SPECIFICATION OF CONTENT (PHASE OVERVIEW)

NUMBERS, OPERATIONS AND RELATIONSHIPS

- The main progression in Numbers, Operations and Relationships happens in three ways:
  - the number range increases
  - different kinds of numbers are introduced
  - the calculation techniques change.
- The number range for doing calculations is different from the number range for ordering numbers and for finding multiples and factors.
- As the number range for doing calculations increases up to Grade 6, learners should develop more efficient techniques for calculations, including using columns and learning how to use the calculator. These techniques however should only be introduced and encouraged once learners have an adequate sense of place value and understanding of the properties of numbers and operations.
- Contextual problems should consider the number range for the grade as well as the calculation competencies of learners.
- Contexts for solving problems should build awareness of other subject and content areas, as well as social, economic and environmental issues.

TOPICS	GRADE 4	GRADE 5	GRADE 6
1.1 **Whole numbers**	**Mental calculations involving**: • Addition and subtraction of: - units - multiples of 10 - multiples of 100 - multiples of 1 000 • Multiplication of whole numbers to at least 10 x 10 • Multiplication facts of: - units by multiples of 10 - Units by multiples of 100	**Mental calculations involving**: • Addition and subtraction of: - units - multiples of 10 - multiples of 100 - multiples of 1 000 • Multiplication of whole numbers to at least 10 x 10 • Multiplication facts of: - units by multiples of 10 - units by multiples of 100 - units by multiples of 1 000 - units by multiples of 10 000	**Mental calculations involving**: • Addition and subtraction of: - units - multiples of 10 - multiples of 100 - multiples of 1 000 • Multiplication of whole numbers to at least 12 x 12 • Multiplication facts of: - units and tens by multiples of 10 - units and tens by multiples of 100 - units and tens by multiples of 1 000 - units and tens by multiples of 10 000

TOPICS	GRADE 4	GRADE 5	GRADE 6
1.1 Whole numbers	**Number range for counting, ordering, comparing and representing, and place value of digits** • 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, 1 000 **Number range for calculations** • Addition and subtraction of whole numbers of at least 4 digits • Multiplication of at least whole 2-digit by 2-digit numbers • Division of at least whole 3-digit by 1-digit numbers **Calculation techniques** • Use a range of techniques to perform and check written and mental calculations of whole numbers including - 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 - using multiplication and division as inverse operations	**Number range for counting, ordering, comparing, representing and place value of digits** • 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 and 1 000 **Number range for calculations** • Addition and subtraction of whole numbers of at least 5 digits • Multiplication of at least whole 3-digit by 2-digit numbers • Division of at least whole 3-digit by 2-digit numbers **Calculation techniques** • Using a range of techniques to perform and check written and mental calculations of whole numbers including: - estimation - adding and subtracting in columns - building up and breaking down numbers - using a number line - rounding off and compensating - doubling and halving - using addition and subtraction as inverse operations - using multiplication and division as inverse operations	**Number range for counting, ordering, comparing, representing and place value of digits** • 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 **Number range for calculations** • Addition and subtraction of whole numbers of at least 6 digits • Multiplication of at least whole 4-digit by 3-digit numbers • Division of at least whole 4-digit by 3-digit numbers • Multiple operations on whole numbers with or without brackets **Calculation techniques** • Using a range of techniques to perform and check written and mental calculations of whole numbers including: - estimation - adding, subtracting and multiplying in columns - long division - building up and breaking down numbers - rounding off and compensating - using addition and subtraction as inverse operations - using multiplication and division as inverse operations - using a calculator

