

CONTENT AREAS FOR MATHEMATICS FOR JHS

	Content Areas	Competencies	Descriptive statement
1	Concept of Rational Numbers	<ol style="list-style-type: none"> 1. Demonstrate understanding of rational numbers, properties of rational numbers and operations on rational numbers and their applications in real life situations 2. Demonstrate knowledge of properties of rational numbers. 3. Demonstrate knowledge of operations on rational number. 4. Demonstrate knowledge and skill in applying rational numbers to real-life situations 	<ol style="list-style-type: none"> 1. Identify the following properties of rational numbers: commutativity, associativity and distributivity. 2. Find and use multiples and factors of integers and rational numbers up to 100 3. Identify prime numbers 4. Evaluate positive integer powers of numbers, square roots of perfect squares up to 256, and solve problems involving square roots of whole numbers. 5. Compute and solve problems with positive and negative rational numbers relating them to real life situations.
2	Concept of Sets	<ol style="list-style-type: none"> 1. Demonstrate understanding of sets. 2. Demonstrate knowledge and skill in applying sets to real-life situations. 	<ol style="list-style-type: none"> 1. Solve questions relating to intersection, disjoint and union of sets. 2. Solving and applying two set problems to real world situations.
3	Concept of Number Bases	<ol style="list-style-type: none"> 1. Demonstrate understanding of the numeration systems 2. Demonstrate knowledge and skill of applying numeration system to real-life situations. 	<ol style="list-style-type: none"> 1. Rewriting a number in base ten to a number in either base two, base three or base five. 2. Performing operations (addition, subtraction and multiplication) of number bases (base 2, base 3 and base 5) 3. Grouping of given objects into sets of 2s, 5s and 10s, applying them to real life situations.
4	Concept of Fractions and Decimals	<ol style="list-style-type: none"> 1. Demonstrate understanding of fractions 2. Demonstrate understanding of decimals 3. Demonstrate knowledge and skill of applying fractions in real life situations. 4. Demonstrate knowledge and skill of applying decimals to real life situations. 	<ol style="list-style-type: none"> 1. Compare and order fractions using various models and representations 2. Identify equivalent fractions and decimals using models. 3. Compute with fractions and decimals, including those set-in problem situations. 4. Using order of operations to compute problems relating to fractions, integers, exponents, and parenthesis.

5	Concept of Ratio, Proportion, Rates, and Percentages	<ol style="list-style-type: none"> 1. Demonstrate knowledge in ratios. 2. Demonstrate understanding in proportions and rates. 3. Demonstrate understanding of percentages. 4. Demonstrate knowledge and skill of applying proportion and percents to real life situations. 	<ol style="list-style-type: none"> 1. Identify and find equivalent ratios and divide a quantity according to a given ratio 2. Model a given situation by using a ratio and rates. 3. Solve problems involving proportions or precents, including converting between percent and fractions or decimals. 4. Solve problems involving rates and unit rates in relation to real life situations.
6	Concept of Expressions, operations, and equations	<ol style="list-style-type: none"> 1. Demonstrate understanding of expressions set up in model form. 2. Demonstrate knowledge and skill in operations of expressions. 3. Demonstrate understanding in linear equations in one and two variables. 4. Demonstrate knowledge and skill in applying linear equations in real life situations. 	<ol style="list-style-type: none"> 1. Find the value of an expression or a model given values of the variables. 2. Simplify algebraic expressions involving sums, products, and powers; compare expressions to determine if they are equivalent. 3. Write expressions, equations, or inequalities to represent problem situations. 4. Solve linear equations, linear inequalities, and simultaneous linear equations in two variables, especially those that model real life situations
7	Concept of Relations and functions	<ol style="list-style-type: none"> 1. Demonstrate understanding of relations. 2. Demonstrate understanding of functions. 3. Demonstrate knowledge in sequences. 	<ol style="list-style-type: none"> 1. Interpret, relate, and generate representations of linear functions and non-linear functions (quadratic) in tables, graphs, or words 2. Identify properties of linear functions including slope and intercepts. 3. Formulate pattern relationships in a sequence using numbers, words, or algebraic expressions.

