Similarities and differences between rectangles and parallelograms

	<p>Further activities to focus on the characteristics of shapes</p> <p>Draw 2-D shapes on grid paper</p>	<p>Further activities to focus learners on characteristics of shapes</p> <p>Draw 2-D shapes on grid paper</p> <p>Angles</p> <p>Limited to</p> <ul style="list-style-type: none"> • right angles • angles smaller than right angles • Angles greater than right angles 	<ul style="list-style-type: none"> - reflex - revolution <p>Further activities</p> <ul style="list-style-type: none"> • Draw 2-D shapes on grid paper • Draw circles, patterns in circles and patterns with circles using a pair of compasses <p>Angles</p> <p>Recognize and name the following angles in 2-D shapes:</p> <ul style="list-style-type: none"> - acute - right - obtuse - straight - reflex - revolution <p>Further activities to focus learners on characteristics of shapes</p> <ul style="list-style-type: none"> • Draw 2-D shapes on grid paper • Draw circles, patterns in circles and patterns with circles using a pair of compasses
LTSIM	Resources	<p>Variety of regular and irregular polygons. (To cut out)</p> <ul style="list-style-type: none"> - triangles, squares, rectangles, parallelograms, other quadrilaterals, pentagons, hexagons, heptagons, octagons - Tangrams pair of compasses, geoboards 	

	Grade 4	Grade 5	Grade 6
Workbook reference	WB 1: pp 64 -66 Activities: 22a&b	WB 1: pp 70 – 72 Activities: 22a, 23 a&b	WB 1: pp 54 – 58 Activities: 18a, b, c
DBE Textbook reference	Term 1: Unit 8: Properties of two - dimensional shapes, p. 96	Term 1: Unit 8: Properties of two - dimensional shapes, p. 91	Term 1: Unit 6: Properties of two - dimensional shapes, p. 86
HOMEWORK			
ASSESSMENT	E.g. Informal assessment – Test		



LESSON PLANS: TERM 2



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MATHEMATICS INTERMEDIATE PHASE**MULTI GRADE LESSON PLAN 1****TERM: 2****EDUCATOR:**

DATE: from to		Time: 3 HOURS		
GRADE	CAPS pp. 68	5 CAPS pp. 156	6 CAPS pp. 240	
TOPIC	Whole numbers			
Concepts, Skills and knowledge	<ul style="list-style-type: none">Count forwards and backwards in 2s, 3s, 5s, 10s, 25s, 50s, 100s between 0 and at least 10 000Order, compare and represent numbers to at least 4-digit numbersRepresent odd and even numbers to at least 1 000Recognize the place value of digits in whole numbers to at least 4-digit numbersRound off to the nearest 10, 100, 1 000	<ul style="list-style-type: none">Count forwards and backwards in whole number intervals up to at least 10 000Order, compare and represent numbers to at least 6-digit numbersRepresent odd and even numbers to at least 1 000.Recognize the place value of digits in whole numbers to at least 6 digit numbers.Round off to the nearest 5, 10, 100, and 1 000	<ul style="list-style-type: none">Count forwards and backwards in whole number intervals up to at least 10 000Order, compare and represent numbers to at least 9-digit numbersRepresent prime numbers to at least 100Recognizing the place value of digits in whole numbers to at least 9-digit numbersRound off to the nearest 5, 10, 100, 1 000	

SUGGESTED**See Term 1 notes:**

METHODOLOGY	Explain from known (low number range) to an increased number range; work with concrete LTSM			
Grade 4:	<ul style="list-style-type: none"> Counting number range increased to 10 000 Rounding off to the nearest 10 and 100 Number range for place value, ordering, comparing and representing numbers increased to 4 digits. 			
Grade 5 and 6:	<ul style="list-style-type: none"> Counting number range increased – learners count forwards and backwards in 2s, 3s, 5s, 10s, 25s, 50s, 100s between 0 and at least 10 000. Learners also count in fractions (after the topic of fractions has been covered in the main lesson – see comment in that section about counting in fractions) Rounding off to the nearest 10, 100, 1 000 Number range for place value, ordering, comparing and representing numbers increased to 6 digits <p>See further notes in Term 1, but be aware that number ranges have increased in Term 2. The increased number ranges are shown in the column on the left.</p>			
LTSM				
Resources	Number lines: 0 – 120, Structured -, semi- structured - , unstructured number lines; Counters, Pictures, arrays/ diagrams, Flash cards, Base 10 blocks, 100 charts			
Workbook reference	<table border="1"> <tr> <td>WB 1: pp. 8 – 12 Activities: 3, 4, 5</td> <td>WB 1: pp. 3 – 8 Activities: 2, 3</td> <td>WB 1: pp. 6 – 8; 80 - 82 Activities: 25a&b; 26; 27</td> </tr> </table>	WB 1: pp. 8 – 12 Activities: 3, 4, 5	WB 1: pp. 3 – 8 Activities: 2, 3	WB 1: pp. 6 – 8; 80 - 82 Activities: 25a&b; 26; 27
WB 1: pp. 8 – 12 Activities: 3, 4, 5	WB 1: pp. 3 – 8 Activities: 2, 3	WB 1: pp. 6 – 8; 80 - 82 Activities: 25a&b; 26; 27		
DBE Textbook reference	Term 2: Unit 1: Whole Numbers, p. 119			
HOMEWORK	Term 2: Unit 1: Whole Numbers, p. 115			
ASSESSMENT	Term 2: Unit 1: Whole Numbers, p. 119			



MATHEMATICS INTERMEDIATE PHASE

MULTI GRADE LESSON PLAN 2

TERM: 2

EDUCATOR:

DATE: from to				Time: 3 HOURS		
GRADE	4 CAPS pp. 69	5 CAPS pp. 157	6 CAPS pp. 222			
TOPIC Concepts, Skills and knowledge	Number range for calculating Addition and subtraction of whole numbers of at least 4-digits.	Number range for calculations Addition and subtraction of whole numbers with at least 5-digit numbers	Number range for Whole numbers	Calculation techniques Using a range of techniques to perform and check written and mental calculations of whole numbers including: <ul style="list-style-type: none">estimationbuilding up and breaking down numbersrounding off and compensatingdoubling and halvingusing a number lineusing addition and subtraction as inverse operations		
				Calculation techniques Use a range of techniques to perform and check written and mental calculations with whole numbers including: <ul style="list-style-type: none">estimationadding and subtracting in columnsbuilding up and breaking down numbersusing a number linerounding off and compensatingdoubling and halvingusing addition and subtraction as inverse operations		
				Properties of whole numbers Recognize and use the commutative and associative properties of whole numbers		
				Properties of whole numbers Recognize and use the commutative; associative; distributive properties of whole numbers		

		<p>numbers</p> <ul style="list-style-type: none"> – 0 in terms of its additive property – 1 in terms of its multiplicative property
	<p>Solving problems Solve problems in contexts involving whole numbers, including financial contexts</p>	<p>Solving problems Solve problems involving whole numbers, including the following:</p> <ul style="list-style-type: none"> • financial contexts • measurement contexts
SUGGESTED METHODOLOGY	<p>All grades:</p> <p>In Term 2, learners add and subtract numbers up to 4 digits. Rounding-off includes rounding off to the nearest 1 000 as a way of estimating answers. Learners should solve problems in contexts and do context free calculations</p> <p>Learners continue to</p> <ul style="list-style-type: none"> • check their solutions themselves by using the inverse operation • judge the reasonableness of their solutions by rounding off numbers and estimating answers. <p>The calculation techniques continue to mostly involve breaking down numbers.</p> <p>As the numbers learners work with get larger, learners may begin to lose track of some numbers when they break up numbers to do calculations. Using brackets is helpful to show grouping of numbers and so helps learners keep track of what they are doing. Since the operations in brackets have to be done first, it removes any confusion about the order of operations. Learners thus do not have to learn rules such as BODMAS if brackets are used routinely to indicate which operations have to be done first.</p> <ul style="list-style-type: none"> • Breaking down all numbers according to place value parts to add <p>Example Calculate $5\ 362 + 2\ 486$</p> $ \begin{aligned} 5\ 362 + 2\ 486 &= 5\ 000 + 300 + 60 + 2 + 2\ 000 + 400 + 80 + 6 \\ &= 5\ 000 + 2\ 000 + 300 + 400 + 60 + 80 + 2 + 6 \quad \text{or} \quad \begin{array}{r} 2 \\ + 6 = 8 \\ \hline \end{array} \\ &= 7\ 000 + 700 + 140 + 8 \quad \text{and } \begin{array}{r} 60 \\ + 80 = 140 \\ \hline \end{array} \\ &= 7\ 848 \quad \text{and } \begin{array}{r} 300 \\ + 400 = 700 \\ \hline \end{array} \\ &\quad \text{and } \begin{array}{r} 5\ 000 + 2\ 000 = 7\ 000 \text{ means } 5\ 362 + 2\ 486 = 7\ 848 \\ \hline \end{array} \end{aligned} $	

- **Adding on by breaking down the number to be added**

Example

Calculate $5\ 362 + 2\ 486$
 $5\ 362 + 2\ 000 \rightarrow 7\ 362 + 400 \rightarrow 7\ 762 + 80 \rightarrow 7\ 842 + 6 \rightarrow 7\ 848$

- **Filling up tens by breaking down the number to be added.**

This can also be called rounding off and compensating. Here, compensating means that whatever is added, must be subtracted again so that the statements remain equivalent.

Example

Calculate $2\ 486 + 48$

$$2\ 486 + 48 = (2\ 486 + 14) - 14 + 48 = 2\ 500 + (48 - 14) = 2\ 500 + 34 = 2\ 534$$

- **Breaking down both numbers to subtract**

Example

Calculate $4\ 687 - 2\ 143$

$$\begin{aligned} 4\ 687 - 2\ 143 \\ = 4\ 000 + 600 + 80 + 7 - 2\ 000 - 100 - 40 - 3 & \quad \text{Or} \quad 7 - 3 = 4 \\ = (4\ 000 - 2\ 000) + (600 - 100) + (80 - 40) + (7 - 3) & \quad \text{and } 80 - 40 = 40 \\ = 2\ 000 + 500 + 40 + 4 & \quad \text{and } 600 - 100 = 500 \\ = 2\ 544 & \quad \text{and } 4\ 000 - 2\ 000 = 2\ 000 \end{aligned}$$

This means that:

$$4\ 687 - 2\ 143 = 2\ 000 + 500 + 40 + 4 = 2\ 544$$

- **Breaking down all the numbers to add using compensation (counterbalance)**

Learners cannot subtract 4 from 3 or 80 from 40. Instead of breaking down 743 into 700 + 40 + 3 they will break down 743 into 600 + 130 + 13. Then they can subtract 4 from 13 and 80 from 130.

Calculate: $8\ 743 - 5\ 684$

$$\begin{aligned} 8\ 743 - 5\ 684 &= (8\ 000 + 700 + 40 + 3) - 5\ 000 - 600 - 80 - 4 \\ &= (8\ 000 + 600 + 130 + 13) - 5\ 000 - 600 - 80 - 4 \quad (\text{breaking up } 743 \text{ into } 600 + 130 + 13) \\ &= (8\ 000 - 5\ 000) + (600 - 600) + (130 - 80) + (13 - 4) \\ &= 3\ 000 + 0 + 50 + 9 \\ &= 3\ 059 \end{aligned}$$

- **Subtracting by breaking down the number to be subtracted**

$$\begin{aligned} \text{Calculate } 4\ 687 - 2\ 143 \\ 4\ 687 - 2\ 000 \rightarrow 2\ 687 - 100 \rightarrow 2\ 587 - 40 \rightarrow 2\ 547 - 3 \rightarrow 2\ 544 \end{aligned}$$

	<p>Kinds of problems</p> <ul style="list-style-type: none"> Summation, Increase and decrease, comparison by difference; comparison by ratio See the description of problem types at the end of the grade notes <p>Grade 5 and 6:</p> <ul style="list-style-type: none"> In Term 2, learners add and subtract numbers with up to 5 digits. Rounding off as a way of estimating answers to include rounding off to the nearest 1 000 as well as rounding off to the nearest 10, 100
	<p>Learners should solve problems in contexts and do context free calculations</p> <p>As number ranges get larger many learners tend to lose the parts of the numbers that they break up, when they try to combine again. This is especially the case when more than two 5-digit numbers are being added. It is for this reason that column addition and column subtraction are introduced in Grade 5. In Term 2 one can still encourage learners to expand the numbers as they write them in columns. In Term 1, an option of a column method was provided, but it consisted of putting different place values into different rows.</p> <p>Learners continue to:</p> <ul style="list-style-type: none"> check their solutions themselves e.g. by using the inverse operation judge the reasonableness of their solutions e.g. by rounding off numbers and estimating answers <p>Example:</p> <p>Calculate: 56 423 + 7 581 + 21 479</p> <ul style="list-style-type: none"> Breaking down all the numbers to add Adding in a row (horizontally) $ \begin{aligned} & 50\ 000 + 6\ 000 + 400 + 20 + 3 + 7\ 000 + 500 + 80 + 1 + 20\ 000 + 1\ 000 + 400 + 70 + 9 \\ & = 50\ 000 + 20\ 000 + 6\ 000 + 7\ 000 + 1\ 000 + 400 + 500 + 4 + 00 + 20 + 80 + 70 + 3 + 1 + 9 \\ & = 70\ 000 + 14\ 000 + 1\ 300 + 170 + 14 \\ & = 70\ 000 + 10\ 000 + 4\ 000 + 1\ 000 + 300 + 100 + 70 + 10 + 4 \\ & = 80\ 000 + 5\ 000 + 400 + 80 + 4 \\ & = 85\ 484 \end{aligned} $ <p>The horizontal method may get unwieldy when more than two 5-digit numbers are added. The alternative is to use the expanded vertical method.</p> <ul style="list-style-type: none"> Expanded vertical method $ \begin{array}{r} 56\ 423 = 50\ 000 + 6\ 000 + 400 + 20 + 9 \\ + 7\ 581 = + 7\ 000 + 500 + 80 + 1 \\ + 21\ 479 = + 400 + 70 + 9 \\ \hline 70\ 000 + 14\ 000 + 1300 + 170 + 10 \end{array} $



$$\begin{aligned} &= 70\ 000 + 10\ 000 + 5\ 000 + 400 + 80 + 4 \\ &= 85\ 484 \end{aligned}$$

- **Adding on (by breaking down the number to be added)**

Calculate: $56\ 423 + 7\ 581$
 $56\ 423 + 7\ 000 \rightarrow 63\ 423 + 500 \rightarrow 63\ 923 + 80 \rightarrow 64\ 003 + 1 \rightarrow 64\ 004$

This tends to work better if only two numbers are added. If a third or fourth number is added, they can be broken up and added one at a time, but the expanded column method is more efficient.

- **Breaking down all the numbers according to place value parts to subtract using compensation (counterbalance)**

Example:

Calculate: $8\ 743 - 5\ 684$

$$\begin{aligned} 8\ 743 - 5\ 684 &= 8\ 000 + 700 + 40 + 3 - 5\ 000 - 600 - 80 - 4 \\ &= 8\ 000 + 600 + 130 + 13 - 5\ 000 - 600 - 80 - 4 \\ (\text{by breaking up } 743 \text{ into } 600 + 130 + 13) \\ &= 8\ 000 - 5\ 000 + 600 - 600 + 130 - 80 + 13 - 4 \\ &= 3\ 000 + 0 + 50 \\ &= 3\ 059 \end{aligned}$$

- **Breaking down numbers and using the expanded column method**

Example:

Calculate: $98\ 743 - 45\ 684$

Learners cannot subtract 4 from 3 or 80 from 40. Instead of breaking down 743 into 700 + 40 + 3 they will break down 743 into 600 + 130 + 13. Then they can subtract 4 from 13 and 80 from 130.

$$\begin{array}{r} 98\ 74\ 3 \\ - 45\ 68\ 4 \\ \hline 50000+ 3000+ 0+ 50+ 9 \end{array} = \begin{array}{r} 90\ 000+ 8\ 000+ 700+ 40+ 3 \\ 40\ 000+ 5\ 000+ 600+ 80+ 4 \\ \hline 53\ 059 \end{array}$$

- **Subtracting by breaking down number to be subtracted**

Example:

Calculate $74\ 687 - 52\ 143$
 $74\ 687 - 50\ 000 \rightarrow 24\ 687 - 2\ 000 \rightarrow 22\ 687 - 100 \rightarrow 22\ 587 - 40 \rightarrow 22\ 547 - 3 = 22\ 544$

OR

$$\begin{aligned}
 25\ 746 - 10\ 000 - 4\ 000 - 500 - 30 - 2 &= (15\ 746 - 4\ 000) - 500 - 30 - 2 \\
 &= (11\ 746 - 500) - 30 - 2 \\
 &= (11\ 246 - 30) - 2 \\
 &= 11\ 216 - 2 \\
 &= 11\ 214
 \end{aligned}$$

This tends to work better if only one number is subtracted from another. If a second or third number is subtracted, they can be broken up and subtracted one at a time, but the expanded column method is more efficient.

Problems

- Summation, increase and decrease, comparison by difference; comparison by ratio
- See the description of problem types at the end of the grade notes

Grade 6:

Checking solutions

Learners should know that they can

- **check an addition calculation by subtraction.**

Example: If 45 362 + 32 488 = 77 848; then 77 848 – 32 488 = 45 362

- **check a subtraction calculation by addition**

Example: If 54 687 – 32 134 = 22 544, then 22 544 + 32 134 = 54 687

Using the inverse operation to check solutions is one reason for teaching addition and subtraction simultaneously.

Another reason for doing the two operations at the same time is that when learners solve problems, it is sometimes possible to solve the same problem by doing either addition or subtraction.

Example: Veli's shopping costs R163. He pays with a R200 note. How much change does he get?

Some learners may add on from R163 to get R200 as follows:

$$R163 + R7 = R170, \text{ then } R170 + R30 = R200.$$

Veli gets R37 change.

Example:
Calculate: 56 423 + 7 581 + 21 479

- **Column method for adding**
By Grade 6 learners should have had enough experience with breaking up numbers to add and subtract them. The horizontal



method of expanding numbers before adding them can get unwieldy when more than two 5-digit numbers are added. Term 1 learners can revisit the expanded vertical method, and then move on to the traditional column method

- **Expanded vertical column method to add**

$$\begin{array}{r} 56\ 423 = & 50\ 000 & + & 6\ 000 & + & 400 & + & 20 & + & 3 \\ +7\ 581 = & & 7\ 000 & + & 500 & + & 80 & + & 1 \\ +21\ 479 = & \underline{20\ 000} & + & \underline{1\ 000} & + & \underline{400} & + & \underline{70} & + & \underline{9} \\ \text{Total} = & \underline{70\ 000} & + & \underline{14\ 000} & + & \underline{1\ 300} & + & \underline{170} & + & \underline{13} \end{array}$$

This can be written as $70\ 000 + 10\ 000 + 5\ 000 + 400 + 80 + 3 = 85\ 483$

- **The vertical column method to add.**

$$\begin{array}{r} 1\ 1\ 1\ 1 \\ 56\ 423 \\ + 21\ 479 \\ + 7581 \\ \hline 85483 \end{array}$$

- **Expanded vertical column method to subtract**
Example: Calculate: $98\ 743 - 45\ 684$

$$\begin{array}{r} 98\ 743 = & 90\ 000 & + & 8\ 000 & + & 600 & + & 130 & + & 40 & + & 3 \\ - 45\ 684 = & 40\ 000 & + & 5\ 000 & + & 3\ 000 & + & 0 & + & 80 & + & 4 \\ \text{Total} = & 50\ 000 & + & & & & & & & & & & 9 \end{array}$$

Therefore $50\ 000 + 3\ 000 + 0 + 50 + 9 = 53\ 059$

- **The vertical column method to subtract**

$$\begin{array}{r} 6\ 13\ 13 \\ 98\ 743 \\ - 45684 \\ \hline 53\ 059 \end{array}$$

Problems

- Summation, increase and decrease, comparison by difference; comparison by ratio
- See the description of problem types at the end of the Grade 6 notes

	<p>Working with calculators</p> <ul style="list-style-type: none"> The mental mathematics programme contains work on number concept, number facts and mental calculation techniques. Daily work on mental Mathematics combined with daily written calculations will prevent learners from becoming dependent on calculators and not knowing how to calculate without them. Calculators are a useful way for learners to explore number patterns and when working with very large numbers. 																						
LTS M																							
Resources	Number lines: Structured - , semi- structured - , unstructured number lines; Counters, Pictures, arrays/ diagrams, Flash cards, Base 10 blocks, 100 charts,																						
Workbook reference	<table border="1"> <thead> <tr> <th>Grade 4</th> <th>Grade 5</th> <th>Grade 6</th> </tr> </thead> <tbody> <tr> <td> WB 1: pp. 26 – 38 Activities: 9, 10a&b; 12 </td> <td> WB 1: pp 30 – 32 Activities: 10a&b </td> <td> WB 1: pp. 14 - 24 Activities: 8a&b </td> </tr> <tr> <td> pp. 92 – 96 Activities: 32a&b; 33 </td> <td> pp 90 – 96 Activities: 29a&b, 30a&b </td> <td> Term 1: Unit 3: Whole Numbers: Addition and subtraction, p. 25 </td> </tr> <tr> <td>DBE Textbook reference</td> <td>Term 2: Unit 2: Whole Numbers: Addition and subtraction, p. 128</td> <td>Term 1: Unit 3: Whole Numbers: Addition and subtraction, p. 121</td> </tr> <tr> <td>HOMEWORK</td> <td></td> <td></td> </tr> <tr> <td>ASSESSMENT</td> <td></td> <td></td> </tr> <tr> <td>E.g. Informal assessment – Test</td> <td></td> <td></td> </tr> </tbody> </table>	Grade 4	Grade 5	Grade 6	WB 1: pp. 26 – 38 Activities: 9, 10a&b; 12	WB 1: pp 30 – 32 Activities: 10a&b	WB 1: pp. 14 - 24 Activities: 8a&b	pp. 92 – 96 Activities: 32a&b; 33	pp 90 – 96 Activities: 29a&b, 30a&b	Term 1: Unit 3: Whole Numbers: Addition and subtraction, p. 25	DBE Textbook reference	Term 2: Unit 2: Whole Numbers: Addition and subtraction, p. 128	Term 1: Unit 3: Whole Numbers: Addition and subtraction, p. 121	HOMEWORK			ASSESSMENT			E.g. Informal assessment – Test			
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HOMEWORK																							
ASSESSMENT																							
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MATHEMATICS INTERMEDIATE PHASE

MULTI GRADE LESSON PLAN 3

EDUCATOR:
TERM: 2

GRADE	DATE: from to	Time: 3 HOURS		
TOPIC	Number range for calculations	5 Multiplication of Whole Numbers CAPS pp. 166	6 Multiplication of at least whole 4-digit numbers CAPS pp. 240	6 Multiplication of at least whole 4-digit numbers CAPS pp. 240
Concepts, Skills and knowledge	<ul style="list-style-type: none">Multiplication of at least whole 2-digit by 2-digit numbers	<p>Number range for calculations</p> <p>Multiplication of at least whole 3-digit by 2-digit numbers</p>	<p>Number range for calculations</p> <p>Multiplication of at least whole 4-digit numbers with or without brackets</p>	<p>Number range for calculations</p> <ul style="list-style-type: none">Multiplication of at least whole 4-digit numbersMultiple operations on whole numbers with or without brackets

	<p>Number range for multiples and factors</p> <ul style="list-style-type: none"> Multiples of 1-digit numbers to at least 100 <p>Properties of whole numbers</p> <ul style="list-style-type: none"> Recognize and use the commutative; associative; and distributive properties of whole numbers <p>Solving problems</p> <ul style="list-style-type: none"> Solve problems in contexts involving whole numbers, including financial contexts 	<p>Number range for multiples and factors</p> <ul style="list-style-type: none"> Multiples of 2-digits whole numbers to at least 100 Factors of 2-digit whole numbers to at least 100 <p>Properties of whole numbers</p> <ul style="list-style-type: none"> Recognize and use the commutative; associative and distributive properties with whole numbers 0 in terms of its additive property 1 in terms of its multiplicative property <p>Solving problems</p> <ul style="list-style-type: none"> Solve problems involving whole numbers, including financial contexts Solve problems involving whole numbers, including comparing two or more quantities of the same kind (ratio) Solve problems involving whole numbers, including <ul style="list-style-type: none"> comparing two or more quantities of the same kind (ratio) comparing two quantities of different kinds (rate) 	<p>Number range for multiples and factors</p> <ul style="list-style-type: none"> Multiples of 2-digit and 3-digit numbers Factors of 2-digit and 3-digit whole numbers Prime factors of numbers to at least 100 <p>Properties of whole numbers</p> <ul style="list-style-type: none"> Recognize and use the commutative; associative; distributive properties of whole numbers 0 in terms of its additive property 1 in terms of its multiplicative property <p>Solving problems</p> <ul style="list-style-type: none"> Solve problems involving whole numbers and decimal fractions, including <ul style="list-style-type: none"> - financial contexts - measurement contexts Solve problems involving whole numbers, including comparing two or more quantities of the same kind (ratio) Solve problems involving whole numbers, including <ul style="list-style-type: none"> comparing two or more quantities of the same kind (ratio) comparing two quantities of different kinds (rate)
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LTSM Resources	Number lines: 0 – 120, Structured - , semi- structured - , unstructured number lines; Counters, Pictures, arrays/ diagrams, Flash cards, Base 10 blocks, 100 charts, multiplication table		
Grade 4	Grade 5	Grade 6	
Workbook reference	<p>WB 1: pp. 126 – 128 Activities: 46,47</p> <p>p. 162 Activities: 64</p>	<p>WB 1: pp. 50 – 52 Activities: 17a&b</p> <p>pp. 140 Activity: 49</p>	<p>WB 1: pp. 88 - 92 Activities: 30; 31; 32;</p> <p>p. 126 Activities: 47</p>
DBE Textbook reference	Term 2: Unit 5: Whole Numbers: Multiplication, p. 161	Term 2: Unit 2: Whole Numbers: Multiplication, p. 157	Term 2: Unit 2: Whole Numbers: Multiplication, p. 125
HOMEWORK			
ASSESSMENT	E.g. Informal assessment – Test		



MATHEMATICS INTERMEDIATE PHASE
MULTI GRADE LESSON PLAN 4
TERM: 2

EDUCATOR:

DATE: from to	GRADE	TOPIC	Time: 3 HOURS
		Number range for calculations <ul style="list-style-type: none"> Division of at least whole 3-digit by 1-digit numbers. Calculation techniques <ul style="list-style-type: none"> Use a range of techniques to perform and check written and mental calculations of whole numbers including <ul style="list-style-type: none"> - estimation - building up and breaking down numbers - rounding off and compensating - doubling and halving - using multiplication and division as inverse operations 	6 CAPS pp. 84 - 85 5 CAPS pp. 172 - 173 Division of Whole Numbers Number range for calculations Division of at least whole 3-digit by 2-digit numbers
		Number range for calculations <ul style="list-style-type: none"> Division of at least whole 4-digit by 3-digit numbers multiple operations on whole numbers with or without brackets Calculation techniques <ul style="list-style-type: none"> Use a range of techniques to perform and check written and mental calculations with whole numbers including <ul style="list-style-type: none"> - estimation - building up and breaking down numbers - rounding off and compensating - using multiplication and division as inverse operations Number range for counting, ordering and representing, and place value of digits <ul style="list-style-type: none"> Recognize the place value of digits in whole numbers to at least 6-digit numbers. Round off to the nearest 10, 100, 1 000 Number range for multiples and factors <ul style="list-style-type: none"> Multiples of 1-digit numbers to at least 100 	6 CAPS pp. 250 - 251 Number range for calculations <ul style="list-style-type: none"> Division of at least whole 4-digit by 3-digit numbers multiple operations on whole numbers with or without brackets Calculation techniques <ul style="list-style-type: none"> estimation using the reciprocal relationship between multiplication and division long division building up and breaking down numbers rounding off and compensating using a calculator Number range for counting, ordering and representing, and place value of digits <ul style="list-style-type: none"> Recognize the place value of digits in whole numbers to at least 6-digit numbers. Round off to the nearest 10, 100, 1 000 Number range for multiples and factors <ul style="list-style-type: none"> Multiples of 2-digit and 3-digit



	<ul style="list-style-type: none"> least 100 Factors of 2-digit whole numbers to at least 100 <p>Multiplication facts</p> <ul style="list-style-type: none"> Units by multiples of 10 Units by multiples of 100 	<ul style="list-style-type: none"> Factors of 2-digit and 3-digit whole numbers Prime factors of numbers up to at least 100 <p>Properties of whole numbers</p> <ul style="list-style-type: none"> Recognize and use the commutative; associative; and distributive properties of whole numbers 1 in terms of its multiplicative property 	<ul style="list-style-type: none"> Numbers Factors of 2-digit and 3-digit whole numbers Prime factors of numbers up to at least 100 <p>Properties of whole numbers</p> <ul style="list-style-type: none"> Recognize and use the commutative; associative; and distributive properties of whole numbers 0 in terms of its additive property 1 in terms of its multiplicative property
	<p>Solving problems</p> <ul style="list-style-type: none"> Solve problems in contexts involving whole numbers - financial contexts - measurement contexts Solve problems involving whole numbers, including <ul style="list-style-type: none"> - comparing two or more quantities of the same kind (ratio) - comparing two quantities of different kinds (rate) - grouping and equal sharing with remainders - comparing two or more quantities of the same kind (ratio) - comparing two quantities of different kinds (rate) 	<p>Solving problems</p> <ul style="list-style-type: none"> Solve problems in contexts involving whole numbers, including financial contexts Solve problems involving whole numbers, including <ul style="list-style-type: none"> - comparing two or more quantities of the same kind (ratio) - comparing two or more quantities of different kinds (ratio) - grouping and equal sharing with remainders 	<p>Solving problems</p> <ul style="list-style-type: none"> Solve problems involving whole numbers and decimal fractions, including <ul style="list-style-type: none"> - financial contexts - measurement contexts - Solve problems involving whole numbers, including <ul style="list-style-type: none"> - comparing two or more quantities of the same kind (ratio) - comparing two or more quantities of different kinds (ratio) - grouping and equal sharing with remainders



LTSM	
Resources	Number lines; Structured -, semi- structured -, unstructured number lines; Counters, Pictures, arrays/ diagrams, Flash cards, Base 10 blocks, 100 charts, multiplication table
Grade 4	Grade 5
WB 1: p. 162 Activities 64	WB 1: pp. 140 Activity: 49 pp. 172 - 174 Activities: 63, 64
DBE TEXTBOOK REFERENCE	Term 2: Whole Numbers: Division, p. 200
HOMEWORK	Term 2: Unit 9: Whole Numbers: Division, p. 187
ASSESSMENT	Term 2: Unit 6: Whole Numbers: Division, p. 165
E.g. Informal assessment – Test	



MATHEMATICS INTERMEDIATE PHASE

MULTI GRADE LESSON PLAN 5

EDUCATOR:
TERM: 2

GRADE	TOPIC	DATE: from to	Time: 9 HOURS		
GRADE	TOPIC	DATE: from to	5	6	6
	Concepts, Skills and knowledge	Describing and ordering fractions	<ul style="list-style-type: none">• Describing and ordering fractions<ul style="list-style-type: none">• Count forwards and backwards in fractions• Compare and order common fractions to at least twelfths	Describing and ordering fractions	<ul style="list-style-type: none">• Compare and order common fractions, including specifically tenths and hundredths
			Common Fractions and Decimal Fractions	Calculations with fractions:	Calculations using fractions
				<ul style="list-style-type: none">• Addition of common fractions with the same denominator• Recognize, describe and use the equivalence of division and fractions• Addition of common fractions with same denominators	<ul style="list-style-type: none">• Addition and subtraction of common fractions with denominators which are multiples of each other.• Addition and subtraction of mixed numbers• Fractions of whole numbers
				Solving problems	Solving problems

	<p>Solve problems in contexts involving fractions, including grouping and equal sharing</p> <p>Equivalent forms: Recognize and use equivalent forms of common fractions (denominators which are multiples of each other)</p>	<ul style="list-style-type: none"> Solve problems in contexts involving common fractions, including grouping and sharing <p>Percentages</p> <ul style="list-style-type: none"> Calculate percentages of whole numbers <p>Equivalent forms: Recognize and use equivalent forms of common fractions with denominators which are multiples of each other.</p>
		<p>Equivalent forms: Recognize and use equivalent forms of common fractions with denominators which are multiples of each other.</p> <p>Recognizing, ordering and place value of decimal fractions</p> <ul style="list-style-type: none"> Count forwards and backwards in decimal fractions to at least two decimal places Compare and order decimal fractions to at least two decimal places Place value of digits to at least two decimal places <p>Calculations with decimal fractions</p> <ul style="list-style-type: none"> Addition and subtraction of decimal fractions of at least two decimal places Multiply decimal fractions by 10 and 100

		<p>Solving problems Solve problems in context involving decimal fractions</p>
SUGGESTED METHODOLOGY	<p>All learners can start of with the easier problems. Grade 4 learners are treating the work as new while the Grade 5 and Grade 6 learners can move on to more complex problems as indicated in the CAPS policy document.</p> <p>All grades: Sevenths are new.</p> <p>There are different ways to understand fractions. This means that learners should develop the concept of fractions in a variety of ways. Problem-solving contexts can help learners to understand many ways of thinking about fractions. A variety of problems should be given to learners. See the types of fractions problems stated at the end of the Grade notes. The concept of a fraction should first be developed before learners focus on equivalence and calculating.</p> <p>Learners can also work with apparatus and diagrams. Different diagrams or apparatus develop different ways of thinking about fractions:</p> <ul style="list-style-type: none"> • Region or area models develop the concept of fractions as part of a whole. If used in particular ways they can also develop the concept of a fraction as a measure. Examples of area models include circles cut into fraction pieces or diagrams of pies, rectangles or other geometric shapes divided into fraction pieces (paper folding), fractions using square or dotty grid paper, geoboards • Length or measurement models can be used to develop the concept of fractions as part of a whole and if used in particular ways also fraction as a measure. Examples of length models include fraction strips, Cuisenaire rods, number lines • Set models develop the concept of a fraction of a collection of objects and can lay the basis for thinking about a fraction of a number e.g. $\frac{1}{3}$ of 12. Examples of set models include counters of any kind in different arrangements. <p>Learners should not only work with one kind of model, because this can limit their understanding of fractions. For example, fractions in diagram forms should include region models (circles and other geometric shapes divided into fraction parts), length models (including number lines) and set models (which show collections of objects).</p> <p>In Term 1 learners should revise and consolidate what they learned about fractions in Grade 3.</p> <p>Learners should solve problems as well as work with apparatus and diagrams involving area, length and set models to ensure that they:</p> <ul style="list-style-type: none"> • understand the relationship between fractions and division i.e. if you share amongst 3 learners you will be making thirds • are able to name fractions. Terminology like “3 over 4” should be avoided as it tends to encourage learners to think about each fraction as two different numbers, rather than $\frac{3}{4}$ being a number which is greater than $\frac{1}{2}$ than but less 	

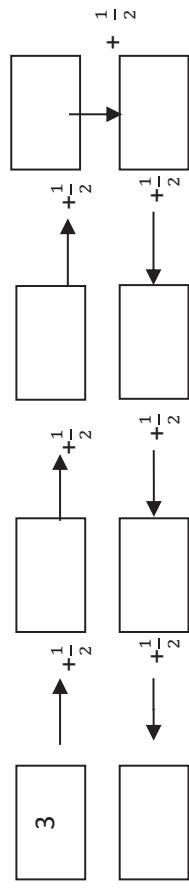


	<p>than 1.</p> <p>When naming fraction parts it is useful for learners to rather use the form “3 quarters”.</p> <p>Learners should, through work with apparatus, diagrams and solving problems, learn the new fractions that they will deal with in Grade 4.</p>
Grade 5 and 6:	<p>What is different to Grade 4?</p> <ul style="list-style-type: none"> • Ninths, tenths, elevenths and twelfths • Learners count in fractions • Subtraction of fractions with the same denominators • Addition and subtraction of mixed numbers • Fractions of whole numbers that result in whole numbers <p>Most of the new work mentioned above can be developed in Terms 3 and 4. However, learners can begin to count in fractions</p> <p>Learners should develop the concept of fractions in a variety of ways. Problem solving contexts can help learners to understand many ways of thinking about fractions. A variety of problems should be given to learners. See the types of fractions problems stated at the end of the grade notes.</p> <p>Learners can also work with apparatus and diagrams. Different diagrams or apparatus develop different ways of thinking about fractions.</p> <ul style="list-style-type: none"> • Region or area models develop the concept of fractions as part of a whole. If used in particular ways they can also develop the concept of fraction as a measure. Examples of area models include circles cut into fraction pieces (or diagrams of pies), rectangles or other geometric shapes divided into fraction pieces (paper folding), fractions using square or dotty grid paper, geoboards. • Length or measurement models can be used to develop the concept of fractions as part of a whole and if used in particular ways also fraction as a measure. Examples of length models include fraction strips, Cuisenaire rods, number lines. • Set models develop the concept of fraction of a collection of objects (and can lay the basis for thinking about a fraction of a number e.g. $\frac{1}{3}$ of 12). Examples of set models include counters of any kind in different arrangements. <p>Learners should not only work with one kind of model, because this can limit their understanding of fractions. For example fractions in diagram forms should include region model (circles and other geometric shapes divided into fraction parts), length models (including number lines) and set models (which show collections of objects).</p> <p>In Term 2 learners should revise and consolidate what they learned about fractions in Grade 4. This is described below, but learners can also count in fractions.</p>



Counting in fractions can happen

- as learners place down fraction pieces
- on the number line
- or in number chains like the one shown below.



