Grade R

MAT.LO1 (GET)

NUMBERS, OPERATIONS AND RELATIONSHIPS

The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standards

We know this when the learner:

R.1.1
- Counts to at least 10 everyday objects reliably.

R.1.2
- Says and uses number names in familiar contexts.

R.1.3
- Knows the number names and symbols for 1 to 10.

R.1.4
- Orders and compares collections of objects using the words 'more', 'less' and 'equal'.

R.1.5
- Solves and explains solutions to practical problems that involve equal sharing and grouping with whole numbers of at least 10 and with solutions that include remainders.

R.1.6
- Solves verbally-stated additions and subtraction problems with single-digit numbers and with solutions to at least 10.

R.1.7
- Uses the following techniques:
  - building up and breaking down numbers to at least 10;
  - doubling and halving to at least 10;
  - using concrete apparatus (e.g. counters).

R.1.8
- Explains own solutions to problems.

Grade R

MAT.LO2 (GET)

PATTERNS, FUNCTIONS AND ALGEBRA

The learner will be able to recognise, describe and represent patterns and relationships, as well as to solve problems using algebraic language and skills.

Assessment Standards

We know this when the learner:

R.2.1
- Copies and extends simple patterns using physical objects and drawings (e.g. using colours and shapes).

R.2.2
- Creates own patterns.

Grade R

MAT.LO3 (GET)

SPACE AND SHAPE (GEOMETRY)

The learner will be able to describe and represent characteristics and relationships between two-dimensional shapes and three-dimensional objects in a variety of orientations and positions.

Assessment Standards

We know this when the learner:

R.3.1
- Recognises, identifies and names three-dimensional objects in the classroom and in pictures, including:
  - boxes (prisms);
  - balls (spheres).

R.3.2
- Describes, sorts and compares physical three-dimensional objects according to:
  - size;
  - objects that roll;
  - objects that slide.

R.3.3
- Builds three-dimensional objects using concrete materials (e.g. building blocks).

R.3.4
- Recognises symmetry in self and own environment (with focus on front and back).

R.3.5
- Describes one three-dimensional object in relation to another (e.g. 'in front of' or 'behind').

R.3.6
- Follows directions (alone and/or as a member of a group or team) to move or place self within the classroom (e.g. 'at the front' or 'at the back').

Grade R

MAT.LO4 (GET)

MEASUREMENT
The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

Assessment Standards

We know this when the learner:

R.4.1
- Describes the time of day in terms of day or night.

R.4.2
- Orders recurring events in own daily life.

R.4.3
- Sequences events within one day.

R.4.4
- Works concretely comparing and ordering objects using appropriate vocabulary to describe:
  - mass (e.g. light, heavy, heavier);
  - capacity (e.g. empty, full, less than, more than);
  - length (e.g. longer, shorter, wider, tall, short).

Grade R

MAT.LO5 (GET)

DATA HANDLING

The learner will be able to collect, summarise, display and critically analyse data in order to draw conclusions and make predictions, and to interpret and determine chance variation.

Assessment Standards

We know this when the learner:

R.5.1
- Collects physical objects (alone and/or as a member of a group or team) in the environment according to stated features (e.g. collects 10 dead flowers).

R.5.2
- Sorts physical objects according to one attribute (property) (e.g. red shapes).

R.5.3
- Draws a picture as a record of collected objects.

R.5.4
- Answers questions (e.g. 'Which has the most…?') based on own picture or own sorted objects.

Grade 1

MAT.LO1 (GET)

NUMBERS, OPERATIONS AND RELATIONSHIPS

The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standards

We know this when the learner:

1.1.1
- Counts to at least 34 everyday objects reliably.

1.1.2
- Counts forwards and backwards in:
  - ones from any number between 0 and 100;
  - tens from any multiple of 10 between 0 and 100.

1.1.3
- Knows and reads number symbols from 1 to at least 100 and writes number names from 1 to at least 34.

1.1.5
- Orders, describes and compares whole numbers to at least 2-digit numbers.

1.1.7
- Solves money problems involving totals and change in rands and cents.

1.1.8
- Solves and explains solutions to practical problems that involve equal sharing and grouping with whole numbers to at least 34 and with solutions that include remainders.

Grade 2

Assessment Standards

We know this when the learner:

2.1.1
- Counts to at least 100 everyday objects reliably.

2.1.2
- Counts forwards and backwards in:
  - ones from any number between 0 and 200;
  - tens from any multiple of 10 between 0 and 200;
  - fives from any multiple of 5 between 0 and 200;
  - twos from any multiple of 2 between 0 and 200.

2.1.3
- Knows and reads number symbols from 1 to at least 200 and writes number names from 1 to at least 100.

2.1.5
- Orders, describes and compares the following numbers:
  - whole numbers to at least 2-digit numbers;
  - common fractions including halves and quarters.

2.1.6
- Recognises the place value of digits in whole numbers to at least 2-digit numbers.

2.1.7
- Solves money problems involving totals and change in rands and cents.

2.1.8
- Solves and explains solutions to practical problems that involve equal sharing and grouping and that lead to solutions that also include unitary fractions (e.g. $\frac{1}{4}$).

Grade 3

Assessment Standards

We know this when the learner:

3.1.2
- Counts forwards and backwards in:
  - the intervals specified in Grade 2 with increased number ranges;
  - twenties, twenty-fives, fifties and hundreds between 0 and at least 1 000.

3.1.3
- Knows number names from 1 to at least 10 in the mother tongue (if not the language of learning and teaching) and one other local language.

3.1.4
- Knows, reads and writes number symbols and names from 1 to at least 1 000.

3.1.5
- Orders, describes and compares the following numbers:
  - whole numbers to at least 3-digit numbers;
  - common fractions including halves, quarters and thirds.

3.1.6
- Recognises the place value of digits in whole numbers to at least 3-digit numbers.

3.1.7
- Solves money problems involving totals and change in rands and cents, including converting between rands and cents.

3.1.8
- Solves and explains solutions to practical problems that involve equal sharing and grouping and that lead to solutions that also include unitary and non-unitary fractions (e.g. $\frac{1}{4}$, $\frac{3}{4}$).

Grade 1

Learning Outcome 1
Continued

NUMBERS, OPERATIONS AND RELATIONSHIPS
The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standards

We know this when the learner:

1.1.9
- Can perform calculations, using appropriate symbols, to solve problems involving:
  - addition and subtraction with whole numbers and solutions to at least 34;
  - repeated addition with whole numbers and with solutions to at lease 34;
  - estimation.

1.1.10
- Performs mental calculations involving addition and subtraction for numbers to at least 10.

1.1.11
- Uses the following techniques:
  - building up and breaking down numbers;
  - doubling and halving;
  - using concrete apparatus (e.g. counters);
  - number-lines.

1.1.12
- Explains own solutions to problems.

1.1.13
- Checks the solution given to problems by peers.

Grade 2

Assessment Standards

We know this when the learner:

2.1.9
■ Can perform calculations, using appropriate symbols, to solve problems involving:
- addition and subtraction of whole numbers with at least 2 digits;
- multiplication of whole 1-digit by 1-digit numbers with solutions to at least 50;
- estimation.

2.1.10
■ Performs mental calculations involving:
- addition and subtraction for numbers to at least 20;
- multiplication of whole numbers with solutions to at least 20.

2.1.11
■ Uses the following techniques:
- building up and breaking down numbers;
- doubling and halving;
- using concrete apparatus (e.g. counters);
- number-lines.

2.1.12
■ Explains own solutions to problems.

2.1.13
■ Checks the solution given to problems by peers.

Grade 3

Assessment Standards

We know this when the learner:

3.1.9
■ Can perform calculations, using appropriate symbols, to solve problems involving:
- addition and subtraction of whole numbers with at least 3 digits;
- multiplication of at least whole 2-digit by 1-digit numbers;
- division of at least whole 2-digit by 1-digit numbers;
- estimation.

3.1.10
■ Performs mental calculations involving:
- addition and subtraction for numbers to at least 50;
- multiplication of whole numbers with solutions to at least 50.

3.1.11
■ Uses the following techniques:
- building up and breaking down numbers;
- doubling and halving;
- number-lines;
- rounding off in tens.

3.1.12
■ Explains own solutions to problems.

3.1.13
■ Checks the solution given to problems by peers.

Grade 1

MAT.LO2 (GET)

PATTERNS, FUNCTIONS AND ALGEBRA

The learner will be able to recognise, describe and represent patterns and relationships, as well as to solve problems using algebraic language and skills.

Assessment Standards

We know this when the learner:

1.2.1
- Copies and extends simple patterns using physical objects and drawings (e.g. using colours and shapes).

1.2.2
- Copies and extends simple number sequences to at least 100.

1.2.3
- Creates own patterns.