TOPICS	GRADE 4	GRADE 5	GRADE 6
1.1 **Whole numbers**	**Number range for multiples and factors** • Multiples of 1-digit numbers to at least 100 **Properties of whole numbers** • Recognize and use the commutative, associative, and distributive properties with whole numbers **Solving problems** • Solve problems in contexts involving whole numbers, including - 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) - grouping and equal sharing with remainders	**Number range for multiples and factors** • Multiples of 2-digits whole numbers to at least 100 • Factors of 2-digit whole numbers to at least 100 **Properties of whole numbers** • 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 **Solving problems** • Solve problems involving whole numbers, including - 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) - grouping and equal sharing with remainders	**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 **Properties of whole numbers** • 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 **Solving problems** • Solve problems involving whole numbers and decimal fractions, including - 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) - grouping and equal sharing with remainders

TOPICS	GRADE 4	GRADE 5	GRADE 6
1.2 **Common Fractions**	**Describing and ordering fractions:** • Compare and order common fractions with different denominators (halves; thirds, quarters; fifths; sixths; sevenths; eighths) • Describe and compare common fractions in diagram form **Calculations with fractions:** • Addition of common fractions with the same denominators • Recognize, describe and use the equivalence of division and fractions **Solving problems** • Solve problems in contexts involving fractions, including grouping and equal sharing **Equivalent forms:** • Recognize and use equivalent forms of common fractions (fractions in which one denominator is a multiple of another)	**Describing and ordering fractions:** • Count forwards and backwards in fractions • Compare and order common fractions to at least twelfths **Calculations with fractions:** • 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 **Solving problems** • Solve problems in contexts involving common fractions, including grouping and sharing **Equivalent forms**: • Recognize and use equivalent forms of common fractions (fractions in which one denominator is a multiple of another)	**Describing and ordering fractions:** • Compare and order common fractions, including tenths and hundredths **Calculations with fractions:** • 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** • Solve problems in contexts involving common fractions, including grouping and sharing **Percentages** • Find percentages of whole numbers **Equivalent forms:** • 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

TOPICS	GRADE 4	GRADE 5	GRADE 6
1.3 **Decimal fractions**			**Recognizing, ordering and place value of decimal fractions** • 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 **Calculations with decimal fractions** • Addition and subtraction of decimal fractions with at least two decimal places • Multiply decimal fractions by 10 and 100 **Solving problems** • Solve problems in context involving decimal fractions **Equivalent forms**: • 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

SPECIFICATION OF CONTENT (PHASE OVERVIEW)

PATTERNS, FUNCTIONS AND ALGEBRA

- The main progression in Patterns, Functions and Algebra occurs in the range and complexity of relationships between numbers in the patterns.
- In Patterns, Functions and Algebra, learners are given opportunities to:
  - complete and extend patterns
  - represent patterns in different forms
  - identify and describe patterns.

  This prepares learners to describe rules for patterns, which become more formalized in algebraic work in the Senior Phase.
- In this phase, the emphasis is on practice with completing and extending number patterns as well as representing patterns in different forms.
- Patterns, Functions and Algebra also provide opportunities to develop an understanding of the properties of operations with whole numbers e.g. commutative, distributive, and inverse operations.
- Finding input and output values gives learners practice in thinking about and describing functional relationships between numbers.
- Writing and solving number sentences prepares learners for writing algebraic expressions and solving equations in the Senior Phase. Writing and solving number sentences also provides opportunity to consolidate learners' number knowledge.

TOPICS	GRADE 4	GRADE 5	GRADE 6
2.1 **Numeric patterns**	**Investigate and extend patterns** • Investigate and extend numeric patterns looking for relationships or rules of patterns: - 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** • Determine input values, output values and rules for patterns and relationships using - flow diagrams - tables	**Investigate and extend patterns** • Investigate and extend numeric patterns looking for relationships or rules of patterns: - sequences not limited to a constant difference or ratio - of learner's own creation • Describe observed relationships or rules in learner's own words **Input and output values** • Determine input values, output values and rules for the patterns and relationships using flow diagrams - flow diagrams - tables	**Investigate and extend patterns** • Investigate and extend numeric patterns looking for relationships or rules of patterns: - sequences not limited to a constant difference or ratio - of learner's own creation - represented in tables • Describe the general rules for the observed relationships **Input and output values** • Determine input values, output values and rules for the patterns and relationships using: - flow diagrams - tables

