basic education
Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

ANNUAL NATIONAL ASSESSMENT 2015
ASSESSMENT GUIDELINES
MATHEMATICS
GRADE 8

INTRODUCTION

The 2015 cycle of Annual National Assessment (ANA 2015) will be administered in all public and designated[1] independent schools i September 2015. During this period all learners in Grades 7 - 9 will write nationally set tests in Language and Mathematics. The results will be used to report progress related to achieving the goals set in the *Action Plan 2014, Towards Schooling 2025*.

The ANA tests will be written during the third school term. Therefore, the Department of Basic Education (DBE) has developed Assessment Guideline documents provided for Language and Mathematics in each grade. These guidelines outline the minimum curriculum content that must be covered by all learners prior to the writing of the test. The Assessment Guidelines set the limits of the scope of work that will be covered in the test for each grade and subject. The ANA 2015 Assessment Guidelines have been designed in line with the Curriculum and Assessment Policy Statement (CAPS).

SENIOR PHASE: Grade 8

In Grade 8, the test will cover topics that are prescribed in CAPS for the **first three terms** of the school year. It is important to note that the ANA 2015 Assessment Guidelines do not imply that the delimited scope is all that must be taught and learnt during the school year. Instead, the Assessment Guidelines provide the basic minimum curriculum, excluding representing, interpreting, analysing and reporting data that should have been covered by the end of the third school term. There will only be one non-routine question in the ANA test.

For this grade the Assessment Guidelines are arranged in four columns. The content area to be assessed is specified in the first column, the topics are listed in the second column, the concepts and skills are listed in the third column and the descriptive statements are indicated in the fourth column.

Teachers are expected to use these Guidelines together with the CAPS to ensure that all the topics that will be assessed have been covered.

[1] "Designated" independent schools are those that will apply and register either their Grade 3 or Grade 6 learners to participate in ANA for purposes of securing State subsidy.

CONTENT AREA	TOPICS	CONCEPTS AND SKILLS	DESCRIPTIVE STATEMENTS The learner will be assessed on:
Numbers, Operations and Relationships	Whole numbers	Calculations with whole numbers	Calculations with whole numbers involving the: • distributive property of multiplication over addition and subtraction • inverse operation • additive property of 0 • multiplicative property of 1 • division property of 0
		Multiples and factors	Determining the LCM and/ or HCF of numbers to at least 3-digit whole numbers by inspection or factorisation.
		Calculation techniques	Calculations using addition, subtraction, multiplication and division and various techniques.
		Problem solving	Solving problems involving whole numbers including: • ratio, rate, speed, distance and/or time • sharing in a given ratio where the whole is given • increasing or decreasing a number in a given ratio
	Integers	Recognising, ordering, comparing and counting integers	• Recognising, ordering and/or comparing integers. • Counting backwards and forwards in integers for any interval
		Calculations	Adding and/or subtracting and multiplying and/or dividing integers.
			Determining squares, cubes, square roots and/or cube roots of integers.
		Problem solving	Solving problems in context involving multiple operations with integers.
	Exponents	Representing and comparing	Representing and comparing numbers in exponential form.

CONTENT AREA	TOPICS	CONCEPTS AND SKILLS	DESCRIPTIVE STATEMENTS The learner will be assessed on:
		Recognise and use laws	Recognising and using appropriate laws of operations using numbers involving exponents, square roots and cube roots.
		Calculations	Performing calculations involving all four operations with numbers that involve squares, cubes, square roots and/or cube roots of integers.
			Calculating the squares, cubes, square roots and/or cube roots of rational numbers.
		Scientific notation	Writing very large numbers in scientific notation.
	Common fractions	Calculation techniques	Using knowledge of multiples and factors to write fractions in the simplest form before or after calculations.
			Using knowledge of equivalent fractions to add and subtract common fractions including mixed numbers.
			Multiplying common fractions including mixed numbers.
			Using knowledge of reciprocal relationships to divide common fractions.
			Solving problems in context involving common fractions and/or mixed numbers, including grouping, sharing and determining fractions of whole numbers.
	Decimal fractions	Percentages	Calculating percentages: • of whole numbers • of part of a whole Calculating percentage increase or decrease
			Solving problems in context involving percentage including profit and loss, discount, simple interest and/or loans.
		Ordering and comparing decimal fractions	Ordering and comparing decimal fractions of at least 3 decimal places and rounding off to at least 2 decimal places.