1.2.4
- Describes observed patterns.

1.2.5
- Identifies, describes and copies geometric patterns in natural and cultural artefacts of different cultures and times.

Grade 2

Assessment Standards

We know this when the learner:

2.2.1
- Copies and extends simple patterns using physical objects and drawings.

2.2.2
- Copies and extends simple number sequences to at least 200.

2.2.3
- Creates own patterns.

2.2.4
- Describes observed patterns.

2.2.5
- Identifies, describes and copies geometric patterns in natural and cultural artefacts of different cultures and times.

Grade 3

Assessment Standards

We know this when the learner:

3.2.1
- Copies and extends simple patterns using physical objects and drawings.

3.2.2
- Copies and extends simple number sequences to at least 1 000.

3.2.3
- Creates own patterns.

3.2.4
- Describes observed patterns.

3.2.5
- Identifies, describes and copies geometric patterns in natural and cultural artefacts of different cultures and times.

Grade 1

MAT.LO3 (GET)

SPACE AND SHAPE (GEOMETRY)
The learner will be able to describe and represent characteristics and relationships between two-dimensional shapes and three-dimensional objects in a variety of orientations and positions.

Assessment Standards

We know this when the learner:

1.3.1
- Recognises, identifies and names two-dimensional shapes and three-dimensional objects in the classroom and in pictures, including:
  - boxes (prisms) and balls (spheres);
  - triangles and rectangles;
  - circles.

1.3.2
- Describes, sorts and compares physical two-dimensional shapes and three-dimensional objects according to:
  - size;
  - objects that roll or slide;
  - shapes that have straight or round edges.

1.3.3
- Observes and builds given three-dimensional objects using concrete materials (e.g. building blocks and construction sets).

1.3.4
- Recognises symmetry in self and own environment (with focus on 'left', 'right', 'front' and 'back').

1.3.5
- Describes one three-dimensional object in relation to another (e.g. 'in front of' or 'behind').

1.3.6
- Follows directions (alone and/or as a member of a group or team) to move or place self within the classroom or three-dimensional objects in relation to each other.

Grade 2

Assessment Standards

We know this when the learner:

2.3.1
- Recognises, identifies and names two-dimensional shapes and three-dimensional objects in the school environment and in pictures, including:
  - boxes (prisms), balls (spheres) and cylinders;
  - triangles, squares and rectangles;
  - circles.

2.3.2
- Describes, sorts and compares two-dimensional shapes and three-dimensional objects in pictures and the environment according to:
  - size;
  - objects that roll or slide;
  - shapes that have straight or round edges.

2.3.3
- Observes and creates given two-dimensional shapes and three-dimensional objects using concrete materials (e.g. building blocks, construction sets and cut-out two-dimensional shapes).

2.3.4
- Recognises symmetry in two-dimensional shapes and three-dimensional objects.

2.3.5
- Recognises three-dimensional objects from different positions.

2.3.6
- Positions self within the classroom or three-dimensional objects in relation to each other.

2.3.7
- Describes positional relationships (alone and/or as a member of a group or team) between three-dimensional objects or self and a peer.

Grade 3

Assessment Standards

We know this when the learner:

3.3.1
- Recognises, identifies and names two-dimensional shapes and three-dimensional objects in the environment and in pictures, including:
  - boxes (prisms), balls (spheres) and cylinders;
  - triangles, squares and rectangles;
  - circles;
  - cones and pyramids.

3.3.2
- Describes, sorts and compares two-dimensional shapes and three-dimensional objects in pictures and the environment, including:
  - two-dimensional shapes in or on the faces of three-dimensional objects;
  - flat/straight and curved/round surfaces and edges.

3.3.3
- Observes and creates given and described two-dimensional shapes and three-dimensional objects using concrete materials (e.g. building blocks, construction sets, cut-out two-dimensional shapes, clay, drinking straws).

3.3.4
- Determines lines of symmetry in two-dimensional shapes using paper folding and reflection.

3.3.5
- Recognises and describes three-dimensional objects from different positions.

3.3.6
- Reads, interprets and draws informal maps of the school environment or of an arrangement of three-dimensional objects and locates objects on the map.

3.3.7
- Describes positional relationships (alone and/or as a member of a group or team) between three-dimensional objects or self and a peer.

Grade 1

MAT.LO4 (GET)

MEASUREMENT
The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

Assessment Standards

We know this when the learner:

1.4.2
- Describes the time of day using vocabulary such as 'early', 'late morning', 'afternoon' and 'night'.

1.4.3
- Compares events in terms of the length of time they take (longer, shorter, faster, slower).

1.4.4
- Sequences events using language such as 'yesterday', 'today' and 'tomorrow'.

1.4.5
- Places birthdays on a calendar.

1.4.7
- Estimates, measures, compares and orders three-dimensional objects using non-standard measures:
  - mass (e.g. bricks, sand bags);
  - capacity (e.g. spoons, cups);
  - length (e.g. hand spans, footsteps)

Grade 2

Assessment Standards

We know this when the learner:

2.4.1
■ Reads analogue and digital clock time in hours and minutes.

2.4.2
■ Names in order the days of the week and the months of the year.

2.4.3
■ Calculates elapsed time in:
  ● hours and minutes using clocks;
  ● days, weeks and months using calendars.

2.4.4
■ Sequences events according to days, weeks, months and years.

2.4.5
■ Identifies important dates on calendars including dates of:
  ● religious festivals;
  ● historical events.

2.4.7
■ Estimates, measures, compares and orders three-dimensional objects using non-standard measures:
  ● mass (e.g. bricks, sand bags);
  ● capacity (e.g. spoons, cups);
  ● length (e.g. hand spans, footsteps).

Grade 3

Assessment Standards

We know this when the learner:

3.4.1
■ Reads and writes analogue and digital clock time in terms of hours, half-hours, quarters of an hour and minutes.

3.4.2
■ Solves problems involving calculations with and conversions between:
  ● minutes ↔ hours;
  ● hours ↔ days;
  ● days ↔ months.

3.4.5
■ Identifies important dates on calendars including dates of:
  ● religious festivals;
  ● historical events.

3.4.6
■ Recognises and describes different calendars used in different cultures.

3.4.7
■ Estimates, measures, compares and orders three-dimensional objects using non-standard and standard measures:
  ● mass (e.g. packets, kilograms);
  ● capacity (e.g. bottles, litres);
  ● length (e.g. desk lengths, metres).

3.4.8
■ Investigates (alone and/or as a member of a group or team) and approximates:
  ● distance around two-dimensional shapes using string;
  ● area of two-dimensional shapes using tiling.

Grade 1

MAT.LO5 (GET)

DATA HANDLING
The learner will be able to collect, summarise, display and critically analyse data in order to draw conclusions and make predictions, and to interpret and determine chance variation.

Assessment Standards

We know this when the learner:

1.5.1
- Collects everyday objects (alone and/or as a member of a group or team) in the classroom and school environment according to given criteria or categories.

1.5.2
- Sorts physical objects according to one attribute chosen for a reason (e.g. 'Sort crayons into colours.').

1.5.3
- Gives reasons for collections being grouped in particular ways.

1.5.4
- Draws a picture as a record of collected objects.

1.5.5
- Constructs pictographs where stickers or stamps represent individual elements in a collection of objects.

1.5.6
- Describes own collection of objects, explains how it was sorted, and answers questions about it.

Grade 2

Assessment Standards

We know this when the learner:

2.5.1
- Collects data (alone and/or as a member of a group or team) in the classroom and school environment to answer questions posed by the teacher (e.g. 'How many learners are there in each classroom?').

2.5.2
- Sorts physical objects according to one attribute chosen by the teacher.

2.5.3
- Gives reasons for collections being grouped in particular ways.

2.5.4
- Draws pictures and constructs pictographs that have a 1-1 correspondence between own data and representations.

2.5.5
- Describes own or a peer's collection of objects, explains how it was sorted, and answers questions about it.

Grade 3

Assessment Standards

We know this when the learner:

3.5.1
- Collects data (alone and/or as a member of a group or team) in the classroom and school environment to answer questions posed by the teacher and class (e.g. 'How many learners walk to school?').

3.5.2
- Sorts, orders and organises own and supplied data by one or more attributes for a particular reason.

3.5.4
- Draws pictures and constructs pictographs and bar graphs that have a 1-1 correspondence between own data and representation.

3.5.6
- Reads, interprets and reports on information in own and a peer's representations of data.

3.5.7
- Reads and interprets data presented in simple tables and lists.

Grade 4

MAT.LO1 (GET)

NUMBERS, OPERATIONS AND RELATIONSHIPS

The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standards

We know this when the learner:

4.1.1
- Counts forwards and backwards in a variety of intervals (including 2s, 3s, 5s, 10s, 25s, 50s and 100s) between 0 and at least 10 000.