TOPICS	GRADE 4	GRADE 5	GRADE 6
2.1 **Numeric patterns**	**Equivalent forms** Determine equivalence of different descriptions of the same relationship or rule presented • verbally • in a flow diagram • in a table • by a number sentence	**Equivalent forms** Determine equivalence of different descriptions of the same relationship or rule presented • verbally • in a flow diagram • in a table • by a number sentence	**Equivalent forms** Determine equivalence of different descriptions of the same relationship or rule presented • verbally • in a flow diagram • in a table • by a number sentence
2.2 **Geometric patterns**	**Investigate and extend patterns** • Investigate and extend geometric patterns looking for relationships or rules of patterns - 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 learner's own words **Input and output values** Determine input values, output values and rules for the patterns and relationships using flow diagrams **Equivalent forms** • Determine equivalence of different descriptions of the same relationship or rule presented - verbally - in a flow diagram - by a number sentence	**Investigate and extend patterns** • Investigate and extend geometric patterns looking for relationships or rules of patterns - 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 learner's own words **Input and output values** Determine input values, output values and rules for the patterns and relationships using flow diagrams **Equivalent forms** • Determine equivalence of different descriptions of the same relationship or rule presented - verbally - in a flow diagram - by a number sentence	**Investigate and extend patterns** • Investigate and extend geometric patterns looking for relationships or rules of patterns - represented in physical or diagram form - sequences not limited to a constant difference or ratio - of learner's own creation - represented in tables • Describe the general rules for the observed relationships **Input and output values** Determine input values, output values and rules for the patterns and relationships using • flow diagrams • tables **Equivalent forms** • Determine equivalence of different descriptions of the same relationship or rule presented - verbally - in a flow diagram - in a table - by a number sentence

TOPICS	GRADE 4	GRADE 5	GRADE 6
2.3 **Number sentences** (Introduction to Algebraic Expressions)	**Number sentences** • Write number sentences to describe problem situations • Solve and complete number sentences by - inspection - trial and improvement • Check solution by substitution	**Number sentences** • Write number sentences to describe problem situations • Solve and complete number sentences by - inspection - trial and improvement • Check solution by substitution	**Number sentences** • Write number sentences to describe problem situations • Solve and complete number sentences by - inspection - trial and improvement • Check solution by substitution

SPECIFICATION OF CONTENT (PHASE OVERVIEW)

SPACE AND SHAPE (GEOMETRY)

- The main progression in Space and Shape (Geometry) is achieved by a focus on new properties and characteristics of 2-D shapes and 3-D objects in each grade.
- Learners are given opportunities to identify and describe characteristics of 2-D shapes and 3-D objects and to develop their abilities to classify shapes and objects in the Senior Phase

TOPICS	GRADE 4	GRADE 5	GRADE 6
3.1 **Properties of 2-D shapes**	**Range of shapes** • Recognize, visualize and name 2-D shapes in the environment and geometric settings - regular and irregular polygons – triangles, squares, rectangles, other quadrilaterals, pentagons, hexagons - circles **Characteristics of shapes** • Describe, sort and compare 2-D shapes in terms of - straight and curved sides - number of sides	**Range of shapes** • Recognize, visualize and name 2-D shapes in the environment and geometric setting, focusing on • regular and irregular polygons - triangles, squares, rectangles, other quadrilaterals, pentagons, hexagons, heptagons • circles • similarities and differences between squares and rectangles **Characteristics of shapes** • Describe, sort and compare 2-D shapes in terms of - straight and curved sides - number of sides - lengths of sides - angles in shapes, limited to ◊ right angles ◊ angles smaller than right angles ◊ angles greater than right angles **Further activities** • Draw 2-D shapes on grid paper	**Range of shapes** • Recognize, visualize and name 2-D shapes in the environment and geometric settings, focusing on - regular and irregular polygons - triangles, squares, rectangles, parallelograms, other quadrilaterals, pentagons, hexagons, heptagons, octagons - circles - similarities and differences between rectangles and parallelograms **Characteristics of shapes** • Describe, sort and compare 2-D shapes in terms of - number of sides - lengths of sides - sizes of angles ◊ acute ◊ right ◊ obtuse ◊ straight ◊ reflex ◊ revolution **Further activities** • Draw 2-D shapes on grid paper • Draw circles, patterns in circles and patterns with circles using a pair of pair of compasseses