Equivalence, comparing and ordering

Equivalence should be approached using apparatus, diagrams or problem contexts. Learners are not expected to be able to give equivalent fractions in symbolic (number) form without having diagrams to which they can refer or a problem context in which to make sense of the equivalence. Once learners are comfortable with equivalence, it is easy for them to compare and order fractions.

Calculations with fractions:

Calculations with fractions in the first term can focus on:

- making fractions through grouping or sharing which is linked with understanding the relationship between division and fractions e.g. If children share sweets equally, they will each get $\frac{1}{5}$ of the sweets
 - adding fractions with the same denominators
- Calculations as with other aspects of fractions should be developed either through problem contexts or with the use of apparatus or diagrams. Learners should be given problem contexts in which they need to add fraction parts. Learners should also be given either fraction pieces to count e.g. $\frac{3}{8} + \frac{4}{8}$ can be done by counting out and counting on in eighths with apparatus or by coloring in diagrams or by “hopping” in eighths on a number line.

Grade 6

It is useful to practice equivalence between the common fraction, decimal fractions and percentage forms of the same number. Decimal fraction is a new topic for Grade 6 learners.

Learners should already have worked with tenths and hundredths in common fraction form. They should start by rewriting and converting tenths and hundredths in common fraction form to decimal fractions. Where denominators of other fractions are factors of 10 e.g. 2, 5 or factors of 100 e.g. 2, 4, 25, 50 learners can convert these to hundredths using what they know about

	<p>equivalence. Dividing whole numbers by 10, 100, 1 000, etc. helps to build learners' understanding of the place value of the digits in decimal fractions. Calculators can be useful tools for learners to learn about patterns when multiplying or dividing decimal fractions by 10, 100, etc.</p> <p>Counting in decimals Learners should not spend a lot of time doing verbal counting in decimals. A more useful exercise is using number chains like the one below. These counting or "adding on" exercises often help learners to increase their understanding of place value.</p> <p>Exercises like the one above can be checked using calculators and learners can explain any differences between their answers and those shown by the calculator.</p>	<p>Equivalence between common fractions and decimal fraction forms</p> <p>Learners are not expected to be able to convert all common fraction into its decimal fraction form, merely to see the relationship between tenths and hundredths in their decimal forms.</p>	<p>Calculating using decimals</p> <p>Learners add and subtract decimal fractions. Learner should estimate their answers before calculating. They should be able to judge the reasonableness of answers and also check their own answers. Understanding place value of digits in decimals will help learners when adding and subtracting. Learners can use the column method as they do with whole numbers. All problem types that are used for whole numbers can be used for decimal fractions.</p> <p>During lessons on measurement, learners can practise what they know about decimals.</p>
LTSM Resources	Number lines: Structured -, semi- structured - , unstructured number lines; Counters, Pictures, arrays/ diagrams, fraction walls, fraction circles, different models of fractions, fraction strips,		
Workbook reference	Grade 4 WB 1 pp. 98 - 108 Activities 34 - 39	Grade 5 WB 1 pp. 104 – 114 Activities 34 - 39	Grade 6 WB 1 pp. 26 – 40, 42, 44 Activities 9a&b; 10a-c; 11-13; 14, 15 pp. 128 – 138 Activities 48, 49; 50a&b; 51a&b
DBE Textbook reference	Term 2: Unit 3: Common Fractions, p. 136	Term 2: Unit 3: Common Fractions, p. 129	Term 1: Unit 4: Common Fractions, p. 55 Term 2: Unit 4: Common Fractions, p. 55 Term 2: Unit 7: Decimals, p. 177
HOMEWORK			
ASSESSMENT	E.g. Informal assessment – Test		





MATHEMATICS INTERMEDIATE PHASE**MULTI GRADE LESSON PLAN 6****TERM 2**

EDUCATOR:

DATE: fromto	Time: 2 HOURS		
GRADE	4 CAPS p. 119	5 CAPS p. 208	6 CAPS p. 249
TOPIC	Symmetry		
Concepts, Skills and knowledge	Symmetry <ul style="list-style-type: none"> Recognize, draw and describe line(s) of symmetry in 2-D shapes. 		
SUGGESTED METHODOLOGY	Grade 4 – 6	<ul style="list-style-type: none"> Recognize, draw and describe line(s) of symmetry in 2-D shapes. Recognize, draw and describe line(s) of symmetry in 2-D shapes. 	Symmetry <ul style="list-style-type: none"> Recognize, draw and describe line(s) of symmetry in 2-D shapes. Recognize, draw and describe line(s) of symmetry in 2-D shapes.
LTSM	<p>This should include shapes in which there is more than one line of symmetry. Drawings of 2-D shapes should include those where the line of symmetry is not necessarily vertical.</p>		
Resources	Variety of 2D shapes/ 3D objects, charts with letters, symbols		
Grade 4	Grade 5		
Workbook reference	WB 1 pp. 140 – 142 Activities 52,54	WB 1 pp 158 – 160 Activities 58a&b	WB 1 pp. 104 – 106 Activities 38, 39
DBE Textbook reference	Term 2: Unit 8: Symmetry, p. 189	Term 2: Unit 8: Symmetry, p. 181	Term 2: Unit 5: Symmetry, p. 161
HOMEWORK			
ASSESSMENT			
E.g. Informal assessment – Test			

**MATHEMATICS INTERMEDIATE PHASE****MULTI GRADE LESSON PLAN 7****TERM: 2****EDUCATOR:**

DATE: from to		Time: 5 HOURS		
GRADE	TOPIC	CAPS pp. 73 - 75	CAPS pp. 163 - 165	CAPS pp. 272 - 274
	Concepts, Skills and knowledge Practical measuring of 2-d shapes and 3-d objects by: <ul style="list-style-type: none">• estimating• measuring• recording• comparing and ordering Measuring instruments rulers, metre sticks, tape measures, trundle wheels Units: millimetres (<i>mm</i>), centimetres (<i>cm</i>), metres (<i>m</i>), kilometres (<i>km</i>) Calculations and problem-solving related to length Solve problems in contexts related to length Conversions include converting between any of the following	4 Practical measuring of 2-d shapes and 3-d objects by: <ul style="list-style-type: none">• estimating• measuring• recording• comparing and ordering Measuring instruments rulers, metre sticks, tape measures, trundle wheels Units: millimetres (<i>mm</i>), centimetres (<i>cm</i>), metres (<i>m</i>), kilometres (<i>km</i>) Calculations and problem-solving related to length Solve problems in context related to length Conversions include converting between any of the following	5 Practical measuring of 2-d shapes and 3-d objects by: <ul style="list-style-type: none">• estimating• measuring• recording• comparing and ordering Measuring instruments rulers, metre sticks, tape measures, trundle wheels Units: millimetres (<i>mm</i>), centimetres (<i>cm</i>), metres (<i>m</i>), kilometres (<i>km</i>) Calculations and problem-solving related to length Solve problems in contexts related to length Conversions include converting between any of the following	6 Practical measuring of 2-d shapes and 3-d objects by: <ul style="list-style-type: none">• estimating• measuring• recording• comparing and ordering Measuring instruments rulers, metre sticks, tape measures, trundle wheels Units: millimetres (<i>mm</i>), centimetres (<i>cm</i>), metres (<i>m</i>), kilometres (<i>km</i>) Calculations and problem-solving related to length Solve problems in contexts related to length Conversions include converting between any of the following

<ul style="list-style-type: none"> • millimetres (<i>mm</i>), and centimetres (<i>cm</i>) • centimetres (<i>cm</i>) and metres (<i>m</i>) • metres (<i>m</i>) and kilometres (<i>km</i>) <p>Conversions are limited to whole numbers and fractions</p>	<ul style="list-style-type: none"> units: • millimetres (<i>mm</i>), centimetres (<i>cm</i>), metres (<i>m</i>) and kilometres (<i>km</i>) <p>Conversions limited to whole numbers and fractions</p>	<ul style="list-style-type: none"> • millimetres (<i>mm</i>), centimetres (<i>cm</i>), metres (<i>m</i>) and kilometres (<i>km</i>) <p>Conversions should include fraction and decimal forms (to 2 decimal places)</p>
SUGGESTED METHODOLOGY	<p>All learners can start off with the easier problems. Grade 4 learners are treating the work as new while the Grade 5 and Grade 6 learners can move on to more complex problems as indicated in the CAPS policy document.</p>	<p>All grades: In Grade 3 learners work with non-standard or informal units when measuring. They are introduced to metres and centimetres. They use rulers to measure in centimetres only. In Grade 3 learners use metre sticks or lengths of string to measure in metres. They do not learn that there are 100 cm in 1 m. They do not do conversions between units. In Grade 4 learners work with new measuring instruments. Millimetres and kilometres are introduced and learners do conversions between units. Grade 4 learners need to understand and learn the relationship between metres and centimetres, centimetres and millimetres, metres and kilometres.</p>

Reading instruments for measuring lengths

Learners should measure lengths using

- rulers (*mm*, *cm*)
- metre sticks (*m*)
- tape measures (*m*, *cm*, *mm*)
- trundle wheels (*m*)

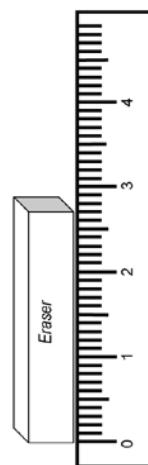
Learners find rulers easy to use for measuring because:

- centimetres are always numbered
- there are always 10mm divisions in a centimetre

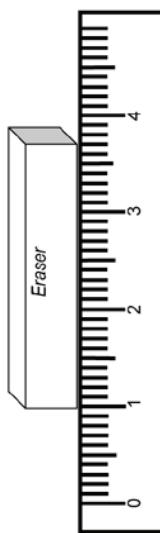
In Grade 4 learners normally record their measurements with rulers as millimetres or centimetres or millimetres and centimetres e.g. the pencil is 11 centimetres and 3 millimetres long.

Learners can sometimes record their measurements in centimetres and fractions of centimeters e.g. the eraser is $2 \frac{1}{2}$ cm long. This is easy to do because on a ruler, the 5th millimetre gradation line is normally longer. Once learners have learned, from reading commercial mass and capacity packaging, that is the same as 2,5, they will also be able to use the decimal 5 in their recording i.e. 2,5 cm long.

Check that learners know to start measuring from zero, or to subtract the initial measurement from the final measurement. This is illustrated below.

Example:

The eraser is 2 cm + 7 mm or 20 mm + 7 mm or 27 mm long



The eraser is $(3\text{cm} - 1\text{cm}) + 7\text{mm} = 2\text{cm} + 7\text{mm}$ or $20\text{mm} + 7\text{mm}$ or 27mm long

Once learners have some experience of measuring in each unit, they should estimate before every measurement. It is useful to have everyday referents as comparisons e.g. the width of a door and height of a window are often 1 m, the width of a match is often 1 mm.

Tape measures that are longer than 1 m and 2 m should also be used e.g. builder tapes or surveyor tapes can be more than 10 metres. The longer measuring tapes are more difficult to use. Learners cannot only read off the number corresponding with the final measurement. They also need to know for how many metres they have unrolled the tape, e.g. the distance may be 4 m and 78 cm, but the tape may only show the number 78. When using the longer measuring tapes, estimation becomes even more important.

Compare and order lengths up to 4 digits in mm, cm, m, km

In Grades R to 2 learners place objects next to each other and discuss which is longer or shorter. In the Intermediate Phase learners need to compare lengths and heights when given drawings of objects with specified lengths, or written descriptions of objects with specified lengths. At first learners can compare length given in the same units, but once they know how to convert between units, they can compare lengths and heights of objects which are specified in different units.

Calculations (including conversions) and problem –solving

Measurement provides a context in which to practise skills acquired in Numbers, Operations and Relationships. The skills, operations and number ranges that learners have worked with so far in the year, are given below:

Estimate and calculate using mm, cm, m, km

- rounding numbers up or down to the appropriate unit of length
- rounding off to 10, 100, 1 000
- addition and subtraction of up to 4-digit numbers
- multiplication of 2-digit by 1-digit numbers
- division of 2-digit by 1-digit numbers
- add fractions in measurement contexts (using only halves, thirds, quarters, fifths, sixths, sevenths and eighths)

By the end of the year the number ranges and operations can be increased to include everything that is covered under *Numbers, Operations and Relationships*.

Solve problems relating to distance and length

Include rate and ratio problems

Conversions between units: $mm \leftrightarrow cm; cm \leftrightarrow m; m \leftrightarrow km$

Converting between the units of measurement above provides a context for practising multiplying and dividing by 10; 100 and 1 000.

Conversions should be limited to whole numbers and fractions given only as halves, thirds, quarters, fifths, sixths, sevenths, eighths.

In Grade 4 learners do not calculate using decimals. When doing division they sometimes have a remainder e.g. $37 \div 4 = 9$ remainder 1. Similarly when converting between units, they may give their answers in a combination of units e.g.

- $35mm = 3cm$ and $5mm$ or $3\frac{1}{2}cm$
- $526cm = 5m$ and $26cm$
- $2\ 500m = 2m$ and $500cm$
- $4\frac{1}{2}km = 4\ 500m$

Grade 5 and 6:

In Grade 5 learners work with the same units of length that they worked with in Grade 4. They also work with the same measuring instruments. Check whether learners have a sense of which units and instruments are appropriate for measuring various lengths, heights and distances

Learners should have a sense of which units are appropriate for measuring different lengths. For example, they need to know which units to use to state

- the length and width of a desk
- the distance to the next town
- the length of a nail

Learners should have a sense of which instruments are appropriate for measuring different lengths. For example, they need to know which instruments to use to measure:

- the length and width of a desk
- the length of the classroom
- the length of a rugby field

Reading instruments for measuring lengths

Learners should measure lengths using

- rulers (mm , cm)
- metre sticks (m)
- tape measures (m , cm , mm)
- trundle wheels (m)



Learners find rulers easy to use for measuring. This is because

- centimetres are always numbered
- there are always 10mm divisions in a centimetre.

Stating and recording length measurements

In Grade 5 learners continue to record their measurements using rulers, as millimetres or centimetres or millimetres and centimetres e.g. the pencil is 11 centimetres and 3 millimetres long. They can sometimes record their measurements in centimetres and fractions of centimetres e.g. the eraser is $2\frac{1}{2}$ cm long. This is easy to do because on a ruler, the 5th millimetre graduation line is normally longer. Once learners have learned, from reading commercial mass and capacity packaging, that $2\frac{1}{2}$ is the same as 2,5 , they will also be able to use the decimal '5' in their recording i.e. 2,5cm long.

Tape measures that are longer than 1m and 2m should also be used e.g. builder tapes or surveyor tapes can be more than 10 metres. The longer measuring tapes are more difficult to use. Learners cannot only read off the number corresponding with the final measurement. They also need to know for how many metres they have unrolled the tape, e.g. the distance may be 4m and 78cm, but the tape may only show the number 78. When using the longer longer measuring tapes, estimation becomes even more important.

Compare and order lengths up to 6 digits in mm, cm, m, km

In the Intermediate Phase learners need to work with drawings of objects with specified lengths, or written descriptions of objects with specified lengths. At first learners can compare length given in the same units, but once they know how to convert between units, they can compare lengths and heights of objects which are specified in different units



Calculations (including conversions) and problem-solving

Measurement provides a context in which to practise skills acquired in Numbers, Operations and Relationships. The skills, operations and number ranges required are given below.

Estimate and calculate using

- Round numbers up or down to the appropriate unit of length
- Rounding off to 5, 10, 100 and 1 000
- Addition and subtraction up to 5-digit numbers
- Multiplication: 3-digit number by 2-digit number
- Division: 3-digit number by 2-digit number
- Add common fractions in the context of measurement (using only halves, thirds, quarters, fifths, sixths, sevenths and eighths)

By the end of the year the number ranges and operations can be increased to include everything that is covered under *Numbers, Operations and Relationships*.

Solve problems relating to distance and length including rate and ratio problems.

Conversions between units: $mm \leftrightarrow cm$; $cm \leftrightarrow m$; $m \leftrightarrow km$

Converting between the units of measurement above provides a context for practising multiplication and division by 10, 100, 1 000

Conversions should be limited to whole numbers and fractions given only as halves / thirds / quarters / fifths / sixths / sevenths / eighths.

	<p>In Grade 5 learners do not calculate using decimals. When doing division there will sometimes be a remainder in the answer, e.g. $37 \div 4 = 9$ remainder 1. Similarly when converting between units, answers may be stated in a combination of units e.g.</p> <ul style="list-style-type: none"> • $35\text{cm} = 3\text{cm}$ and 5mm or $3\frac{1}{2}\text{ cm}$ • $526\text{cm} = 5\text{m}$ and 26cm • $2\ 500\text{m} = 2\text{m}$ and 500cm • $4\frac{1}{2}\text{ km} = 4\ 500\text{m}$
	<p>Grade 6: Decimals are introduced.</p> <p>This allows learners to express conversions and parts of measures in decimal fraction form to one or two decimal places. Use the contexts of length measurement to practise the reading, writing and understanding of decimal fractions, and for rounding off, converting, adding and subtracting with decimal fractions.</p> <p>Reading instruments for measuring lengths</p> <p>Learners should measure lengths using</p> <ul style="list-style-type: none"> • rulers (mm, cm) • metre sticks (m) • tape measures (m, cm, mm) • trundle wheels (in m) <p>Learners find rulers easy to use for measuring because</p> <ul style="list-style-type: none"> • centimetres are always numbered • there are always 10mm divisions in a centimetre •

	<p>Stating and recording length measurements</p> <p>In Grade 6 learners should be given opportunities to record their measurements using rulers, in decimal fraction from e.g e.g. the eraser is 2,5cm long.</p> <p>Tape measures that are longer than 1m and 2m should also be used e.g. builder tapes or surveyor tapes can be more than 10 metres. The longer measuring tapes are more difficult to use. Learners can't only read off the number at the end of the distance. They also need to know how many metres they have unrolled the tape. For example, the distance may be 4m and 78cm, but at the end of the object / distance the tape may only show the number 78. With these longer tape measures estimation becomes even more important. Recording this in one unit of measurement can also become more complex: in this example 4,78m or 478cm. But if the measurement is 4m and 7cm, learners need to remember to convert correctly into 4,07m or 407cm</p>
	<p>Compare and order lengths up to 9 digits in mm, cm, m, km</p> <p>In the Intermediate Phase learners need to work with drawings of objects with specified lengths, or written descriptions of objects with specified lengths. In Grade 6 the focus is on comparing lengths given in decimal form</p> <p>Calculations (including conversions) and problem-solving</p> <p>Measurement provides a context in which to practise skills acquired in Numbers, Operations and Relationships. The skills, operations and number ranges required are given below.</p> <p>Estimate and calculate using mm, cm, m, km</p> <ul style="list-style-type: none"> • round numbers up or down to the appropriate unit of length • rounding off to 5, 10, 100, 1 000 (reading measurements from rulers and tape measures can help learners to understand the meaning behind rounding up or down)

	<ul style="list-style-type: none"> addition and subtraction calculations can include calculations with common fractions and decimal fractions to 2 decimal places <ul style="list-style-type: none"> multiplication of 4-digit by 3-digit numbers division of 4-digit by 3-digit numbers find percentages of whole numbers multiple operations with or without brackets 								
	<p>Solve problems relating to distance and length</p> <ul style="list-style-type: none"> Include rate and ratio problems. Problems with decimals should be limited to adding and subtracting the numbers. <p>Conversions between units</p> <ul style="list-style-type: none"> $mm \leftrightarrow cm$ $cm \leftrightarrow m$ $m \leftrightarrow km$ $mm \leftrightarrow m$ $mm \leftrightarrow km$ $cm \leftrightarrow km$, <p>using whole numbers, common fractions and decimal fractions. This provides a context for learners to practise multiplying and dividing by 10, 100 and 1 000.</p> <p>If conversions require more than 2 decimal places e.g. 3 245m converted to kilometres, learners can continue to write this as 3km and 245m as they have in previous grades. On the whole though examples should be chosen to avoid this problem.</p>								
LTS M	<table border="1"> <tr> <td>Resources</td> <td>Measuring tape, rulers, string, trundle wheel</td> </tr> <tr> <td></td> <td>Grade 4</td> </tr> <tr> <td></td> <td>Grade 5</td> </tr> <tr> <td></td> <td>Grade 6</td> </tr> </table>	Resources	Measuring tape, rulers, string, trundle wheel		Grade 4		Grade 5		Grade 6
Resources	Measuring tape, rulers, string, trundle wheel								
	Grade 4								
	Grade 5								
	Grade 6								

Worbook reference	WB 1 pp. 110 – 114 Activities 40; 41; 42	WB 1 pp. 116 – 126 Activities 40; 41a&b; 42a&b; 43	WB 1 pp. 96 – 106 Activities 100a&b; 101 - 104
DBE Textbook reference	Term 2: Unit 4: Length, p. 147	Term 2: Unit 4: Length, p. 143	Term 3: Unit 11: Length, p. 285
HOMEWORK			
ASSESSMENT	E.g. Informal assessment – test		



MATHEMATICS INTERMEDIATE PHASE

MULTI GRADE LESSON PLAN 8

EDUCATOR:
TERM: 2

DATE: from to		Time: 5 HOURS		
GRADE	TOPIC	4 CAPS pp. 108 - 110	5 CAPS pp. 178 - 180 Mass	6 CAPS pp. 259 - 261
Concepts, Skills and knowledge	<p>Practical measuring of 3-D objects by</p> <ul style="list-style-type: none">estimatingmeasuring, recordingcomparing and ordering3-D objects using mass <p>Measuring instruments</p> <p>bathroom scales, kitchen scales and balances</p> <p>Units</p> <p>grams (g) and kilograms (kg);</p> <p>Calculations and problem-solving with mass include</p> <p>Solve problems in contexts with mass converting between grams and kilograms limited to examples with whole numbers and fractions</p>	<p>Practical measuring of 3-D objects by</p> <ul style="list-style-type: none">estimatingmeasuring, recordingcomparing and ordering <p>Measuring instruments</p> <p>bathroom scales, kitchen scales and balances</p> <p>Units</p> <p>grams (g) and kilograms (kg);</p> <p>Calculations and problem-solving related to mass include</p> <p>Solve problems in contexts related to mass converting between grams and kilograms limited to examples with whole numbers and fraction and decimal forms (to 2 decimal places).</p>	<p>Practical measuring of 3-D objects by</p> <ul style="list-style-type: none">estimatingmeasuring, recordingcomparing and ordering <p>Measuring instruments</p> <p>bathroom scales (analogue and digital), kitchen scales (analogue and digital) and balances</p> <p>Units</p> <p>grams (g) and kilograms (kg)</p> <p>Calculations and problem-solving related to mass include</p> <p>Solve problems in context using mass converting between grams and kilograms conversions should include fraction and decimal forms (to 2 decimal places).</p>	

SUGGESTED METHODOLOGY	<p>All learners can start off with the easier problems. Grade 4 learners are treating the work as new while the Grade 5 and Grade 6 learners can move on to more complex problems as indicated in the CAPS policy document.</p> <p>All grades:</p> <p>In Grade 3 learners work with non-standard or informal units when measuring mass. They also work with kilograms and grams. They read bathroom scales but only read the mass at the numbered calibration lines. They do not learn that there are 1 000g in 1kg. They do not convert between units. The Grade 4 learners must learn the relationship between the two units.</p> <p>Grade 4 learners need to:</p> <ul style="list-style-type: none"> • consolidate their sense of how much 1kg is • further develop a sense of how much 1g is • understand and know the relationship between grams and kilogram • convert between grams and kilograms • read measurements on scales indicated on both numbered and unnumbered calibration lines. <p>Reading instruments and measuring mass</p> <p>Learners need to:</p> <ul style="list-style-type: none"> • estimate mass in grams and kilograms • read the masses stipulated on packaging • read the mass on pictures of kitchen scales (in g & kg) and bathroom scales (in kg) and balance scales (in g & kg) • read the mass on real kitchen scales in (g & kg) and bathroom scales (in kg) and balance scales (in g & kg). <p>Reading the mass on kitchen and bathroom scales involves:</p> <ul style="list-style-type: none"> • knowing where to stand to read the scale correctly • knowing how to read the numbered gradation lines and to calculate what the un-numbered gradation lines mean. <p>Learners need to read:</p> <ul style="list-style-type: none"> ◊ different kinds of mass meters ◊ mass meters on which the numbered intervals/ gradation lines / calibration represent different intervals /masses ◊ apparatus which have different numbers of un-numbered intervals within each numbered interval.
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Learners need to practice with examples in which the numbered intervals are divided into:

- 2 un-numbered intervals
- 4 un-numbered intervals
- 5 un-numbered intervals
- 10 un-numbered intervals

Example:

Here the numbered lines show 100g intervals: 100g, 200g, 300g, 400g, 500g, 600g, 700g, 800g, 900g, 1 000g



It is sometimes useful to convert the circular dial into a number line for learners



There are 10 spaces between each 100g.

Each 100g interval has been divided into 10 smaller spaces.

This means that each un-numbered interval shows $100g \div 10 = 10g$

	<p>Compare masses with up to 4 digits in grams and kilograms</p> <p>Learners should sequence containers marked in grams and/kilograms. Here learners need to be able to translate the decimal numbers on some packaging into fractions e.g. 2.5kg of flour is the same as $2\frac{1}{2}\text{kg}$ of flour. One should also choose examples that allow learners to realize that the size of a container or the volume it contains is not directly proportional to the mass: some substances have a greater density than others.</p> <p>Calculations (including conversions) and problem-solving</p> <p>Measurement provides a context in which to practice skills acquired in Numbers, Operations and Relationships. The skills, operations and number ranges required are given below.</p>	<p>Calculate and estimate (using grams and kilograms)</p> <ul style="list-style-type: none"> • round numbers up or down to the appropriate unit of mass • rounding to 10, 100, 1 000 • addition and subtraction of up to 4-digit numbers • multiplication 2-digit by 2-digit numbers • division: 3-digit by 1-digit numbers • add fractions in context (using only halves, thirds, quarters, fifths, sixths, sevenths and eighths) <p>Solve problems relating to mass:</p> <ul style="list-style-type: none"> • include rate especially rands per kilograms and ratio problems e.g. increasing or decreasing the mass of ingredients in a recipe by a set ratio • write number sentences to describe problems <p>Convert between units: $\text{g} \leftrightarrow \text{kg}$</p> <p>Converting between the units of measurement above provides a context for practising multiplying and dividing by 1 000.</p>	<p>Conversions should be limited to whole numbers and fractions given only as halves / thirds / quarters / fifths / sixths / sevenths / eighths. Conversions can also include converting the decimal half to the common fraction form of half.</p> <p>When learners do division in Grade 4 the answers may have remainders e.g. $115 \div 25 = 4$ remainder 15. Similarly when converting grams to kilograms, learners may get part of the answer in kilograms and state the remaining part in grams e.g. $4250\text{g} = 4\text{kg}$ and 250g</p>
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Recording masses

Because learners will only work with decimal fractions in Grade 6, they should record masses in:

- kilograms only e.g. 5kg
- grams only e.g. 250g

Since learners will be reading half kilograms in decimal form on some packaging, they can also write half kilograms in the decimal form. However this is not a requirement in this grade.

Grade 5:

Let the Grade 4, 5 and 6 learners do the same work with the differences as indicated below.

Reading instruments and measuring mass

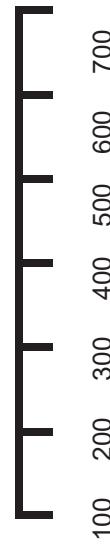
Learners need to:

- estimate mass in grams and kilograms, including being able to match objects to the appropriate unit of measurement before measuring them.
- choose, with reasons, the most appropriate scale to use for particular objects from a range of scales provided

Example

Here the numbered lines show 100g intervals: 100g; 200g; 300g; 400g; 500g; 600g; 700g;

It is sometimes useful to convert a circular dial into a number line for learners



There are 10 spaces between each 100g.

Each 100g interval has been divided into 10 smaller spaces.

This means that each un-numbered interval shows $100\text{g} \div 10 = 10\text{g}$

Compare masses with up to 6-digits in grams and kilograms.



	<p>Grade 6:</p> <p>It makes sense to let learners work with digital scales, particularly ones that give readings up to one or two decimal places.</p> <p>Problems, calculations and conversions around mass provide a context for practising calculating with decimal fractions. Supermarkets with electronic scales often print the mass labels including decimal places e.g. 2,25kg potatoes. These contexts can be used to practise the reading, writing and understanding of decimal fractions, and for rounding off, converting, adding and subtracting decimal fractions.</p> <p>In Grade 6 learners work with the same units of mass they worked with in Grades 4 and 5. They also work with the same measuring instruments.</p>	<p>Learners need to:</p> <ul style="list-style-type: none"> • consolidate their sense of how much is 1kg • consolidate their sense of how much is 1g • to understand and know the relationship between kilograms and grams. <p>Learners should have a sense of which units are appropriate for measuring which different masses. For example, they need to know which units to use to state the mass of:</p> <ul style="list-style-type: none"> • a cow • a baby • flour for baking a cake • their own mass 	<p>Reading scales and balances</p> <p>Learners need to:</p> <ul style="list-style-type: none"> • estimate mass in grams and kilograms • read kitchen scales (grams and kilograms) bathroom scales (kilograms) and balances scales (grams and kilograms) <p>This includes reading the mass on:</p> <ul style="list-style-type: none"> • real digital scales • pictures of decimal scales • real analogue scales • pictures of analogue scales
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The skills involved in reading analogue scales include:

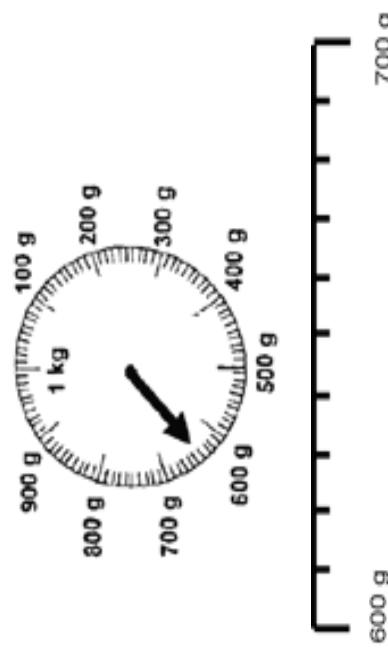
- knowing where to stand to read the scales correctly
- Knowing how to read the numbered gradation lines and to calculate what the un-numbered gradation lines indicate.