4.1.2
- Describes and illustrates various ways of counting in different cultures (including local) throughout history.

4.1.3
- Recognises and represents the following numbers in order to describe and compare them:
  - whole numbers to at least 4-digit numbers;
  - common fractions with different denominators including halves, thirds, quarters, fifths, sixths, sevenths and eighths;
  - common fractions in diagrammatic form;
  - decimal fractions of the form 0,5; 1,5 and 2,5 and so on, in the context of measurement;
  - odd and even numbers to at least 1 000;
  - multiples of single-digit numbers to at least 100.

4.1.4
- Recognises the place value of digits in whole numbers to at least 4-digit numbers.

4.1.5
- Recognises and uses equivalent forms of the numbers listed above, including:
  - common fractions with denominators that are multiples of each other;
  - decimal fractions of the form 0,5, 1,5 and 2,5 and so on, in the context of measurement.

Grade 5

Assessment Standards

We know this when the learner:

5.1.1
- Counts forwards and backwards in whole number intervals and fractions.

5.1.2
- Describes and illustrates various ways of writing numbers in different cultures (including local) throughout history.

5.1.3
- Recognises and represents the following numbers in order to describe and compare them:
  - whole numbers to at least 6-digit numbers;
  - common fractions to at least twelfths;
  - decimal fractions of the form 0,5, 1,5 and 2,5 and so on, in the context of measurement;
  - 0 in terms of additive inverses;
  - 1 in terms of multiplicative inverses;
  - multiples of single-digit numbers to at least 100;
  - factors of at least any 2-digit whole number.

5.1.4
- Recognises the place value of digits in whole numbers to at least 6-digit numbers.

5.1.5
- Recognises and uses equivalent forms of the numbers listed above, including:
  - common fractions with denominators that are multiples of each other;
  - decimal fractions of the form 0,5, 1,5 and 2,5 and so on, in the context of measurement.

Grade 6

Assessment Standards

We know this when the learner:

6.1.1
- Counts forwards and backwards in decimals.

6.1.2
- Describes and illustrates written number systems different to own.

6.1.3
- Recognises and represents the following numbers in order to describe and compare them:
  - whole numbers to at least 9-digit numbers;
  - decimal fractions to at lease two decimal places;
  - common fractions including specifically tenths, hundreds and percentages;
  - 0 in terms of its additive property;
  - 1 in terms of its multiplicative property;
  - multiples and factors of at least any 2-digit and 3-digit whole number;
  - prime numbers to at least 100.

6.1.4
- Recognises the place value of digits in:
  - whole numbers to at least 9-digit numbers;
  - decimal fractions to at least 2 decimal places.

6.1.5
- Recognises and uses equivalent forms of the numbers listed above, including:
  - common fractions with 1-digit or 2-digit denominators;
  - decimal fractions to at least 2 decimal places;
  - percentages.

Grade 4

Learning Outcome 1 Continued

NUMBERS, OPERATIONS AND RELATIONSHIPS

The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standards

We know this when the learner:

4.1.6
- Solves problems in context including contexts that may be used to build awareness of other Learning Areas, as well as human rights, social, economic and environmental issues such as:
  - financial (including buying and selling, and simple budgets);
  - measurements in Natural Sciences and Technology contexts.

4.1.7
- Solves problems that involve:
  - comparing two or more quantities of the same kind (ratio);
  - comparing two quantities of different kinds (rate, e.g. kg/R).

4.1.8
- Estimates and calculates by selecting and using operations appropriate to solving problems that involve:
  - rounding off to the nearest 10, 100 or 1 000;
  - addition and subtraction of whole numbers with at least 4 digits;
  - addition of common fractions in context;
  - multiplication of at least whole 2-digit by 2-digit numbers;
  - division of at least whole 3-digit by 1-digit numbers;
  - equal sharing with remainders.

Grade 5

Assessment Standards

We know this when the learner:

5.1.6
- Solves problems in context including contexts that may be used to build awareness of other Learning Areas, as well as human rights, social, economic and environmental issues such as:
  - financial (including buying and selling, profit and loss, and simple budgets);
  - measurements in Natural Sciences and Technology contexts.

5.1.7
- Solves problems that involve:
  - comparing two or more quantities of the same kind (ratio);
  - comparing two quantities of different kinds (e.g. learners/teacher).

5.1.8
- Estimates and calculates by selecting and using operations appropriate to solving problems that involve:
  - rounding off to the nearest 5, 10, 100 or 1 000;
  - addition and subtraction of whole numbers with at least 5 digits;
  - addition and subtraction of common fractions with the same denominator and whole numbers with common fractions (mixed numbers);
  - multiplication of at least whole 3-digit by 2-digit numbers;
  - division of at least whole 3-digit by 2-digit numbers;
  - finding fractions of whole numbers which result in whole numbers;
  - equivalent fractions.

Grade 6

Assessment Standards

We know this when the learner:

6.1.6
- Solves problems in context including contexts that may be used to build awareness of other Learning Areas, as well as human rights, social, economic and environmental issues such as:
  - financial (including buying and selling, profit and loss, simple budgets, reading and interpreting accounts, and discount);
  - measurements in Natural Sciences and Technology contexts.

6.1.7
- Solves problems that involve:
  - comparing two or more quantities of the same kind (ratio);
  - comparing two quantities of different kinds (rate, e.g. wages/day).

6.1.8
- Estimates and calculates by selecting and using operations appropriate to solving problems that involve:
  - rounding off to the nearest 5, 10, 100 or 1 000;
  - addition and subtraction of whole numbers;
  - addition and subtraction of common fractions with denominators which are multiples of each other and whole numbers with common fractions (mixed numbers);
  - multiplication of at least whole 4-digit by 3-digit numbers;
  - division of at least whole 4-digit by 3-digit numbers;
  - finding fractions of whole numbers;
  - equivalent fractions;
  - addition and subtraction of positive decimals with at least 2 decimal places;
  - finding percentages of whole numbers;
  - multiple operations on whole numbers with or without brackets.

Grade 4

Learning Outcome 1
Continued

NUMBERS, OPERATIONS AND RELATIONSHIPS

The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standards

We know this when the learner:

4.1.9
- Performs mental calculations involving:
  - addition and subtraction;
  - multiplication of whole numbers to at least 10 x 10.

4.1.10
- Uses a range of techniques to perform written and mental calculations with whole numbers including:
  - building up and breaking down numbers;
  - rounding off and compensating;
  - doubling and halving;
  - using a number-line;
  - using a calculator.

4.1.11
- Uses a range of strategies to check solutions and judges the reasonableness of solutions.

4.1.12
- Recognises, describes and uses:
  - the reciprocal relationship between multiplication and division (e.g. if 5 x 3 = 15 then $15 \div 3 = 5$ and $15 \div 5 = 3$);
  - the equivalence of division and fractions (e.g. $1 \div 8 = \frac{1}{8}$);
  - the commutative, associative and distributive properties with whole numbers (the expectation is that learners should be able to use the properties and not necessarily know the names).

Grade 5

Assessment Standards

We know this when the learner:

5.1.9
- Performs mental calculations involving:
  - addition and subtraction;
  - multiplication of whole numbers to at least 10 x 10.

5.1.10
- Uses a range of techniques to perform written and mental calculations with whole numbers including:
  - adding and subtracting in columns;
  - building up and breaking down numbers;
  - rounding off and compensating;
  - doubling and halving;
  - using a calculator.

5.1.11
- Uses a range of strategies to check solutions and judge the reasonableness of solutions.

5.1.12
- Recognises, describes and uses:
  - the reciprocal relationship between multiplication and division (e.g. if 5 x 3 = 15 then 15 ÷ 3 = 5 and 15 ÷ 5 = 3);
  - the equivalence of division and fractions (e.g. $1 \div 8 = \frac{1}{8}$);
  - the commutative, associative and distributive properties with whole numbers (the expectation is that learners should be able to use the properties and not necessarily know the names).

Grade 6

Assessment Standards

We know this when the learner:

6.1.9
- Performs mental calculations involving:
  - addition and subtraction;
  - multiplication of whole numbers to at least 12 x 12.

6.1.10
- Uses a range of techniques to perform written and mental calculations with whole numbers including:
  - adding, subtracting and multiplying in columns;
  - long division;
  - building up and breaking down numbers;
  - rounding off and compensating;
  - using a calculator.

6.1.11
- Uses a range of strategies to check solutions and judge the reasonableness of solutions.

6.1.12
- Recognises, describes and uses:
  - divisibility rules for 2, 5, 10, 100 and 1 000;
  - the commutative, associative and distributive properties with whole numbers (the expectation is that learners should be able to use the properties and not necessarily know the names).