8	Concept of Properties of Lines, Angles, and Geometric shapes (Two- and Three-Dimensional shapes)	<ol style="list-style-type: none"> 1. Demonstrate understanding in lines and angles. 2. Demonstrate knowledge in properties of lines and angles. 3. Demonstrate knowledge in geometric shapes. 4. Demonstrate knowledge in two- and three-dimensional shapes. 	<ol style="list-style-type: none"> 1. Identify and draw types of angles and pairs of lines 2. Relate the relationships between angles on lines and in geometric figures to solve problems involving measurement of land, real objects, and others. 3. Identify two-dimensional and three-dimensional shapes 4. Use the geometric properties (sides, parallel lines, angles, etc.) of 2-D and 3-D shapes to solve real life problems
9	Concept of Modulus, Perimeter, Area, and Volume of objects	<ol style="list-style-type: none"> 1. Demonstrate understanding and skill modulus, perimeter area and volume of objects 	<ol style="list-style-type: none"> 1. Solve problems involving modulus, perimeter, area and volume of geometric objects (circles, triangles, rectangles etc.) especially as they relate to real life situations (fencing, painting of surfaces, volumes of gallons, etc.)
10	Concept Cartesian coordinate planes (Similarities and Congruences)	<ol style="list-style-type: none"> 1. Demonstrate understanding of the cartesian coordinate plane. 2. Demonstrate knowledge in geometric transformations. 3. Demonstrate understanding in congruent and similar triangles and rectangles. 	<ol style="list-style-type: none"> 1. Solve problems involving points in the Cartesian plane. 2. Recognize and identify coordinates of images of geometric transformations (translations, reflections, and rotations) in the plane. 3. Identify congruent and similar triangles and rectangles and solve related problems.
11	Concept of Pythagoras Theorem and the three Trigonometric ratios (sine, cosine, and tangent)	<ol style="list-style-type: none"> 1. Demonstrate knowledge in Pythagoras Theorem. 2. Demonstrate understanding in the three trigonometric ratios. 	<ol style="list-style-type: none"> 1. Applying Pythagoras Theorem in solving problems relating to length (examples: diagonals of rectangles and squares, height of buildings/towers, etc.), area (examples: triangles, circles, farms) and trigonometric ratios. 2. Calculating the length or angles of geometrical objects using the three trigonometric ratios (sine, cosine, and tangent)
12	Concept of Handling Data	<ol style="list-style-type: none"> 1. Demonstrate knowledge in collecting data. 2. Demonstrate understanding of organizing and representing data. 3. Demonstrate skill in interpreting data 	<ol style="list-style-type: none"> 1. Identify ways and procedure for collecting data. 2. Determine various ways to organize and represent data in tables to help in solving real world questions (example: frequency distribution table, relative frequency table,

		<ol style="list-style-type: none"> 4. Demonstrate understanding and skill in central tendency. 5. Demonstrate skills in interpreting graphs 	<p>cumulative frequency table for grouped and ungrouped data excluding unequal intervals).</p> <ol style="list-style-type: none"> 3. Read and interpret data from one or more sources to solve problems (example: make comparisons, estimates, draw conclusions). 4. Calculate, use, or interpret statistic (example: mean, median, mode, range) summarizing data distributions; recognize the effect of spread (example: range, variance, and standard deviation) and outliers. 5. Drawing and interpreting graphs (example histogram, simple bar graph, pie chart, line graph, cumulative frequency curve) on real life situations data.
13	Concept of Probability	<ol style="list-style-type: none"> 1. Demonstrate knowledge of selection of objects. 2. Demonstrate knowledge in probability. 3. Demonstrate understanding and skill in estimating probability for simple and compound events. 	<ol style="list-style-type: none"> 4. Determine the probability of selecting objects with replacement. 5. Determine hypothetical probability (based on equally likely outcomes, e.g., rolling a fair die, tossing a coin or any real-world situation) for simple and compound events 6. Estimate the empirical probability (based on experimental outcomes, relative frequency) for simple and compound events:

Developing Test Blueprint Mathematics for JHS

		Subject Outcomes(Depth of Knowledge)				
	Content Areas	Level 1 Remembering (Recall)	Level 2 (Understanding Skills/Concept)	Level 3 Applying (Strategic Thinking)	Level 4 Analysing/Evaluating /creating (Extended Thinking)	Total
1.	Rational Numbers	1	1	1	0	3
2.	Sets	0	1	1	1	3
3.	Number Bases	1	0	1	1	3
4.	Fractions and Decimals	1	1	2	1	5
5.	Ratio, proportion, rates and precents	0	2	2	2	6
6.	Expressions, operations and Equations	1	3	3	3	10
7.	Relations and Functions	1	1	1	1	4
8.	Properties of Lines, Angles, and Geometric shapes (two- and three-dimensional shapes)	1	1	1	0	3
9.	Modulus, Perimeter, Area and Volume of Objects		1	1	2	4
10.	Cartesian coordinate planes (Similarities and Congruences)	0	1	1	1	3

11.	Pythagoras Theorem and the three trigonometric ratios (sine, cosine, and tangent)	0	1	1	2	4
12.	Handling Data	1	1	2	3	8
13.	Probability	1	1	1	1	4
	Total	(9)15%	(15)25%	(18)30%	(18)30%	60