TOPICS	GRADE 4	GRADE 5	GRADE 6
3.1 **Properties of 2-D shapes**	**Further activities** • Draw 2-D shapes on grid paper	**Angles** • Recognize and describe angles in 2-D shapes: - right angles - angles smaller than right angles - angles greater than right angles	**Angles** • Recognize and name the following angles in 2-D shapes: - acute - right - obtuse - straight - reflex - revolution
3.2 **Properties of 3-D objects**	**Range of objects** • Recognize, visualize and name 3-D objects in the environment and geometric settings, focusing on: - rectangular prisms, - spheres - cylinders - pyramids **characteristics of objects** • Describe, sort and compare 3-D objects in terms of - shapes of faces - flat and curved surfaces **Further activities** • Make 3-D models using cut out polygons	**Range of objects** • Recognize, visualize and name 3-D objects in the environment and geometric settings, focusing on: - rectangular prisms and other prisms - cubes - cylinders - cones - pyramids - similarities and differences between cubes and rectangular prisms **characteristics of objects** • Describe, sort and compare 3-D objects in terms of - shape of faces - number of faces - flat and curved surfaces **Further activities** • Make 3-D models using cut out polygons • Cut open boxes to trace and describe their nets	**Range of objects** • Recognize, visualize and name 3-D objects in the environment and geometric settings, focusing on - rectangular prisms - cubes - tetrahedrons - pyramids - similarities and differences between tetrahedrons and other pyramids **characteristics of objects** • Describe, sort and compare 3-D objects in terms of - number and shape of faces - number of vertices - number of edges **Further activities** • Make 3-D models using: - drinking straws, toothpicks etc - nets

TOPICS	GRADE 4	GRADE 5	GRADE 6
3.3 Symmetry	**Symmetry** • Recognize, draw and describe line(s) of symmetry in 2-D shapes	**Symmetry** • Recognize, draw and describe line(s) of symmetry in 2-D shapes	**Symmetry** • Recognize, draw and describe line(s) of symmetry in 2-D shapes
3.4 Transformations	**Build composite shapes** • Put 2-D shapes together to make different composite 2-D shapes including some shapes with line symmetry. **Tessellations** • Pack out 2-D shapes to make tessellated patterns including some patterns with line symmetry. **Describe patterns** • Refer to lines, 2-D shapes, 3-D objects and lines of symmetry when describing patterns - in nature - from modern everyday life - our cultural heritage	**Use transformations to make composite shapes** • Make composite 2-D shapes including shapes with line symmetry by tracing and moving a 2-D shape in one or more of the following ways: - by rotation - by translation - by reflection **Use transformations to make tessellations** • Make tessellated patterns including some patterns with line symmetry by tracing and moving 2-D shapes in one or more of the following ways - by rotation - by translation - by reflection **Describe patterns** • Refer to lines, 2-D shapes, 3-D objects, lines of symmetry, rotations, reflections and translations when describing patterns - in nature - from modern everyday life - from our cultural heritage	**Enlargement and reductions** • Draw enlargement and reductions of 2-D shapes to compare size and shape of - triangles - quadrilaterals **Describe patterns** • Refer to lines, 2-D shapes, 3-D objects, lines of symmetry, rotations, reflections and translations when describing patterns - in nature - from modern everyday life - from our cultural heritage
3.5 Viewing of objects	**Position and views** • Match different views of everyday objects • Identify everyday objects from different views	**Position and views** Links the position of viewer to views of: • single everyday objects • collections of everyday objects or everyday scenes	**Position and views** Links the position of viewer to views of: • single everyday objects or collections of objects • single or composite geometric objects