Grade 4

MAT.LO2 (GET)

PATTERNS, FUNCTIONS AND ALGEBRA

The learner will be able to recognise, describe and represent patterns and relationships, as well as to solve problems using algebraic language and skills.

Assessment Standards

We know this when the learner:

4.2.1
- Investigates and extends numeric and geometric patterns looking for a relationship or rules, including patterns:
  - represented in physical or diagrammatic form;
  - not limited to sequences involving constant difference or ratio;
  - found in natural and cultural contexts;
  - of the learner's own creation.

4.2.2
- Describes observed relationships or rules in own words.

4.2.3
- Determines output values for given input values using:
  - verbal descriptions;
  - flow diagrams.

4.2.4
- Writes number sentences to describe a problem situation, including problems within contexts that may be used to build awareness of human rights, social, economic, cultural and environmental issues.

4.2.5
- Solves or completes number sentences by inspection or by trial-and-improvement, checking the solutions by substitution (e.g. $\square \div 4 = 12$).

4.2.6
- Determines, through discussion and comparison, the equivalence of different descriptions of the same relationship or rule presented:
  - verbally;
  - in flow diagrams;
  - by number sentences.

Grade 5

Assessment Standards

We know this when the learner:

5.2.1

- Investigates and extends numeric and geometric patterns looking for a relationship or rules, including patterns:
  - represented in physical or diagrammatic form;
  - not limited to sequences involving constant difference or ratio;
  - found in natural and cultural contexts;
  - of the learner's own creation.

5.2.2

- Describes observed relationships or rules in own words.

5.2.3

- Determines output values for given input values using:
  - verbal descriptions;
  - flow diagrams.

5.2.4

- Writes number sentences to describe a problem situation, including problems within contexts that may be used to build awareness of human rights, social, economic, cultural and environmental issues.

5.2.5

- Solves or completes number sentences by inspection or by trial-and-improvement, checking the solutions by substitution (e.g. $\square \div 4 = 12$).

5.2.6

- Determines, through discussion and comparison, the equivalence of different descriptions of the same relationship or rule presented:
  - verbally;
  - in flow diagrams;
  - by number sentences.

Grade 6

Assessment Standards

We know this when the learner:

6.2.1

- Investigates and extends numeric and geometric patterns looking for a relationship or rules, including patterns:
  - represented in physical or diagrammatic form;
  - not limited to sequences involving constant difference or ratio;
  - found in natural and cultural contexts;
  - of the learner's own creation;
  - represented in tables.

6.2.2

- Describes observed relationships or rules in own words.

6.2.3

- Determines output values for given input values, or input values for given output values, using:
  - verbal descriptions;
  - flow diagrams;
  - tables.

6.2.4

- Writes number sentences to describe a problem situation, including problems within contexts that may be used to build awareness of human rights, social, economic, cultural and environmental issues.

6.2.5

- Solves or completes number sentences by inspection or by trial-and-improvement, checking the solutions by substitution (e.g. $2 \text{ x } \square - 8 = 0$).

6.2.6

- Determines, through discussion and comparison, the equivalence of different descriptions of the same relationship or rule presented:
  - verbally;
  - in flow diagrams;
  - by number sentences;
  - in tables.

Intermediate Phase

Grade 4

MAT.LO3 (GET)

SPACE AND SHAPE (GEOMETRY)
The learner will be able to describe and represent characteristics and relationships between two-dimensional shapes and three-dimensional objects in a variety of orientations and positions.

Assessment Standards

We know this when the learner:

4.3.1
- Recognises, visualises and names two-dimensional shapes and three-dimensional objects in the environment including:
  - rectangular prisms, spheres, cylinders, and other objects;
  - prisms and pyramids;
  - circles and rectangles;
  - polygons in terms of the number of sides up to 8-sided figures.

4.3.2
- Describes, sorts and compares two-dimensional shapes and three-dimensional objects from the environment according to geometrical properties including:
  - shapes of faces,
  - number of sides;
  - flat and curved surfaces, straight and curved sides.

4.3.3
- Investigates and compares (alone and/or as a member of a group or team) two-dimensional shapes and three-dimensional objects studied in this grade according to properties listed above by:
  - making three-dimensional models using cut-out polygons (supplied);
  - drawing shapes on grid paper.

4.3.4
- Recognises and describes lines of symmetry in two-dimensional shapes, including those in nature and its cultural art forms.

Grade 5

Assessment Standards

We know this when the learner:

5.3.1
- Recognises, visualises and names two-dimensional shapes and three-dimensional objects in natural and cultural forms and geometric settings including those previously dealt with and focusing on:
  - similarities and differences between cubes and rectangular prisms;
  - similarities and differences between squares and rectangles.

5.3.2
- Describes, sorts and compares two-dimensional shapes and three-dimensional objects from the environment and from drawings or pictures according to properties including:
  - number and/or shape of faces;
  - number and/or length of sides.

5.3.3
- Investigates and compares (alone and/or as a member of a group or team) two-dimensional shapes and three-dimensional objects studied in this grade according to properties listed above by:
  - making models of geometric objects using polygons they have cut out;
  - cutting open models or geometric objects (e.g. boxes) to trace their nets;
  - drawing shapes on grid paper.

5.3.4
- Recognises, describes and performs rotations (turns), reflections (flips) and translations (slides) using geometric figures and solids.

Grade 6

Assessment Standards

We know this when the learner:

6.3.1
- Recognises, visualises and names two-dimensional shapes and three-dimensional objects in natural and cultural forms and geometric settings including those previously dealt with and focusing on:
  - similarities and differences between tetrahedrons and other pyramids;
  - similarities and differences between rectangles and parallelograms.

6.3.2
- Describes and classifies two-dimensional shapes and three-dimensional objects in terms of properties including:
  - faces, vertices and edges;
  - length of sides;
  - angle size of corners.

6.3.3
- Investigates and compares (alone and/or as a member of a group or team) two-dimensional shapes and three-dimensional objects studied in this grade according to properties listed above by:
  - making three-dimensional models using:
    - ▶ drinking straws to make a skeleton,
    - ▶ nets provided by the teacher;
  - drawing shapes on grid paper;
  - using a pair of compasses to draw circles, patterns in circles, and patterns with circles.

6.3.4
- Uses the vocabulary and properties of rotations, reflections and translations to describe the relationships between distinct two-dimensional shapes and three-dimensional objects within patterns (including transformations and symmetry).

Grade 4

Learning Outcome 3
Continued

SPACE AND SHAPE (GEOMETRY)
The learner will be able to describe and represent characteristics and relationships between two-dimensional shapes and three-dimensional objects in a variety of orientations and positions.

Assessment Standards

We know this when the learner:

4.3.5
- Makes two-dimensional shapes, three-dimensional objects and patterns from geometric objects and shapes (e.g. tangrams) with a focus on tiling (tessellation) and line symmetry.

4.3.6
- Recognises and describes natural and cultural two-dimensional shapes, three-dimensional objects and patterns in terms of geometric properties.

4.3.7
- Describes changes in the view of an object held in different positions.

4.3.8
- Locates position on a coded (labelled) grid including:
  - maps from given instructions;
  - column and row.

Grade 5

Assessment Standards

We know this when the learner:

5.3.5
- Makes two-dimensional shapes, three-dimensional objects and patterns from geometric shapes and describes these in terms of:
  - tessellations;
  - line and rotational symmetry;
  - movement including rotations, reflections and translations.

5.3.6
- Recognises and describes natural and cultural two-dimensional shapes, three-dimensional objects and patterns in terms of geometric properties.

5.3.7
- Describes and sketches views of a simple three-dimensional object in different positions.

5.3.8
- Locates position on a coded (labelled) grid including maps and traces a path between positions following verbal and written instructions.

Grade 6

Assessment Standards

We know this when the learner:

6.3.5
- Draws enlargements and reductions of two-dimensional shapes (at least quadrilaterals and triangles) using grid paper to compare their size and shape.

6.3.6
- Recognises and describes natural and cultural two-dimensional shapes, three-dimensional objects and patterns in terms of geometric properties.

6.3.7
- Draws and interprets sketches of simple three-dimensional objects from different positions (perspectives).

6.3.8
- Locates positions on a coded grid, describes how to move between positions on the grid, and recognises maps as grids.

Grade 4

MAT.LO4 (GET)

MEASUREMENT
The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

Assessment Standards

We know this when the learner:

4.4.1
- Reads, tells and writes analogue, digital and 24-hour time to at least the nearest minute and second.

4.4.2
- Solves problems involving calculation and conversion between appropriate time units including seconds, minutes, hours, days, weeks, months and years.

4.4.3
- Uses time-measuring instruments to appropriate levels of precision, including watches and clocks.

4.4.4
- Describes and illustrates ways of measuring and representing time in different cultures throughout history.