Learners need to read:

- different kinds of measuring apparatus
- apparatus in which the numbered intervals, gradation lines or calibration represent different intervals
- Apparatus in which there are a different number of un-numbered intervals within each numbered interval. Learners need practice with examples in which the numbered intervals are divided into:

- 2 un-numbered intervals
- 4 un-numbered intervals
- 5 un-numbered intervals
- 10 un-numbered intervals

Example:



Here the numbered lines show 100 g intervals: 100g; 200g; 300g; 400g; 500g; 600g; 700g.

It is sometimes useful to convert the **circular dial** into a **number line**

There are 10 spaces between each 100g. Each 100g interval has been divided into 10 smaller spaces. This means that each un-numbered interval shows $100\text{g} \div 10 = 10\text{g}$

Compare, order, sequence masses of up to 9 digits in grams and kilograms

If learners have not in previous grades sequenced containers marked in grams and kilograms, it is worth doing. Choose examples that allow learners to realize that the size of a container or the volume it contains is not directly proportional to the mass because some substances have a greater density than others. Learners should do exercises from their textbook that ask them to order and compare the mass of objects including grocery items labelled in grams and kilograms.

Learners should also compare, order, sequence masses stated in different units.

Calculations (including conversions) and problem-solving

Measurement provides a context in which to practise skills acquired in Numbers, Operations and Relationships. The skills, operations and number ranges using grams and kilograms required are given below.

- Rounding numbers up or down to the most appropriate unit of mass
- Rounding off to 5, 10, 100 and 1 000 Measurement especially when focusing on reading analogue measuring instruments can help learners to understand the meaning behind rounding up or down
- Addition and subtraction Calculations and problems should include fractional parts of kilograms expressed either as common fractions or decimal fractions- up to 2 decimal places
- Multiplication of up to 4-digit by 3-digit whole numbers
- Division of up to 4-digit by 3-digit whole numbers
- Find percentages of whole numbers
- multiple operations with or without brackets

Solve problems relating to mass including:

- rate e.g. price per kilogram and ratio problems
- problems with decimals should be limited to addition and subtraction

Convert between units: $g \leftrightarrow kg$

Conversions should be given in the following forms: whole numbers, common fractions, decimal fractions up to 2 decimal places This provides a context for learners to practise multiplying and dividing by 1 000.

	If conversions require more than 2 decimal places e.g. 3 245 grams converted to kilograms learners can continue to write this as 3kg and 245g as in previous grades. On the whole though examples should be chosen to avoid this problem.
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LTS M	Resources	Kitchen scale, bathroom scale, balance	Grade 4	Grade 5	Grade 6
Workbook reference		WB 2 pp. 112 – 122 Activities 111, 112, 113a&b, 114, 115)		WB 1 pp. 20 – 26 Activities 74a&b, 75, 76	WB 2 pp. 2 – 9 Activities 65, 66a&b, 67
DBE Textbook reference		Term 4: Unit 3: Mass, p. 297		Term 3: Unit 2: Mass, p. 211	Term 3: Unit 1: Mass, p. 215
HOMEWORK					
ASSESSMENT		E.g. Informal assessment – Test			



MATHEMATICS INTERMEDIATE PHASE

MULTI GRADE LESSON PLAN 9

EDUCATOR:
TERM: 2

DATE: from to		Time: 5 HOURS			
GRADE	TOPIC	4 CAPS pp. 88 - 90	5 Capacity and Volume CAPS pp. 150 - 153	6 Practical measuring of 3-D objects by estimating, measuring, recording, comparing and ordering	Practical measuring of 3-D objects by estimating, measuring, recording, comparing and ordering
Concepts, Skills and knowledge	Practical measuring of 3-D objects by <ul style="list-style-type: none"> estimating measuring recording comparing and ordering 	Practical measuring of 3-D objects by <ul style="list-style-type: none"> estimating measuring recording comparing and ordering 	Measuring instruments measuring spoon, measuring cups, measuring jugs	Measuring instruments measuring spoons, measuring cups, measuring jugs	Measuring instruments measuring jugs



	<ul style="list-style-type: none">Solve problems in contexts using capacityConvert between litres and millilitres, limited to examples of whole numbers and fractions	<ul style="list-style-type: none">solving problems in contexts using capacity/volumeconverting between litres and millilitres limited to examples with whole numbers and fractions	<ul style="list-style-type: none">solving problems in context with capacityconverting between kilolitres, litres and millilitresconversions should include fraction and decimal forms to 2 decimal places
LTSM			
Resources	Measuring jugs, bottles, variety of containers from learner's context, cubes		
	Grade 4	Grade 5	Grade 6
Workbook reference	WB 2 pp. 2 – 12 Activities 65; 66a&b; 67a&b; 68 pp. 152 – 156 Activities 130, 131, 132	WB 2 pp. 74 – 76 Activities 24a&b pp. 160 -164 Activities 130, - 132.	WB 1 pp. 160 – 162 Activities 62; 63 WB 2 pp. 158 Activity 124
DBE Textbook reference	Term 3: Unit 2: Capacity and volume, p. 225	Term 1: Unit 9: Capacity and volume, p. 104	Term 2: Unit 8: Capacity and volume, p. 200
HOMEWORK			
ASSESSMENT	E.g. Informal assessment – Test		

MATHEMATICS INTERMEDIATE PHASE

MULTI GRADE LESSON PLAN 10

EDUCATOR:
TERM: 2

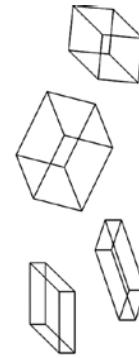
DATE: from to				Time: 5 HOURS			
GRADE	CAPS pp. 78 - 79	CAPS pp. 167 - 168	CAPS pp. 244 - 246	TOPIC	Objects learners need to know and name	Objects learners need to know and name	Objects learners need to know and name
Concepts, Skills and knowledge	4 CAPS pp. 78 - 79	5 3D Objects	6 CAPS pp. 244 - 246	Concepts, Skills and knowledge	<ul style="list-style-type: none"> rectangular prisms spheres cylinders cones square-based pyramids 	<ul style="list-style-type: none"> rectangular prisms and other prisms cubes cylinders cones pyramids similarities and differences between cubes and rectangular prisms 	<ul style="list-style-type: none"> rectangular prisms cubes tetrahedrons and other pyramids similarities and differences between tetrahedrons and other pyramids

SUGGESTED METHODOLOGY	<p>Complexity changes from grade to grade as is stipulated in the CAPS document.</p> <p>All grades:</p> <p>What is different to Grade 3?</p> <p>Learners focus on the same 3-D geometrical objects, but in Grade 3 they spoke of</p> <ul style="list-style-type: none"> • boxes, and in Grade 4 they call these rectangular prisms • ball shapes and in Grade 4 they call these spheres <p>Objects and their distinguishing characteristics</p> <p>There are two ways in which learners distinguish 3-D objects in Grade 4.</p> <ol style="list-style-type: none"> 1. Check whether they have flat or curved surfaces. Three dimensional objects can be grouped as follows: <ul style="list-style-type: none"> • <u>Objects with a curved surface only:</u> <p>Example: a sphere</p>  <ul style="list-style-type: none"> • <u>Objects with flat and curved surfaces</u> <table border="0"> <tr> <td style="text-align: center;">Cones</td><td style="text-align: center;">Cylinders</td></tr> <tr> <td></td><td></td></tr> </table>	Cones	Cylinders		
Cones	Cylinders				
					

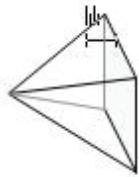
- Objects with only flat surfaces. In Grade 4 learners only identify and name them.

Examples

rectangular prisms.



pyramids: square-base pyramid



- When looking at the group of objects with flat surfaces, learners should know that the flat surfaces of a 3-D object are called **faces**. They describe these objects according to the kinds of 2-D shapes that make up the flat surfaces e.g. the faces of a rectangular prism can all be rectangles or some can be squares. Square-based pyramids have one square face and the other faces are triangles

Grade 5 and 6:

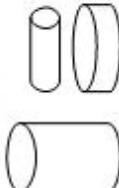
What is different?

- cubes are introduced
- learners work with prisms as a group for the first time
- in the same way that learners distinguish between rectangles and squares, using the lengths of their sides, so they distinguish between cubes and rectangular prisms using the shapes of their faces
- learners count the number of faces on 3-D objects and use this as part of their descriptions of objects

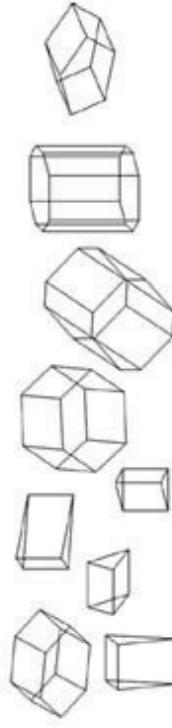
Objects and their distinguishing characteristics

There are **three** ways in which learners distinguish 3-D objects in Grade 5

1. By checking whether they have flat or curved surfaces. Three dimensional objects can be grouped as follows:
 - Objects with a curved surface only:

	<p>Example: sphere</p> 	
	<ul style="list-style-type: none">• <u>Objects with flat and curved surfaces</u>	
	<p>Examples:</p> <p>cylinders</p>  <p>cones</p> 	<ul style="list-style-type: none">• <u>Objects with only flat surfaces.</u> In Grade 5 learners only identify and name
	<p>Rectangular prisms</p>  <p>Cubes</p>  	

other prisms



pyramids: square based pyramid.



2. When looking at the group of objects with flat surfaces, learners should know that the flat surfaces of a 3-D object are called **faces**. They describe these objects according to the kinds of 2-D shapes that make up the flat surfaces e.g. the faces of a rectangular prism can all be rectangles or some can be squares. Square-based pyramids have one square face and the other faces are triangles.
3. Learners can also look for right angles on the faces of objects. If the object that they are examining has faces with only right angles, then it will be either a cube or a rectangular prism.

Further activities to focus learners on characteristics of objects:

- Learners create 3-D objects by putting together cut-out polygons, which helps to focus attention on the shapes of the faces of the 3-D objects.
- Learners cut open boxes to make nets. They describe the nets of the boxes. Interpreting drawings of 3-D objects and written exercises

Learners need to work with real objects. However they also need to do written exercises on 3-D objects. Interpreting pictures of 3-D objects is more difficult than working with the real objects. Learners should practice interpreting drawings of 3-D objects. They should identify and name 3-D objects in drawings and identify everyday objects that look like geometric objects e.g. a milk carton looks like a rectangular prism. Describe the surfaces of objects when shown drawing of 3-D objects, match



the 2-D shapes that have the same shape as the faces of 3-D objects, match nets of rectangular prisms to the appropriate drawing of rectangular prisms and compare 3-D objects from drawings.

Grade 6:**What is different?**

- Tetrahedrons are new objects
- Other pyramids are new objects
- Learners distinguish between tetrahedrons and other pyramids by looking at the shapes of their bases,
- Learners use nets to build objects
- Learners match nets with drawings of objects
- Learners count the number of edges of 3-D objects
- Learners build skeleton objects using drinking straws
- Learners count the number of vertices of objects.

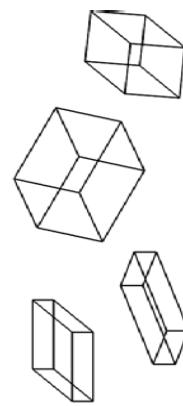
Objects and their distinguishing characteristics

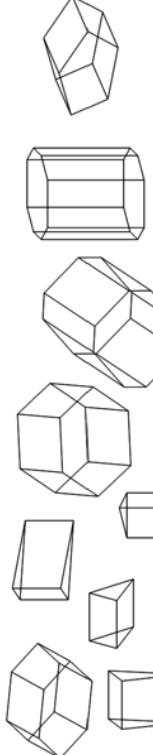
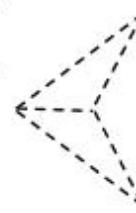
There are **three** ways in which learners distinguish 3-D objects in Grade 6.

1. Checking whether they have flat or curved surfaces.

Objects with only flat surfaces: In Grade 6 learners only identify and name the objects.

Prisms

Rectangular prisms

	Cubes 	
	Other prisms 	
	Pyramids  tetrahedron or triangular pyramid  other pyramids 	<p>2. When looking at the group of objects with flat surfaces, learners should know that the flat surfaces of 3-D objects are called faces. They describe these objects according to</p> <ul style="list-style-type: none"> • the kinds and numbers of 2-D shapes that make up the flat surfaces e.g. a rectangular prism can have 6 faces that are rectangles or 4 that are rectangles and 2 that are squares. • the number of edges • the number of vertices

3. Learners can also look for right angles on the faces of objects. If the object that they are examining has faces with only right angles, then it will be either a cube or a rectangular prism.

Further activities: making models of 3-d objects

- Learners create 3-D objects from nets
- Learners create skeletons of 3-D objects with straws / toothpicks, etc.

Interpreting drawings of 3-D objects and written exercises

Learners need to work with real objects. However they also need to do written exercises on 3-D objects. Interpreting pictures of 3-D objects is more difficult than working with the real objects. Learners should practise interpreting drawings of 3-D objects. They should identify and name 3-D objects in drawings identify everyday objects that look like geometric objects e.g. a milk carton looks like a rectangular prism, match nets of objects to drawing of objects, describe 3-D objects by stating the number of flat and curved surfaces, count the number of vertices, edges, and number and shape of faces when shown drawings of 3-D objects.

In Term 2 learners focus on the kind of surface, the shape and the number of faces of a 3-D object. They also build objects using nets.

In Term 4 they can consolidate what they have learned in Term 1 and build skeleton shapes with straws or toothpicks. They will then focus on the edges and vertices of the objects. This means that by the end of the year they will be able to describe 3-D geometric objects according to surfaces, faces, edges and vertices.

LTSM

Resources	Variety of 3D objects from learner's context, geosolids
Grade 4	Grade 5
	Grade 6



Workbook reference	WB 1 pp 130 -134 Activities 48, 49, 50	WB 1 pp. 142 – 150 Activities 50; 51; 52; 53; 54	WB 1 pp 94 – 96 Activities 33; 34
DBE Textbook reference	Term 2: Unit 6: Properties of three dimensional objects, p. 173	Term 2: Unit 6: Properties of three dimensional objects, p. 167	Term 2: Unit 3: Properties of three dimensional objects, p. 142
HOMEWORK			
ASSESSMENT E.g. Informal assessment – test			

LESSON PLANS: TERM 3



MATHEMATICS INTERMEDIATE PHASE
MULTI GRADE LESSON PLAN 1
TERM 3

EDUCATOR:

GRADE	DATE : fromto	Time: 3 HOURS		
TOPIC	CAPS p.92 (methodology explained on pp. 37 - 38)	CAPS p.81 (methodology explained on pp. 125 -126)	CAPS p.262 (methodology explained on pp. 215 – 216)	6
Concepts, Skills and knowledge	<ul style="list-style-type: none"> Count forwards and backwards in 2s, 3s, 5s, 10s, 25s, 50s, 100s between 0 and at least 10 000 Order, compare and represent numbers to at least 4 digit numbers. Represent odd and even numbers to at least 1 000 Recognize the place value of digits in whole numbers to at least 4-digit numbers Round off to the nearest 10, 100, 1000. 	<ul style="list-style-type: none"> Count forwards and backwards in whole number intervals up to at least 10 000 Order, compare and represent numbers to at least 6-digit numbers Represent odd and even numbers to at least 1 000. Recognize the place value of digits in whole numbers to at least 6 digit numbers. Round off to the nearest 5, 10, 100, 1 000 and 10 000 	<ul style="list-style-type: none"> Count forwards and backwards in whole number intervals up to at least 10 000 Order, compare and represent numbers to at least 9-digit numbers Represent prime numbers to at least 100 Recognizing the place value of digits in whole numbers to at least 9-digit numbers Round off to the nearest 5, 10, 100, 1 000, 10 000, 100 000, and 1 000 000 	

SUGGESTED METHODOLOGY	<p>Refer back to Term 1 Explain from known (low number range) to unknown (higher range of numbers); work with concrete LTSM</p> <p>Counting, ordering, comparing, representing digits</p> <p>Note : According to CAPS number range per grade per term as in content clarification</p> <ul style="list-style-type: none"> • Read, say and write up to at least 4-digit numbers (Gr4), 6-digit (Gr5) and 9-digit (Gr6) (Learners can write numbers with fingers in the air while they are reading / saying the words.) e.g., One hundred and twenty-nine. • Convert from words to numbers and numbers to words • Arrange the numbers below from the smallest to the biggest: <p>Example: 10 111; 1 101; 1 110; 1 011</p> <ul style="list-style-type: none"> • Make the biggest/smallest number you can with these digits: 3, 2, 5, 4, 9. <p>Odd and even numbers: Explore practically by working with numbers to be able to describe the pattern e.g. all odd numbers end in 1, 3, 5, 7 or 9 therefore 2 201, 2 203, 2 205, 2 207, 2 209 are all odd numbers.</p> <p>Prime numbers for Grade 6 Identify prime numbers and composite numbers up to at least 100</p> <p>Multiples: I count in multiples of 3, up to 100.</p> <ul style="list-style-type: none"> • Will I count the number 12? Why? • Will I count the number 42? Why? <p>Place value: Distinguish between the numeric value and the place value.</p> <ul style="list-style-type: none"> • Use place value cards to build up and break down numbers <p>Rounding off:</p> <ul style="list-style-type: none"> • Round off as indicated per grade (use base ten blocks, number lines, place value table) • Use concept of rounding off, in problem solving context
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LTS M	
Resources	Number lines: 0 – 120, Structured -, semi- structured - , unstructured number lines; Counters, Pictures, arrays/ diagrams, Flash cards, Base 10 blocks, 100 charts, abacus, beads
Workbook reference	Grade 4 WB 2 pp 28 - 30 Activities 76, 77 Grade 5 WB 2 pp 32 Activity 79 Grade 6 WB 2 pp 108 – 110 Activity 105a&b
DBE Textbook reference	Term 3: Unit 3: Whole Numbers p. 238
HOMEWORK	Term 3: Unit 3: Whole Numbers p. 218
ASSESSMENT	Term 3: Unit 3: Whole Numbers p. 221



MATHEMATICS INTERMEDIATE PHASE
MULTI GRADE LESSON PLAN 2
TERM 3

EDUCATOR:

GRADE	DATE : fromto	TOPIC	Time: 8 HOURS
		Concepts, Skills and knowledge <ul style="list-style-type: none"> Number range for calculations <ul style="list-style-type: none"> Addition and subtraction of whole numbers of at least 4 digits 	CAPS p.93 (methodology explained on pp. 43 - 45) Addition and subtraction of whole numbers <ul style="list-style-type: none"> Number range for calculations <ul style="list-style-type: none"> Addition and subtraction of whole numbers of at least 5 digits
		Calculation techniques <p>Use a range of techniques to perform and check written and mental calculations of whole numbers including</p> <ul style="list-style-type: none"> estimation building up and breaking down numbers rounding off and compensating doubling and halving using a number line using addition and subtraction as inverse operations 	CAPS p.182- 183 (methodology explained on pp. 132 - 135) Number range for calculations <ul style="list-style-type: none"> Number range for calculations <ul style="list-style-type: none"> Addition and subtraction of whole numbers with at least 6-digit number

	<p>Properties of whole numbers</p> <ul style="list-style-type: none"> Recognize and use the commutative and associative properties with whole numbers <p>Solving problems</p> <ul style="list-style-type: none"> Solve problems in contexts involving whole numbers, including financial contexts 	<p>Properties of whole numbers</p> <ul style="list-style-type: none"> Recognize and use the commutative, associative and distributive properties with whole numbers 0 in terms of its additive property 1 in terms of its multiplicative property <p>Solving problems</p> <ul style="list-style-type: none"> Solve problems involving whole numbers, including financial contexts <ul style="list-style-type: none"> measurement contexts 	<p>Properties of whole numbers</p> <ul style="list-style-type: none"> Recognize and use the commutative, associative, distributive properties of whole numbers 0 in terms of its additive property <p>Solving problems</p> <ul style="list-style-type: none"> Solve problems involving whole numbers and decimal fractions, including <ul style="list-style-type: none"> financial contexts measurement contexts measurement contexts Solve problems involving whole numbers, including comparing two or more quantities of the same kind (ratio)
LTSW			
Resources	Number lines: 0 – 120, Structured -, semi- structured -, unstructured number lines; Counters, Pictures, arrays/ diagrams, Flash cards, Base 10 blocks, 100 charts, counters, maths video clips, E learning resources online, Maths games	Grade 4	Grade 5
Workbook reference	WB 2 pp. 32 -40 ; pp 70 – 76 Activities (78a&b; 79-81; 95a&b; 96)	WB 2 pp. 40 – 48 Activities 82a&b; 83-85	WB 2 pp. 20 – 44 Activities 71a&b; 72a&b; 73-78
DBE Textbook reference	Term 2: Unit 9: Whole Numbers: Addition and subtraction, p. 193 Term 3: Unit 4: Whole Numbers: Addition and subtraction, p. 243	Term 3: Unit 4: Whole Numbers: Addition and subtraction, p. 223	Term 3: Unit 3: Whole Numbers: Addition and subtraction, p. 224
HOMEWORK			
ASSESSMENT	E.g. Informal assessment – Test		



MATHEMATICS INTERMEDIATE PHASE

MULTI GRADE LESSON PLAN 3

TERM 3

EDUCATOR:

GRADE	DATE : fromto	4 Multiplication - CAPS pp.101	5 Multiplication - CAPS p.192 (Refer to p.166 for methodology.)	Time: 3 HOURS	6 Multiplication - CAPS p.241-243
TOPIC	Number range for calculations		Number range for calculations	Number range for counting, ordering, comparing and representing, and place value of digits	
Concepts, Skills and knowledge	Number range for calculations • Multiplication of at least whole 2-digit by 2-digit numbers	Number range for calculations • Multiplication of at least whole 3-digit by 2-digit numbers	Number range for calculations • Multiplication of at least whole 3-digit by 2-digit numbers	• Order, compare and represent numbers to at least 9-digit numbers • Represent prime numbers to at least 100 • Recognize the place value of digits in whole numbers to at least 9-digit numbers • Round off to the nearest 5, 10, 100 or 1 000	Number range for calculations • Multiplication of at least whole 4-digit by 3-digit numbers • Multiple operations on whole numbers with or without brackets

Calculation techniques Use a range of techniques to perform and check written and mental calculations with whole numbers including:	Calculation techniques Using a range of techniques to perform and check written and mental calculations of whole numbers including: <ul style="list-style-type: none"> • estimation • building up and breaking down numbers • rounding off and compensating • doubling and halving Number range for multiples and factors Multiples of 1-digit numbers to at least 100	Calculation techniques include <ul style="list-style-type: none"> • estimation • multiplying in columns • building up and breaking down numbers • rounding off and compensating • using a calculator Number range for multiples and factors <ul style="list-style-type: none"> • Multiples of 2-digits whole numbers to at least 100 • Factors of 2-digit whole numbers to at least 100 • Prime factors of numbers to at least 100 Properties of whole numbers <ul style="list-style-type: none"> • Recognize and use the commutative, associative and distributive properties of whole numbers • 0 in terms of its additive property • 1 in terms of its multiplicative property Solving problems <ul style="list-style-type: none"> • Solve problems involving whole numbers, including financial contexts
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	<ul style="list-style-type: none"> Solve problems involving whole numbers, including <ul style="list-style-type: none"> comparing two or more quantities of the same kind (ratio) comparing two quantities of different kinds (rate) 	<ul style="list-style-type: none"> financial contexts measurement contexts Solve problems involving whole numbers, including comparing two or more quantities of the same kind (ratio) comparing two quantities of different kinds (rate) 	<ul style="list-style-type: none"> - financial contexts - measurement contexts Solve problems involving whole numbers, including <ul style="list-style-type: none"> comparing two or more quantities of the same kind (ratio) comparing two quantities of different kinds (rate)
SUGGESTED METHODOLOGY	<p>Refer to Term 1 and Term 2 lesson Plans</p> <p>Explain from known (low number range); work with concrete LTSM.</p> <p>Learners should do context free calculations and solve problems in contexts</p> <p>Learners should continue to</p> <ul style="list-style-type: none"> check their solutions by using multiplication when doing division and vice versa judge the reasonableness of their solutions, by estimating before calculating <p>Multiplication (Know times tables – practice regularly up to 10×10 for Grades 4 and 5 and 12×12 for Grade 6).</p> <p>Follow these steps in teaching multiplication:</p> <ul style="list-style-type: none"> Solve problems in context. <p>Understand that $86 + 86 + 86$ is equivalent to 86×3 or 3×86 (repeated addition)</p> <ul style="list-style-type: none"> multiplication by 1 leaves a number unchanged e.g. $5 \times 1 = 5$; $99 \times 1 = 99$ multiplication of zero results in zero e.g. $7 \times 0 = 0$; $31 \times 0 = 0$ <p>Understand that multiplication is the inverse of division (multiplication reverses division and vice versa) and use this to check results. e.g. $15 \times 35 = 525$ $\square 525 \div 15 = 25$</p> <p>Note: In Grade 5 Term 3 learners are introduced to column methods of multiplication</p>		



	DIVISION Mental division : Turning the tables – practice regularly (e.g. $5 \times 8 = 40$ $\square 40 \div 8 = 5$ / $40 \div 5 = 8$) (Also called inverse operation or reciprocal operation.) Make learners aware that division is non-commutative i.e. $81 \div 9$ is not the same as $9 \div 81$. With the concept grasped, teaching division will become more about guided practice to help the learners to become familiar with the division operation (although it's really going to be a different type of multiplication practice.) Start by practising division by 1, 2 and 3 and then gradually move up to 9. Note: Grade 4 and 5 focus is on using the clue board – method ONLY! Grade 6 is the introduction of long division in the third term	
LTSM		
Resources	Number lines: 0 – 120, Structured - , semi- structured - , unstructured number lines; Counters, Pictures, arrays/ diagrams, Flash cards, Base 10 blocks, 100 charts, multiplication table maths video clips, E learning resources online, Maths games, counters	
Workbook reference	Grade 4 WB 2 pp. 78 – 90 Activities 98 a&b, 99a&b; 100-101	Grade 5 WB 2 pp. 90 – 94 Activities 103a&b; 104
DBE reference	Term 3: Unit 10 Whole Numbers: Multi[lication, p. 275	Term 4: Unit 11: Whole Numbers: Multi[lication, p. 269
HOMEWORK		
ASSESSMENT E.g. Informal assessment – Test		





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MATHEMATICS INTERMEDIATE PHASE**MULTI GRADE LESSON PLAN 4**

EDUCATOR:

TERM 3

DATE : fromto	GRADE	TOPIC	Time: 4 HOURS
	4 Division - CAPS p.84-85 (Methodology refer to pp. 84 - 85)	Number range for calculations Division of at least whole 3-digit by 1-digit numbers.	5 Division - CAPS p.200 (Methodology refer to pp.172)
		Calculation techniques Use a range of techniques to perform and check written and mental calculations of whole numbers including <ul style="list-style-type: none">- estimation- building up and breaking down numbers- rounding off and compensating- doubling and halving- using multiplication and division as inverse operations	6 Division - CAPS p. 250 – 251 (Methodology refer to pp.172) Number range for calculations Division of at least whole 3-digit by 2-digit numbers Calculation techniques Use a range of techniques to perform and check written and mental calculations with whole numbers including <ul style="list-style-type: none">• estimation• building up and breaking down numbers• rounding off and compensating• using a calculator

	<p>Number range for multiples and factors</p> <ul style="list-style-type: none"> Multiples of 1-digit numbers to at least 100 <p>Properties of whole numbers</p> <ul style="list-style-type: none"> Recognize and use the commutative; associative; and distributive properties of whole numbers 	<p>Number range for counting, ordering and representing, and place value of digits</p> <ul style="list-style-type: none"> Recognize the place value of digits in whole numbers to at least 6-digit numbers. Round off to the nearest 10, 100, 1 000 <p>Number range for multiples and factors</p> <ul style="list-style-type: none"> Multiples of 2-digit numbers to at least 100 Factors of 2-digit whole numbers Prime factors of numbers up to at least 100 <p>Properties of whole numbers</p> <ul style="list-style-type: none"> Recognize and use the commutative; associative; distributive properties of whole numbers 0 in terms of its additive property 1 in terms of its multiplicative property <p>Multiplication facts</p> <ul style="list-style-type: none"> Units by multiples of 10 Units by multiples of 100 <p>Solving problems</p> <ul style="list-style-type: none"> Solve problems in contexts involving whole numbers <ul style="list-style-type: none"> - financial contexts - measurement contexts Solve problems involving whole numbers, including <ul style="list-style-type: none"> - grouping and equal sharing with remainders - comparing two or more quantities of the same kind (ratio) - comparing two quantities of different kinds (rate) - comparing two quantities of different kinds (rate) 	<p>Number range for multiples and factors</p> <ul style="list-style-type: none"> Multiples of 2-digit and 3-digit numbers Factors of 2-digit and 3-digit whole numbers Prime factors of numbers up to at least 100 <p>Properties of whole numbers</p> <ul style="list-style-type: none"> Recognize and use the commutative; associative; distributive properties of whole numbers 0 in terms of its additive property 1 in terms of its multiplicative property <p>Solving problems</p> <ul style="list-style-type: none"> Solve problems involving whole numbers and decimal fractions, including <ul style="list-style-type: none"> - financial contexts - measurement contexts Solve problems involving whole numbers, including <ul style="list-style-type: none"> - comparing two or more quantities of the same kind (ratio) - comparing two quantities of different kinds (rate) - grouping and equal sharing with remainders
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SUGGESTED METHODOLOGY	<ul style="list-style-type: none"> • Solve problems involving whole numbers, including <ul style="list-style-type: none"> - comparing two or more quantities of the same kind (ratio) - comparing two quantities of different kinds (rate) - grouping and equal sharing with remainders <p>Refer to Term 1 and Term 2 lesson plans for clarification.</p> <p>Explain from known (low number range); work with concrete LTSM.</p> <p>Learners should do context free calculations and solve problems in contexts.</p> <p>Learners should continue to</p> <ul style="list-style-type: none"> • check their solutions themselves, by using multiplication when doing division and vice versa • judge the reasonableness of their solutions, by estimating before calculating <p>Multiplication (Know times tables – practice regularly up to 10×10 for Grade 4 and 5 and 12×12 for Grade 6).</p> <p>Follow these steps in teaching multiplication:</p> <ul style="list-style-type: none"> - Solve problems in context. <p>Understand that: $86 + 86 + 86$ is equivalent to 86×3 or 3×86 (repeated addition)</p> <ul style="list-style-type: none"> - multiplication by 1 leaves a number unchanged e.g. $5 \times 1 = 5$; $99 \times 1 = 99$ - multiplication of zero results in zero e.g. $7 \times 0 = 0$; $31 \times 0 = 0$
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	<p>Understand that multiplication is the inverse of division (multiplication reverses division and vice versa) and use this to check results. e.g. $15 \times 35 = 525$ \square $525 \div 25 = 15$ or $525 \div 15 = 25$</p> <p>DIVISION</p> <p>Mental division : Turning the tables – practice regularly (e.g. $5 \times 8 = 40$ \square $40 \div 8 = 5$ / $40 \div 5 = 8$) (Also called inverse operation or reciprocal operation.)</p> <p>Make learners aware that division is non-commutative i.e. $81 \div 9$ is not the same as $9 \div 81$.</p> <p>With the concept grasped, teaching division will become more about guided practice to help your learners to become familiar with the division operation (although it's really going to be a different type of multiplication practice.) Start by practising division by 1, 2 and 3 and then gradually move up to 9.</p> <p>Note: Grades 4 and 5 focus is on using the clue board – method ONLY! In Grade 6 the long division is introduced in the third term</p>
LTS	
Resources	Text books; Internet Web sites; Number board; Flard cards; Base 10 blocks / Dienes blocks; Concrete material, e.g. counters; Number lines + empty ones; Hundred chart, multiplication table, maths video clips, E learning resources online, Maths games
Grade 4	Grade 5
Workboo reference	<p>WB 2 p. 142 Activities 125</p> <p>WB 2 pp. 138 – 144 Activities 120 - 123</p>
	WB 2 pp. 164 – 174 Activities 126; 127a/b; 128; 129a&b
DBE Textbook reference	<p>Term 4: Unit 6: Whole Numbers: Division, p. 313</p>
HOMEWORK	Term 3: Unit 5: Whole Numbers: Division, p. 310
ASSESSMENT	Term 4: Unit 7: Whole Numbers: Division, p. 336
E.g. Informal assessment – Test	



MATHEMATICS INTERMEDIATE PHASE

MULTI GRADE LESSON PLAN 5

TERM 3

EDUCATOR:

DATE : fromto	GRADE	TOPIC	Time: 6 HOURS
	<ul style="list-style-type: none"> • Numeric patterns: pp. 97 - 99 • Geometric patterns: pp. 117 method explained on pp. 80 -82 	<p>Note: Geometric patterns are being done as extended consolidation in this cycle.</p> <p>Numeric patterns:</p> <ul style="list-style-type: none"> Investigate and extend numeric patterns looking for relationships or rules of patterns: <ul style="list-style-type: none"> ○ sequences involving a constant difference or ratio of learner's own creation represented in tables ○ Describe the general rules for the observed relationships 	<p>Numeric patterns:</p> <ul style="list-style-type: none"> Investigate and extend numeric patterns looking for relationships or rules of patterns: <ul style="list-style-type: none"> ○ sequences not limited to a constant difference or ratio of learner's own creation ○ Describe the general rules for the observed relationships <p>Input and output values</p> <ul style="list-style-type: none"> Determine input values, output values and rules for the patterns and relationships using: <ul style="list-style-type: none"> ○ flow diagrams ○ tables
	<p>Equivalent forms</p> <p>Determine equivalence of different descriptions of the same relationship or rule presented</p>	<p>Equivalent forms</p> <p>Determine equivalence of different descriptions of the same relationship or rule presented</p>	<p>Equivalent forms</p> <p>Determine equivalence of different descriptions of the same relationship or rule presented</p>

	<ul style="list-style-type: none"> • Verbally • in a flow diagram • in a table • by a number sentence <p>Geometric patterns</p> <ul style="list-style-type: none"> • Investigate and extend geometric patterns looking for relationships or rules of patterns <ul style="list-style-type: none"> ○ represented in physical or diagram form ○ sequences not limited to a constant difference or ratio of learner's own creation • Describe observed relationships or rules in learners' own words <p>Input and output values</p> <ul style="list-style-type: none"> • Determine input values, output values and rules for the patterns and relationships using flow diagrams 	<ul style="list-style-type: none"> • verbally • in a flow diagram • in a table • by a number sentence <p>Geometric patterns</p> <ul style="list-style-type: none"> • Investigate and extend geometric patterns looking for relationships or rules of patterns <ul style="list-style-type: none"> ○ represented in physical or diagram form ○ sequences not limited to a constant difference or ratio of learner's own creation ○ represented in tables <p>Input and output values</p> <ul style="list-style-type: none"> • Determine input values, output values and rules for the patterns and relationships using flow diagrams 	<p>Equivalent forms</p> <ul style="list-style-type: none"> • Determine equivalence of different descriptions of the same relationship or rule presented <ul style="list-style-type: none"> ○ verbally ○ in a flow diagram ○ by a number sentence <p>Equivalent forms</p> <ul style="list-style-type: none"> • Determine equivalence of different descriptions of the same relationship or rule presented <ul style="list-style-type: none"> ○ verbally ○ in a flow diagram ○ in a table ○ by a number sentence
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<p>SUGGESTED METHODOLOGY</p> <p><u>Refer back to the lesson plan for Term 1 on Numeric Patterns for revision</u></p> <p>Numeric Patterns:</p> <p>The focus should be on input-output flow diagrams that help learners to understand and learn about:</p> <ul style="list-style-type: none"> • the inverse operation between multiplication and division • the multiplication of units by multiples of ten in Grade 4; and 10, 100 and 1000 in Grade 5 and Grade 6 • the associative property with whole numbers and how we can use this property when we multiply by multiples of 10. <p>Using flow diagrams help learners to understand and use the fact that multiplication and division are inverse operations</p> <p>Learners are not expected to use the expression “inverse operations”. They are expected to know that:</p> <ul style="list-style-type: none"> • they can use multiplication to check division calculations • they can use division to check multiplication calculations <p>Then they can work with examples which have a two stage rule e.g. multiply and then add, where one stage is left out.</p> <p>Sequences of numbers:</p> <p>In the Intermediate Phase learners extend sequences of numbers. In Grade 4 they work with two kinds of sequences.</p> <ol style="list-style-type: none"> 1. Sequences involving a constant difference <p>Examples</p> <ul style="list-style-type: none"> a) 2; 4; 6; 8... b) 18; 16; 14; 12... <p>In the examples above learners are adding 2 or subtracting 2 to make the pattern. Learners may describe it as a pattern of counting on or counting back in twos. Learners should also be given examples which do not start on a multiple of the number they are adding or subtracting.</p>



	<p>Examples</p> <p>a) 1; 4; 7; 10; b) 87; 66; 45;</p> <p>2. Sequences involving a constant ratio</p> <p>Example</p> <p>1 600; 800; 400; ...</p> <p>In the above example learners are dividing by 2. All the numbers in the sequence are multiples of 2.</p>	<p>Learners should also be given examples in which the numbers in the sequence are not multiples of the number by which they are multiplying or dividing.</p> <p>Examples</p> <p>a) 3; 6; 12; 24; ... b) 10; 30; 90; 270; ...</p> <p>NB: Towards the end of Grade 6, the focus should be on “finding the rule”</p>	<p>Geometric Patterns</p> <p>NB:</p> <ol style="list-style-type: none">1. Patterns investigated should include shapes as per Grade, required in Content Area 3. In Grade 6 there is an increase in complexity of examples.2. Educators may prefer to teach Geometric patterns first and link it with numeric patterns. <p>Learners show the same patterns in different ways: in a diagram, as a verbal description, as a flow diagram and in a number sentence. Sometimes learners are able to see different aspects of a pattern when they change the form in which the pattern is presented. Learners work with patterns that are made from 2-D shapes and 3-D objects or from drawings/diagrams of</p>
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these shapes and objects. In Patterns, Functions and Algebra we choose geometric patterns that can be re-described using a number pattern (this does not mean that it can't be described in words, in fact the description in words is usually the starting point). In Shape and Space learners also work with visual patterns that are geometric. However, in Shape and Space they are only required to describe the patterns using the language of geometry and to copy the patterns. While many of these patterns can be described using algebraic expressions, this is beyond the scope of Intermediate Phase learners.

Grade 4, 5 and 6

What is different to Grade 3?

In Grade 3 learners copy, extend and describe patterns made with numbers, objects or drawings. The descriptions are only verbal. They also create their own patterns.

The kinds of patterns become more complex in Grade 4.

In Grade 4 learners are introduced to a new way to represent patterns: the input- output flow diagram (some learners may have used this in Foundation Phase, but it is not a specification).

Learners show the same patterns in different ways: in a diagram, as a verbal description, as a flow diagram and in a number sentence. Sometimes learners are able to see different aspects of a pattern when they change the form in which the pattern is presented.

Learners work with patterns that are made from 2-D shapes and 3-D objects or from drawings/diagrams of these shapes and objects. In Patterns, Functions and Algebra we choose geometric patterns that can be re-described using a number pattern (this does not mean that it can't be described in words, in fact the description in words is usually the starting point). In Shape and Space learners also work with visual patterns that are geometric. However, in Shape and Space they are only required to describe the patterns using the language of geometry and to copy the patterns. While many of these patterns can be described using algebraic expressions, this is beyond the scope of Intermediate Phase learners.

What kinds of geometric patterns should learners work with?

- Simple repeating patterns – but this is really more of a focus in the Foundation Phase

Example: Complete the pattern

$$\textcircled{O} \square \textcircled{O} \textcircled{O} \square \textcircled{O} \square \textcircled{O} \textcircled{O} \square \textcircled{O} \textcircled{O} \square \dots$$

- **Patterns in which the shapes grow or decrease in different ways.** We can describe these patterns by the way they look.

- patterns in which the shape keeps its form, but gets larger (or smaller) in each stage.



- patterns in which a shape or part of a shape is added at each stage

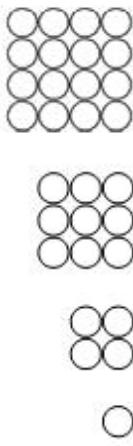


In each of the examples above the patterns are made by adding on the same number of matches in each successive shape. In the top pattern 3 matches are added each time. In the second pattern two matches are added each time. Both patterns show number **patterns with a constant difference**.

Most geometric patterns learners see in Grade 4, will be patterns with a constant difference. They are more likely to get patterns with a constant ratio when working only with number sequences.

- Patterns with neither a constant difference nor a constant ratio.

Example



What should learners do?

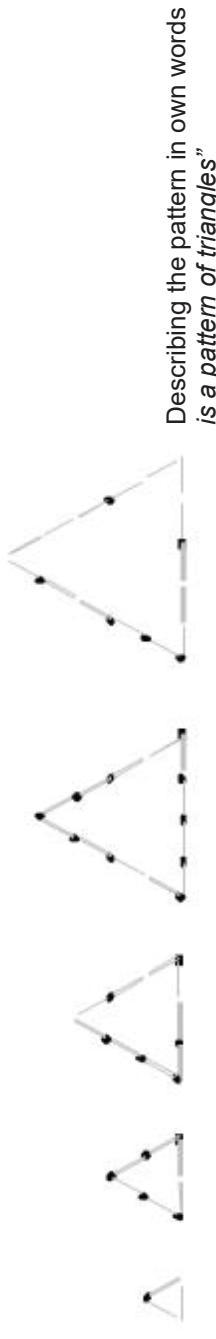
- Copy and extend the pattern. This helps them to understand how the pattern is formed.
- Describe the pattern in words.
- Different learners will describe different aspects of the pattern.
- You want learners to describe the relationship between shapes in the sequence or rules in their own words. To do this, learners need to discuss how they made the pattern or to answer the question “How do I get from one stage in the pattern to the next?”

Learners need to have opportunities to see that sometimes changing the form of representation (geometric to verbal or to a flow diagram or to a table) can help them to understand the pattern in different ways. Learners should “translate” these geometric sequences into other forms of expression or representation, namely

- verbally describe the pattern
- number sequences which can also be recorded in a table form.

Example:

Extending the pattern:



“It
“Each triangle is bigger than the one before”

“Each triangle has one more matchstick to each side than the triangle on its left”

Describing how they made the pattern or answering the question “how do I get from one stage to the next?”

“I added one more matchstick to each side of each triangle”

“Each triangle has one more matchstick in each side than the triangle on its left”



	Recording the number pattern in a table. When learners fill in the table like the one shown below, they will see that the number of matchsticks used for each triangle is 3 times the position of the triangle in the sequence. They will see that the rule is triangle number times 3 . Learners can then be asked to predict how many matches they will use for triangles they have not built, e.g. 10th, 100th etc.	<table border="1"><thead><tr><th>triangle number</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>5</th><th>10</th></tr><tr><th>number of matchsticks</th><td>3</td><td>6</td><td>9</td><td></td><td></td><td></td><td></td></tr></thead></table>	triangle number	1	2	3	4	5	5	10	number of matchsticks	3	6	9					<p>Grade 6:</p> <p>What is different?</p> <ul style="list-style-type: none">• There is more emphasis on presenting patterns in tables.• There is more emphasis on stating the general rule of the pattern. <p>What kinds of geometric patterns should learners work with?</p> <p>Learners can work with patterns which are made from real shapes, or objects concrete apparatus.</p> <p>What kinds of patterns should learners work with?</p> <p>Patterns in which the shapes grow or decrease in different ways.</p>	<p>LTSM</p> <p>Resources</p> <p>Number lines: 0 – 120, Structured -, semi- structured -, unstructured number lines; Counters, Pictures, arrays/ diagrams, Flash cards, Base 10 blocks, 100 charts, maths video clips, E learning resources online, Maths games</p>	<table border="1"><thead><tr><th>Grade 4</th><th>Grade 5</th><th>Grade 6</th></tr></thead><tbody><tr><td>Workbook reference</td><td>WB 2 pp. 168 – 170 Activities 138-139</td><td>WB 2 pp. 180 – 184 Activities 140; 141a&b;101; 102)</td></tr><tr><td>DBE Textbook reference</td><td>Term 4: Unit 10: Geometric Patterns, p. 339</td><td>Term 4: Unit 9: Geometric Patterns, p. 338</td></tr><tr><td>HOMEWORK</td><td></td><td></td></tr><tr><td>ASSESSMENT</td><td>E.g. Informal assessment – Test</td><td>Term 2: Unit 4: Geometric Patterns, p. 152</td></tr></tbody></table>	Grade 4	Grade 5	Grade 6	Workbook reference	WB 2 pp. 168 – 170 Activities 138-139	WB 2 pp. 180 – 184 Activities 140; 141a&b;101; 102)	DBE Textbook reference	Term 4: Unit 10: Geometric Patterns, p. 339	Term 4: Unit 9: Geometric Patterns, p. 338	HOMEWORK			ASSESSMENT	E.g. Informal assessment – Test	Term 2: Unit 4: Geometric Patterns, p. 152
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MATHEMATICS INTERMEDIATE PHASE

MULTI GRADE LESSON PLAN 6

TERM 3

EDUCATOR:

DATE : fromto	GRADE	TOPIC	Time: 8 HOURS
	4 CAPS p. 93, 115 and 116		5 CAPS p. 184 - 185 Properties of 2-D shapes. Transformations; Position and views; Location and directions
		Concepts, Skills and knowledge Recognize, visualize and name 2-D shapes in • regular and irregular polygons – triangles, squares, rectangles, other quadrilaterals, pentagons, hexagons, heptagons and circles • similarities and differences between squares and rectangles	2 - D shapes, Recognize, visualize and name 2-D shapes in • regular and irregular polygons – triangles, squares, rectangles, other quadrilaterals, pentagons, hexagons, heptagons, octagons and circles • similarities and differences between rectangles and parallelograms Characteristics of shapes • straight sides • curved sides • number of sides • angles in shape

	<p>Recognize and describe angles in 2-D shapes</p> <p>Transformations</p> <ul style="list-style-type: none"> • Build composite shapes • Tessellations • Describe patterns <p>Position and views</p> <p>Location and directions</p>	<p>Recognize and describe angles in 2-D shapes</p> <p>Transformations</p> <ul style="list-style-type: none"> • Use transformations to make composite shapes • Use transformations to make tessellations • Describe patterns <p>Position and views</p> <p>Location and directions</p>	<p>Recognize and describe angles in 2-D shapes</p> <p>Transformations</p> <ul style="list-style-type: none"> • Use transformations to make composite shapes • Enlargement and reductions • Describe patterns <p>Position and views</p> <p>Location and directions</p>
SUGGESTED METHODOLOGY	<p>Properties of 2D shapes</p> <p>See Term 1 for suggested teaching methodology.</p> <p>Learners revise and consolidate what they learned in Term 1. Grade 6 learners draw circles and patterns with circles using a pair of compasses.</p> <p>Viewing objects</p> <p>Learners work with side views, plan views and top views of simple single objects such as a cup, hat, shoe, box or apple. They also work with side views and plan views of a classroom, simple buildings, and school fields.</p> <p>Position / Location and direction</p> <p>This links with the work done in Geography in Map Skills. Cells in a grid are often labelled with a letter and a number e.g. D4; A3; E7. This is called alpha-numeric referencing. The skills of identifying everyday objects and collections of objects, and the skills described below can be developed in the Geography lesson and practised in the Mathematics lesson.</p> <ul style="list-style-type: none"> • Learners work with alpha-numeric grid references on grids and maps. Locate objects using the grid references. <p>When learners work with grid references they need to learn</p> <ul style="list-style-type: none"> • to find the cell i.e. to answer questions like “What is in cell B3?” • in which cell an object is i.e. to answer questions like “Where is the cow?” <p>Transformations</p> <p>Grade 4 learners should focus on:</p> <ul style="list-style-type: none"> • building composite shapes including some shapes with line symmetry. 		



	<ul style="list-style-type: none">• tessellations and describing patterns in real life. <p>Tessellations</p> <ul style="list-style-type: none">• Learners use 2-D shapes to create tessellation patterns. Tiling patterns can be made by packing out the tiles.• Learners need to identify and describe tessellation patterns.• Grade 4 learners are not required to create the patterns by rotating, translating or reflecting a single shape.	<p>Learners describe patterns by talking about the shapes they see in the pattern. e.g.</p> <ul style="list-style-type: none">• the pattern I see on the crane is made of straight lines• the pattern we see on the honeycomb looks like a tessellation pattern of hexagons• the pattern I see on the bead bracelet looks like a tessellation pattern of triangles <p>Learners describe patterns by discussing the symmetry of shapes e.g. the butterfly's wings make a symmetrical pattern. Learners often find patterns easier to describe, once they have copied or made the patterns. It is useful to link the process of making or copying patterns with the descriptions of patterns from nature, modern everyday life and our cultural heritage. Often the geometrical process you use to make a copy of the pattern is not the same as the original process used to make the pattern.</p> <p>In Grade 5 learners work with views of single everyday objects or collections of everyday objects. They match views of the object or objects with the position of the viewer. Learners are presented with multiple views of an everyday object or collection of everyday objects or scenes from everyday life, as well as positions of viewers in relation to the object or objects. They match each view with a viewer or viewpoint. Everyday objects often have more irregular surfaces than geometric objects e.g. compare a teapot to a sphere or a person to a cube. This makes it easier to identify views and viewpoints of everyday objects.</p> <ul style="list-style-type: none">• In Grade 4 learners create composite shapes by placing 2-D shapes next to each other. In Grade 5 learners trace and move a 2-D shape using reflections, rotations and translations to draw composite shapes.• In Grade 4 learners create tessellations by packing out shapes. In Grade 5 learners trace and move a 2-D shape using reflections, rotations and translations to draw tessellations. <p>Learners use a 2-D shape as a template which they trace and move by reflecting, translating and rotating to create composite shapes. Some of the new shapes drawn should have lines of symmetry. Learners describe how they moved the shape to create the pattern using the words "rotation, translation and reflection"</p> <p>In Grade 6 viewing and position is extended to geometric objects or collections of geometric objects or composite geometric objects. Learners are presented with multiple views of an everyday or geometric object or collections of objects or composite</p>
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	<p>geometric objects, as well as positions of viewers in relation to the object or objects. They match each view with a viewer or viewpoint.</p> <p>In Grade 6, learners are only required to use the transformation concepts in describing patterns. Learners describe patterns by discussing the shapes they see in the pattern and how they would transform that shape if they wanted to extend the pattern</p> <ul style="list-style-type: none"> • The pattern I see on the honeycomb looks like a tessellation pattern of hexagons. I can make this pattern by translating the hexagon. • The pattern I see on the bead bracelet looks like a tessellation pattern of triangles. I can make this pattern by reflecting the triangle. • I can make a pattern like the one I see on the doily by translating the parallelogram. <p>Learners identify symmetry in patterns. Although learners are not required to draw the patterns in Grade 6, they often find patterns easier to describe, once they have copied or made the patterns. It is useful to link the process of making or copying patterns with the descriptions of patterns from nature, modern everyday life and our cultural heritage. Often the geometrical process you use to make a copy of the pattern is not the same as the original process used to make the pattern. Bees do not tessellate with hexagons to make a honeycomb, but if learners tessellate with a hexagon, they can make a pattern that looks similar to the pattern they see in the honeycomb.</p>	<p>Grade 6 learners also do enlargements and reductions.</p>						
LTS M								
Resources	<p>Variety of regular and irregular polygons: (To cut out)</p> <ul style="list-style-type: none"> - triangles, squares, rectangles, parallelograms, other quadrilaterals, pentagons, hexagons, heptagons, octagons - Tangrams pair of compasses, geoboards 	<table border="1"> <thead> <tr> <th>Grade 4</th><th>Grade 5</th><th>Grade 6</th></tr> </thead> <tbody> <tr> <td>WB 2 pp. 42 – 50 Activities 82-85 pp. 158 – 162 Activities 133-135)</td><td>WB 2 pp. 50 – 66 Activities 86-93; pp. 166 – 178 Activities 133-139</td><td>WB 2 pp. 46 – 48 Activities 79a&b; 83; 84a&b</td></tr> </tbody> </table>	Grade 4	Grade 5	Grade 6	WB 2 pp. 42 – 50 Activities 82-85 pp. 158 – 162 Activities 133-135)	WB 2 pp. 50 – 66 Activities 86-93; pp. 166 – 178 Activities 133-139	WB 2 pp. 46 – 48 Activities 79a&b; 83; 84a&b
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DBE Textbook reference	<p>Term 3: Unit 6: Properties of two dimensional shapes, p. 355</p> <p>Term 3: Unit 12: Transformation, p. 286</p> <p>Term 4: Unit 9: Transformation, p. 333</p> <p>Term 3: Unit 5: Viewing objects, p. 250</p> <p>Term 4: Unit 8: Position and movement, p. 329</p>	<p>Term 3: Unit 6: Properties of two dimensional shapes, p. 236</p> <p>Term 3: Unit 7: Transformation, p. 242</p> <p>Term 4: Unit 8: Transformation, p. 333</p> <p>Term 3: Unit 5: Viewing objects, p. 233</p>						

	Term 4: Unit 7: Position and movement, p. 331	Term 4: Unit 10: Position and movement, p. 358
HOMEWORK		
ASSESSMENT E.g. Informal assessment –Test		



MATHEMATICS INTERMEDIATE PHASE

MULTI GRADE LESSON PLAN 7

TERM 3

EDUCATOR:

DATE : fromto	GRADE	4 Make use of lesson plans of Term 2	5 Make use of lesson plans of Term 2	6 Length, Mass, Capacity and Volume Make use of lesson plans of Term 2	Time: 4 HOURS
TOPIC					
Concepts, Skills and knowledge	Length	<ul style="list-style-type: none"> Practical measuring of 2-D shapes and 3-D objects Measuring instruments Units Calculations and problem solving involving length 	<ul style="list-style-type: none"> Practical measuring of 2-D shapes and 3-D objects Measuring instruments Units Calculations and problem solving involving length 	Length <ul style="list-style-type: none"> Practical measuring of 2-D shapes and 3-D objects Measuring instruments Units Calculations and problem solving involving length 	Length <ul style="list-style-type: none"> Practical measuring of 2-D shapes and 3-D objects Measuring instruments Units Calculations and problem solving involving length
Concepts, Skills and knowledge	Mass	<ul style="list-style-type: none"> Practical measuring of 2-D shapes and 3-D objects Measuring instruments Units ((millilitres, litres)) Calculations and problem solving involving mass 	<ul style="list-style-type: none"> Practical measuring of 2-D shapes and 3-D objects Measuring instruments Units (millilitres, litres) Calculations and problem solving involving mass 	Mass <ul style="list-style-type: none"> Practical measuring of 2-D shapes and 3-D objects Measuring instruments Units (millilitres, litres) Calculations and problem solving involving mass (include fraction and decimal forms to 2 decimal places) 	Mass <ul style="list-style-type: none"> Practical measuring of 2-D shapes and 3-D objects Measuring instruments Units (millilitres, litres) Calculations and problem solving involving mass (include fraction and decimal forms to 2 decimal places)
Concepts, Skills and knowledge	Capacity/Volume	<ul style="list-style-type: none"> Practical measuring of 2-D shapes and 3-D objects Measuring instruments Units Calculations and problem solving involving capacity/volume 	<ul style="list-style-type: none"> Practical measuring of 2-D shapes and 3-D objects Measuring instruments Units Calculations and problem solving involving capacity/volume 	Capacity/Volume <ul style="list-style-type: none"> Practical measuring of 2-D shapes and 3-D objects Measuring instruments Units Calculations and problem solving involving capacity/volume 	Capacity/Volume <ul style="list-style-type: none"> Practical measuring of 2-D shapes and 3-D objects Measuring instruments Units Calculations and problem solving involving capacity/volume



LTSM Resources	Measuring tape, rulers, string, trundle wheel, Kitchen scale, bathroom scale, balance, Measuring jugs, bottles, variety of containers from learner's context, cubes	Grade 4	Grade 5	Grade 6
Workbook reference	WB 1 pp. 110 – 114 Activities 40 – 42 Mass WB 2 pp. 112 - 122 Activities 111-115 Volume/ Capacity WB 2 pp. 152 – 156 Activities 130-132	WB 1 pp 116 - 126 Activities 40 – 43 Mass WB 2 pp. 20 - 26 WB 2 Activities 74 - 76; 78 Volume/capacity WB 2 pp. 160 – 164 Activities 130 - 132	WB 1 pp 116 - 126 Activities 40 – 43 Mass WB 2 pp. 20 - 26 WB 2 Activities 74 - 76; 78 Volume/capacity WB 2 pp. 160 – 164 Activities 130 - 132	Length WB 1 pp. 102 - 106 Activities 102 - 104 Mass WB 1 pp. 10 – 12 Activities 68a&b Volume/ capacity WB 1 pp. 164 – 166 Activities 64a&b
DBE Textbook reference	Term 2: Unit 4: Length, p. 147 Term 4: Unit 3: Mass, p. 297 Term 3: Unit 2: Capacity and volume, p. 225	Term 2: Unit 4: Length, p. 143 Term 3: Unit 2: Mass, p. 211 Term 1: Unit 9: Capacity and volume, p. 104	Term 2: Unit 4: Length, p. 143 Term 3: Unit 2: Mass, p. 211 Term 1: Unit 9: Capacity and volume, p. 104	Term 3: Unit 11: Length, p. 285 Term 3: Unit 1: Mass, p. 215 Term 2: Unit 8: Capacity and volume, p. 200
HOMEWORK				
ASSESSMENT	E.g. Informal assessment – Test			

MATHEMATICS INTERMEDIATE PHASE

MULTI GRADE LESSON PLAN 8

TERM 3

EDUCATOR:

DATE : fromto	GRADE	TOPIC	Time: 12 HOURS
	4	Common Fractions CAPS p.91	5
			Common fractions CAPS p.160-162, 176-177 & 199 6 Common fractions CAPS p. 226-227, 280 Decimal fractions - CAPS p. 252, Percentages - CAPS p.267

Concepts, Skills and knowledge	Describing and ordering fractions	Describing and ordering fractions:	Describing and ordering fractions:
	<ul style="list-style-type: none"> Compare and order common fractions with different denominators (halves; thirds, quarters; fifths; sixths; sevenths, eighths) Describe and compare common fractions in diagram form 	<ul style="list-style-type: none"> Count forwards and backwards in fractions Compare and order common fractions to at least twelfths 	<ul style="list-style-type: none"> Compare and order common fractions, including tenths and hundredths
	Calculations with fractions:	Calculations with fractions:	Calculations with fractions:
	<ul style="list-style-type: none"> Addition of common fractions with the same denominators Recognize, describe and use the equivalence of division and fractions 	<ul style="list-style-type: none"> Addition and subtraction of common fractions with the same denominators Addition and subtraction of mixed numbers Fractions of whole numbers which result in whole numbers Recognize, describe and use the equivalence of division and fractions 	<ul style="list-style-type: none"> Addition and subtraction of common fractions in which one denominator is a multiple of another Addition and subtraction of mixed numbers Fractions of whole numbers
	Solving problems	Solving problems	Solving problems
	<ul style="list-style-type: none"> Solve problems in contexts involving grouping and equal sharing 	<ul style="list-style-type: none"> Solve problems in contexts involving common fractions, including grouping and sharing 	<ul style="list-style-type: none"> Solve problems in contexts involving common fractions, including grouping and sharing
	Percentages	Percentages	Percentages
		<ul style="list-style-type: none"> Find percentages of whole numbers 	<ul style="list-style-type: none"> Find percentages of whole numbers
	Equivalent forms:	Equivalent forms:	Equivalent forms:
	<p>Recognize and use equivalent forms of common fractions (fractions in which one denominator is a multiple of another)</p>	<p>Recognize and use equivalent forms of common fractions (fractions in which one denominator is a multiple of another)</p>	<ul style="list-style-type: none"> Recognize and use equivalent forms of common fractions with 1-digit or 2-digit denominators (fractions in which one denominator is a multiple of another) Recognize equivalence between



	<ul style="list-style-type: none"> common fraction and decimal fraction forms of the same number Recognize equivalence between common fraction, decimal fraction and percentage forms of the same number <p>Recognizing, ordering and place value of decimal fractions</p> <ul style="list-style-type: none"> Count forwards and backwards in decimal fractions to at least two decimal places Compare and order decimal fractions to at least two decimal places Place value of digits to at least two decimal places <p>Calculations with decimal fractions</p> <ul style="list-style-type: none"> Addition and subtraction of decimal fractions with at least two decimal places Multiply decimal fractions by 10 and 100 <p>Solving problems</p> <ul style="list-style-type: none"> Solve problems in context involving decimal fractions <p>Calculations</p> <ul style="list-style-type: none"> Find percentages of whole numbers. 	
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**SUGGESTED
METHODOLOGY**

Refer to the Lesson plans in Term 2

In Grade 4 this is revision and consolidation of the concepts developed in Term 3. (See Term 3 notes)

In Term 4 length, capacity and mass can be used as contexts for fractions.

Teaching fractions in diagram forms should include: region models , length models (including number lines) and set models.

Learners should solve problems as well as work with apparatus to understand the relationship between fractions and division i.e. if you share 1 amongst 3 learners you will be making thirds.

Learners must be able to name fractions. Terminology like “3 over 4” should be avoided as it tends to encourage learners to think about each fraction as two different numbers, rather than $\frac{3}{4}$ being a number which is greater $\frac{1}{2}$ than but less than 1. When naming fraction parts it is useful for learners to rather use the form “3 quarters” .

Learners should, through work with apparatus, diagrams and solving problems, learn the new fractions that they will deal with in Grade 4

Teach fractions as equal parts of a whole

Example 1

- Divide a banana unevenly and ask two learners whether they would be satisfied with this division. Why not?
- Explain that fractions are formed with the dividing of a whole into EQUAL PARTS.

Example 2

Give different mathematical shapes to learners – circles / rectangles / squares / etc.

- Work practically – divide one (circle) equally between 2 – then 4 – then 8 learners
- Explain what we call these fractions and what the notation looks like $\frac{1}{2}; \frac{1}{4}$ (at first only)

Example 3

Divide a chocolate (rectangle) equally between 3 – then 6 learners.

Example 4

Divide a cake (square) equally between 5 – then 10 learners.

Explain the notation every time in the above examples.

A written or oral exercise can be done at this point. The following can be used:
The teacher should take the lead and ask questions. Ask the learners to write the fraction notation on the board for the whole class to see.