TOPICS	GRADE 4	GRADE 5	GRADE 6
3.6 **Position and movement**	**Location and directions** • Locate position of objects, drawings or symbols on a grid with alpha-numeric grid references • Locate positions of objects on a map by using alpha-numeric grid references	**Location and directions** • Locate position of objects, drawings or symbols on a grid with alpha-numeric grid references • Locate positions of objects on a map by using alpha-numeric grid references • Follow directions to trace a path between positions on a map	**Location and directions** • Locate position of objects, drawings or symbols on a grid with alpha-numeric grid references • Locate positions of objects on a map by using alpha-numeric grid references • Give directions to move between positions or places on a map

SPECIFICATION OF CONTENT (PHASE OVERVIEW)

MEASUREMENT

- The main progression in measurement across the grades is achieved by
  - the introduction of new measuring units, particularly in Grades 4 and 6.
  - the increase in number range and complexity of calculations that learners are able to do in each grade
- Practical measuring using measuring instruments is central to measurement in this phase.
- In the sequencing of measurement topics within each grade, cognizance should be taken of the number work that has already been covered in that year, particularly with regard to calculations and solving problems.

TOPICS	GRADE 4	GRADE 5	GRADE 6
4.1 Length	**Practical measuring** of 2-D shapes and 3-D objects by • estimating • measuring • recording • comparing and ordering **Measuring instruments:** rulers, metre sticks, tape measures, trundle wheels **Units:** millimetres (mm), centimetres (cm), metres (m), kilometres (km) **Calculations and problem-solving involving length** • Solve problems in contexts involving length • Conversions include converting between - millimetres (mm), and centimetres (cm) - centimetres (cm) and metres (m) - metres (m) and kilometres (km) • Conversions limited to whole numbers and common fractions	**Practical measuring** of 2-D shapes and 3-D objects by • estimating • measuring • recording • comparing and ordering **Measuring instruments:** rulers, metre sticks, tape measures, trundle wheels **Units:** millimetres (mm), centimetres (cm), metres (m), kilometres (km) **Calculations and problem-solving involving length** • Solve problems in contexts involving length • Conversions include converting between any of the following units: - millimetres (mm) - centimetres (cm) - metres (m) - kilometres (km) • Conversions limited to whole numbers and common fractions	**Practical measuring** of 2-D shapes and 3-D objects by • estimating • measuring • recording • comparing and ordering **Measuring instruments:** rulers, metre sticks, tape measures, trundle wheels **Units:** millimetres (mm), centimetres (cm), metres (m), kilometres (km) • **Calculations and problem-solving involving length** • Solve problems in contexts involving length • Conversions include converting between any of the following units: - millimetres (mm) - centimetres (cm) - metres (m) - kilometres (km) • Conversions should include common fraction and decimal fractions to 2 decimal places