4.4.5
- Estimates, measures, records, compares and orders two-dimensional shapes and three-dimensional objects using S.I. units with appropriate precision for:
  - mass using grams (g) and kilograms (kg);
  - capacity using millilitres (ml) and litres (l);
  - length using millimetres (mm), centimetres (cm), metres (m) and kilometres (km).

4.4.6
- Solves problems involving selecting, calculating with and converting between appropriate S.I. units listed above, integrating appropriate contexts for Technology and Natural Sciences.

Grade 5

Assessment Standards

We know this when the learner:

5.4.1
- Reads, tells and writes analogue, digital and 24-hour time to at least the nearest minute and second.

5.4.2
- Solves problems involving calculation and conversion between appropriate time units including decades, centuries and millennia.

5.4.3
- Uses time-measuring instruments to appropriate levels of precision including watches and stopwatches.

5.4.4
- Describes and illustrates ways of representing time in different cultures throughout history.

5.4.5
- Estimates, measures, records, compares and orders two-dimensional shapes and three-dimensional objects using S.I. units with appropriate precision for:
  - mass using grams (g) and kilograms (kg);
  - capacity using millilitres (ml) and litres (l);
  - length using millimetres (mm), centimetres (cm), metres (m) and kilometres (km);
  - temperature using degree Celsius scale.

5.4.6
- Solves problems involving selecting, calculating with and converting between appropriate S.I. units listed above, integrating appropriate contexts for Technology and Natural Sciences.

Grade 6

Assessment Standards

We know this when the learner:

6.4.1
- Reads, tells and writes analogue, digital and 24-hour time to at least the nearest minute and second.

6.4.2
- Solves problems involving calculations and conversion between appropriate time units including time zones and differences.

6.4.4
- Describes and illustrates ways of representing time in different cultures throughout history.

6.4.5
- Estimates, measures, records, compares and orders two-dimensional shapes and three-dimensional objects using S.I. units with appropriate precision for:
  - mass using grams (g) and kilograms (kg);
  - capacity using millilitres (ml) and litres (l);
  - length using millimetres (mm), centimetres (cm), metres (m) and kilometres (km);
  - temperature using degree Celsius scale.

6.4.6
- Solves problems involving selecting, calculating with and converting between appropriate S.I units listed above, integrating with appropriate Technology and Natural Sciences contexts.

Grade 4

Learning Outcome 4
Continued

MEASUREMENT
The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

Assessment Standards

We know this when the learner:

4.4.7
- Uses appropriate measuring instruments (with understanding of their limitations) to appropriate levels of precision including:
  - bathroom scales, kitchen scales and balances to measure mass;
  - measuring jugs to measure capacity;
  - rulers, metre sticks, tape measures and trundle wheels to measure length.

4.4.9
- Investigates and approximates (alone and/or as a member of a group or team):
  - perimeter using rulers or measuring tapes;
  - area of polygons (using square grids and tiling) in order to develop an understanding of square units;
  - volume/capacity of three-dimensional objects (by packing or filling them) in order to develop an understanding of cubic units.

Grade 5

Assessment Standards

We know this when the learner:

5.4.7
- Uses appropriate measuring instruments (with understanding of their limitations) to appropriate levels of precision including:
  - bathroom scales, kitchen scales and balances to measure mass;
  - measuring jugs to measure capacity;
  - rulers, metre sticks, tape measures and trundle wheels to measure length;
  - thermometers to measure temperature.

5.4.9
- Investigates and approximates (alone and/or as a member of a group or team):
  - perimeter using rulers or measuring tapes;
  - area of polygons (using square grids and tiling) in order to develop an understanding of square units;
  - volume/capacity of objects (by packing or filling them) in order to develop an understanding of cubic units.

5.4.12
- Recognises and describes right angles in two-dimensional shapes, three-dimensional objects and the environment.

Grade 6

Assessment Standards

We know this when the learner:

6.4.7
- Uses appropriate measuring instruments (with understanding of their limitations) to appropriate levels of precision including:
  - bathroom scales, kitchen scales and balances to measure mass;
  - measuring jugs to measure capacity;
  - rulers, metre sticks, tape measures and trundle wheels to measure length;
  - thermometers to measure temperature.

6.4.8
- Describes and illustrates ways of measuring in different cultures throughout history, including informal measuring systems.

6.4.9
- Investigates and approximates (alone and/or as a member of a group or team):
  - perimeter using rulers or measuring tapes;
  - area of polygons (using square grids) in order to develop rules for calculating the area of squares and rectangles;
  - volume/capacity of objects (by packing or filling them) in order to develop rules for calculating volume of rectangular prisms.

6.4.10
- Investigates relationships between the perimeter and area of rectangles and squares.

6.4.11
- Investigates relationships between surface area, volume and the dimensions of rectangular prisms.

6.4.12
- Recognises and describes angles in two-dimensional shapes, three-dimensional objects and the environment in terms of:
  - right angles;
  - angles smaller than right angles;
  - angles greater than right angles.

Grade 4

MAT.LO5 (GET)

DATA HANDLING
The learner will be able to collect, summarise, display and critically analyse data in order to draw conclusions and make predictions, and to interpret and determine chance variation.

Assessment Standards

We know this when the learner:

4.5.1
- Poses simple questions about own school and family environment, and identifies appropriate data sources in order to address human rights, social, political, cultural, environmental and economic issues in that environment.

4.5.2
- Collects data (alone and/or as a member of a group or team) in the classroom and school environment to answer questions posed by the teacher and the class.

4.5.4
- Organises and records data using tallies and tables.

4.5.6
- Draws a variety of graphs to display and interpret data (ungrouped) including:
  - pictographs with a one-to-one correspondence between data and representation (e.g. one picture = one person);
  - bar graphs.

Grade 5

Assessment Standards

We know this when the learner:

5.5.1
- Poses simple questions about own school and family environment, and identifies appropriate data sources in order to address human rights, social, political, cultural, environmental and economic issues in that environment.

5.5.2
- Makes and uses simple data collection sheets that involve counting objects in order to collect data (alone and/or as a member of a group or team) to answer questions posed by the teacher and the class.

5.5.4
- Organises and records data using tallies and tables.

5.5.5
- Examines ungrouped numerical data to determine the most frequently occurring score (mode) of the data set in order to describe central tendencies.

5.5.6
- Draws a variety of graphs to display and interpret data (ungrouped) including:
  - pictographs with a many-one correspondence and appropriate keys (e.g. one picture = ten persons);
  - bar graphs.

Grade 6

Assessment Standards

We know this when the learner:

6.5.1
- Poses simple questions about own school and family environment, and identifies appropriate data sources in order to address human rights, social, political, cultural, environmental and economic issues in that environment.

6.5.2
- Uses simple data collection sheets (requiring tallies) and simple questionnaires (with yes/no type responses) in order to collect data (alone and/or as a member of a group or team) to answer questions posed by the teacher, class and self.

6.5.3
- Distinguishes between samples and populations.

6.5.4
- Organises and records data using tallies and tables.

6.5.5
- Examines ungrouped numerical data to determine the most frequently occurring score (mode) and the midpoint (median) of the data set in order to describe central tendencies.

6.5.6
- Draws a variety of graphs by hand/technology to display and interpret data (grouped and ungrouped) including:
  - pictographs with a many-one correspondence and appropriate keys;
  - bar graphs and double bar graphs.

Grade 4

Learning Outcome 5
Continued

DATA HANDLING
The learner will be able to collect, summarise, display and critically analyse data in order to draw conclusions and make predictions, and to interpret and determine chance variation.

Assessment Standards

We know this when the learner:

4.5.7
- Critically reads and interprets data presented in a variety of ways (including own representations and representations in the media – both words and graphs) to draw conclusions and make predictions sensitive to the role of:
  - context (e.g. rural or urban);
  - other human rights issues.

4.5.8
- Compares and classifies events from daily life as:
  - certain that they will happen; or
  - certain that they will not happen; or
  - uncertain.

4.5.10
- Counts the number of possible outcomes for simple trials.

Grade 5

Assessment Standards

We know this when the learner:

5.5.7
- Critically reads and interprets data presented in a variety of ways (including own representations, representations in the media – both words and graphs) to draw conclusions and make predictions sensitive to the role of:
  - context (e.g. rural or urban);
  - categories within the data (e.g. gender and race);
  - other human rights issues.

5.5.8
- Compares, classifies and orders events from daily life on a scale from 'certain that they will happen' to 'certain that they will not happen'.

5.5.9
- Lists possible outcomes for simple experiments (including tossing a coin, rolling a die, and spinning a spinner.

5.5.10
- Counts the frequency of actual outcomes for a series of trials.

Grade 6

Assessment Standards

We know this when the learner:

6.5.7
- Critically reads and interprets data presented in a variety of ways (including own representations, representations in the media – words, graphs, pie graphs) to draw conclusions and make predictions sensitive to the role of:
  - context (e.g. rural or urban, national or provincial);
  - categories within the data (e.g. age, gender, race);
  - other human rights issues.