	<p>Addition of fractions:</p> <ul style="list-style-type: none"> · Work with concrete objects. · Work with diagrams. Shade one part in one colour. Shade another part in a different colour. Which fraction is shaded in total? · Work with fraction wall: (Start with simple fractions) Start with the same denominator, e.g., $\frac{1}{4} + \frac{1}{4}$ <p>If learners can do the addition using concrete examples, they can then progress to writing the fraction notation below the concrete example.</p> <p>Follow these steps, e.g.</p> <p>Step 1: Make sure the bottom numbers (the denominators) are the same</p> <p>Step 2: Add the top numbers (the numerators). Put the answer over the same denominator as in step 1</p> <p>Step 3: Simplify the fraction (if needed).</p>
	<p>DECIMALS</p> <p>Important: Refer to the Lesson Plans on Decimal Fractions in Term 2</p> <p>Convert from fractions to decimal fractions and to percentages. Only taught in Grade 6.</p>
	<p>PERCENTAGES</p> <p>Percentages are a new topic for Grade 6 learners.</p> <p>Learners have already worked with tenths and hundredths in common fraction form. They should start by rewriting and converting tenths and hundredths in common fraction form to percentages. Where denominators of other fractions are factors of 10, e.g., 2, 5 or factors of 100 e.g. 2, 4, 5, 20, 25, 50 learners can convert these to hundredths using what they know about equivalence.</p> <p>Equivalence between common fractions and percentage</p> <p>Learners are not expected to be able to convert any common fraction into its percentage form, merely to see the relationship between tenths and hundredths in their percentage form. Learners should be able to convert any decimal fraction in tenths or hundredths into a percentage.</p>

	Calculations Learners should be able to find percentages of whole numbers e.g. What is 25% of R300? Here learners use what they know about both converting between percentage and common fraction form and also what they know about finding fractions of whole numbers e.g. 25% of R30 = $\frac{1}{4}$ of R300 = R75.	
LTSM Resources	Number lines: Structured -, semi- structured - , unstructured number lines; Counters, Pictures, arrays/ diagrams, fraction walls, fraction circles, different models of fractions, fraction strips,	
	Grade 4 Workbook reference WB 1 pp. 34 – 39 Activities 98 - 108 WB 2 pp. 128 – 138 Activities 118 - 123	Grade 5 Grade 6 WB 2 pp. 116 – 132 Activities 112 - 118
DBE Textbook reference	Term 3: Unit 1: Common Fractions, p. 211	Term 3: Unit 1: Common Fractions, p. 199 Term 4: Unit 3: Common Fractions, p. 306 Term 2: Unit 7: Decimals, p. 177 Term 3: Unit 8: Percentages, p. 262
HOMEWORK		
ASSESSMENT	E.g. Informal assessment – Test	



LESSON PLANS: TERM 4



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MATHEMATICS INTERMEDIATE PHASE**MULTI GRADE LESSON PLAN 1****TERM 4**

EDUCATOR:

GRADE	DATE: fromto	Time: 3 HOURS		
TOPIC	CAPS p.104 (methodology explained on pp. 37 - 38)	4	5 CAPS p.194 (methodology explained on pp. 125 -126) Whole numbers	6 CAPS p. 276 (methodology explained on pp. 215 – 216)
Concepts, Skills and knowledge	<ul style="list-style-type: none">Count forwards and backwards in 2s, 3s, 5s, 10s, 25s, 50s, 100s between 0 and at least 10 000Order, compare and represent numbers to at least 4 digit numbers.Represent odd and even numbers to at least 1 000Recognize the place value of digits in whole numbers to at least 4-digit numbersRound off to the nearest 10, 100, 1 000.	<ul style="list-style-type: none">Count forwards and backwards in whole number intervals up to at least 10 000Order, compare and represent numbers to at least 6-digit numbersRepresent odd and even numbers to at least 1 000.Recognize the place value of digits in whole numbers to at least 6 digit numbers.Round off to the nearest 5, 10, 100, 1 000 and 10 000	<ul style="list-style-type: none">Count forwards and backwards in whole number intervals up to at least 10 000Order, compare and represent numbers to at least 9-digit numbersRepresent prime numbers to at least 100Recognizing the place value of digits in whole numbers to at least 9-digit numbersRound off to the nearest 5, 10, 100, 1 000, 10 000, 100 000, and 1 000 000	
SUGGESTED METHODOLOGY	<p>Refer back to Term 1</p> <p>Explain from known (low number range) to unknown (higher range of numbers); work with concrete LTM</p> <p>Counting, ordering, comparing, representing of digits</p>			<p>Note: According to CAPS number range per grade per term as in content clarification</p> <ul style="list-style-type: none">Read, say and write up to at least 4-digit numbers (Grade 4) , 6-digit (Grade 5) and 9-digit (Grade 6)

	<p>(Learners can write numbers with fingers in the air while they are reading / saying the words.) e.g. One hundred and twenty-nine</p> <ul style="list-style-type: none"> Convert from words to numbers and numbers to words Arrange the numbers below from the smallest to the biggest: <p>Example:</p> <p>10 111; 1 101; 1 110; 1 011</p> <ul style="list-style-type: none"> Make the biggest/smallest number you can with these digits: 3, 2, 5, 4, 9. <p>Odd and even numbers:</p> <p>Explore practically by working with numbers to be able to describe the pattern e.g. all odd numbers end in 1, 3, 5, 7 or 9 therefore 2 201, 2 203, 2 205, 2 207, 2 209 are all odd numbers.</p>
	<p>Prime numbers for Grade 6</p> <p>Identify prime numbers and composite numbers up to at least 100</p> <p>Multiples:</p> <p>I count in multiples of 3, up to 100.</p> <ul style="list-style-type: none"> Will I count the number 12? Why? Will I count the number 42? Why? <p>Place value:</p> <ul style="list-style-type: none"> Distinguish between the numeric value and the place value. Use place value cards to build up and break down numbers <p>Rounding off:</p> <ul style="list-style-type: none"> Round off as indicated per grade (use base ten blocks, number lines, place value table)



		<ul style="list-style-type: none"> • Use concept of rounding off, in problem solving context
LTS M		
Resources	Number lines: 0 – 120, Structured -, semi- structured -, unstructured number lines; Counters, Pictures, arrays/ diagrams, Flash cards, Base 10 blocks, 100 charts, multiplication table	
	Grade 4	Grade 5
Workbook reference	WB 2 p. 100 Activities 105	WB 2 p. 32 – 38; p. 96 Activities 79 - 81; 105)
DBE Textbook reference	Term 4: Unit 1: Whole Numbers, p. 291 283	Term 4: Unit 1: Whole Numbers, p. 297
HOMEWORK		
ASSESSMENT		
	E.g. Informal assessment – test	



MATHEMATICS INTERMEDIATE PHASE
MULTI GRADE LESSON PLAN 2
TERM 4

EDUCATOR:

GRADE	DATE : fromto	TOPIC	Time: 6 HOURS
4	CAPS p.93 (methodology explained on pp. 43 - 45)	Number range for calculations Addition and subtraction of whole numbers of at least 4 digits	<p>CAPS pp 182- 183 (methodology explained on pp. 132 – 135)</p> <p>Addition and subtraction of whole numbers</p> <ul style="list-style-type: none"> • Addition and subtraction of whole numbers of at least 5 digits • Multiple operations on whole numbers with or without brackets
5	CAPS pp 182- 183 (methodology explained on pp. 132 – 135)	Number range for calculations Addition and subtraction of whole numbers with at least 6-digit number	<p>Number range for calculations</p> <ul style="list-style-type: none"> • Addition and subtraction of whole numbers with at least 6-digit number • Multiple operations on whole numbers with or without brackets <p>Calculation techniques Using a range of techniques to perform and check written and mental calculations with whole numbers including</p> <ul style="list-style-type: none"> • estimation • building up and breaking down numbers • rounding off and compensating • doubling and halving • using a number line • using addition and subtraction as inverse operations • estimation • adding and subtracting in columns • building up and breaking down numbers • rounding off and compensating • using a number line • rounding off and compensating • doubling and halving • using addition and subtraction as inverse operations
6	CAPS pp.262-263 (methodology explained on pp. 222 – 225)	Number range for calculations Multiple operations on whole numbers with or without brackets	<p>Calculation techniques Using a range of techniques to perform and check written and mental calculations with whole numbers including</p> <ul style="list-style-type: none"> • estimation • adding, subtracting in columns • building up and breaking down numbers • rounding off and compensating • using addition and subtraction as inverse operations

	<p>Properties of whole numbers</p> <p>Recognize and use the commutative and associative properties with whole numbers</p> <p>Solving problems</p> <p>Solve problems in contexts involving whole numbers, including financial contexts</p>	<p>Properties of whole numbers</p> <ul style="list-style-type: none"> Recognize and use the commutative, associative and distributive properties with whole numbers <ul style="list-style-type: none"> - 0 in terms of its additive property - 1 in terms of its multiplicative property <p>Solving problems</p> <p>Solve problems involving whole numbers, including:</p> <ul style="list-style-type: none"> - financial contexts - measurement contexts 	<p>Properties of whole numbers</p> <ul style="list-style-type: none"> Recognize and use the commutative; associative; distributive properties of whole numbers <ul style="list-style-type: none"> - 0 in terms of its additive property - 1 in terms of its multiplicative property <p>Solving problems</p> <ul style="list-style-type: none"> Solve problems involving whole numbers and decimal fractions, including <ul style="list-style-type: none"> - financial contexts - measurement contexts Solve problems involving whole numbers, including comparing two or more quantities of the same kind (ratio)
LTS M Resources	Number lines: 0 – 120, Structured - , semi- structured - , unstructured number lines; Counters, Pictures, arrays/ diagrams, Flash cards, Base 10 blocks, 100 charts, multiplication table		
Grade 4 Workbook reference	WB 2 pp. 102 – 110; p.176 Activities 107 – 110; 142	Grade 5 WB 2 pp. 98 – 108; p. 186 Activities 106a&b - 110; 142	Grade 6 WB 2 pp. 20 – 44 Activities 71a&b - 78
DBE Textbook reference	Term 3: Unit 9: Whole Numbers: Addition and subtraction, p. 268 Term 4: Unit 2: Whole Numbers: Addition and subtraction, p. 293 Term 4: Unit 11: Whole Numbers: Addition and subtraction, p. 343	Term 4: Unit 2: Whole Numbers: Addition and subtraction, p. 286	Term 3: Unit 3: Whole Numbers: Addition and subtraction, p. 224
HOMEWORK			
ASSESSMENT	E.g. Informal assessment		



- Test

MATHEMATICS INTERMEDIATE PHASE
MULTI GRADE LESSON PLAN 3
TERM 4

EDUCATOR:

GRADE	DATE : fromto	TOPIC	Time: 3 HOURS
	4	Multiplication - CAPS pp.101	5 Multiplication - CAPS p.192 (Refer to p.166 for methodology.)
Concepts, Skills and knowledge		Multiplication of whole numbers	<p>Number range for counting, ordering, comparing and representing, and place value of digits</p> <ul style="list-style-type: none"> Order, compare and represent numbers to at least 9-digit numbers Represent prime numbers to at least 100 Recognize the place value of digits in whole numbers to at least 9-digit numbers Round off to the nearest 5, 10, 100 or 1 000 <p>Number range for calculations</p> <ul style="list-style-type: none"> Multiplication of at least whole 3-digit by 2-digit numbers <p>Calculation techniques</p> <p>Using a range of techniques to perform and check written and mental</p>
			<p>Multiplication - CAPS p.241-243</p> <p>Number range for calculations</p> <ul style="list-style-type: none"> Multiplication of at least whole 4-digit by 3-digit numbers Multiple operations on whole numbers with or without brackets <p>Calculation techniques include</p> <ul style="list-style-type: none"> estimation multiplying in columns



	<p>calculations with whole numbers including</p> <ul style="list-style-type: none"> estimation building up and breaking down numbers rounding off and compensating doubling and halving <p>Number range for multiples and factors</p> <p>Multiples of 1-digit numbers to at least 100</p>	<p>mental calculations of whole numbers including:</p> <ul style="list-style-type: none"> estimation building up and breaking down numbers using a number line rounding off and compensating doubling and halving <p>Number range for multiples and factors</p> <ul style="list-style-type: none"> Multiples of 2-digits whole numbers to at least 100 Factors of 2-digit whole numbers to at least 100 	<ul style="list-style-type: none"> building up and breaking down numbers rounding off and compensating using a calculator <p>Number range for multiples and factors</p> <ul style="list-style-type: none"> Multiples of 2-digit and 3-digit numbers Factors of 2-digit and 3-digit whole numbers Prime factors of numbers to at least 100
		<p>Properties of whole numbers</p> <ul style="list-style-type: none"> Recognize and use the commutative; associative; and distributive properties of whole numbers <ul style="list-style-type: none"> 0 in terms of its additive property 1 in terms of its multiplicative property 	<p>Properties of whole numbers</p> <ul style="list-style-type: none"> Recognize and use the commutative; associative and distributive properties with whole numbers <ul style="list-style-type: none"> 0 in terms of its additive property 1 in terms of its multiplicative property <p>Solving problems</p> <ul style="list-style-type: none"> Solve problems involving whole numbers, including financial contexts
			<p>Properties of whole numbers</p> <ul style="list-style-type: none"> Recognize and use the commutative; associative; and distributive properties of whole numbers <p>Solving problems</p> <ul style="list-style-type: none"> Solve problems in contexts involving whole numbers, including financial contexts
			<p>Solving problems</p> <ul style="list-style-type: none"> Solve problems involving whole numbers and decimal fractions, including financial contexts

	<ul style="list-style-type: none"> Solve problems involving whole numbers, including <ul style="list-style-type: none"> comparing two or more quantities of the same kind (ratio) comparing two quantities of different kinds (rate) 	<ul style="list-style-type: none"> measurement contexts Solve problems involving whole numbers, including <ul style="list-style-type: none"> comparing two or more quantities of the same kind (ratio) 	<ul style="list-style-type: none"> measurement contexts Solve problems involving whole numbers, including <ul style="list-style-type: none"> comparing two or more quantities of the same kind (ratio) of the same kind (ratio) comparing two quantities of different kinds (rate)
Topic	Number range for calculations	Division of whole numbers	Number range for calculations
	<ul style="list-style-type: none"> Division of at least whole 3-digit by 1-digit numbers. 	<p>Division of at least whole 3-digit by 2-digit numbers</p> <ul style="list-style-type: none"> multiple operations on whole numbers with or without brackets 	<p>Division of at least whole 4-digit by 3-digit numbers</p> <ul style="list-style-type: none"> multiple operations on whole numbers with or without brackets



	<p>Number range for counting, ordering and representing, and place value of digits</p> <ul style="list-style-type: none"> Recognize the place value of digits in whole numbers to at least 6-digit numbers. Round off to the nearest 10, 100, 1 000 	
	<p>Number range for multiples and factors</p> <ul style="list-style-type: none"> Multiples of 1-digit numbers to at least 100 	<p>Number range for multiples and factors</p> <ul style="list-style-type: none"> Multiples of 2-digit and 3-digit numbers Factors of 2-digit and 3-digit whole numbers Prime factors of numbers up to at least 100
	<p>Multiplication facts</p> <ul style="list-style-type: none"> Units by multiples of 10 Units by multiples of 100 	<p>Properties of whole numbers</p> <ul style="list-style-type: none"> Recognize and use the commutative; associative; and distributive properties of whole numbers <ul style="list-style-type: none"> 1 in terms of its multiplicative property
	<p>Solving problems</p> <ul style="list-style-type: none"> Solve problems in contexts involving whole numbers <ul style="list-style-type: none"> financial contexts measurement contexts 	<p>Solving problems</p> <ul style="list-style-type: none"> Solve problems in contexts involving whole numbers, including financial contexts <ul style="list-style-type: none"> financial contexts measurement contexts

	<ul style="list-style-type: none"> Solve problems involving whole numbers, including <ul style="list-style-type: none"> grouping and equal sharing with remainders comparing two or more quantities of the same kind (ratio) comparing two quantities of different kinds (rate) grouping and equal sharing with remainders 	<ul style="list-style-type: none"> Solve problems involving whole numbers, including <ul style="list-style-type: none"> comparing two or more quantities of the same kind (ratio) comparing two quantities of different kinds (rate) grouping and equal sharing with remainders 	<ul style="list-style-type: none"> measurement contexts
SUGGESTED METHODOLOGY	<p>Refer to Term 1 and Term 2 lesson Plans</p> <p>Explain from known (low number range); work with concrete LTSM.</p> <p>Learners should do context free calculations and solve problems in contexts</p> <p>Learners should continue to</p> <ul style="list-style-type: none"> check their solutions by using multiplication when doing division and vice versa judge the reasonableness of their solutions, by estimating before calculating <p>Multiplication (Know times tables – practice regularly up to 10×10 for Grades 4 and 5 and 12×12 for Grade 6).</p> <p>Follow these steps in teaching multiplication:</p> <ul style="list-style-type: none"> Solve problems in context. <p>Understand that: $86 + 86 + 86$ is equivalent to 86×3 or 3×86 (repeated addition)</p> <ul style="list-style-type: none"> multiplication by 1 leaves a number unchanged e.g. $5 \times 1 = 5$; $99 \times 1 = 99$ multiplication of zero results in zero e.g. $7 \times 0 = 0$; $31 \times 0 = 0$ <p>Understand that multiplication is the inverse of division (multiplication reverses division and vice versa) and use this to check results. e.g. $15 \times 35 = 525$ \square $525 \div 25 = 15$ or $525 \div 15 = 25$</p> <p>Note: In Grade 5 Term 3 learners are introduced to column methods of multiplication</p>		



	<p>DIVISION Mental division : Turning the tables – practice regularly (e.g. $5 \times 8 = 40 \square 40 \div 8 = 5 / 40 \div 5 = 8$) (Also called inverse operation or reciprocal operation.)</p> <p>Make learners aware that division is non-commutative i.e. $81 \div 9$ is not the same as $9 \div 81$.</p> <p>With the concept grasped, teaching division will become more about guided practice to help the learners to become familiar with the division operation (although it's really going to be a different type of multiplication practice.) Start by practising division by 1, 2 and 3 and then gradually move up to 9.</p> <p>Note: Grade 4 and 5 focus is on using the clue board – method ONLY! Grade 6 is the introduction of long division in the third term</p>		
LTSMS			
Resources	Number lines: 0 – 120, Structured -, semi- structured -, unstructured number lines; Counters, Pictures, arrays/ diagrams, Flash cards, Base 10 blocks, 100 charts, multiplication table		
	Grade 4	Grade 5	
Workbook reference	<p>WB 2 pp. 78 – 90 Activities 98a-c, 99a&b; 100-101 pp. 142 – 144 Activities 124 - 125</p>	<p>WB 2 pp. 90 – 94 Activities 103a&b; 104; pp. 138 – 152 Activities 120 - 126a&b</p>	Grade 6
			<p>WB 2 pp. 112 – 130 Activities 106a&b-112a&b pp.164 – 174 Activities; 126-129a&b</p>
DBE Textbook reference	<p>Term 3: Unit 10: Whole Numbers: Multiplication, p. 275</p> <p>Term 4: Unit 6: Whole Numbers: Division, p. 313</p>	<p>Term 3: Unit 11: Whole Numbers: Multiplication, p. 269</p> <p>Term 4: Unit 5: Whole Numbers: Division, p. 310</p>	<p>Term 4: Unit 2: Whole Numbers: Multiplication, p. 300</p> <p>Term 4: Unit 7: Whole Numbers: Division, p. 336</p>
HOMEWORK			
ASSESSMENT	E.g. Informal assessment – Test		

**MATHEMATICS INTERMEDIATE PHASE
MULTI GRADE LESSON PLAN 4
TERM 4**

EDUCATOR:

TOPIC	DATE : from to	GRADE	Properties of 3-D objects Range of Objects:	Properties of 3-D objects Range of Objects:	Properties of 3-D shapes	Time: 6 HOURS
Concepts, Skills and knowledge			<ul style="list-style-type: none"> - rectangular prisms, - spheres - cylinders - pyramids 	<ul style="list-style-type: none"> - rectangular prisms and other prisms - cubes - cylinders - cones - pyramids - similarities and differences between cubes and rectangular prisms 	<p>Characteristics of objects</p> <ul style="list-style-type: none"> - shape of faces - number of faces - flat and curved surfaces <p>Further activities</p> <ul style="list-style-type: none"> • Make 3-D models using cut out polygons - nets 	<p>Characteristics of 3-D objects</p> <ul style="list-style-type: none"> - rectangular prisms - cubes - tetrahedrons - pyramids - similarities and differences between tetrahedrons and other pyramids <p>Further activities</p> <ul style="list-style-type: none"> • Make 3-D models using: - drinking straws, toothpicks etc - nets



SUGGESTED METHODOLOGY	<p>Refer to Term 2 notes for revision and consolidation.</p> <p>In Term 4 learners should consolidate what they learnt about 3-D objects earlier in the year. This includes:</p> <ul style="list-style-type: none"> • working with all of the objects prescribed for Grade 4, 5 and 6. • focusing on the kind of surface and the shape and number of faces. • building objects using nets.
	<p>In Term 4 learners can build skeleton shapes with straws or toothpicks. They will then focus on the edges and vertices of the objects. This means that by the end of the year they will be able to describe 3-D geometric objects according to the number and shape of faces and the number of edges and vertices of 3-D Objects. Learners need to work with real objects. However, they also need to do written exercises on 3-D objects. Interpreting pictures about 3-D objects is more difficult than working with the real objects. Learners should practise interpreting drawings of 3-D objects. They should identify and name 3-D objects in drawings; identify everyday objects that look like geometric objects (e.g. a milk carton looks like a rectangular prism), match nets of objects to drawing of objects, describe 3-D objects by stating the number of flat and/or curved surfaces, the number of vertices, edges, and number and shape of faces when shown drawings of 3-D objects.</p>

LTS M Resources	Variety of 3D objects from learner's context, geosolids Grade 4	Grade 5	Grade 6
Workbook reference	WB 2 pp. 124 – 126 Activities 116 - 117	WB 1 pp. 150 Activity 54	WB 2 pp. 152 Activity 122
DBE Textbook reference	Term 4: Properties of three dimensional objects, p. 306	Term 4: Unit 3: Properties of three dimensional objects, p. 292	Term 4: Unit 4: Properties of three dimensional objects, p. 315
HOMEWORK			
ASSESSMENT	E.g. Informal assessment – Test		

MATHEMATICS INTERMEDIATE PHASE
MULTI GRADE LESSON PLAN 5
TERM 4

EDUCATOR:

GRADE	DATE : fromto.....	TOPIC	Time: 8 HOURS
4 CAPS p. 114	4 CAPS p. 114	<p>Perimeter Measure perimeter using rulers or measuring tapes</p> <p>Measurement of area Find areas of regular and irregular shapes by counting squares on grids in order to develop an understanding of square units</p>	<p>5 CAPS p. 202</p> <p>Perimeter, Area and Volume Measure perimeter using rulers or measuring tapes</p> <p>Measurement of area Find areas of regular and irregular shapes by counting squares on grids in order to develop an understanding of square units</p> <p>Measurement of volume Find volume/capacity of objects by packing or filling them in order to develop an understanding of cubic units</p>
			<p>6 CAPS p. 282</p> <p>Perimeter Measure perimeter using rulers or measuring tapes</p> <p>Measurement of area Continue to find areas of regular and irregular shapes by counting squares on grids</p> <ul style="list-style-type: none"> Develop an understanding of why the area of rectangles can be described as their length multiplied by their width <p>Measurement of volume Continue to find volume/capacity of objects (by packing or filling them) and squares</p> <ul style="list-style-type: none"> Develop an understanding of why the volume of rectangular prisms can be described as their length multiplied by their width multiplied by their height <p>Investigate the:</p> <ul style="list-style-type: none"> relationship between perimeter and area of rectangles and squares relationship between surface area and volume of rectangular prisms



SUGGESTED METHODOLOGY	<p>What is capacity? What is volume?</p> <p>Capacity is the amount of substance that an object can hold or the amount of space inside the object.</p> <p>Volume is the amount of space that an object occupies.</p> <p>A bottle can have a 1 litre capacity, but it may not be filled to its full capacity, it could for example, only contain a volume of 250ml.</p> <p>Content</p> <ul style="list-style-type: none"> • Area and volume are only measured informally in the Intermediate Phase. Learners are not required to know or apply formulae for the perimeter, area or volume of any shape or objects. • In Grade 3 learners only measured perimeter informally by finding the distance around two-dimensional shapes using string. Learners in Grade 3 are not required to state or write how long a perimeter is. They only show the string length or compare different perimeters by comparing string lengths. In Grade 4 learners measure the perimeters of shapes and spaces with rulers and measuring tapes. They are required to state and record this measurement in standard units: mm, cm, m. Learners are also required to work from drawings in which side lengths are specified in mm, cm, m, km. Here they add the lengths. In Grade 4 they will also count the lengths of the perimeters by counting the number of sides of square grids on which shapes are drawn. Here learners need to know that the diagonal distances between corners of a grid square are longer than the vertical or horizontal distances between corners of a grid square. • In Grade 3 learners only investigate areas using tiling. In Grade 4 area measurements continue to be informal, but now learners use both tiling and square grids. Learners count how many grid squares the shape covers. The area is stated in number of grid squares. Shapes should include regular shapes, irregular shapes and shapes with curved sides. • Learners do not work with volume in Grade 3. In Grade 4 learners count how many cubes or rectangular prisms are used to fill a container. The volume of the container is stated in number of cubes or rectangular prisms such as boxes or blocks. Learners make stacks with cubes or rectangular prisms. The volume of the stack is stated in number of cubes or rectangular prisms such as boxes or blocks. • In Grade 4, learners interpret pictures of stacks made of cubes or rectangular prisms in order to state the volume in terms of the number of cubes or rectangular prisms. They interpret pictures of containers filled with cubes or rectangular prisms in order to state the volume in terms of the number of cubes or rectangular prisms. • In Grade 5 and 6 learners practise and consolidate what they have learned about perimeter, area and volume in Grade 4.
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	<ul style="list-style-type: none"> In Grade 6 they should investigate why the area of a rectangle can be stated as its length multiplied by its width. They are not required to know this formula off by heart, nor are they required to apply this formula in area calculations. 																		
	<ul style="list-style-type: none"> Grade 6 learners investigate the relationship between the area and perimeter of rectangles and squares. This investigation can be done as an Assessment Task. There are two different investigations that learners can do. <ol style="list-style-type: none"> If learners are given the perimeter of a rectangle, they can draw a number of rectangles of differing areas. Does this also work with squares? Similarly if they are given the area of a square, there will only be one possibility for the length of the sides. Is this the same for rectangles? Investigating the relationship between the areas and perimeters of squares and rectangles can be combined with the shape and space requirement. 																		
	<ul style="list-style-type: none"> Grade 6 learners also draw enlargements and reductions of 2-D shapes using grid paper to compare their size and shape. Here learners can draw a square or rectangle with specified side lengths. Then they can investigate what happens to the area of the shape, if the length of one pair of opposite sides of the shape are doubled or halved 																		
LTS M																			
Resources	Variety of 2D shapes. Rulers, measuring tapes, square block paper																		
	<table border="1"> <thead> <tr> <th>Grade 4</th> <th>Grade 5</th> <th>Grade 6</th> </tr> </thead> <tbody> <tr> <td>Workbook reference</td> <td>WB 2 pp. 146 - 156 Activities 127 - 132</td> <td>WB 2 pp. 154 - 164 Activities 127 - 130</td> </tr> <tr> <td>DBE Textbook reference</td> <td>Term 4: Unit 7: Perimeter, area and volume, p. 318</td> <td>Term 4: Unit 6: Perimeter, area and volume, p. 318</td> </tr> <tr> <td>HOMEWORK</td> <td></td> <td></td> </tr> <tr> <td>ASSESSMENT</td> <td></td> <td></td> </tr> <tr> <td>E.g. Informal assessment – Test</td> <td></td> <td></td> </tr> </tbody> </table>	Grade 4	Grade 5	Grade 6	Workbook reference	WB 2 pp. 146 - 156 Activities 127 - 132	WB 2 pp. 154 - 164 Activities 127 - 130	DBE Textbook reference	Term 4: Unit 7: Perimeter, area and volume, p. 318	Term 4: Unit 6: Perimeter, area and volume, p. 318	HOMEWORK			ASSESSMENT			E.g. Informal assessment – Test		
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HOMEWORK																			
ASSESSMENT																			
E.g. Informal assessment – Test																			



MATHEMATICS INTERMEDIATE PHASE
MULTI GRADE LESSON PLAN 6
TERM 4

EDUCATOR:

GRADE	DATE : fromto.....	4 CAPS p. 95	5 CAPS p. 187 - 188	Time: 4 HOURS	6 CAPS p. 268 - 269
TOPIC	Data Handling				
Concepts, Skills and knowledge	Data handling <ul style="list-style-type: none"> Collecting and organizing data Representing data Analysing, interpreting and reporting data Ungrouped data 				
SUGGESTED METHODOLOGY	Data handling <ul style="list-style-type: none"> Collecting and organizing data Representing data Analysing, interpreting and reporting data Ungrouped data <p>Teachers in this phase should ensure that different topics are chosen for data collection in each of the grades. The following are new in Grade 4</p> <ul style="list-style-type: none"> Learners read, interpret, analyse and summarise pie charts, where the information is presented in fractions only Learners read, analyse data represented in words i.e. short paragraphs – the data presented in words should be represented in other forms and then analysed <p>Analysing graphs Analyse graphs on environmental or socio-economic contexts and answer questions on graphs. Both graphs and questions to be provided by teacher or textbook. Learners should work with at least</p> <ul style="list-style-type: none"> 1 pie graph where the information is given in common fractions and not percentages 1 bar graph <p>Suitable topics include:</p> <ul style="list-style-type: none"> quantities of materials recycled in the town, province, country quantities of recycling materials collected by schools around the country sources of lighting and heating in SA kinds of toilets in SA homes kinds of homes in SA 				

The following are new in Grade 5

- ordering data sets
- analyzing data not only according to categories but also taking into account contexts and sources of data
- analyzing ungrouped numerical data sets to find the mode
- pictographs which show many-to-one correspondence
- conclusions and predictions when analysing and summarising data

Develop critical analysis skills

Learners compare graphs on the same topic, but where data has been collected from different groups of people, at different times, in different places or in different ways. Here learners will be able to discuss the differences between the graphs. The aim is also for learners to become aware of factors that can impact on the data. Learners can summarize the findings of their comparison in a paragraph.

Examples could include:

- comparing data about cars that pass the school at different times or comparing data about cars that pass different venues (busy and quiet areas, poorer and richer areas etc)
 - comparing data collected at your school to national data from 'Census At School' e.g. favourite sports; favourite subjects; transport to school; time taken to get to school; type of dwelling; access to goods and services at home
 - comparing data collected from girls and boys e.g. favourite sports, favourite movies, favourite school subjects
 - comparing rainfall each month for a town in summer and winter rainfall areas
- Learners should do at least 1 example in which they compare graphs.

Complete data cycle: context personal data

The complete data cycle includes asking a question, collection, organising, representing, analyzing and interpreting data and reporting on the data. Choose a different topic to Term 1. Work through the whole data cycle to make an individual bar graph using contexts that relate to themselves, their class, their school or their family.

Suitable topics include:

- favourite sports / favourite movies / favourite music / favourite TV programmes / foods or cool drinks/ favourite colours, etc.
- heights of learners in class
- mass of learners in class
- shoe size of learners in class
- average time taken to get from home to school
- number of people staying in homes of learners in the class

<p>Analyse ungrouped numerical data using measures of central tendency</p> <p>Learners determine the mode of ungrouped numerical data sets.</p> <p>Suitable topics include:</p> <ul style="list-style-type: none"> • heights of learners in the class • mass of learners in the class • shoe size of learners in the class • average time taken to get from home to school • number of people staying in the homes of learners in the class • temperatures for a month 	<p>The following are new in Grade 6</p> <ul style="list-style-type: none"> • graphs can include data expressed in percentages. This is important in pie charts, but percentages can also be used in bar graphs or double bar graphs • collecting data by using simple questionnaires • double bar graphs • the median of a data set 	<p>Complete a data cycle including drawing a double bar graph: context personal data</p> <p>This is recommended as the Mathematics project in Grade 6</p> <p>The complete data cycle includes posing a question, collecting, organising, representing, analyzing, interpreting data and reporting on the data. Learners work through the whole data cycle to make an individual double bar graph using contexts that relate to themselves, their class, their school or their family.</p> <p>Suitable topics include:</p> <ul style="list-style-type: none"> • favourite sports / favourite movies / favourite music / favourite TV programmes / foods or cool drinks/ favourite colours, etc. Include boys versus girls • heights of learners in class. Include boys versus girls • mass of learners in class. Include boys versus girls • shoe size of learners in class. Include boys versus girls <p>Analysing ungrouped numerical data using measures of central tendency</p> <p>Learners find the mode and median of ungrouped numerical data sets. Suitable topics same as for Grade 5.</p> <p>Teachers in this phase should ensure that different topics are chosen for data collection and analysis in each of the grades.</p>
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LTSM	
Resources	Exemplars of pictographs, bar graphs, pie charts – (context sensitive), ICT – Excel worksheets with graphs, video clips, E learning online resources, Maths games,
Grade 4	Grade 5
Workbook reference	WB 2 pp. 52 – 62 Activities 86 - 91
DBE Textbook reference	Term 3: Unit 7: Data Handling, p. 258 Term 4: Unit 12: Probability, p. 347
HOMEWORK	
ASSESSMENT	E.g. Informal assessment – Test

MATHEMATICS INTERMEDIATE PHASE
MULTI GRADE LESSON PLAN 7
TERM 4

EDUCATOR:

GRADE	DATE : fromto	TOPIC	Time: 12 HOURS
		<p>Common Fractions CAPS p.91</p> <p>Describing and ordering fractions:</p> <ul style="list-style-type: none"> • Compare and order common fractions with different denominators (halves; thirds, quarters; fifths; sixths; sevenths; eighths) • Describe and compare common fractions in diagram form <p>Calculations with fractions:</p> <ul style="list-style-type: none"> • Addition of common fractions with the same denominators • Recognize, describe and use the equivalence of division and fractions 	<p>Common fractions CAPS pp.160-162, 176-177 & 199</p> <p>Common fractions, decimal fractions and percentages</p> <p>Describing and ordering fractions:</p> <ul style="list-style-type: none"> • Count forwards and backwards in fractions • Compare and order common fractions to at least twelfths <p>Calculations with fractions:</p> <ul style="list-style-type: none"> • Addition and subtraction of common fractions with the same denominators • Addition and subtraction of mixed numbers • Fractions of whole numbers which result in whole numbers • Recognize, describe and use the equivalence of division and fractions
		<p>Common fractions CAPS pp. 226-227, 280</p> <p>Decimal fractions - CAPS p. 252, Percentages - CAPS p.267</p> <p>Describing and ordering fractions:</p> <ul style="list-style-type: none"> • Compare and order common fractions, including tenths and hundredths 	<p>Common fractions CAPS pp. 226-227, 280</p> <p>Decimal fractions - CAPS p. 252, Percentages - CAPS p.267</p> <p>Describing and ordering fractions:</p> <ul style="list-style-type: none"> • Compare and order common fractions, including tenths and hundredths