TOPICS	GRADE 4	GRADE 5	GRADE 6
4.2 **Mass**	**Practical measuring** of 3-D objects by • estimating • measuring • recording • comparing and ordering **Measuring instruments:** bathroom scales, kitchen scales and balances **Units:** grams (g) and kilograms (kg); **Calculations and problem-solving involving mass include:** • problems in contexts involving mass • converting between grams and kilograms limited to examples with whole numbers and fractions	**Practical measuring** of 3-D objects by • estimating • measuring • recording • comparing and ordering **Measuring instruments:** bathroom scales, kitchen scales and balances **Units:** grams (g) and kilograms (kg); **Calculations and problem-solving involving mass include:** • problems in contexts involving mass • converting between grams and kilograms limited to examples with whole numbers and fractions	**Practical measuring** of 3-D objects by • estimating • measuring • recording • comparing and ordering **Measuring instruments:** bathroom scales (analogue and digital); , kitchen scales (analogue and digital) and balances **Units:** grams (g) and kilograms (kg); **Calculations and problem-solving involving mass include:** • problems in contexts involving mass • converting between grams and kilograms • conversions should include fraction and decimal forms (to 2 decimal places)
4.3 **Capacity/Volume**	**Practical measuring** of 3-D objects by • estimating • measuring • recording • comparing and ordering **Measuring instruments:** measuring spoons, measuring cups, measuring jugs **Units:** millilitres (ml) , litres (l) **Calculations and problem solving involving capacity/volume include:** • problems in contexts involving capacity/volume • converting between litres and millilitres limited to examples with whole numbers and fractions	**Practical measuring** of 3-D objects by • estimating • measuring • recording • comparing and ordering **Measuring instruments:** measuring spoons, measuring cups, measuring jugs **Units:** millilitres (ml) , litres (l) **Calculations and problem solving involving capacity/volume include:** • problems in contexts involving capacity/volume • converting between litres and millilitres limited to examples with whole numbers and fractions	**Practical measuring** of 3-D objects by • estimating • measuring • recording • comparing and ordering **Measuring instruments:** measuring jugs **Units:** millilitres (ml), litres (l) and kilolitres (kl) **Calculations and problem solving involving capacity/volume include:** • problems in contexts involving capacity/volume • converting between kilolitres, litres and millilitres - conversions should include fraction and decimal forms (to 2 decimal places)

TOPICS	GRADE 4	GRADE 5	GRADE 6
4.4 **Time**	**Reading time and time instruments** • Read, tell and write time in 12-hour and 24-hour formats on both analogue and digital instruments in - hours - minutes - seconds • Instruments include clocks and watches **Reading calendars** **Calculations and problem solving time include** • problems in contexts involving time • 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 **History of time** Know some ways in which time was measured and represented in the past	**Reading time and time instruments** • Read, tell and write time in 12-hour and 24-hour formats on both analogue and digital instruments in - hours - minutes - seconds • Instruments include clocks, watches and stopwatches **Reading calendars** **Calculations and problem solving time include** • problems in contexts involving time • calculation of time intervals where time is given in - seconds and/or minutes - minutes and/or hours - hours and/or days - days, weeks and/or months - years and/or decades **History of time** Know some ways in which time was measured and represented in the past	**Reading time and time instruments** • Read, tell and write time in 12-hour and 24-hour formats on both analogue and digital instruments in - hours - minutes - seconds • Instruments include clocks, watches and stopwatches **Reading calendars** **Calculations and problem solving time include** • problems in contexts involving time • reading time zone maps and calculating time differences based on time zones • calculation of time intervals where time is given in - seconds and/or minutes - minutes and/or hours - hours and/or days - days, weeks and/or months - years and/or decades - centuries, decades and/or years **History of time** Know some ways in which time was measured and represented in the past.

TOPICS	GRADE 4	GRADE 5	GRADE 6
4.5 **Temperature**		**Practical measuring of temperature by** • estimating • measuring • recording • comparing and ordering **Measuring instruments:** • thermometers **Units:** • degrees Celsius **Calculations and problem-solving related to temperature include:** • problems in contexts related to temperatures • calculating temperature differences limited to positive whole numbers	**Practical measuring of temperature by** • estimating • measuring • recording • comparing and ordering **Measuring instruments:** • thermometers (analogue and digital) **Units:** • degrees Celsius **Calculations and problem-solving related to temperature include:** • problems in contexts related to temperatures • calculating temperature differences limited to positive whole numbers
4.6 **Perimeter, surface area and volume**	**Perimeter** Measure perimeter using rulers or measuring tapes **Measurement of area** • Find areas of regular and irregular shapes by counting squares on grids in order to develop an understanding of square units **Measurement of volume** • Find volume/capacity of objects by packing or filling them in order to develop an understanding of cubic units	**Perimeter** Measure perimeter using rulers or measuring tapes **Measurement of area** • Find areas of regular and irregular shapes by counting squares on grids in order to develop an understanding of square units **Measurement of volume** • Find volume/capacity of objects by packing or filling them in order to develop an understanding of cubic units	**Perimeter** Measure perimeter using rulers or measuring tapes **Measurement of area** • Continue to find areas of regular and irregular shapes by counting squares on grids • Develop rules for calculating the areas of squares and rectangles **Measurement of volume** • Continue to find volume/capacity of objects by packing or filling them • Develop an understanding of why the volume of rectangular prisms is given by length multiplied by width multiplied by height **Investigate** • Relationship between perimeter and area of rectangles and squares. • Relationship between surface area and volume of rectangular prisms