6.5.8
- Predicts the likelihood of events in daily life based on observation, and places them on a scale from 'impossible' to 'certain'.

6.5.9
- Lists possible outcomes for simple experiments (including tossing a coin, rolling a die, and spinning a spinner).

6.5.10
- Counts the frequency of actual outcomes for a series of trials.

Grade 7

MAT.LO1 (GET)

NUMBERS, OPERATIONS AND RELATIONSHIPS

The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standards

We know this when the learner:

7.1.1
- Counts forwards and backwards in the following ways:
  - in decimal intervals;
  - in integers for any intervals.

7.1.2
- Describes and illustrates the historical and cultural development of numbers (e.g. integers, common fractions).

7.1.3
- Recognises, classifies and represents the following numbers in order to describe and compare them:
  - integers;
  - decimals (to at least three decimal places), fractions and percentages;
  - factors including prime factors of 3-digit whole numbers;
  - numbers in exponential form including squares of natural numbers to at least 12^2, cubes of natural numbers to at least 5^3, and their square and cube roots.

7.1.4
- Recognises and uses equivalent forms of the rational numbers listed above, including:
  - common fractions;
  - decimals;
  - percentages.

Grade 8

Assessment Standards

We know this when the learner:

8.1.2
- Describes and illustrates the historical and cultural development of numbers (e.g. irrational numbers).

8.1.3
- Recognises, classifies and represents the following numbers in order to describe and compare them:
  - integers;
  - decimals, fractions and percentages;
  - numbers written in exponential form including squares and cubes of natural numbers and their square and cube roots;
  - large numbers in scientific notation;
  - additive and multiplicative inverses;
  - multiples and factors;
  - irrational numbers in the context of measurement (e.g. π and square and cube roots of non-perfect squares and cubes).

8.1.4
- Recognises and uses equivalent forms of the rational numbers listed above.

Grade 9

Assessment Standards

We know this when the learner:

9.1.2
- Describes and illustrates the historical development of number systems in a variety of historical and cultural contexts (including local).

9.1.3
- Recognises, uses and represents rational numbers (including very small numbers written in scientific notation), moving flexibly between equivalent forms in appropriate contexts.

Grade 7

Learning Outcome 1
Continued

NUMBERS, OPERATIONS AND RELATIONSHIPS

The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standards

We know this when the learner:

7.1.5
- Solves problems in context including contexts that may be used to build awareness of other Learning Areas, as well as human rights, social, economic and environmental issues such as:
  - financial (including profit and loss, budgets, accounts, loans, simple interest, hire purchase, exchange rates);
  - measurements in Natural Sciences and Technology contexts.

7.1.6
- Solves problems that involve ratio and rate.

7.1.7
- Estimates and calculates by selecting and using operations appropriate to solving problems that involve:
  - rounding off numbers to at lease one decimal place;
  - multiple operations with integers;
  - addition, subtraction and multiplication of common fractions;
  - addition, subtraction and multiplication of positive decimals to at least 2 decimal places;
  - division of positive decimals with at least 3 decimal places by whole numbers;
  - finding percentages;
  - exponents.

7.1.8
- Performs mental calculations involving squares of natural numbers to at least 10^2 and cubes of natural numbers to at least 5^3.

Grade 8

Assessment Standards

We know this when the learner:

8.1.5
- Solves problems in context including contexts that may be used to build awareness of other Learning Areas, as well as human rights, social, economic and environmental issues such as:
  - financial (including profit and loss, budgets, accounts, loans, simple interest, hire purchase, exchange rates);
  - measurements in Natural Sciences and Technology contexts.

8.1.6
- Solves problems that involve ratio and rate.

8.1.7
- Estimates and calculates by selecting and using operations appropriate to solving problems that involve:
  - rounding off;
  - multiple operations with rational numbers (including division with fractions and decimals);
  - exponents.

Grade 9

Assessment Standards

We know this when the learner:

9.1.5
- Solves problems in context including contexts that may be used to build awareness of other Learning Areas, as well as human rights, social, economic and environmental issues such as:
  - financial (including profit and loss, budgets, accounts, loans, simple and compound interest, hire purchase, exchange rates, commission, rentals and banking);
  - measurements in Natural Sciences and Technology contexts.

9.1.6
- Solves problems that involve ratio, rate and proportion (direct and indirect).

9.1.7
- Estimates and calculates by selecting and using operations appropriate to solving problems and judging the reasonableness of results (including measurement problems that involve rational approximations of irrational numbers).

Grade 7

Learning Outcome 1
Continued

NUMBERS, OPERATIONS AND RELATIONSHIPS

The learner will be able to recognise, describe and represent numbers and their relationships, and to count, estimate, calculate and check with competence and confidence in solving problems.

Assessment Standards

We know this when the learner:

7.1.9
- Uses a range of techniques to perform calculations including:
  - using the commutative, associative and distributive properties with positive rational numbers and zero;
  - using a calculator.

7.1.10
- Uses a range of strategies to check solutions and judges the reasonableness of solutions.

7.1.11
- Recognises, describes and uses:
  - algorithms for finding equivalent fractions;
  - the commutative, associative and distributive properties with positive rational numbers and zero (the expectation is that learners should be able to use these properties and not necessarily to know the names of the properties).

Grade 8

Assessment Standards

We know this when the learner:

8.1.9
- Uses a range of techniques to perform calculations including:
  - using the commutative, associative and distributive properties with rational numbers;
  - using a calculator.

8.1.10
- Uses a range of strategies to check solutions and judges the reasonableness of solutions.

8.1.11
- Recognises, describes and uses:
  - algorithms for finding equivalent fractions;
  - the commutative, associative and distributive properties with rational numbers (the expectation is that learners should be able to use these properties and not necessarily to know the names of the properties).

Grade 9

Assessment Standards

We know this when the learner:

9.1.9
- Uses a range of techniques and tools (including technology) to perform calculations efficiently and to the required degree of accuracy, including the following laws and meanings of exponents (the expectation being that learners should be able to use these laws and meanings in calculations only):
  - $x^n \times x^m = x^{n+m}$
  - $x^n \div x^m = x^{n-m}$
  - $x^0 = 1$
  - $x^{-n} = \dfrac{1}{x^n}$

9.1.11
- Recognises, describes and uses the properties of rational numbers.

Grade 7

MAT.LO2 (GET)

PATTERNS, FUNCTIONS AND ALGEBRA

The learner will be able to recognise, describe and represent patterns and relationships, as well as to solve problems using algebraic language and skills.

Assessment Standards

We know this when the learner:

7.2.1
- Investigates and extends numeric and geometric patterns looking for a relationship or rules, including patterns:
  - represented in physical or diagrammatic form;
  - not limited to sequences involving constant difference or ratio;
  - found in natural and cultural contexts;
  - of the learner's own creation;
  - represented in tables.

7.2.2
- Describes, explains and justifies observed relationships or rules in own words.

7.2.3
- Represents and uses relationships between variables in order to determine input and/or output values in a variety of ways using:
  - verbal descriptions;
  - flow diagrams;
  - tables.

7.2.4
- Constructs mathematical models that represent, describe and provide solutions to problem situations, showing responsibility toward the environment and the health of others (including problems within human rights, social, economic, cultural and environmental contexts).

7.2.5
- Solves or completes number sentences by inspection or by trial-and-improvement, checking the solutions by substitution (e.g. $2 \times \square - 8 = 4$).

Grade 8

Assessment Standards

We know this when the learner:

8.2.1
- Investigates and extends numeric and geometric patterns looking for a relationship or rules, including patterns:
  - represented in physical or diagrammatic form;
  - not limited to sequences involving constant difference or ratio;
  - found in natural and cultural contexts;
  - of the learner's own creation;
  - represented in tables;
  - represented algebraically.

8.2.2
- Describes, explains and justifies observed relationships or rules in own words or in algebra.

8.2.3
- Represents and uses relationships between variables in order to determine input and/or output values in a variety of ways using:
  - verbal descriptions;
  - flow diagrams;
  - tables;
  - formulae and equations.

8.2.4
- Constructs mathematical models that represent, describe and provide solutions to problem situations, showing responsibility toward the environment and the health of others (including problems within human rights, social, economic, cultural and environmental contexts).

8.2.5
- Solves equations by inspection, trial-and-improvement or algebraic processes (additive and multiplicative inverses), checking the solution by substitution.

Grade 9

Assessment Standards

We know this when the learner:

9.2.1
- Investigates, in different ways, a variety of numeric and geometric patterns and relationships by representing and generalising them, and by explaining and justifying the rules that generate them (including patterns found in natural and cultural forms and patterns of the learner's own creation).