CONTENT AREA	TOPICS	CONCEPTS AND SKILLS	DESCRIPTIVE STATEMENTS The learner will be assessed on:
		Addition, subtraction, multiplication and division	Adding, subtracting and multiplying decimal fractions of at least 3 decimal places. Calculating the squares, cubes, square roots and cube roots of decimal fractions.
			Recognising equivalence between common fraction, decimal fraction and/or percentage forms of the same number.
		Problem solving	Solving problems in context involving decimal fractions rounding off where appropriate.
Patterns, Functions and Algebra	Numeric and geometric patterns	Investigate and extend patterns	Investigating and extending numeric and/or geometric patterns looking for relationships between numbers including patterns: • represented in diagram form • not limited to sequences involving a constant difference or ratio • represented in tables • represented algebraically
			Describing and justifying the general rules for relationships between numbers in own words or in algebraic language.
	Algebraic expressions	Algebraic language	Identifying variables, constants, coefficients and exponents in given algebraic expressions. Identifying and classifying like and unlike terms in given algebraic expressions.
			Adding and subtracting like terms in algebraic expressions.
			Multiplying the following by integers and monomials: • monomials • binomials
			Dividing the following by integers and monomials: • monomials

CONTENT AREA	TOPICS	CONCEPTS AND SKILLS	DESCRIPTIVE STATEMENTS The learner will be assessed on:
			• trinomials
			Simplifying algebraic expressions involving addition, subtraction, multiplication and division.
			Determining the squares, cubes, square roots and cube roots of single algebraic terms or like algebraic terms.
			Determining the numerical value of an algebraic expression by substitution.
	Algebraic equations	Equations	Solving equations by: • inspection • using additive and/or multiplicative inverses • using the laws of exponents
			Setting up and solving equations to describe problem situations.
	Functions and relationships	Input and output values or rules	Determining input and output values or rules using: • flow diagrams • tables • formulae • and/or equations
Space and Shape (geometry)	Geometry of straight lines	Angle relationship	Recognising and describing pairs of angles formed by: • perpendicular lines • intersecting lines and/or • parallel lines cut by a transversal
		Problem solving	Solving geometric problems using relationships between pairs of angles.

CONTENT AREA	TOPICS	CONCEPTS AND SKILLS	DESCRIPTIVE STATEMENTS The learner will be assessed on:
	Geometry of 2-D shapes	Definitions	Identifying and defining triangles in terms of their sides and/ or angles distinguishing between equilateral, isosceles and/ or right-angled triangles.
			Identifying and defining quadrilaterals in terms of their sides and/ or angles distinguishing between a parallelogram, rectangle, square, rhombus, trapezium and/ or kite.
		Similar and congruent 2-D shapes	Identifying and describing the properties of congruent and/ or similar shapes.
		Problem solving	Solving geometric problems involving unknown sides and/ or angles in triangles and/ or quadrilaterals, using known properties and definitions.
	Geometry of 3D - objects	Classifying 3D- objects	Describing, sorting and comparing cubes, rectangular prisms, triangular prisms, pyramids and cylinders in terms of shape and number of faces, vertices and edges.
Measurement	Theorem of Pythagoras	Use the Theorem of Pythagoras	Using the Theorem of Pythagoras to calculate a missing length in a right-angled triangle leaving irrational answers in surd form.
	Perimeter and area of 2-D shapes	Perimeter of polygons and area of squares, rectangles, triangles and/or circles	Using appropriate formulae to calculate the perimeter and/or area of: • squares • rectangles • triangles • circles
			Using and converting between appropriate SI units including: $mm^2 \leftrightarrow cm^2 \leftrightarrow m^2 \leftrightarrow km^2$

CONTENT AREA	TOPICS	CONCEPTS AND SKILLS	DESCRIPTIVE STATEMENTS The learner will be assessed on:
			Solving problems with or without using a calculator involving perimeter and area of polygons and circles.
	Surface area and volume of 3-D objects	Surface area, volume and/or capacity of cubes and/or rectangular prisms	Using appropriate formulae to calculate the surface area, volume and/or capacity of cubes, rectangular prisms and/or triangular prisms.
		SI units	Using and converting between appropriate SI units, including: $mm^2 \leftrightarrow cm^2$ $cm^2 \leftrightarrow m^2$ $mm^3 \leftrightarrow cm^3$ $cm^3 \leftrightarrow m^3$ $1\ cm^3 \leftrightarrow 1\ ml$ $1\ m^3 \leftrightarrow 1\ kl$
			Solving problems with or without using a calculator involving surface area, volume and/or capacity.
Data Handling	Organise and summarise data	Organise and summarise data	Summarising data using measures of central tendency including the mean, median, mode and measures of dispersion including range and the extremes.