	<p>Solving problems Solve problems in contexts involving fractions, including grouping and equal sharing</p> <p>Equivalent forms: Recognize and use equivalent forms of common fractions (fractions in which one denominator is a multiple of another)</p>	<p>Solving problems Solve problems in contexts involving common fractions, including grouping and sharing</p> <p>Percentages • Find percentages of whole numbers</p> <p>Equivalent forms: Recognize and use equivalent forms of common fractions (fractions in which one denominator is a multiple of another)</p>	<p>Solving problems Solve problems in contexts involving common fractions, including grouping and sharing</p> <p>Percentages • Find percentages of whole numbers</p> <p>Equivalent forms: <ul style="list-style-type: none"> • Recognize and use equivalent forms of common fractions with 1-digit or 2-digit denominators (fractions in which one denominator is a multiple of another) • Recognize equivalence between common fraction and decimal fraction forms of the same number • Recognize equivalence between common fraction, decimal fraction and percentage forms of the same number </p> <p>Recognizing, ordering and place value of decimal fractions <ul style="list-style-type: none"> • Count forwards and backwards in decimal fractions to at least two decimal places • Compare and order decimal fractions to at least two decimal places • Place value of digits to at least two decimal places </p>
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	<p>Calculations with decimal fractions</p> <ul style="list-style-type: none"> • Addition and subtraction of decimal fractions with at least two decimal places • Multiply decimal fractions by 10 and 100 <p>Solving problems</p> <p>Solve problems in context involving decimal fractions</p> <p>Calculations</p> <p>Find percentages of whole numbers.</p> <p>Equivalent forms:</p> <ul style="list-style-type: none"> • Recognize equivalence between common fraction and decimal fraction forms of the same number • Recognize equivalence between common fraction, decimal fraction and percentage forms of the same number
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<p>SUGGESTED METHODOLOGY</p> <p><u>Refer to the Lesson plans in Term 2</u></p> <p>In Grade 4 this is revision and consolidation of the concepts developed in Term 3. (See Term 3 notes)</p> <p>In Term 4 length, capacity and mass can be used as contexts for fractions.</p> <p>Teaching fractions in diagram forms should include: region models , length models (including number lines) and set models.</p> <p>Learners should solve problems as well as work with apparatus to understand the relationship between fractions and division i.e. if you share 1 amongst 3 learners you will be making thirds.</p> <p>Learners must able to name fractions. Terminology like “3 over 4” should be avoided as it tends to encourage learners to think about each fraction as two different numbers, rather than $\frac{3}{4}$ being a number which is greater $\frac{1}{2}$ than but less than 1. When naming fraction parts it is useful for learners to rather use the form “3 quarters” .</p> <p>Learners should, through work with apparatus, diagrams and solving problems, learn the new fractions that they will deal with in Grade 4</p> <p>Teach fractions as equal parts of a whole</p>	<p>Example 1</p> <ul style="list-style-type: none"> - Divide a banana unevenly and ask two learners whether they would be satisfied with this division. Why not? - Explain that fractions are formed with the dividing of a whole into EQUAL PARTS. <p>Example 2</p> <p>Give different mathematical shapes to learners – circles / rectangles / squares / etc.</p> <ul style="list-style-type: none"> - Work practically – divide one (circle) equally between 2 – then 4 – then 8 learners - Explain what we call these fractions and what the notation looks like $\frac{1}{2}; \frac{1}{4}$ (at first only) <p>Example 3</p> <p>Divide a chocolate (rectangle) equally between 3 – then 6 learners.</p>
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	<p>Example 4</p> <p>Divide a cake (square) equally between 5 – then 10 learners.</p> <p>Explain the notation every time in the above examples.</p> <p>A written or oral exercise can be done at this point. The following can be used: The teacher should take the lead and ask questions. Ask the learners to write the fraction notation on the board for the whole class to see.</p> <p>Addition of fractions:</p> <p>Work with concrete objects:</p> <p>Work with diagrams. Shade one part in one colour. Shade another part in a different colour. Which fraction is shaded in total?</p> <p>Work with fraction wall:</p> <p>(Start with simple fractions) Start with the same denominator, e.g., $\frac{1}{4} + \frac{1}{4}$</p> <p>If learners can do the addition using concrete examples, they can then progress to writing the fraction notation below the concrete example.</p> <p>Follow these steps, e.g. Step 1: Make sure the bottom numbers (the denominators) are the same Step 2: Add the top numbers (the numerators). Put the answer over the same denominator as in step 1 Step 3: Simplify the fraction (if needed).</p> <p>DECIMALS</p> <p>Important: Refer to the Lesson Plans on Decimal Fractions in Term 2 Convert from fractions to decimal fractions and to percentages. Only taught in Grade 6.</p>
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PERCENTAGES							
Percentages are a new topic for Grade 6 learners.							
<p>Learners have already worked with tenths and hundredths in common fraction form. They should start by rewriting and converting tenths and hundredths in common fraction form to percentages. Where denominators of other fractions are factors of 10, e.g., 2, 5 or factors of 100 e.g. 2, 4, 5, 20, 25, 50 learners can convert these to hundredths using what they know about equivalence.</p>	<p>Equivalence between common fractions and percentage</p> <p>Learners are not expected to be able to convert any common fraction into its percentage form, merely to see the relationship between tenths and hundredths in their percentage form. Learners should be able to convert any decimal fraction in tenths or hundredths into a percentage.</p>						
	<p>Calculations</p> <p>Learners should be able to find percentages of whole numbers, e.g., What is 25% of R300? Here learners use what they know about both converting between percentage and common fraction form and also what they know about finding fractions of whole numbers e.g. 25% of R30 = $\frac{1}{4}$ of R300 = R75.</p>						
LTSM	<p>Gr 4 Text books, Internet Web sites, Number board,, Cuisennarie rods/number rods, Fraction circles, 2D relational shapes, Base 10 blocks/Dienes blocks, Concrete material, e.g. counters, Number lines, Fraction wall counters; Number lines + empty ones; Hundred chart</p>						
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center; width: 50%;">Grade 4</th> <th style="text-align: center; width: 50%;">Grade 5</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">WB 2 pp. 128 – 138 Activities 118 - 123</td> <td style="text-align: center;">WB 2 pp. 2 – 18; 28; 116 Activities 65 – 73, 77, 112</td> </tr> <tr> <td style="text-align: center;">Term 4: Unit 5: Common Fractions, p. 312</td> <td style="text-align: center;">Term 4: Unit 4: Common Fractions, p. 301</td> </tr> </tbody> </table>		Grade 4	Grade 5	WB 2 pp. 128 – 138 Activities 118 - 123	WB 2 pp. 2 – 18; 28; 116 Activities 65 – 73, 77, 112	Term 4: Unit 5: Common Fractions, p. 312	Term 4: Unit 4: Common Fractions, p. 301
Grade 4	Grade 5						
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Term 4: Unit 5: Common Fractions, p. 312	Term 4: Unit 4: Common Fractions, p. 301						
Resources	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center; width: 50%;">Grade 6</th> <th style="text-align: center; width: 50%;">Grade 6</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">WB 2 pp. 132 – 148 Activities 113 - 120</td> <td style="text-align: center;">WB 2 pp. 132 – 148 Activities 113 - 120</td> </tr> </tbody> </table>	Grade 6	Grade 6	WB 2 pp. 132 – 148 Activities 113 - 120	WB 2 pp. 132 – 148 Activities 113 - 120		
Grade 6	Grade 6						
WB 2 pp. 132 – 148 Activities 113 - 120	WB 2 pp. 132 – 148 Activities 113 - 120						
Workbook reference							
DBE Textbook reference							
HOMEWORK							
ASSESSMENT							
E.g. Informal assessment – Test							

MATHEMATICS INTERMEDIATE PHASE
MULTI GRADE LESSON PLAN 8
TERM 4

EDUCATOR:

GRADE	DATE : from to	TOPIC	Time: 3 HOURS					
		CAPS pp. 39 – 42	5 CAPS pp. 127 -131					
		This lesson acts as consolidation for the topic of number sentences	6 CAPS pp. 217 – 222					
		<p>Concepts, Skills and knowledge</p> <ul style="list-style-type: none"> • Write number sentences to describe problem situations • Solve and complete number sentences by <ul style="list-style-type: none"> - inspection - trial and improvement - Check solution by substitution <p>SUGGESTED METHODOLOGY</p> <ul style="list-style-type: none"> • Use number sentences to describe problem situations. <p>Example: Problem situation: I bought 750g of sweets and divided them among 25 children. Number sentence: $750 \div 25$</p> <ul style="list-style-type: none"> • Use number sentences as equivalent form of expression to sections of flow diagram or tables. <p>Example: Table</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>x3</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> </table>	x3	1	2	3	4	
x3	1	2	3	4				

	<p>Flow diagram</p> <p>Equivalent representation of the table and the flow diagram: $\square \times 3$</p> <ul style="list-style-type: none"> Using number sentences to help learners understand and use the fact that addition and subtraction are inverse operations Example: $37 - 4 + 4 = \Delta$ Use number sentences helps learners develop addition and subtraction techniques Example: $36+13 = \square$ therefore $49 - 13 = \square$ Commutative property of addition Numbers can be added in any order. Example: $29 + 19 = 19 + 26$ Therefore $13 + 49 = \square$ or $49 + 13 = \square$ Associative property of addition The associative property allows numbers to be grouped in different ways when adding more than two numbers, without it affecting the answer. Example: $(31 + 26) + 19 = \square$ is the same as $31 + (26 + 19) = \square$ 	<ul style="list-style-type: none"> Use number sentences to help learners see and use patterns in addition and subtraction number bonds for:
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	<ul style="list-style-type: none"> - 10 - multiples of 10 - multiples of 100 <p>Examples:</p> <ul style="list-style-type: none"> - Ten $3 + 7 = \square$ $4 + 6 = \square$ $2 + 8 = \square$ $5 + 5 = \square$ - Multiples of 10 $13 + 7 = \square$ $14 + 6 = \square$ $12 + 8 = \square$ $15 + 5 = \square$ - Multiples of 100 	
LTS M	<p>Similar examples can be given for multiples of 100 such as 200; 300; 400; 500; 600; 700; 800; 900</p> <p>[See CAPS at the indicated pages for more example / details]</p>	
Resources	Grade 4	Grade 5
Workbook reference	WB 1 pp. 14 - 16 Activities 6 a & b; 29	WB 1 pp. 10 – 12 Activities 4, 5
DBE Textbook reference	Term 3: Unit 11: Number Sentences, p. 281	Term 4: Unit 10: Number Sentences, p. 342
HOMEWORK		Term 4: Unit 8: Number Sentences, p. 344
ASSESSMENT	E.g. Informal assessment – Test	

TASKS & MEMORANDA



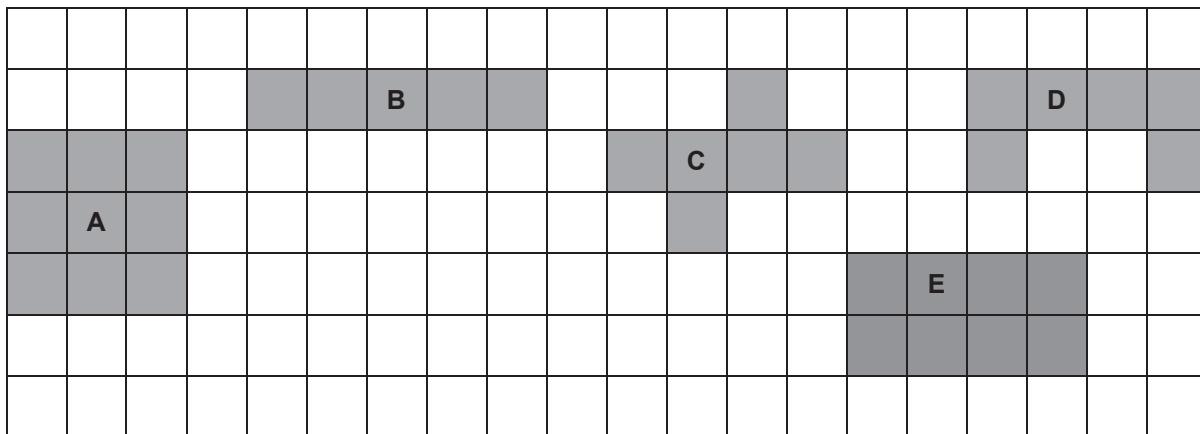
EXEMPLAR INVESTIGATION: GRADE 4

TERM 4

Investigating the relationship between perimeter and area

15 marks

1. The side of each square in the grid below is 1 unit.
 - Determine the perimeter and the area of each of the shape.
 - Write your answers in the table provided.



Shape	A	B	C	D	E
Perimeter					
Area in number of squares					

(10)

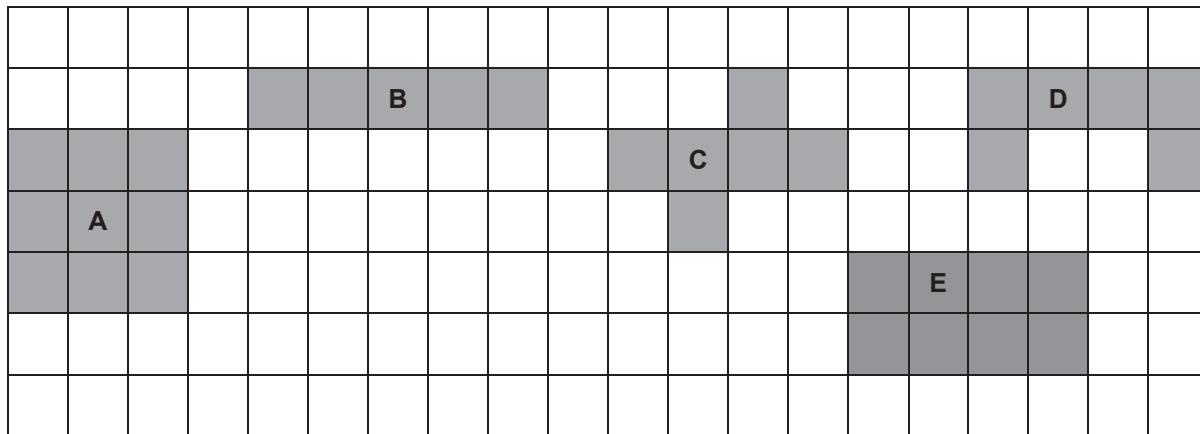
2. Does the shape with the longest perimeter also have the greatest area? (1)
3. Which shapes have equal perimeter? (2)
4. Do shapes of equal perimeter have equal area? (1)
5. Does the perimeter tell something about the area of a shape? (1)

**EXEMPLAR INVESTIGATION MEMO: GRADE 4
TERM 4**

Investigating the relationship between perimeter and area

15 marks

1. The side of each square in the grid below is 1unit.
 - Determine the perimeter and the area of each of the shape.
 - Write your answers in the table provided.



Shape	A	B	C	D	E
Perimeter	12	12	14	14	12
Area in number of squares	9	5	6	6	8

(10)

2. Does the shape with the longest perimeter also have the greatest area?

No

(1)

3. Which shapes have equal perimeter?

A, B and E
C and D

(2)

4. Do shapes of equal perimeter have equal area?

No

(1)

5. Does the perimeter tell something about the area of a shape?

No

(1)

GRADE 4 EXEMPLAR TEST – TERM 2

INSTRUCTIONS TO LEARNERS:

1. Answer all questions in the spaces provided.
2. The use of calculators is NOT allowed.
3. The test duration is 40 minutes

QUESTION 1

Circle the letter next to the correct answer.

1.1 The multiple of 5 in the following is

- A 58
B 90
C 59
D 09

(1)

1.2 The number 967 rounded off to the nearest 10 is

- A 900
B 960
C 970
D 1 000

(1)

1.3 Complete: $40 + 35 = 30 + \underline{\hspace{1cm}}$

- A 35
B 40
C 75
D 45

(1)

(3)

QUESTION 2

2.1 Write the following numbers in order from the smallest to the largest.

4 910 9 410 4 190 9 140

_____ (1)

2.2 What is the biggest number you can make using the digits

7 1 4 8 ?

_____ (1)

2.3 What is the value of the underlined digit?

8 367

_____ (1)

2.4 Fill in the missing numbers in the following:

2.4.1 930; 933; 936; _____.

_____ (1)

2.4.2 $7\ 050; 7\ 000; 6\ 950$; _____.

(1)

2.5 Which number is written in expanded notation as
 $(4 \times 1\ 000) + (5 \times 100) + (8 \times 10) + (2 \times 1)$?

(1)

2.6 Write 6 427 in words.

(1)

2.7 Draw a circle around all the odd numbers in the group below.

710	477
804	415
655	312
666	971

(2)

2.8 Say whether each of the following is TRUE or FALSE.

2.8.1 $67 - 45$ is equal to $45 - 67$

(1)

2.8.2 $54 + 29$ is equal to $29 + 54$

(1)

(11)

QUESTION 3

Calculate each of the following.

3.1 $3\ 679 + 3\ 124$

(2)

3.2 $5\ 635 - 4\ 334$

(2)

3.3 65×24

(3)

3.4 $584 \div 8$

(3)
(10)**QUESTION 4**

- 4.1 If 3 153 people live in Phambili and 5 244 people live in Sinamuva. How many people live in Phambili and Sinamuva altogether?

(3)

- 4.2 Rajen changes his R100 note for R5 coins only. How many coins does he get.

Rajen gets _____ coins.

(3)

- 4.3 Betty wants to buy a book for R46,99 and a poster for R25,89.

- 4.3.1 How much will this cost altogether?

(3)

- 4.3.2 Betty only has R60,00 in her wallet. How much more money does she need?

(3)

- 4.4 Tshepo planted 11 rows of tomatoes with 6 plants in each row. How many tomato plants did he plant altogether?

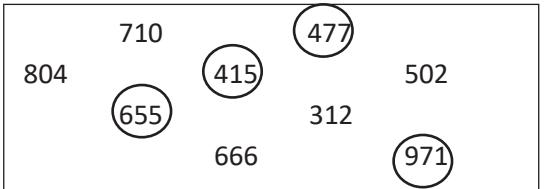
(2)

- 4.5 Calculate the difference between the value of the underlined digits in the numbers 9 008 and 8 190.

(3)
(18)



GRADE 4 EXEMPLAR TEST – MEMORANDUM

QUESTION	EXPECTED ANSWER	MARKS	TOT AL								
1.1	B	(1)									
1.2	C	(1)									
1.3	D	(1)									
2.1	4 190 4 910 9 140 9 410	(1)									
2.2	8 741	(1)									
2.3	8 000	(1)									
2.4.1	939	(1)									
2.4.2	6 900	(1)									
2.5	4 582	(1)									
2.6	Six thousand four hundred and twenty seven	(1)									
2.7		(2)	11								
2.8.1	False	(1)									
2.8.2	True	(1)									
3.1	$ \begin{aligned} & 3\ 659 + 3\ 124 \\ & = 3\ 000 + 600 + 50 + 9 + 3\ 000 + 100 + 20 + 4 \\ & = 3\ 000 + 3\ 000 + 600 + 100 + 50 + 20 + 9 + 4 \\ & = 6\ 000 + 700 + 70 + 13 \\ & = 6\ 783 \end{aligned} $	(2)									
3.2	$ \begin{aligned} & 5\ 635 - 4\ 334 \\ & = 5\ 000 + 600 + 30 + 5 - (4\ 000 + 300 + 30 + 4) \\ & = (5\ 000 - 4\ 000) + (600 - 300) + (30 - 30) + (5 - 4) \\ & = 1\ 000 + 300 + 0 + 1 \\ & = 1\ 301 \end{aligned} $	(2)									
3.3	$ \begin{aligned} & 65 \times 24 \\ & = (60 + 5) \times (20 + 4) \\ & = (60 \times 20) + (60 \times 4) + (5 \times 20) + (5 \times 4) \\ & = 1\ 200 + 240 + 100 + 20 \\ & = 1\ 440 + 100 + 20 \\ & = 1\ 540 + 20 \\ & = 1\ 560 \end{aligned} $	(3)	10								
3.4	$586 \div 8 = 70 + 3 = 73 \text{ remainder } 2$ <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <th>Multiply</th> <th>Subtract</th> <th colspan="2">CLUE BOARD</th> </tr> <tr> <td> $70 \times 8 = 560$ $3 \times 8 = 24$ </td> <td> $586 - 560 = 26$ $26 - 24 = 2 \text{ rem}$ </td> <td> $10 \times 8 = 80$ $20 \times 8 = 160$ $30 \times 8 = 240$ $40 \times 8 = 320$ $50 \times 8 = 400$ $60 \times 8 = 480$ $70 \times 8 = 560$ $80 \times 8 = 640$ </td> <td> $8 \times 1 = 8$ $8 \times 2 = 16$ $8 \times 3 = 24$ </td> </tr> </table>	Multiply	Subtract	CLUE BOARD		$70 \times 8 = 560$ $3 \times 8 = 24$	$586 - 560 = 26$ $26 - 24 = 2 \text{ rem}$	$10 \times 8 = 80$ $20 \times 8 = 160$ $30 \times 8 = 240$ $40 \times 8 = 320$ $50 \times 8 = 400$ $60 \times 8 = 480$ $70 \times 8 = 560$ $80 \times 8 = 640$	$8 \times 1 = 8$ $8 \times 2 = 16$ $8 \times 3 = 24$	(3)	
Multiply	Subtract	CLUE BOARD									
$70 \times 8 = 560$ $3 \times 8 = 24$	$586 - 560 = 26$ $26 - 24 = 2 \text{ rem}$	$10 \times 8 = 80$ $20 \times 8 = 160$ $30 \times 8 = 240$ $40 \times 8 = 320$ $50 \times 8 = 400$ $60 \times 8 = 480$ $70 \times 8 = 560$ $80 \times 8 = 640$	$8 \times 1 = 8$ $8 \times 2 = 16$ $8 \times 3 = 24$								
4.1	$ \begin{aligned} & 3\ 153 + 5\ 244 \\ & = 3\ 100 + (5\ 244 + 53) [\text{Rounding off and compensating}] \\ & = 3\ 100 + 5\ 297 \\ & = 8\ 398 \\ & 8\ 398 \text{ live in Phambili and Sinamuva,} \end{aligned} $	(3)	18								

4.2	Rajen gets 20 coins.	(3)	
4.3.1	R46,99 + R25,89 = R47,00 + R25,88 [Rounding off and compensating] = R40,00 + R32,88 = R72,88 The book and poster cost R72,88	(3)	
4.3.2	She needs R72,88 – R60,00 = R 12,88	(3)	
4.4	Tshepo planted 11 rows of tomatoes with 6 plants in each row. How many tomato plants did he plant altogether? Tshepo planted 11×6 = 66 rows	(3)	
4.5	The difference is $9\ 000 - 90$ = 8 910	(3)	
GRAND TOTAL		40 MARKS	

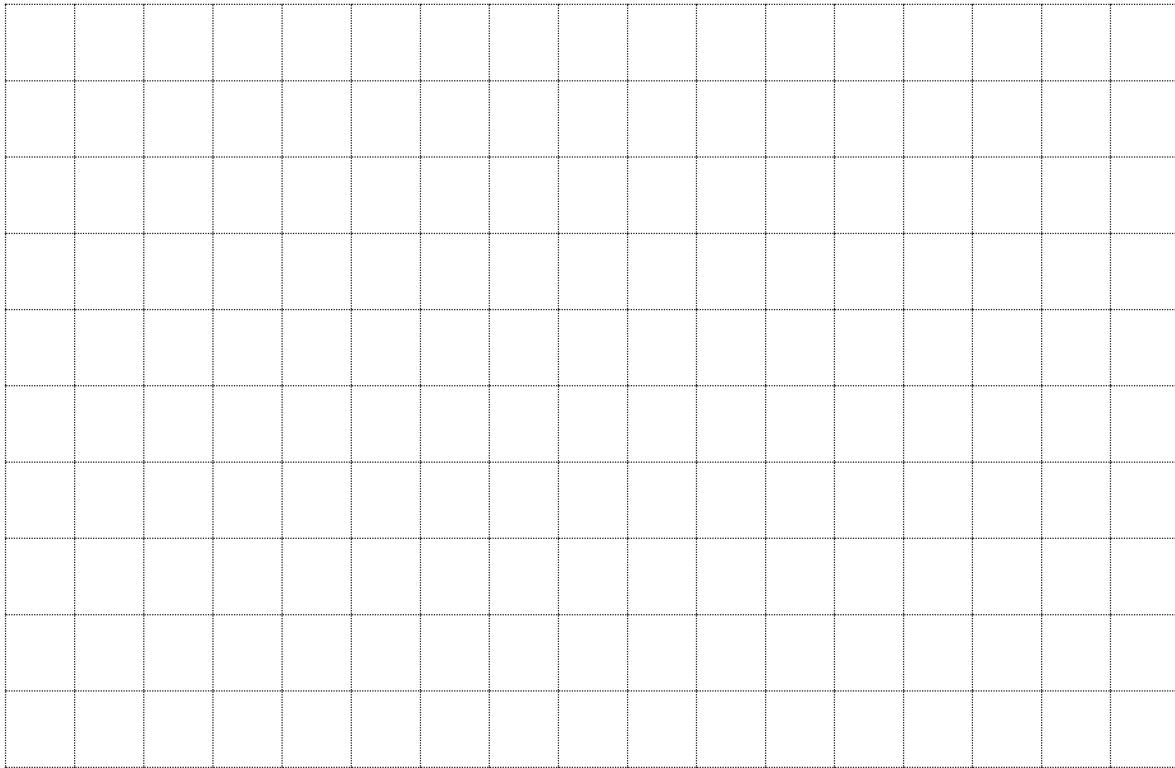
**EXEMPLAR INVESTIGATION: GRADE 5
TERM 4**

Investigating the relationship between perimeter and area
marks

20

QUESTION 1

- 1.1 Draw the following shapes in the grid provided. Label you're the shapes.
- A square S1 with a perimeter of 16 units.
 - Two different rectangles R1 and R2 also having a perimeter of 16 units



(3)

- 1.2 Use the shapes that you have drawn to complete the table.

Shape	S1	R1	R2
Perimeter			
Area			

(3)

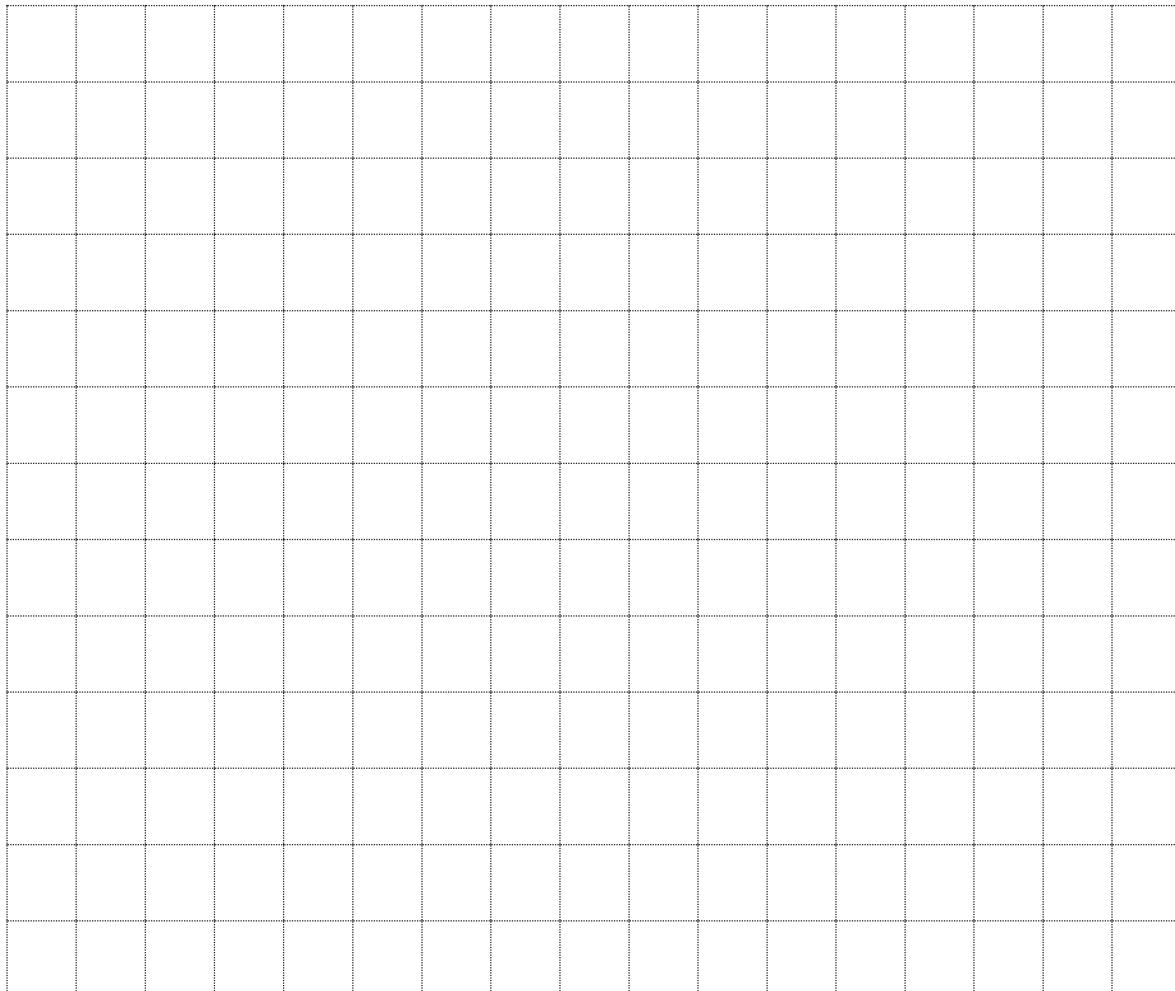
- 1.3 Is the area of the square greater, smaller or equal to that of the triangles? (1)

- 1.4 Do the shapes have equal area? (1)

- 1.5 Is it correct to say that, “quadrilaterals with equal perimeter have equal area”? (1)

QUESTION 2

2.1 Draw the following shapes in the grid provided; three different rectangles R1, R2, and R3 each with an area of 24 squares. Label your diagrams.



(3)

2.2 Use the shapes that you have drawn to complete the table.

Shape	R1	R2	R3
Perimeter			
Area			

(3)

2.3 Do the shapes have equal perimeter?

(1)

2.4 Does the shape with a larger perimeter have the biggest area?

(1)

2.4 Is it correct to say that, “quadrilaterals with equal area have equal perimeter”?

(1)

2.5 Does perimeter of a shape tell us anything about the area of that shape?

(1)

2.6 Does area of a shape tell us anything about the perimeter of the shape?

(1)

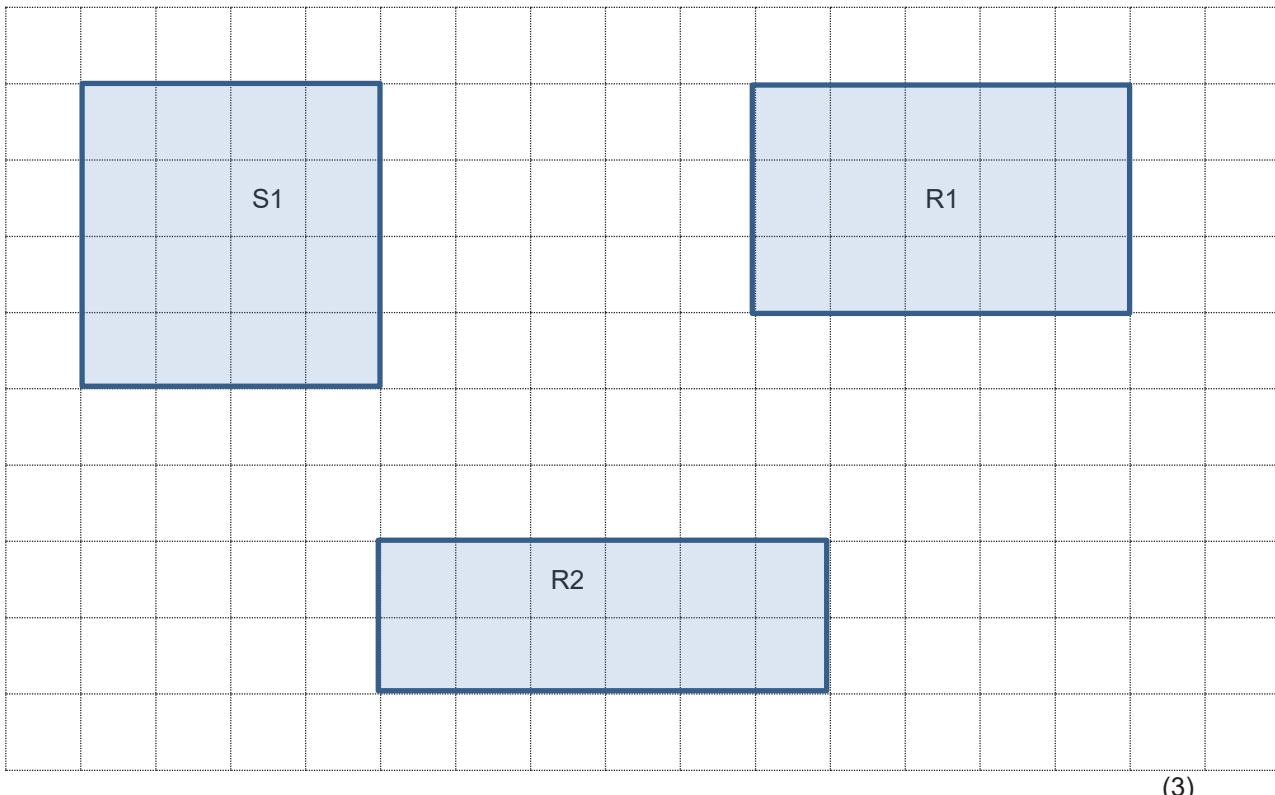
**EXEMPLAR INVESTIGATION MEMO: GRADE 5
TERM 4**

Investigating the relationship between perimeter and area
marks

20

QUESTION 1

- 1.2 Draw the following shapes in the grid provided. Label you're the shapes.
- e) A square S1 with a perimeter of 16 units.
 - f) Two different rectangles R1 and R2 also having a perimeter of 16 units



(3)

- 1.3 Use the shapes that you have drawn to complete the table.