9.2.3
- Represents and uses relationships between variables in order to determine input and/or output values in a variety of ways using:
  - verbal descriptions;
  - flow diagrams;
  - tables;
  - formulae and equations.

9.2.4
- Constructs mathematical models that represent, describe and provide solutions to problem situations, showing responsibility toward the environment and the health of others (including problems within human rights, social, economic, cultural and environmental contexts).

9.2.5
- Solves equations by inspection, trial-and-improvement or algebraic processes (additive and multiplicative inverses, and factorisation), checking the solution by substitution.

Grade 7

Learning Outcome 2
Continued

PATTERNS, FUNCTIONS AND ALGEBRA

The learner will be able to recognise, describe and represent patterns and relationships, as well as to solve problems using algebraic language and skills.

Assessment Standards

We know this when the learner:

7.2.6
- Describes a situation by interpreting a graph of the situation, or draws a graph from a description of a situation (e.g. height of a roller-coaster car over time; the speed of a racing car going around a track).

7.2.7
- Determines, analyses and interprets the equivalence of different descriptions of the same relationship or rule presented:
  - verbally;
  - in flow diagrams;
  - in tables;
  - by equations or expressions
  in order to select the most useful representation for a given situation.

Grade 8

Assessment Standards

We know this when the learner:

8.2.6
- Describes a situation by interpreting a graph of the situation, or draws a graph from a description of a situation, with special focus on trends and features such as:
  - linear or non-linear;
  - increasing or decreasing;
  - maximum/minimum;
  - discrete or continuous.

8.2.7
- Determines, analyses and interprets the equivalence of different descriptions of the same relationship or rule presented:
  - verbally;
  - in flow diagrams;
  - in tables;
  - by equations or expressions

in order to select the most useful representation for a given situation.

Grade 9

Assessment Standards

We know this when the learner:

9.2.6
- Draws graphs on the Cartesian plane for given equations (in two variables), or determines equations or formulae from given graphs using tables where necessary.

9.2.7
- Determines, analyses and interprets the equivalence of different descriptions of the same relationship or rule presented:
  - verbally;
  - in flow diagrams;
  - in tables;
  - by equations or expressions;
  - by graphs on the Cartesian plane

in order to select the most useful representation for a given situation.

Grade 7

Learning Outcome 2 Continued

PATTERNS, FUNCTIONS AND ALGEBRA

The learner will be able to recognise, describe and represent patterns and relationships, as well as to solve problems using algebraic language and skills.

Assessment Standards

(There are no further Assessment Standards for this Learning Outcome in Grade 7.)

Grade 8

Assessment Standards

We know this when the learner:

8.2.8
- Uses conventions of algebraic notation and the commutative, associative and distributive laws to:
  - classify terms as like or unlike, and to justify the classification;
  - collect like terms;
  - multiply or divide an algebraic expression with one, two or three terms by a monomial;
  - simplify algebraic expressions given in bracket notation, involving one or two sets of brackets and two kinds of operations;
  - compare different representations of algebraic expressions involving one or more operations, selecting those which are equivalent, and justifying own choice;
  - write algebraic expressions, formulae or equations in simpler or more useful equivalent forms in context.

8.2.9
- Interprets and uses the following basic algebraic vocabulary in context: term, expression, coefficient, exponent (or index), base, constant, variable, equation, formula (or rule).

Grade 9

Assessment Standards

We know this when the learner:

9.2.8
- Uses the distributive law and manipulative skills developed in Grade 8 to:
  - find the product of two binomials;
  - factorise algebraic expressions (limited to common factors and difference of squares).

9.2.10
- Uses the laws of exponents to simplify expressions and solve equations.

9.2.11
- Uses factorisation to simplify algebraic expressions and solve equations.

Grade 7

MAT.LO3 (GET)

SPACE AND SHAPE (GEOMETRY)
The learner will be able to describe and represent characteristics and relationships between two-dimensional shapes and three-dimensional objects in a variety of orientations and positions.

Assessment Standards

We know this when the learner:

7.3.1
■ Recognises, visualises and names geometric figures and solids in natural and cultural forms and geometric settings, including those previously dealt with as well as focusing on:
  ● similarities and differences between different polyhedra;
  ● similarities and differences between all quadrilaterals including kites and trapeziums.

7.3.2
■ In contexts that include those that may be used to build awareness of social, cultural and environmental issues, describes and classifies geometric figures and solids in terms of properties, including:
  ● faces, vertices and edges;
  ● sides and angles of polygons (with focus on, but not limited to, triangles and quadrilaterals);
  ● parallel and perpendicular sides.

7.3.4
■ Uses a pair of compasses, ruler and protractor to accurately construct geometric figures for investigation of own property and design of nets.

7.3.5
■ Designs and uses nets to make models of geometric solids studied up to and including this grade.

Grade 8

Assessment Standards

We know this when the learner:

8.3.1
- Recognises, visualises and names geometric figures and solids in natural and cultural forms and geometric settings, including:
  - those previously dealt with;
  - the platonic solids (tetrahedron, cube, octahedron, dodecahedron, icosahedron).

8.3.2
- In contexts that include those that may be used to build awareness of social, cultural and environmental issues, describes and classifies geometric figures and solids in terms of properties, including:
  - sides, angles and diagonals and their interrelationships, with focus on triangles and quadrilaterals (e.g. types of triangles and quadrilaterals).

8.3.3
- Uses vocabulary to describe parallel lines cut by a transversal, perpendicular lines, intersecting lines and triangles in terms of angle relationships (e.g. vertically opposite, corresponding).

8.3.4
- Uses a pair of compasses, ruler and protractor to accurately construct geometric figures for investigation of own property and design of nets.

8.3.5
- Designs and uses nets to make a model of geometric solids studied up to and including this grade.

Grade 9

Assessment Standards

We know this when the learner:

9.3.1
- Recognises, visualises and names geometric figures and solids in natural and cultural forms and geometric settings, including:
  - regular and irregular polygons and polyhedra;
  - spheres;
  - cylinders.

9.3.2
- In contexts that include those that may be used to build awareness of social, cultural and environmental issues, describes the interrelationships of the properties of geometric figures and solids with justification, including:
  - congruence and straight line geometry;
  - transformations.

9.3.3
- Uses geometry of straight lines and triangles to solve problems and to justify relationships in geometric figures.

9.3.4
- Draws and/or constructs geometric figures and makes models of solids in order to investigate and compare their properties and model situations in the environment.

Grade 7

Learning Outcome 3
Continued

SPACE AND SHAPE (GEOMETRY)
The learner will be able to describe and represent characteristics and relationships between two-dimensional shapes and three-dimensional objects in a variety of orientations and positions.

Assessment Standards

We know this when the learner:

7.3.6
- Uses transformations (rotations, reflections and translations) and symmetry to investigate (alone and/or as a member of a group or team) properties of geometric figures.

7.3.7
- Recognises and describes the properties of similar and congruent figures and the difference between them.

7.3.8
- Draws and interprets sketches of solids from different perspectives.

7.3.9
- Locates positions on co-ordinate systems (ordered grids) and maps using:
  - horizontal and vertical change;
  - compass directions.

Grade 8

Assessment Standards

We know this when the learner:

8.3.6
- Uses transformations (rotations, reflections and translations) and symmetry to investigate (alone and/or as a member of a group or team) properties of geometric figures.

8.3.7
- Uses proportion to describe the effect of enlargement and reduction on properties of geometric figures.

8.3.8
- Draws and interprets sketches of geometric solids from different perspectives with attention to the preservation of properties.

8.3.9
- Locates positions on co-ordinate systems (ordered grids), Cartesian plane (first quadrant) and maps, and describes how to move between positions using:
  - horizontal and vertical change;
  - ordered pairs;
  - compass directions.

Grade 9

Assessment Standards

We know this when the learner:

9.3.6
- Uses transformations, congruence and similarity to investigate, describe and justify (alone and/or as a member of a group or team) properties of geometric figures and solids, including tests for similarity and congruence of triangles.

9.3.8
- Recognises and describes geometric solids in terms of perspective, including simple perspective drawing.

9.3.9
- Uses various representational systems to describe position and movement between positions, including:
  - ordered grids;
  - Cartesian plane (4 quadrants);
  - compass directions in degrees;
  - angles of elevation and depression.

Grade 7

MAT.LO4 (GET)

MEASUREMENT
The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

Assessment Standards

We know this when the learner:

7.4.1
- Solves problems involving time, including relating time, distance and speed.

7.4.2
- Solves problems involving:
  - length;
  - perimeter and area of polygons;
  - volume and surface area of rectangular prisms.

7.4.3
- Solves problems using a range of strategies including:
  - estimating;
  - calculating to at least 2 decimal places;
  - using and converting between appropriate S.I. units.