TOPICS	GRADE 4	GRADE 5	GRADE 6
4.7 **History of measurement**			Know some ways in which people measured and recorded measurement in the past.

SPECIFICATION OF CONTENT (PHASE OVERVIEW)

DATA HANDLING

- The main progression in Data Handling across the grades is achieved by
  - working with new forms of data representation
  - developing new analytic tools for interpreting and reporting data.
- Learners should work through the full data cycle a few times a year – this involves collecting, organizing, representing, analyzing, interpreting and reporting data.
- Some of the above aspects of data handling can also be dealt with as discrete activities.
- Data handling contexts should be selected to build awareness of social, economic and environmental issues.
- Learners should become sensitized to how data-gathering contexts can impact on the interpretations and predictions of the data.
- Data handling also provides the opportunity for completing projects

TOPICS	GRADE 4	GRADE 5	GRADE 6
5.1 **Collecting and Organising data**	**Collecting and organising data** • Collect data using tally marks and tables for recording	**Collecting and organising data** • Collect data using tally marks and tables for recording • Order data from smallest group to largest group	**Collecting and organising data** • Collect data - using tally marks and tables for recording - using simple questionnaires (yes/no type response) • Order data from smallest group to largest group
5.2 **Representing data**	**Representing data** Draw a variety of graphs to display and interpret data including: • pictographs (one-to-one correspondence between data and representation) • bar graphs	**Representing data** Draw a variety of graphs to display and interpret data including: • pictographs (many-to-one correspondence) • bar graphs	**Representing data** Draw a variety of graphs to display and interpret data including: • pictographs (many-to-one correspondence) • bar graphs and double bar graphs

TOPICS	GRADE 4	GRADE 5	GRADE 6
5.3 **Analysing, Interpreting and Reporting data**	**Interpreting data** Critically read and interpret data represented in • words • pictographs • bar graphs • pie charts **Analysing data** Analyse data by answering questions related to data categories **Reporting data** Summarise data verbally and in short written paragraphs	**Interpreting data** Critically read and interpret data represented in • words • pictographs • bar graphs • pie charts **Analysing data** Analyse data by answering questions related to: • data categories • data sources and contexts **Reporting data** Summarise data verbally and in short written paragraphs that include • drawing conclusions about the data • making predictions based on the data **Ungrouped data** Examine ungrouped numerical data to determine the most frequently occurring score in the data set (mode)	**Interpreting data** Critically read and interpret data represented in • words • pictographs • bar graphs • double bar graphs • pie charts **Analysing data** Analyse data by answering questions related to: • data categories, including data intervals • data sources and contexts • central tendencies – (mode and median) **Reporting data** Summarise data verbally and in short written paragraphs that includes. • drawing conclusions about the data • making predictions based on the data **Ungrouped data** Examine ungrouped numerical data to determine • the most frequently occurring score in the data set (mode) • the middlemost score in the data set (median)
5.4 **Probability**	**Probability experiments** • Perform simple repeated events and list possible outcomes for experiments such as: - tossing a coin - rolling a die	**Probability experiments** • Perform simple repeated events and list possible outcomes for experiments such as: - tossing a coin - rolling a die - spinning a spinner • Count and compare the frequency of actual outcomes for a series of trials up to 20 trials	**Probability experiments** • Perform simple repeated events and list possible outcomes for experiments such as: - tossing a coin - rolling a die - spinning a spinner • Count and compare the frequency of actual outcomes for a series of trials up to 50 trials