Shape	S1	R1	R2
Perimeter	16	16	16
Area	16	15	12

(3)

- 1.3 Is the area of the square greater, smaller or equal to that of the triangles?
Greater

(1)

- 1.4 Do the shapes have equal area?
No

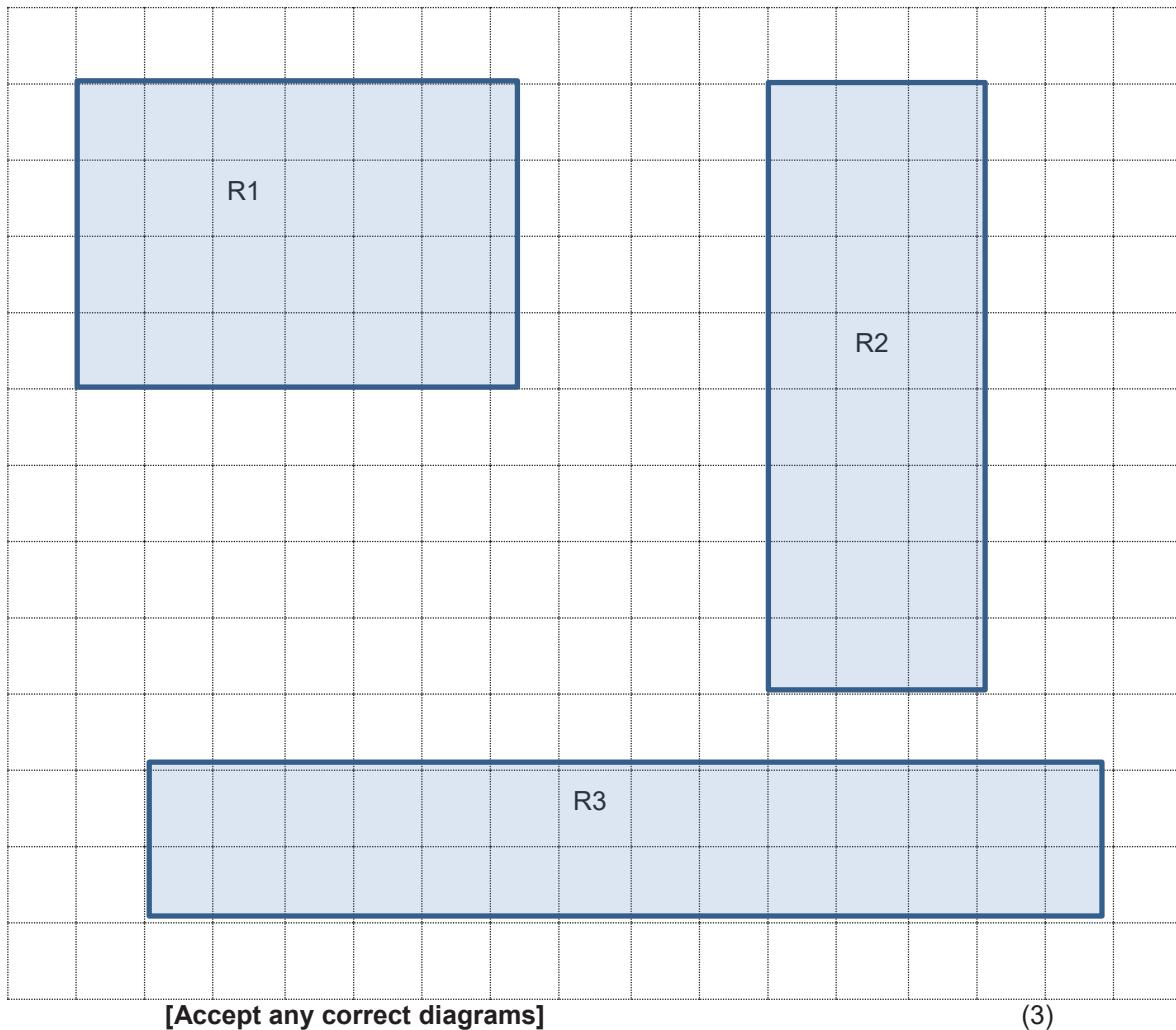
(1)

- 1.5 Is it correct to say that, “quadrilaterals with equal perimeter have equal area”?
It is incorrect

(1)

QUESTION 2

2.3 Draw the following shapes in the grid provided; three different rectangles R1, R2, and R3 each with an area of 24 squares. Label your diagrams.



2.4 Use the shapes that you have drawn to complete the table.

Shape	R1	R2	R3
Perimeter	20	22	28
Area	24	24	24

(3)

2.3 Do the shapes have equal perimeter?

No (1)

2.4 Does the shape with a larger perimeter have the biggest area?

No (1)

2.4 Is it correct to say that, “quadrilaterals with equal area have equal perimeter”?

No (1)

2.5 Does perimeter of a shape tell us anything about the area of that shape?

It tells us nothing (1)

2.6 Does area of a shape tell us anything about the perimeter of the shape?

It does not tell us anything (1)

GRADE 5 EXEMPLAR TEST – TERM 2

INSTRUCTIONS TO LEARNERS:

1. Answer all questions in the space provided.
2. The use of calculators is NOT allowed.
3. The test duration is 60 minutes

QUESTION 1

Circle the letter next to the correct answer.

- 1.1 Which number is 2 000 more than 957 467?
- A 972 467
B 959 467
C 957 667
D 977 467 (1)
- 1.2 The third multiple of 9 is
- A 3
B 9
C 18
D 27 (1)
- 1.3 Which number consists of the following:
 $6H + 4Th + 8Tth + 7U + 5T$
- A 64 875
B 57 864
C 75 684
D 84 657 (1)
- 1.4 A number divided by 5 is 12. What is the number?
- A 55
B 60
C 65
D 70 (1)
- 1.5 The number 33 756 rounded off to the nearest 5 is _____
- A 33 750
B 33 755
C 33 760
D 33 765 (1)
[5]

QUESTION 2

- 2.1 Write the following numbers in order from the smallest to the largest.
4 910 9 410 4 190 9 140
_____ (1)
- 2.2 What is the biggest number you can make using the digits
7 1 4 8 5?
_____ (1)
- 2.3 What is the value of the underlined digit?
128 367
_____ (1)
- 2.4 Fill in the missing numbers in the following:
2.4.1 5 930 ; 5 933 ; 5 936 ; _____ (1)
2.4.2 27 050 ; 27 000 ; 26 950 ; _____ (1)
- 2.5 Which number is written in expanded notation as
 $(6 \times 10\ 000) + (4 \times 1\ 000) + (5 \times 100) + (8 \times 10) + (2 \times 1)$?
_____ (1)
- 2.6 Write 86 427 in words.
_____ (1)
- 2.7 Draw a triangle around all the odd numbers in the group below.
- | | | | | |
|-----|------|-------|-------|-------|
| | 1710 | | 3 477 | |
| 804 | | 6 415 | | 3 502 |
| | 655 | | 312 | |
| | 666 | | 2 971 | |
- (2)
[9]

QUESTION 3

- 3.1 Say whether the following are **True** or **False**?
- 3.1.1 $51 + 32 = 32 + 51$ (1)
3.1.2 $34 \div 5 = 5 \div 34$ (1)
3.1.3 $3(4 + 5) = (3 \times 4) + (3 \times 5)$ (1)
3.1.4 $63 \div 7 \times 7 = 63$ (1)
3.1.5 $(251 + 27) + 49$ has the same answer as $251 + (27 + 49)$ (1)

- 3.2 Write down all the multiples 9 between 40 and 60. (1)

- 3.3 3.3.1 Is 21 758 closer to 21 700 or 21 800? (1)

- 3.3.2 R214,76 \approx _____ rounded off to the nearest rand. (1)
- 3.4 3.4.1 Insert the missing factor of 12:
2, _____, 12, 3, 6, 4 (1)
- 3.4.2 Which 2 whole numbers can I multiply to get 99?
_____ and _____ (2)
- [11]

QUESTION 4

Calculate

- 4.1 $73\ 679 + 25\ 184$

_____ (2)
- 4.2 $65\ 635 - 64\ 384$

_____ (2)
- 4.3 365×24

_____ (3)
- 4.4 $928 \div 12$

_____ (3)
- [10]

QUESTION 5

5.1 There were 41 295 spectators at a soccer match, 23 985 were men, 11 378 were women and the remainder were children.

5.1.1 How many adults attended the soccer match?

(3)

5.2 How many children attended the soccer match?

(3)

5.3 Mr Brown buys a muffin for R2,50 and sells it for R5,50.

5.3.1 How much profit does he make?

(3)

5.3.2 How much profit will he make if he sells 35 muffins?

(3)

5.5 375 learners will use buses during a school excursion. How many buses will they hire if each bus transports 95 learners? (3)

[15]

GRADE 5 MATHEMATICS TEST MEMORANDUM – TERM 2

General marking notes:

1. Give full marks for answers only, unless otherwise stated.
2. Accept any alternative correct solution that is not included in the memorandum.
3. Apply consistency accuracy [CA], where necessary.

QUESTION	EXPECTED ANSWER			MARKS	TOTAL
1.1	B			(1)	5
1.2	D			(1)	
1.3	D			(1)	
1.4	B			(1)	
1.5	B			(1)	
2.1	4 190 4 910 9 140 9 410			(1)	9
2.2	87 541			(1)	
2.3	Twenty thousand or 20 000 or $(2 \times 10\ 000)$			(1)	
2.4.1	5 930; 5 933; 5 936; <u>5 939</u>			(1)	
2.4.2	27 050; 27 000; 26 950; <u>26 900</u>			(1)	
2.5	64 582			(1)	
2.6	Eighty six thousand four hundred and twenty seven			(1)	
2.7	 numbers are 655, 2 971, 3 477 and 6 415			(2)	
3.1.1	True			(1)	11
3.1.2	False			(1)	
3.1.3	True			(1)	
3.1.4	True			(1)	
3.1.5	True			(1)	
3.2	45 and 54			(1)	
3.3.1	21 758 is closer to 21 800			(1)	
3.3.1	R214,76 \approx R215,00 rounded off to the nearest rand.			(1)	
3.4.1	1			(1)	
3.4.2	9 and 11			(2)	
4.1	73 679 + <u>25 184</u> <u>98 863</u>	70 000 + 3 000 + 600 + 70 + 9 + <u>20 000 + 5 000 + 100 + 80 + 4</u> <u>90 000 + 8 000 + 800 + 60 + 3</u> <u>= 98 863</u>	[Accept any method] 1 mark for 863 and 1 mark for 98. A mark for correct hundreds, tens & units and another mark for thousands and ten thousands	(2)	10
4.2	65 635 - <u>64 384</u>	Any suitable method	[1 mark for 251 and 1	(2)	

	<u>1 251</u>	mark for 1. A mark for correct hundreds, tens & units and another mark for thousands]								
4.3	$ \begin{aligned} & 365 \times 24 \\ & = (300 + 60 + 5) \times (20 + 4) \\ & = (300 \times 20) + (60 \times 20) + (5 \times 20) + (300 \times 4) + (60 \\ & \quad \times 4) + (5 \times 4) \\ & = 6\ 000 + 1\ 200 + 100 + 1\ 200 + 240 + 20 \\ & = 8\ 400 + 340 + 20 \\ & = 8\ 740 + 20 \\ & = 8\ 760 \end{aligned} $	[Accept any method] [2 marks for method 1 mark for correct answer]	(3)							
4.4	$928 \div 12 = 77 \text{ rem } 4$ <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <th>MULTIPLY</th> <th>SUBTRACT</th> <th>CLUE BOARD</th> </tr> <tr> <td> $12 \times 70 = 840$ $12 \times 7 = 84$ </td> <td> $928 - 840 = 88$ $88 - 84 = 4 \text{ rem}$ </td> <td> $12 \times 10 = 120$ $12 \times 20 = 240$ $12 \times 30 = 360$ $12 \times 40 = 480$ $12 \times 50 = 600$ $12 \times 60 = 720$ $12 \times 70 = 840$ $12 \times 80 = 960$ </td> </tr> </table>	MULTIPLY	SUBTRACT	CLUE BOARD	$12 \times 70 = 840$ $12 \times 7 = 84$	$928 - 840 = 88$ $88 - 84 = 4 \text{ rem}$	$12 \times 10 = 120$ $12 \times 20 = 240$ $12 \times 30 = 360$ $12 \times 40 = 480$ $12 \times 50 = 600$ $12 \times 60 = 720$ $12 \times 70 = 840$ $12 \times 80 = 960$	[Accept any method] [2 marks for method 1 mark for correct answer]	(3)	
MULTIPLY	SUBTRACT	CLUE BOARD								
$12 \times 70 = 840$ $12 \times 7 = 84$	$928 - 840 = 88$ $88 - 84 = 4 \text{ rem}$	$12 \times 10 = 120$ $12 \times 20 = 240$ $12 \times 30 = 360$ $12 \times 40 = 480$ $12 \times 50 = 600$ $12 \times 60 = 720$ $12 \times 70 = 840$ $12 \times 80 = 960$								
5.1.1	$ \begin{aligned} & 23\ 985 \\ & + 11\ 378 \\ & \hline & = 35\ 363 \end{aligned} $ <p>$\therefore 35\ 363$ adults attended the soccer match.</p>	[Accept any method] [2 marks for method 1 mark for correct answer]	(3)							
5.1.2	$ \begin{aligned} & 41\ 295 \\ & + 35\ 663 \\ & \hline & = 5\ 932 \end{aligned} $ <p>$\therefore 5\ 932$ children attended the soccer match.</p>	[Accept any method] [Apply consistency accuracy] [2 marks for method 1 mark for correct answer]	(3)							
5.2.1	$ \begin{aligned} & R5,50 \\ & - R2,50 \\ & \hline & R3,00 \end{aligned} $ <p>\therefore He makes R3,00 profit.</p>	[Accept any method] [2 marks for method 1 mark for correct answer]	(3)							
5.2.2	<p>He will make $R3,00 \times 35 = R105,00$ profit.</p> $ \begin{aligned} & (R3,00 \times 30) + (R3,00 \times 5) \\ & = R90,00 + R15,00 \\ & = R105,00 \end{aligned} $	[Accept any method] [Apply consistency accuracy] [2 marks for method 1 mark for correct answer]	(3)							

15



5.3	CALCULATION	CLUE BOARD	[Accept any method] [Apply consistency accuracy] [2 marks for method 1 mark for correct answer]	(3)	
	380 is bigger than 375 , so we choose 285. So we can say 3 groups of 95 is 285. We then subtract : $375 - 285 = 90$ $375 \div 95 = 3$ rem 90 ∴ The school will hire 4 buses for an excursion.	$1 \times 95 = 95$ $2 \times 95 = 190$ $3 \times 95 = 285$ $4 \times 95 = 380$			
GRAND TOTAL					40

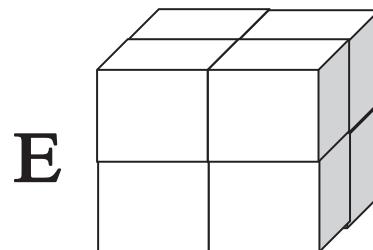
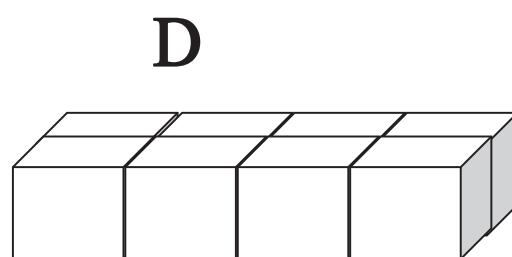
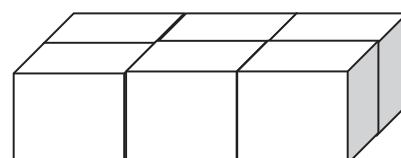
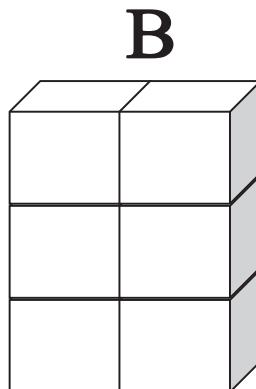
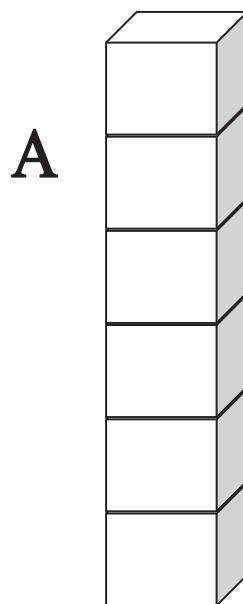
EXEMPLAR INVESTIGATION: GRADE 6
TERM 4

Investigating the relationship between surface area and volume

15 marks

QUESTION 1

- 1.1 Determine the Surface area and the volume of each stack of boxes below. Give the surface area in number of squares and the volume in number of cubes.



STACK	A	B	C	D	E
Surface area in number of squares					
VOLUME in number of cubes					

(12)

- 1.2 Which stacks have the same volume?

(2)

- 1.3 Is the surface area of the stack A equal to that of stack B? (1)
- 1.4 Is the surface area of the stack D equal to that of stack F? (1)
- 1.5 Do stacks of equal volume also have equal surface area? (1)
- 1.6 Which stacks have equal surface area? (1)
- 1.5 Do stacks of equal surface area have equal volume? (1)
- 1.6 Does knowing volume of a stack tell us the surface area of the stack? (1)
- 1.7 What conclusion can be drawn from the above observations? (2)

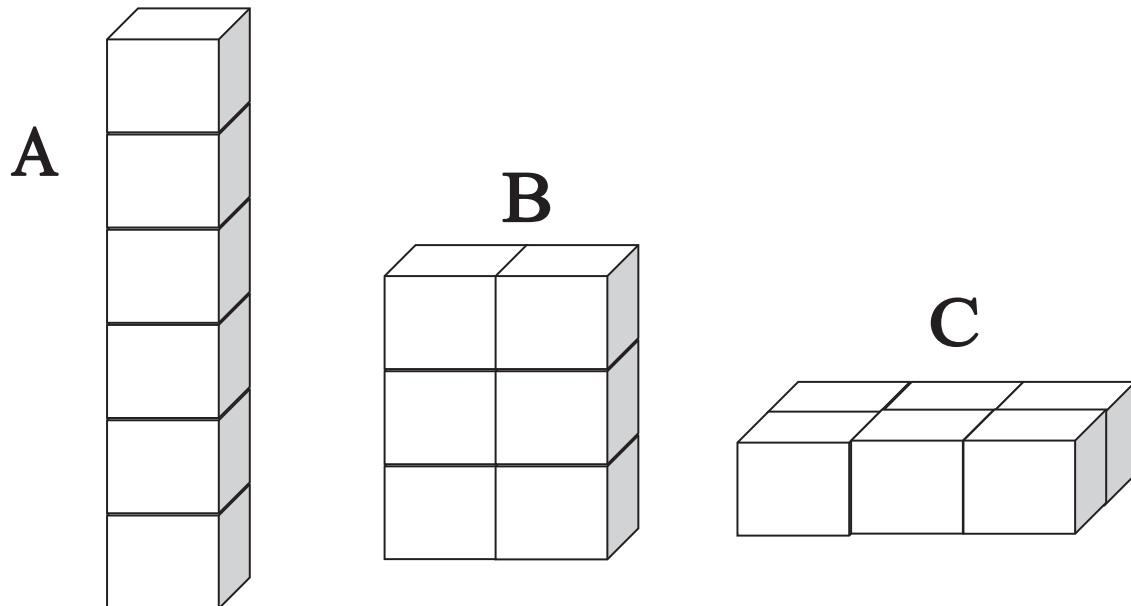
EXEMPLAR INVESTIGATION MEMO: GRADE 6
TERM 4

Investigating the relationship between surface area and volume

15 marks

QUESTION 1

1.1 Determine the Surface area and the volume of each stack of boxes below. Give the surface area in number of squares and the volume in number of cubes.



1.2

STACK	A	B	C	D	E
Surface area in number of squares	26	22	22	28	24
VOLUME in number of cubes	6	6	6	8	8

(10)

- 1.2 Which stacks have the same volume?
A, B and C
D and E (2)
- 1.3 Is the surface area of the stack A equal to that of stack B?
No (1)
- 1.4 Is the surface area of the stack D equal to that of stack F?
No (1)
- 1.5 Do stacks of equal volume also have equal surface area?
Sometimes (1)
- 1.6 Which stacks have equal surface area?
B and C (1)
- 1.5 Do stacks of equal surface area have equal volume?
Sometimes (1)
- 1.6 Does knowing volume of a stack tell us the surface area of the stack?
No (1)
- 1.7 What conclusion can be drawn from the above observations?
• **Stacks of equal volume do not necessarily have equal surface area**
• **Stacks of equal surface area have equal volume** (2)

GRADE 6 EXEMPLAR TEST – TERM 2

INSTRUCTIONS TO LEARNERS:

1. Answer all questions in the space provided.
2. The use of calculators is NOT allowed.
3. The test duration is 60 minutes

QUESTION 1

Circle the letter next to the correct answer.

- 1.1 The number, three hundred and fifty nine thousand eight hundred and three can be written as
- A 359 308
B 395 803
C 359 803
D 359 083 (1)
- 1.2 Which number is represented by $(3 \times 100\ 000) + (40 \times 1\ 000) + (9\ 000) + (15\ \text{tens}) + (7 \times 1)$?
- A 349 570
B 350 507
C 349 082
D 349 157 (1)
- 1.3 Which number is 3 000 000 more than 567 432 957 ?
- A 570 432 957
B 567 732 957
C 597 432 957
D 867 432 957 (1)
- 1.4 The value of the underlined digit in 65 359 468 is
- A $5 \times 10\ 000\ 000$
B $5 \times 1\ 000\ 000$
C $5 \times 100\ 000$
D $50\ 000\ 000$ (1)
- 1.5 Which is the best estimation of the number of South African soccer fans?
- A 50 000
B 1 800
C 1 208 400
D 160 000 (1)

- 1.6 The number 133 756 rounded off to the nearest 5 is _____
A 133 750
B 133 755
C 133 760
D 133 765 (1)
- 1.7 What is the value of **B** if $51 - 6 = \mathbf{B} - 51$
A 45
B 67
C 81
D 96 (1)
- 1.8 Which sum does **not** give an answer of 49?
A $8 \times 5 + 9$
B $(8 \times 5) + 9$
C $8 \times (5 + 9)$
D $(8 \times 5 + 9)$ (1)
- 1.9 Which number is **not** a factor of 36?
A 3
B 4
C 8
D 18 (1)
- 10 Which number between 12 and 144 is a multiple of 12?
A 6
B 12
C 240
D 96 (1)

(10)

QUESTION 2

- 2.1 Write the following numbers in descending order.
134 910 139 410 143 190 139 140
_____ (1)

- 2.2 What is the biggest number you can make using the digits
7 1 4 8 5 9 4?
_____ (1)

- 2.3 What is the value of the underlined digit?
657 128 367

(1)

2.4 Fill in the missing numbers in the following:

2.4.1 135 930 ; 135 933 ; 135 936 ; _____ . (1)

2.4.2 1 227 050 ; 1 227 000 ; 1 226 950 ; _____ . (1)

2.5 Write the number 5 103 467 in expanded notation

(3)

2.6 Write 35 386 427 in words.

(1)

2.7 57; 27; 72; 36; 61; 81; 45

From the numbers above, choose:

2.7.1 a prime number (1)

(1)

QUESTION 3

3.1 Say whether the following statements are **True** or **False**?

3.1.1 $247\ 889 > 247\ 898$ _____ (1)

3.1.2 $25 \times 27 \approx (20 + 5) \times (20 + 7)$ _____ (1)

3.1.3 $(18 \times 4) \times 5 = 18 \times (5 \times 4)$ _____ (1)

3.1.4 When I multiply a number by 1, the answer is always equal to the original number. (1)

(1)

3.1.5 When we add zero (0) to a number, the number is doubled. (1)

3.2 What is the Lowest Common Multiple (LCM) of 12 and 36.

(2)

3.3 3.3.1 Is 821 758 closer to 821 700 or 821 800?

(1)

3.3.2 R6 214,76 \approx _____ rounded off to the nearest rand. (1)

3.4 3.4.1 Insert the missing factor of 12: 2 , _____ , 12 , 3 , 6 , 4 (1)

3.4.2 List all the factors of 225. (1)

3.4.2 Which 2 whole numbers can I multiply to get to 125? (1)

(12)

QUESTION 4

Calculate

4.1 Add using columns: 3 473 679 ; 725 184 and 2 378 487

(3)

4.2 Subtract 1 764 384 from 3 065 635

(3)

4.3 Multiply 7 365 and 25

(3)

4.4 Calculate the remainder, using long division, if 2 836 is divided by 450

(3)

-

4.5 Calculate:

4.5.1 $(58 + 12) - (33 - 19)$

(3)

4.5.2 $2 + 3 \times 4 - 6$

(2)

(17)



QUESTION 5

- 5.1 A lady buys a specific brand of DVD players for all her stores. She buys 126 789 black, 341 567 white and 344 532 silver DVD players. How many DVD players did she buy altogether?

(3)

- 5.2 Farm workers picked 342 345 pears during the morning. After lunch they picked some more. By the end of the day, they had 866 589 pears. How many pears did they pick after lunch?

(3)

- 5.3 156 pairs of shoes cost R7 020.
How much will one pair of the same shoes cost?

(3)

- 5.4 A company gave 536 boxes of soccer balls to multigrade schools. Each box contained 3 126 soccer balls. How many soccer balls did the company give away?

(3)

(12)



GRADE 6 EXEMPLAR TEST MEMORANDUM – TERM 2

General marking notes:

1. Give full marks for answers only, unless otherwise stated.
2. Accept any alternative correct solution that is not included in the memorandum.
3. Apply consistency accuracy [CA], where necessary.

QUESTION	EXPECTED ANSWER	MARKS	TOTAL
1.1	B	(1)	10
1.2	D	(1)	
1.3	A	(1)	
1.4	B	(1)	
1.5	C	(1)	
1.6	B	(1)	
1.7	D	(1)	
1.8	C	(1)	
1.9	C	(1)	
1.10	D	(1)	
2.1	143 190 139 410 139 140 134 910	(1)	8
2.2	9 875 441	(1)	
2.3	7 000 000 or 7 million or $(7 \times 1 000 000)$	(1)	
2.4.1	135 930; 135 933; 135 936; <u>135 939</u> .	(1)	
2.4.2	1 227 050; 1 227 000; 1 226 950; <u>1 226 900</u> .	(1)	
2.5	Thirty five million three hundred and eighty six thousand four hundred and twenty seven	(1)	
2.6.1	61	(1)	
2.6.2	57 [a product of 3 and 19]	(1)	
3.1.1	False	(1)	13
3.1.2	True	(1)	
3.1.3	True	(1)	
3.1.4	True	(1)	
3.1.5	False	(1)	
3.2	Multiples of 12 = 12; 24; 36; 48; ... Multiples of 36 = 36; 72; 108; ... Lowest Common Multiple = 36	(3)	
3.3.1	821 758 is closer to <u>821 800</u> .	(1)	
3.3.2	R6 214,76 \approx R6 215 rounded off to the nearest rand.	(1)	
3.4.1	The missing factor is 1.	(1)	
3.4.2	Factors of 225 are: 1; 3; 5; 9; 15; 45; 225.	(1)	
3.4.3	1 and 125 or 5 and 25	(1)	
4.1	3 476 679 725 184 + 2 378 487 <u> </u> 6 580 350	[2 marks for method 1 mark for correct answer] Correct answer –3 marks	(3) 17

4.2	$ \begin{array}{r} 3\ 065\ 635 \\ -1\ 764\ 384 \\ \hline 1\ 301\ 251 \end{array} $	[2 marks for method 1 mark for correct answer] Correct answer –3 marks	(3)							
4.3	<p>Calculate the product of 7 365 and 25</p> $ \begin{array}{r} 7\ 365 \\ \times\ 25 \\ \hline 36\ 825 \\ +147\ 200 \\ \hline 184\ 125 \end{array} $	2 marks for method 1 mark for correct answer Correct answer –3 marks	(3)							
4.4	$2\ 836 \div 255 = 11 \text{ remainder } 31$ $ \begin{array}{r} \boxed{11} \\ 255 \quad \boxed{2\ 836} \\ - \quad \boxed{255} \\ \hline 286 \\ -255 \\ \hline 31 \text{ rem} \end{array} $	2 marks for method 1 mark for correct answer Correct answer –3 marks	(3)							
4.5.1	$ \begin{aligned} &(58 + 12) - (33 - 19) \\ &= 70 - 12 \\ &= 58 \end{aligned} $	2 marks for method 1 mark for correct answer	(3)							
4.5.2	$ \begin{aligned} &2 + 3 \times 4 - 6 \\ &= 2 + 12 - 6 \\ &= 14 - 6 \\ &= 8 \end{aligned} $	2 marks for method 1 mark for correct answer	(2)							
5.1	$ \begin{array}{r} 126\ 789 \\ 341\ 567 \\ +\ 344\ 532 \\ \hline 812\ 888 \end{array} $ <p>She bought 812 888 DVD players.</p>	[Accept any method] [2 marks for method 1 mark for correct answer]	(3)							
5.2	$ \begin{array}{r} 866\ 589 \\ -342\ 345 \\ \hline 524\ 244 \end{array} $ <p>Farm workers picked 524 244 pears after lunch.</p>	[Accept any method] [2 marks for method 1 mark for correct answer]	(3)	12						
5.3	$7\ 020 \div 156 = 45$ <p>∴ Each shoe costs R45</p> <table border="1"> <thead> <tr> <th>MULTIPLY</th> <th>SUBTRACT</th> <th>CLUE BOARD</th> </tr> </thead> <tbody> <tr> <td> $\begin{aligned} &156 \times 40 \\ &= 6\ 240 \\ &156 \times 5 \\ &= 780 \end{aligned}$ </td> <td> $\begin{aligned} &7\ 020 - 6\ 240 \\ &= 780 \\ &780 - 780 = 0 \end{aligned}$ </td> <td> $\begin{aligned} &156 \times 10 = 1\ 560 \\ &156 \times 20 = 3\ 120 \\ &156 \times 30 = 4\ 680 \\ &156 \times 40 = 6\ 240 \\ &156 \times 5 = 780 \end{aligned}$ </td> </tr> </tbody> </table>	MULTIPLY	SUBTRACT	CLUE BOARD	$ \begin{aligned} &156 \times 40 \\ &= 6\ 240 \\ &156 \times 5 \\ &= 780 \end{aligned} $	$ \begin{aligned} &7\ 020 - 6\ 240 \\ &= 780 \\ &780 - 780 = 0 \end{aligned} $	$ \begin{aligned} &156 \times 10 = 1\ 560 \\ &156 \times 20 = 3\ 120 \\ &156 \times 30 = 4\ 680 \\ &156 \times 40 = 6\ 240 \\ &156 \times 5 = 780 \end{aligned} $	[Accept any method] [2 marks for method 1 mark for correct answer]	(3)	
MULTIPLY	SUBTRACT	CLUE BOARD								
$ \begin{aligned} &156 \times 40 \\ &= 6\ 240 \\ &156 \times 5 \\ &= 780 \end{aligned} $	$ \begin{aligned} &7\ 020 - 6\ 240 \\ &= 780 \\ &780 - 780 = 0 \end{aligned} $	$ \begin{aligned} &156 \times 10 = 1\ 560 \\ &156 \times 20 = 3\ 120 \\ &156 \times 30 = 4\ 680 \\ &156 \times 40 = 6\ 240 \\ &156 \times 5 = 780 \end{aligned} $								
5.4	$ \begin{array}{r} 3\ 126 \\ \times\ 536 \\ \hline 18\ 756 \\ 93\ 780 \end{array} $	[Accept any method] [2 marks for								

	$\begin{array}{r} + 1\,563\,000 \\ - 1\,675\,536 \\ \hline \end{array}$ <p>The company gave 1 675 536 balls away.</p>	method 1 mark for correct answer]	(3)	
	GRAND TOTAL			60



LESSON PLANS: AFRIKAANS

WISKUNDE INTERMEDIËRE FASE MULTIGRAAD

KWARTAAL EEN **OPVOEDER:**

DATUM : WEEK 3 28 /01 – 01 /02 2013	TYD: 5 DAE	6 URE
GRAAD	4	5
ONDERWERP	Getalle sinne Inleiding tot Algebraise uitdrukings	
BEGRIFFE EN VAARDIGHEDЕ	<ul style="list-style-type: none"> • Ekwivalente uitdrukings / getalsinne • Kommutatiewe-, assosiatiewe- en Distributieweeienskappe • Inverse bewerkings en die Wiskundigewaarde daarvan 	<ul style="list-style-type: none"> • Vermenigvuldigingseienskap van 1 • Optellingseienskap van 0 • Ontwikkeloptel en aftrektegnieked.m.v getalsinne e
		<ul style="list-style-type: none"> • Assosiatieweeienskap van optelling • Getalsinne - Maal en Deel met 10, 100 en 1000 • Volgorde by aftrekking • Los getallesinne op deur <ul style="list-style-type: none"> • Inspeksie • Probeer en verbeter • Kontroleer die oplossing deur vervanging
LOOM:	Patroonkaarte, vloeikaarte,	
HANDBOEK VERWYSINGS.		
NASIONALE WERKBOEK		
TUISWERK OPDRAGTE		
OPMERKING		



WISKUNDE INTERMEDIéRE FASE MULTIGRAAD

KWARTAAL EEN **OPVOEDER:**

DATUM : WEEK 4	GRAAD	4 – 8 FEBRUARIE 2013	TYD: 5 DAE	6 URE
ONDERWERP		HeelgetalleOptelling&Aftrekking		
BEGRIFFE EN VAARDIGHEDЕ	4	<p>Getalgebied: 3-syfer getalle Tegnieke: Skatting Opbou en aftrek van getalle Verdubbel en halveer Getallelyne Afronding en kompensering Eienskappe van heelgetalle: Kommutatiewe en Assosiatieweenskappe Probleemoplossing: Los probleme in konteks op; insluitendfinansiëlekontekste</p>	<p>Getalgebied: 5-syfer getalle Tegnieke: SkattingOpbou en aftrek van getalle Verdubbel en halveeGetallelyneAfronding en kompensering Inverse bewerkings Eienskappe van heelgetalle: Kommutatiewe; Assosiatiewe en distrubutieweenskappe 0 se optellings- eienskap Probleemoplossing: Los probleme in konteks op; insluitendfinansiëlekontekste</p>	<p>Getalgebied: 6 –syfergetalle Veelvuldigebewerking met /sonderhakies Tegnieke: Skatting Opbou en aftrek van getalle Verdubbel en halveer Getallelyne Afronding en kompensering bewerkingsSakrekenaar Eienskappe van heelgetalle: Kommutatiewe; Assosiatiewe en distrubutieweenskappe 0 se optellings- eienskap Probleemoplossing: Los probleme in konteks op; insluitendfinansiëlekontekste Vergelyk 2 of meerhoeveelhede van diesselfde sort [verhouding]</p>
LOOM:		HANDBOEK VERWYSINGS.		
		NASIONALE WERKBOEK		
		TUISWERK		
		OPDRAGTE		
		OPMERKING		