7.4.4
- Describes and illustrates ways of measuring in different cultures throughout history, including metric and other formal measuring systems.

7.4.5
- Calculates, by selecting and using appropriate formulae:
  - perimeter of polygons;
  - area of triangles, rectangles and squares;
  - volume of triangular and rectangular based prisms.

7.4.6
- Describes interrelationships between perimeter and area of geometric figures.

Grade 8

Assessment Standards

We know this when the learner:

8.4.1
- Solves more complex problems involving time, including relating time, distance and speed.

8.4.2
- Solves problems involving:
  - length;
  - perimeter and area of polygons and circles;
  - volume and surface area of rectangular prisms and cylinders.

8.4.3
- Solves problems using a range of strategies including:
  - estimating;
  - calculating to at least 2 decimal places;
  - using and converting between appropriate S.I. units.

8.4.4
- Describes the meaning of and uses π in calculations involving circles and discusses its historical development in measurement.

8.4.5
- Calculates, by selecting and using appropriate formulae:
  - perimeter of polygons and circles;
  - area of triangles, rectangles, circles and polygons by decomposition into triangles and rectangles;
  - volume of triangular and rectangular-based prisms and cylinders.

8.4.6
- Converts between:
  - mm² ↔ cm² ↔ m² ↔ km²
  - mm³ ↔ cm³ ↔ m³
  - ml (cm³) ↔ l ↔ kl

Grade 9

Assessment Standards

We know this when the learner:

9.4.1
- Solves ratio and rate problems involving time, distance and speed.

9.4.3
- Solves problems – including problems in contexts that may be used to develop awareness of human rights, social, economic, cultural and environmental issues – involving known geometric figures and solids in a range of measurement contexts by:
  - measuring precisely and selecting measuring instruments appropriate to the problem;
  - estimating and calculating with precision;
  - selecting and using appropriate formulae and measurements.

9.4.4
- Describes and illustrates the development of measuring instruments and conventions in different cultures throughout history.

Grade 7

Learning Outcome 4 Continued

MEASUREMENT

The learner will be able to use appropriate measuring units, instruments and formulae in a variety of contexts.

Assessment Standards

We know this when the learner:

7.4.7
- Describes interrelationships between surface area and volume of geometric solids.

7.4.8
- Classifies angles into acute, right, obtuse, straight, reflex or revolution.

7.4.9
- Estimates, compares, measures and draws angles accurate to one degree using protractors

Grade 8

Assessment Standards

We know this when the learner:

8.4.9
- Estimates, compares, measures and draws angles accurate to one degree using protractors.

8.4.10
- Investigates (alone and/or as a member of a group or team) the relationship between the sides of a right-angled triangle to develop the Theorem of Pythagoras.

8.4.11
- Uses the Theorem of Pythagoras to calculate a missing length in a right-angled triangle leaving irrational answers in surd form ($\sqrt{\ }$).

8.4.12
- Describes and illustrates ways of measuring in different cultures throughout history (e.g. determining right angles using knotted string, leading to the Theorem of Pythagoras).

Grade 9

Assessment Standards

We know this when the learner:

9.4.11
- Uses the Theorem of Pythagoras to solve problems involving missing lengths in known geometric figures and solids.

Grade 7

MAT.LO5 (GET)

DATA HANDLING

The learner will be able to collect, summarise, display and critically analyse data in order to draw conclusions and make predictions, and to interpret and determine chance variation.

Assessment Standards

We know this when the learner:

7.5.1
- Poses questions relating to human rights, social, economic, environmental and political issues in own environment.

7.5.2
- Selects appropriate sources for the collection of data (including peers, family, newspapers, books, magazines).

7.5.3
- Uses simple questionnaires (with a variety of possible responses) and designs and uses questionnaires (with yes/no type responses) in order to collect data (alone and/or as a member of a group or team) to answer questions.

7.5.4
- Distinguishes between samples and populations, and suggests appropriate samples for investigation (including random samples).

7.5.5
- Organises (including grouping where appropriate) and records data using tallies, tables and stem-and-leaf displays.

7.5.6
- Summarises ungrouped numerical data by determining mean, median and mode as measures of central tendency and distinguishes between them.

7.5.7
- Identifies the largest and smallest scores in a data set and determines the difference between them in order to determine the spread of the data (range).

Grade 8

Assessment Standards

We know this when the learner:

8.5.1
- Poses questions relating to human rights, social, economic, environmental and political issues in own environment.

8.5.2
- Selects appropriate sources for the collection of data (including peers, family, newspapers, books, magazines, the Internet).

8.2.3
- Designs and uses questionnaires with a variety of possible responses in order to collect data (alone and/or as a member of a group or team) to answer questions.

8.5.4
- Performs simple experiments using random number generators, coins, spinners, dice and cards in order to collect data.

8.5.5
- Organises (including grouping where appropriate) and records data using tallies, tables and stem-and-leaf displays.

8.5.6
- Summarises grouped and ungrouped numerical data by determining mean, median and mode as measures of central tendency, and distinguishes between them.

8.5.7
- Determines measures of dispersion, including range and extremes.

Grade 9

Assessment Standards

We know this when the learner:

9.5.1
- Poses questions relating to human rights, social, economic, environmental and political issues in South Africa.

9.5.2
- Selects, justifies and uses appropriate methods for collecting data (alone and/or as a member of a group or team) which include questionnaires and interviews, experiments, and sources such as books, magazines and the Internet in order to answer questions and thereby draw conclusions and make predictions about the environment.

9.5.5
- Organises numerical data in different ways in order to summarise by determining:
  - measures of central tendency;
  - measures of dispersion.

Grade 7

Learning Outcome 5
Continued

DATA HANDLING
The learner will be able to collect, summarise, display and critically analyse data in order to draw conclusions and make predictions, and to interpret and determine chance variation.

Assessment Standards

We know this when the learner:

7.5.8
- Draws a variety of graphs by hand/technology to display and interpret data (grouped and ungrouped) including:
  - bar graphs and double bar graphs;
  - histograms with given intervals;
  - pie charts;
  - line and broken-line graphs.

7.5.9
- Critically reads and interprets data presented in a variety of ways to draw conclusions and make predictions sensitive to the role of:
  - context (e.g. rural or urban, national or provincial);
  - categories within the data (e.g. age, gender, race);
  - scales used in graphs as a source of error and bias;
  - choice of summary statistics (mean, median or mode);
  - any other human rights and inclusivity issues.

7.5.10
- Performs simple experiments where the possible outcomes are equally likely and:
  - lists the possible outcomes based on the conditions of the activity;
  - determines the frequency of actual outcomes for a series of trials;
  - determines the relative frequency using the definition of relative frequency (see Mathematics Learning Area Glossary).

Grade 8

Assessment Standards

We know this when the learner:

8.5.8

- Draws a variety of graphs by hand/technology to display and interpret data including:
  - bar graphs and double bar graphs;
  - histograms with given and own intervals;
  - pie charts;
  - line and broken-line graphs;
  - scatter plots.

8.5.9

- Critically reads and interprets data presented in a variety of ways in order to draw conclusions and make predictions sensitive to the role of:
  - context (e.g. rural or urban, national or provincial);
  - categories within the data (e.g. age, gender, race);
  - data manipulation (e.g. grouping, scale, choice of summary statistics) for different purposes;
  - the role of outliers on data distribution;
  - any other human rights and inclusivity issues.

8.5.10

- Considers a simple situation (with equally likely outcomes) that can be described using probability and:
  - lists all the possible outcomes;
  - determines the probability of each possible outcome using the definition of probability (see Mathematics Learning Area Glossary);
  - finds the relative frequency of actual outcomes for a series of trials;
  - compares relative frequency with probability and explains possible differences;
  - predicts with reasons the relative frequency of the possible outcomes for a series of trials based on probability.

Grade 9

Assessment Standards

We know this when the learner:

9.5.8

- Draws a variety of graphs by hand/technology to display and interpret data including:
  - bar graphs and double bar graphs;
  - histograms with given and own intervals;
  - pie charts;
  - line and broken-line graphs;
  - scatter plots.

9.5.9

- Critically reads and interprets data with awareness of sources of error and manipulation to draw conclusions and make predictions about:
  - social, environmental and political issues (e.g. crime, national expenditure, conservation, HIV/AIDS);
  - characteristics of target groups (e.g. age, gender, race, socio-economic groups);
  - attitudes or opinions of people on issues (e.g. smoking, tourism, sport);
  - any other human rights and inclusivity issues.

9.5.10

- Considers situations with equally probable outcomes, and:
  - determines probabilities for compound events using two-way tables and tree diagrams;
  - determines the probabilities for outcomes of events and predicts their relative frequency in simple experiments;
  - discusses the differences between the probability of outcomes and their relative frequency.