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WISKUNDE INTERMEDIËRE FASE MULTIGRAAD

KWARTAAL EEN

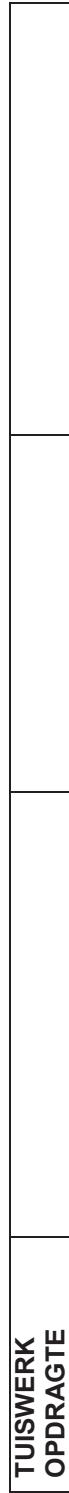
OPVOEDER:

DATUM : WEEK	5	11 – 15 FEBRUARIE 2013	TYD: 4 DAE	5 URE	
GRAAD	4		5		6
ONDERWERP			Numeriese Patroon	KABV Dok.	
BEGRIFFE EN VAARDIGHede	Ondersoek en breipatroonuit	Ondersoek en breipatroonuit	Ondersoek en breipatroonuit	Ondersoek en breipatroonuit	
	<ul style="list-style-type: none"> Kykna die reels Reeks met konstanteverskil/verhoudings Beskryfreëls in woorde Leerder se eieskepping Bepaal Inset- ; uitsetwaardes en reëls met vloeidiagramme Ekwivalentevorms Woordeliks In vloeidiagramme Met getalle sinne 	<ul style="list-style-type: none"> Kykna die reels Reeks met konstanteverskil/verhoudings Beskryfreëls in woorde Leerder se eieskepping Bepaal Inset- ; uitsetwaardes en reëls met vloeidiagramme Ekwivalentevorms Woordeliks In vloeidiagramme Met getalle sinne 	<ul style="list-style-type: none"> Kykna die reels Reeks met konstanteverskil/verhoudings Beskryfreëls in woorde Leerder se eieskepping Bepaal Inset- ; uitsetwaardes en reëls met vloeidiagramme Ekwivalentevorms Woordeliks In vloeidiagramme Met getalle sinne 	<ul style="list-style-type: none"> Kykna die reels Reeks met konstanteverskil/verhoudings Beskryfreëls in woorde Leerder se eieskepping Bepaal Inset- ; uitsetwaardes en reëls met vloeidiagramme Ekwivalentevorms Woordeliks In vloeidiagramme Met getalle sinne 	
LOOM:	HANDBOEK VERWYSINGS.				
	NASIONALE WERKBOEK TUISWERK OPDRAGTE OPMERKING				

WISKUNDE INTERMEDIÉRE FASE MULTIGRAAD

KWARTAAL EEN OPVOEDER:

	DATUM : WEEK 6 – 7 18 FEBRUARIE - 01 MAART 2013	TYD: 10 DAE	12 URE
GRAAD	4	5	6
ONDERWERP	HeelgetalleVermenigvuldiging&Deling	KABV Dok	BI. 54 - 58
BEGRIFFE EN VAARDIGHEDE	<p>Getalgebied: Leerdersontwikkel en leertafels [2x – 10x] Verm: 2-syfer met 1-syfer Deel3-syfer deur 1-syfer Tegnieke: skat Opbou en afbreek Afronding en kompensering Verdubbel&halveer Gebruik van 'n getallelyn Omgekeerdeerbewerking Veelvoude en Faktore: 2-syfer getalle tot 100 EienskappevenHeelgetalle: Kommutatiewe; Assosiatiewe; Distributiewe0 en 1 in terme van syvermenigvuldigingseienkskap Probleemoplossing: In konteks FinansiëleKonteks Vergelykings van dieselfdesoort [ratio] Vergelykings van verskillendesoorte Groepering en verdeling met teste</p>	<p>Getalgebied: Leerdersontwikkel en leertafels [11x; 12x; 13x; 15x; 20x; 25x; 50x] Verm: 4-syfer met 3-syfer [met of sonderhakies]Deel 4-syfer deur 3-syfer[met of sonderhakies] Tegnieke: skatOppou en afbreekAfronding en kompenseringGebruiksakrekenaar Kolomvermenigvuldiging Veelvoude en Faktore: 2-syfer en 3-syfergetalle tot Priemfaktore van getalle tot ten minste 100 EienskappevenHeelgetalle: Kommutatiewe; Assosiatiewe; Distributiewe0 en 1 in terme van syvermenigvuldigingseienkskap Probleemoplossing: In konteks FinansiëleKonteks Vergelykings van dieselfdesoort [ratio] Vergelykings van verskillendesoorte Groepering en verdeling met teste</p>	
LOOM:			
HANDBOEK VERWYSINGS.			
NASIONALE WERKBOEK			



**TUISWERK
OPDRAGTE**



MULTIGRADE TOOLKIT MATHEMATICS INTERMEDIATE PHASE

KWARTAAL EEN

OPVOEDER:

WISKUNDE INTERMEDIËRE FASE MULTIGRAAD

DATUM : WEEK 8	4- 8 MAART 2013 TYD: 5 DAE	6 URE	TYD KABV P.57, 146, 234	6
GRAAD	4	5		
ONDERWERP				
BEGRIFFE EN VAARDIGHEDЕ	<p>Lees, sê en skryf 12- uur en 24 - uuryd op digitale en analoginstrumente in</p> <ul style="list-style-type: none"> • Ure, min en sekondes • Lees van almanakke • Berekenaantaldaetussen 2 datums <p>Probleemoplossing en berekening met betrekking tot tyd</p> <p>Probleemoplossing en berekening met betrekking tot tyd</p> <ul style="list-style-type: none"> • Berekenydintervalle • Berekenydintervalle • Geskiedenis van tyd 	<p>Lees, sê en skryf 12- uur en 24 - uuryd op digitale en analoginstrumente in</p> <ul style="list-style-type: none"> • Ure, min en sekondes • Lees van almanakke • Probleemoplossing en berekening met betrekking tot tyd <p>Lees tydsone op karte</p> <ul style="list-style-type: none"> • Berekenydintervalle • Geskiedenis van tyd 	<p>Lees, sê en skryf 12- uur en 24 - uuryd op digitale en analoginstrumente in</p> <ul style="list-style-type: none"> • Ure, min en sekondes • Lees van almanakke • Probleemoplossing en berekening met betrekking tot tyd <p>Lees tydsone op karte</p> <ul style="list-style-type: none"> • Berekenydintervalle • Geskiedenis van tyd 	
LOOM:				
HANDBOEK				
VERWYSINGS.				
NASIONALE WERKBOEK				
TUISWERK OPDRAGTE				
OPMERKING				

WISKUNDE INTERMEDIËRE FASE MULTIGRAAD

KWARTAAL EEN

OPVOEDER:

DATUM : WEEK 9	11 - 15 MAART2013	TYD: 5 DAE	6 URE	
GRAAD	4	5	DATAHANTERING P.59, 148, 239	6
ONDERWERP	Versamel en organiseer data • tellingstabelle]	Versamel en organiseer data[tellinstabelleasookorden van kleinste tot grootste] Stel data voor	Versamel en organiseer data[tellinstabelleasook ordern van kleinste tot grootste vraelyste Stel data voor	Versamel en organiseer data[tellinstabelleasook ordern van kleinste tot grootste vraelyste Stel data voor
BEGRIFFE EN VAARDIGHEDЕ	Piktogramme • Staafgrafieke Analise; interpretasie en verslagdoening van data • Piktogramme • Staafgrafieke	Piktogramme • Staafgrafieke Analise; interpretasie en verslagdoening van data • Piktogramme • Staafgrafieke	Piktogramme • Staafgrafieke Analise; interpretasie en verslagdoening van data • Piktogramme • Staafgrafieke • Sirkeldiagramme • Woordeliks woordeliks	Piktogramme • Staafgrafieke Analise; interpretasie en verslagdoening van data • Piktogramme • Staafgrafieke • Sirkeldiagramme • Woordeliks modus
LOOM:	HANDBOEK VERWYSINGS. NASIONALE WERKBOEK TUISWERK OPDRAGTE OPMERKING			



WISKUNDE INTERMEDIËRE FASE MULTIGRAAD

KWARTAAL EEN

OPVOEDER:

DATUM : WEEK 2 GRAAD	18 - 22 MAART 2013 4	TYD: 5 DAE 5	6 URE 6	KABV BI. 61 -63 KABV BI. 150-152KABV BI. 235 – 238
ONDERWERP	Eienskappe van 2D-Vorm			
BEGRIFFE EN VAARDIGHEDЕ	<ul style="list-style-type: none"> • Benoemvorms • driehoekе • vierkante • reghoekе • andervierhoekе • pentagonе • heksagone • sirkels 	<ul style="list-style-type: none"> • Benoemvorms • driehoekе • vierkante • reghoekе • andervierhoekе • pentagonе • heksagone • heptagonе • sirkels 	<ul style="list-style-type: none"> • driehoekе • vierkante • reghoekе • andervierhoekе • pentagonе • heksagone • heptagonе • sirkels 	<ul style="list-style-type: none"> Ken en benoem reëlmatrige en onreëlmatrige vierhoekе, driehoekе, vierkante, reghoekе en parallelogramme; pentagonе; heksogone; heptagonе en oktagone Eienskappe van Vorms: • aantalsye • lengte van sye • grootte van hoeke Teken 2D Vorms ; gebruik passer virsirkels Herken en benoem hoeke
LOOM:				
HANDBOEK VERWYSINGS.				
NASIONALE WERKBOEK				
TUISWERK OPDRAGTE				
OPMERKING				ASSESSERING TOETS 1

WISKUNDE INTERMEDIËRE FASE MULTIGRAAD

KWARTAAL EEN **OPVOEDER:**

DATUM : WEEK 3 28 /01 – 01 /02	2013	TYD: 5 DAE	6 URE	
GRAAD	4		5	6
ONDERWERP	Getalleinleiding tot Algebraiseeruitdrukings			
BEGRIFFE EN VAARDIGHede	<ul style="list-style-type: none"> Ekwivalentuiteerdrukings / getalsinne Kommutatiewe-, assosiatiewe- en distributiewe eienskappe Inverse bewerkings en die Wiskundigewaarde daarvan 			
LOOM:	<p>Patroonkaarte, vloeikaarte,</p> <p>Kontroleer die oplossing deur vervanging</p>			



HANDBOEK VERWYSINGS.	NASIONALE WERKBOEK	TUISWERK OPDRAGTE	OPMERKING

WISKUNDE INTERMEDIATE FASE MULTIGRAAD

KWARTAAL EEN

OPVOEDER:

DATUM : WEEK 4	GRAAD	4 – 8 FEBRUARIE 2013	TYD: 5 DAE	6 URE
ONDERWERP		5	HeelgetalleOptelling&Aftrekking	6
BEGRIFFE EN VAARDIGHEDЕ	Getaalgebied: 3-syfer getalle Tegnieke: Skatting Opbou en afbreek van getalle Verdubbel en halveer Getallelyne Afronding en kompensering Eienskappe van heelgetalle: Kommutatiewe en Assosiatieweenskappe Probleemoplossing: Los probleme in konteks op; insluitendfinansiëlekontekste	Getaalgebied: 5-syfer getalle Tegnieke: SkattingOpbou en afbreek van getalle Verdubbel en halveeGetallelyneAfronding en kompensering Inverse bewerkings Eienskappe van heelgetalle: Kommutatiewe; Assosiatiewe en distrubutieweeienskappe 0 se optellings- eienskap Probleemoplossing: Los probleme in konteks op; insluitendfinansiëlekontekste	Getaalgebied: 6 –syfergetalle Veelvuldigebewerkinge met /sonderhakis Tegnieke: Skatting Oppou en afbreek van getalle Verdubbel en halveer Getallelyne Afronding en kompenserin bewerkingsSakrekenaar Eienskappe van heelgetalle: Kommutatiewe; Assosiatieve en distrubutieweeienskappe 0 se optellings- eienskap Probleemoplossing: Los probleme in konteks op; konteks op; insluitendfinansiëlekontekste Vergelyk 2 of meerhoeveelhede van diesselfde sort [verhouding]	

LOOM:	HANDBOEK VERWYSINGS.
NASIONALE WERKBOEK	
TUISWERK	
OPDRAGTE	
OPMERKING	



**WISKUNDE INTERMEDIËRE FASE MULTIGRAAD**

KWARTAAL EEN

OPVOEDER:

DATUM : WEEK	5	11 – 15 FEBRUARIE 2013	TYD: 4 DAE	5 URE	
GRAAD	4		5		6
ONDERWERP	Ondersoek en breipatroonuit	Numeriese Patroon	KABV Dok.		
BEGRIFFE EN VAARDIGHede	<ul style="list-style-type: none">• Kykna die reels• Reeks met konstanteverskil/verhoudings• Beskryfreëls in woorde• Leerder se eieskepping Bepaal Inset- ; uitsetwaardes en reëls met vloeidagramme Ekwivalentevorms• Woordeliks• In vloeidagramme Met getalle sinne	<ul style="list-style-type: none">• Ondersoek en breipatroonuit• Kykna die reels• Reeks met konstanteverskil/verhoudings• Beskryfreëls in woorde• Leerder se eieskepping Bepaal Inset- ; uitsetwaardes en reëls met vloeidagramme Ekwivalentevorms• Woordeliks• Invloeidagramme Met getallesinne	<ul style="list-style-type: none">• Ondersoek en breipatroonuit• Kykna die reels• Reeks met konstanteverskil/verhoudings• Beskryfreëls in woorde• Leerder se eieskepping Bepaal Inset- ; uitsetwaardes en reëls met vloeidagramme Ekwivalentevorms• Woordeliks• Invloeidagramme Met getallesinne		
LOOM: HANDBOEK VERWYSINGS.					
NASIONALE WERKBOEK TUISWERK OPDRAGTE					
OPMERKING					

WISKUNDE INTERMEDIËRE FASE MULTIGRAAD

KWARTAAL EEN
OPVOEDER:

DATUM : WEEK 6 – 7 18 FEBRUARIE - 01 MAART 2013		TYD: 10 DAE 12 URE			
GRAAD	4	5	6	KABV Dok	BI. 54 – 58
ONDERWERP	HeelgetalleVermenigvuldiging&Deling				
BEGRIFFE EN VAARDIGHEDЕ	<p>Getalgebied: Leerdersontwikkel en leertafels [2x – 10x] Verm: 2-syfer met 1-syfer Deel3-syfer deur 1-syfer Tegnieke: skat Opbou en afbreuk Afronding en kompensering Verdubbel&halveer Gebruik van 'n getallelyn Omgekeerde bewerking Veelvoude en Faktore: 2-syfer getalle tot 100 EienskappevenHeelgetalle: Kommutatiewe; Associatiewe; Distributiewe0 en 1 in terme van syvermenigvuldigingsetenskap Probleemoplossing: In konteks FinansiëleKonteks Vergelykings van dieselfdesoort [ratio] Vergelykings van verskillendesoorte met reste</p>	<p>Getalgebied: Leerdersontwikkel en leertafels [2x – 10x] Verm: 3-syfer met 2-syfer Deel 3-syfer deur 2-syfer Tegnieke: skat Opbou en afbreuk Afronding en kompensering Verdubbel&halveer Gebruik van 'n getallelyn Omgekeerde bewerking Veelvoude en Faktore: 2-syfer getalle tot 100 EienskappevenHeelgetalle: Kommutatiewe; Associatiewe; Distributiewe0 en 1 in terme van syvermenigvuldigingsetenskap Probleemoplossing: In konteks FinansiëleKonteks Vergelykings van dieselfdesoort [ratio] Vergelykings van verskillendesoorte Groepering en verdeling Gelykeverdeling</p>	<p>Getalgebied: Leerdersontwikkel en leertafels [11x; 12x; 13x; 15x; 20x; 25x; 50x] Verm: 4-syfer met 3-syfer [met of sonderhakies] Deel 4-syfer deur 3-syfer [met of sonderhakies] Tegnieke: skat AfbreukAfronding en kompenseringGebruiksakrekenaar Kolomvermenigvuldiging Veelvoude en Faktore: 2-syfer en 3-syfergetalle tot Priemfaktore van getalle tot ten minste 100 EienskappevenHeelgetalle: Kommutatiewe; Associatiewe; Distributiewe0 en 1 in terme van syvermenigvuldigingsetenskap Probleemoplossing: In konteks FinansiëleKonteks Vergelykings van dieselfdesoort [ratio] Vergelykings van verskillendesoorte Groepering en verdeling met reste</p>		
LOOM:					
HANDBOEK VERWYSINGS.					
NASIONALE WERKBOEK					



TUISWERK	
OPDRAGTE	

WISKUNDE INTERMEDIËRE FASE MULTIGRAAD

KWARTAAL EEN OPVOEDER:

DATUM : WEEK 8	4- 8 MAART 2013 TYD: 5 DAE	6 URE	TYD KABV P.57, 146, 234
GRAAD	4	5	6
ONDERWERP BEGRIFFE EN VAARDIGHEDЕ	Lees, sê en skryf 12- uur en 24 - uurtyd op digitale en analoginstrumente in Ure, min en sekondes Lees van almanakke • Berekenaantaldaetussen 2 datums Probleemoplossing en berekening met betrekking tot tyd • Berekening tot tyd Geskiedenis van tyd	Lees, sê en skryf 12- uur en 24 - uurtyd op digitale en analoginstrumente in Ure, min en sekondes Lees van almanakke • Berekenaantaldaetussen 2 datums Probleemoplossing en berekening met betrekking tot tyd • Berekeningintervalle Geskiedenis van tyd	Lees, sê en skryf 12- uur en 24 - uurtyd op digitale en analoginstrumente in Ure, min en sekondes Lees van almanakke • Berekenaantaldaetussen 2 datums Probleemoplossing en berekening met betrekking tot tyd • Lees tydsones op karte • Berekenintervalle Geskiedenis van tyd

LOOM:						
HANDBOEK						
VERWYSINGS.						
NASIONALE WERKBOEK						
TUISWERK OPDRAGTE						
OPMERKING						

WISKUNDE INTERMEDIËRE FASE MULTIGRAAD

KWARTAAL EEN

OPVOEDER:

DATUM : WEEK 9	11 - 15 MAART2013	TYD: 5 DAE	6 URE	
GRAAD	4	5	5	6
ONDERWERP	Versamel en organiseer data	Versamel en organiseer data[tellinstabelleasookorden van kleinste tot grootste]	DATHANTERING	P.59, 148, 239
BEGRIFFE EN VAARDIGHEDЕ	<ul style="list-style-type: none"> • Stel data voor • Piktogramme • Staafgrafieke • Analise; interpretasie en verslagdoening van data • Piktogramme • Staafgrafieke 	<ul style="list-style-type: none"> • Stel data voor • Piktogramme • Staafgrafieke • Analise; interpretasie en verslagdoening van data • Piktogramme • Staafgrafieke 	<ul style="list-style-type: none"> • Versamel en organiseer data[tellinstabelleasook orden van kleinste tot grootste] • Piktogramme • Staafgrafieke • Analise; interpretasie en verslagdoening van data • Piktogramme • Staafgrafieke 	<ul style="list-style-type: none"> • Versamel en organiseer data[tellinstabelleasook orden van kleinste tot grootste] • Piktogramme • Staafgrafieke • Analise; interpretasie en verslagdoening van data • Piktogramme • Staafgrafieke
LOOM:	HANDBOEK VERWYSINGS.	NASIONALE WERKBOEK TUISWERK OPDRAGTE OPMERKING		



WISKUNDE INTERMEDIËRE FASE MULTIGRAAD

KWARTAAL EEN

OPVOEDER:

DATUM : WEEK 2 18 - 22 MAART 2013		TYD: 5 DAE 6 URE			
GRAAD	4	5	6		
ONDERWERP	Eienskappe van 2D-Vorm KABV BI. 61-63 238		KABV BI. 150-152KABV BI. 235 –		
BEGRIFFE EN VAARDIGHEDE	<ul style="list-style-type: none"> • Benoemvorms • driehoek • vierkante • reghoek • andervierhoek • pentagone • heksagone • sirkels • Eienskapp van vorms • geboë /reguitsye • aantalsye Teken 2D -Vorms 	<ul style="list-style-type: none"> • driehoek • vierkante • reghoek • andervierhoek • pentagone • heksagone • heptagone • sirkels • Eienskapp van vorms • geboë /reguitsye • aantalsye • lengte van sye hoeke [regtahoek en kleiner/groter as regtahoek] 	<ul style="list-style-type: none"> • Benoemvorms • driehoek • vierkante • reghoek • andervierhoek • pentagone • heksagone • heptagone • sirkels • Eienskapp van vorms • geboë /reguitsye • aantalsye • lengte van sye hoeke [regtahoek en kleiner/groter as regtahoek] 	<ul style="list-style-type: none"> Ken en benoemreëlmatige en onreëlmatige vierhoekie, driehoek, vierkante, reghoek en parallelogramme; pentagone; heksagone; heptagone en oktagone Eienskappe van Vorms: aantalsye lengte van sye grootte van hoeke Teken 2D Vorms ; gebruik passer virsirkels Herken en benoemhoeke 	<ul style="list-style-type: none"> Ken en benoemreëlmatige en onreëlmatige vierhoekie, driehoek, vierkante, reghoek en parallelogramme; pentagone; heksagone; heptagone en oktagone Eienskappe van Vorms: aantalsye lengte van sye grootte van hoeke Teken 2D Vorms ; gebruik passer virsirkels Herken en benoemhoeke
LOOM:	HANDBOEK VERWYSINGS.				
	NASIONALE WERKBOEK				
	TUISWERK OPDRAGTE				
OPMERKING	ASSESSERING TOETS 1				

WISKUNDE INTERMEDIËRE FASE MULTIGRAAD

KWARTAAL EEN **OPVOEDER:**

DATUM : WEEK 3 28 /01 - 01 /02	2013	TYD: 5 DAE	6 URE	
GRAAD	4	5	6	
ONDERWERP	Getalleinnelingleiding tot Algebraiseuitdrukings			
BEGRIFFE EN VAARDIGHEDE	<ul style="list-style-type: none"> • Ekwivalenteuitdrukings / getalsinne • Kommutatiewe-, assiatiewe- en distributieweeienskappe • Inverse bewerkings en die Wiskundigewaardeadaar van 			
	<ul style="list-style-type: none"> • Vermenigvuldigingseienskap van 1 • Optellingseienskap van 0 • Ontwikkeloptel en aftrektegnieked m.vgetalsinne e 			
	<ul style="list-style-type: none"> • Assosiatieweeienskap van optelling • Getalsinne - Maal en Deel met 10, 100 en 1000 • Volgorde by aftrekking • Los getalleinne op deur <ul style="list-style-type: none"> • Inspeksie • Probeer en verbeter • Kontroleer die oplossingdeurvervanging 			
LOOM:	Patroonkaarte, vloeikaarte,			



HANDBOEK VERWYSINGS.			
NASIONALE WERKBOEK			
TUISWERK OPDRAGTE			
OPMERKING			

WISKUNDE INTERMEDIÉRE FASE MULTIGRAAD

KWARTAAL EEN OPVOEDER:

DATUM : WEEK 4	GRAAD ONDERWERP	4 – 8 FEBRUARIE 2013	TYD: 5 DAE	6 URE
		5 HeelgetalleOptelling&Aftrekking	6	
BEGRIFFE EN VAARDIGHEDЕ	Getalgebied: 3-syfer getalle Tegnieke: Skatting Opbou en afbreek van getalle Verdubbel en halveer Getallelynе Afronding en kompensering Eienskappe van heelgetalle: Kommutatiwe en Assosiatieweienskappe Probleemoplossing: Los probleme in konteks op; insluitendfinansiëlekontekste	Getalgebied: 5-syfer getalle Tegnieke: SkattingOpbou en afbreek van getalle Verdubbel en halveeGetallelynеAfronding en kompensering Inverse bewerkings Eienskappe van heelgetalle: Kommutatiwe; Assosiatieve en distributieweienskappe 0 se optellings- eienskap Probleemoplossing: Los probleme in konteks op; insluitendfinansiëlekontekste	Getalgebied: 6-syfergetalle Veelvuldigebewerking met /sonderhakis Tegnieke: Skatting Opbou en afbreek van getalle Verdubbel en halveer Getallelynе Afronding en kompenserin bewerkingsSakrekenaar Eienskappe van heelgetalle: Kommutatiwe; Assosiatieve en distributieweienskappe 0 se optellings- eienskap Probleemoplossing: Los probleme in konteks op; insluitendfinansiëlekontekste Vergelyk 2 of meerhoeveelhede van dieselfede sort [verhouding]	
LOOM: HANDBOEK VERWYSINGS. NASIONALE WERKBOEK TUISWERK OPDRAGTE OPMERKING				



KWARTAAL EEN

OPVOEDER:

WISKUNDE INTERMEDIËRE FASE MULTIGRAAD

DATUM : WEEK	5	11 – 15 FEBRUARIE 2013	TYD: 4 DAE	5 URE	6
GRAAD	4	5	NumeriesePatroon	KABV Dok.	
ONDERWERP	Ondersoek en breipatroonuit	Ondersoek en breipatroonuit	Ondersoek en breipatroonuit	Ondersoek en breipatroonuit	
BEGRIFFE EN VAARDIGHEDЕ	<ul style="list-style-type: none"> • Kykna die reels • Reeks met konstanteverskil/verhoudings • Beskryfreëls in woordes • Leerder se eieskepping Bepaal Inset- ; uitsetwaardes en reëls met vloeidiagramme Ekwivalentevorms • Woordeliks • In vloeidiagramme Met getallesinne 	<ul style="list-style-type: none"> • Kykna die reels • Reeks met konstanteverskil/verhoudings • Beskryfreëls in woordes • Leerder se eieskepping Bepaal Inset- ; uitsetwaardes en reëls met vloeidiagramme Ekwivalentevorms • Woordeliks • Invloediagramme Met getallesinne 	<ul style="list-style-type: none"> • Kykna die reels • Reeks met niekonstanteverskil/verhoudings • Beskryfreëls in woordes • Leerder se eieskepping Bepaal Inset- ; uitsetwaardes en reëls met vloeidiagramme Ekwivalentevorms • Woordeliks • Invloediagramme Met getallesinne 	<ul style="list-style-type: none"> • Kykna die reels • Reeks met niekonstanteverskil/verhoudings • Beskryfreëls in woordes • Leerder se eieskepping Bepaal Inset- ; uitsetwaardes en reëls met vloeidiagramme Ekwivalentevorms • Woordeliks • Invloediagramme Met getallesinne 	
LOOM:					
HANDBOEK VERWYSINGS.					
NASIONALE WERKBOEK					
TUISWERK					
OPDRAGTE					
REMINDERS					
ONDERWERP					



BEGRIFFE EN VAARDIGHEDЕ	<p>Getalgebied: Leerdersontwikkel en leertafels [2x – 10x] Verm: 2-syfer met 1-syfer Deel 3-syfer deur 1-syfer Tegnieke: skat Oppou en afbreek Afronding en kompensering Verdubbel&halveer van 'n getallelyn Omgekeerdebewerking Veelvoude en Faktore: 1- syfer getalle tot 100 EienskappevenHeelgetalle: Kommutatiewe; Assosiatiewe; Distributiewe; Probleemoplossing: In konteks FinansiëleKonteks Vergelykings van dieselfdesoort [ratio] Vergelykings van verskillendesoorte Groepering en gelykeverdeling met reste</p>	<p>Getalgebied: Leerdersontwikkel en leertafels [11x; 12x; 13x; 15x; 20x; 25x; 50x] Verm: 3-syfer met 2-syfer [met of sonderhakies] Deel 4-syfer deur 3-syfer [met of sonderhakies] Tegnieke: skatOppou en afbreekAfronding en kompenseringGebruiksakrekenaar Kolomvermenigvuldiging Veelvoude en Faktore: 2-syfer en 3-syfergetalle tot Priemfaktore van getalle tot ten minste 100 EienskappevenHeelgetalle: Kommutatiewe; Assosiatiewe; Distributiewe0 en 1 in terme van syvermenigvuldigingseienskap Probleemoplossing: In konteks FinansiëleKonteks Vergelykings van dieselfdesoort [ratio] Vergelykings van verskillendesoorte Groepering en verdeling met reste</p>
LOOM:		
HANDBOEK VERWYSINGS.		
NASIONALE WERKBOEK		
TUISWERK OPDRAGTE		

WISKUNDE INTERMEDIËRE FASE MULTIGRAAD

KWARTAAL EEN **OPVOEDER:**

DATUM : WEEK 8	4 - 8 MAART 2013 TYD: 5 DAE	6 URE	5	TYD KABV P.57, 146, 234	6
GRAAD	4				
ONDERWERP					
BEGRIFFE EN VAARDIGHDE	Lees, sê en skryf 12- uur en 24 - uurtyd op digitale en analoginstrumente in Lees van almanakke • Berekenaantaldaetussen 2 datums Probleemoplossing en berekening met betrekking tot tyd • Berekentydintervalle Geskiedenis van tyd	Lees, sê en skryf 12- uur en 24 - uurtyd op digitale en analoginstrumente in • Ure, min en sekondes Lees van almanakke Probleemoplossing en berekening met betrekking tot tyd • Berekentydintervalle Geskiedenis van tyd		Lees, sê en skryf 12- uur en 24 - uurtyd op digitale en analoginstrumente in • Ure, min en sekondes Lees van almanakke Probleemoplossing en berekening met betrekking tot tyd • Lees tydsone op karte • Berekenydintervalle Geskiedenis van tyd	
LOOM: HANDBOEK VERWYSINGS, NASIONALE WERKBOEK TUISWERK OPDRAGTE OPMERKING					



WISKUNDE INTERMEDIËRE FASE MULTIGRAAD

KWARTAAL EEN

OPVOEDER:

DATUM : WEEK 9	11 - 15 MAART2013	TYD: 5 DAE	6 URE	
GRAAD	4	5	DATAHANTERING P.59, 148, 239	6
ONDERWERP	Versamel en organiseer data • tellingstabelle]	Versamel en organiseer data[tellinstabelleasookorden van kleinste tot grootste] Stel data voor	Versamel en organiseer data[tellinstabelleasook orden van kleinste tot grootste vraelyste Stel data voor	Versamel en organiseer data[tellinstabelleasook orden van kleinste tot grootste vraelyste Stel data voor
BEGRIFFE EN VAARDIGHEDЕ	<ul style="list-style-type: none"> • Piktogramme • Staafgrafieke Analise; interpretasie en verslagdoening van data <ul style="list-style-type: none"> • Piktogramme • Staafgrafieke 	<ul style="list-style-type: none"> • Piktogramme • Staafgrafieke Analise; interpretasie en verslagdoening van data <ul style="list-style-type: none"> • Piktogramme • Staafgrafieke woordeliks	<ul style="list-style-type: none"> • Staafgrafieke Analise; interpretasie en verslagdoening van data <ul style="list-style-type: none"> • Piktogramme • Staafgrafieke Sirkeldiagramme	<ul style="list-style-type: none"> • Piktogramme • Staafgrafiekeasookdubbelestaafgrafieke • Sirkeldiagramme • Woordeliks • modus
LOOM:	HANDBOEK VERWYSINGS.			
	NASIONALE WERKBOEK			
	TUISWERK OPDRAGTE			
	OPMERKING			



KWARTAAL EEN

OPVOEDER:

WISKUNDE INTERMEDIËRE FASE MULTIGRAAD

DATUM : WEEK 2 18 - 22 MAART 2013		TYD: 5 DAE 6 URE			6 KABV BI. 150-152KABV BI. 235 – 238
GRAAD	4	5	6		
ONDERWERP	Eienskappe van 2D-Vorm KABV BI. 61-63 238				
BEGRIFFE EN VAARDIGHEDE	Benoemvorms • driehoek • vierkante • reghoek • andervierhoek • pentagone • heksagone • sirkels Eienskapp van vorms • geboë /reguitsye • aantalsye Teken 2D -Vorms	Benoemvorms • driehoek • vierkante • reghoek • andervierhoek • pentagone • heksagone • heptagone • sirkels Eienskapp van vorms • geboë /reguitsye • aantalsye Teken 2D -Vorms	Benoemvorms • driehoek • vierkante • reghoek • andervierhoek • pentagone • heksagone • heptagone • sirkels Eienskapp van vorms • geboë /reguitsye • aantalsye Teken 2D -Vorms	Ken en benoemreëlmatige en onreëlmatige vierhoek, driehoek, vierkante, reghoek en parallelogramme; pentagone; heksagone; heptagone en oktagone Eienskappe van Vorms: • aantalsye • lengte van sye • groote van hoeke Teken 2D Vorms ; gebruik passer virsirkels Herken en benoemhoeke	Ken en benoemreëlmatige en onreëlmatige vierhoek, driehoek, vierkante, reghoek en parallelogramme; pentagone; heksagone; heptagone en oktagone Eienskappe van Vorms: • aantalsye • lengte van sye • groote van hoeke Teken 2D Vorms ; gebruik passer virsirkels Herken en benoemhoeke
LOOM:	HANDBOEK VERWYSINGS. NASIONALE WERKBOEK TUISWERK OPDRAGTE OPMERKING				ASSESSERING TOETS 1

WISKUNDE INTERMEDIËRE FASE MULTIGRAAD