

Excelsior High School

Mathematics Department

Grade 9

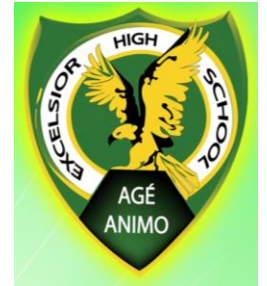


Grade 9

Scope & Sequence

Excelsior High School

Mathematics Department



Scope and Sequence

Term:1 Christmas (September to December)

Topic: Number Theory/Measurement /Geometry and Trigonometry

Duration: 14 weeks (max: 72 contact periods)

Date	Objectives		
<p>Term 1 Week 1</p> <p>Number Theory:</p> <p><i>Whole numbers</i></p>	<p>2.2</p> <p>-(d) approximate values to 3 or more significant figures;</p> <p>-(e) problem solving that uses a mix of strategies including:</p> <ul style="list-style-type: none"> (i) eliminating possibilities; (ii) identifying reasonable answers; (iii) working backward; (iv) checking for hidden assumptions; (iv) using linear graphs (one or two variables) (v) solving a simpler problem 		
<p>Term 1 Week 2</p> <p>Computations</p> <p><i>Rational and irrational numbers</i></p>	<p>3.1</p> <p>-(c) further use of ratios:</p> <ul style="list-style-type: none"> (vi) ratios comparing three or more numbers or quantities; (vii) division of a total into three or more unequal parts (viii) combination of unit rates (ix) increase or decrease in value by a given ratio 		

Date	Objectives		
Term 1 Week 3 Number Theory: <i>Whole numbers</i>	2.3 (d) numbers written as powers of 10 and in <i>standard form</i> ; (x) evaluation of numbers with fractional indices; (xi) use of the index form to derive cubes and cube roots of numbers;		
Term 1 Week 4 Measurements <i>Ratio and proportionality, Inverse proportion</i>	3.1 (d) direct and inverse proportion; (i) special application of the proportion concept to scale drawings (finding actual or representative measures); (ii) formation and solution of problems involving ratio &or rate & or proportion .		
Term 1 Week 5 Sets	4.1-(a) use of the result, $n(A \cup B) = n(A) + n(B) - n(A \cap B)$, to solve simple numerical problems -(c) (iv) the construction and interpretation .of Venn diagrams with no more than three sets and/or subsets		
Week 6 Term 1 Number Theory <i>Rational and irrational numbers</i>	3.3 (iv) writing decimal fractions and mixed numbers in <i>standard form</i> i.e. using scientific notation; (v) the basic operations with numbers that are written in standard form (b) approximate values of decimal fractions and mixed numbers correct to 3 or more sig. figures 3.5 - (b) (ii) operations with other irrational numbers; (results given in surd form when appropriate)		
Week 7	Monthly Test 1		

Date	Objectives		
Term 1 Week 8 Measurements <i>Length, Perimeter and Circumference</i>	2.1-- -(c) increase and/or decrease in length by a (given) scale factor 3.1--(a) (i) length of any part/arc of the whole circumference (ii) perimeter of a sector of a circle		
Term 1 Week 9 Basic Geometric Concepts	1.2 (a) Revision (b) Revision -(c) construction (i) use of compasses to construct a .1 to a line at a point in the line and from a point outside the line		
Term 1 Week 10 Measurements <i>Area</i>	4 .1- (a) area of region covered by (vi) a <i>kite-shaped quad.</i> ; (vii) the sector of a circle;		
Term 1 Week 11 Basic Geometric Concepts	1.3- (a) (i) use of compasses to copy an angle and to construct a line parallel to a given line; (ii) use of ruler and compasses only to draw an angle of size any part or multiple of 60° ;		
Term 1 Week 12 Measurements <i>Area</i>	(viii) in a right. angled triangle: relationship between the area of the square on the hypotenuse and the sum of the areas of the squares on the other two sides		
Term 1 Week 13	Revision		
Week 14	Monthly Test 2		

Term 2: Easter (January to March)

Topic: Measurements /Geometry and Trigonometry/Algebra/

Duration: 12 weeks (max: 54 contact periods)

Date	Objectives		
<p>Term 2 Week 1</p> <p>Volume, Capacity, Mass and Time</p>	<p>5.1 concept of <i>volume</i>: (i) the commonly - used unit of measure (cubic metre , cm^3) and its relation to other cubic units; (ii) calculation of volume of cubes, cuboids, cylinders, triangular prisms;</p> <p>5.2 concept of <i>capacity</i>: (i) the basic unit of capacity(litre) and the relationship between measures of volume and of capacity; (ii) calculation of the capacity of figures named at</p> <p>5.3 (a) concept of <i>mass</i>: (i) the basic unit of mass(gram) and the relationship between measures of volume and of mass (ii) calculation of the mass of figures named at 5.1 (ii); (b) solution of problems involving measurements of volume, capacity and mass of solid figures already introduced</p>		
<p>Term 2 Week 2</p> <p>Movement / Transformation: Reflection</p>	<p>4.2-Revision –Translation & Reflection (a) (i) reflection in two intersecting lines, not necessarily at right angles</p>		

Date	Objectives		
Term 2 Week 3 <i>Volume, Capacity, Mass and Time</i>	5.2 concept of <i>capacity</i> : (iii) the basic unit of capacity(litre) and the relationship between measures of volume and of capacity; (iv) calculation of the capacity of figures named at 5.3 (a) concept of <i>mass</i> : (iii) the basic unit of mass(gram) and the relationship between measures of volume and of mass calculation of the mass of figures named at 5.1 (ii); (b) solution of problems involving measurements of volume, capacity and mass of solid figures already introduced		
Term 2 Week 4 Movement / Transformation: Rotation **Thursday and Friday - Consultation Days	4.2- (c) transformation by rotation or turning: (i) key ideas: (i) <i>centre of rotation</i> ; (ii) <i>angle of rotation</i> ; (iii) <i>direction of rotation</i> (iv) <i>congruence of shapes</i> (ii) the rotation image of a given figure;		
Term 2 Week 5 <i>Volume, Capacity, Mass and Time</i>	5.3 (b) concept of <i>mass</i> : (iv) the basic unit of mass(gram) and the relationship between measures of volume and of mass calculation of the mass of figures named at 5.1 (ii); (b) solution of problems involving measurements of volume, capacity and mass of solid figures already introduced		
Term 2 Week 6 Movement / Transformation: Rotation	4.2 (iii) the centre, angle and direction of rotation when given a figure and its image under rotation (i) use of symbol, Ro , to denote rotation through 90^0 ;		
Week 7	Mid Year Examination		
Week 8	Mid Year Examination		

Date	Objectives		
<p>W Term 2 Week 9 Trigonometry (measures of sides and angles of any right angled triangle) <i>Pythagoras' Theorem</i></p>	<p>5.1 (a) for the right-angled triangle: (i) use of Pythagoras' Theorem to link the measures of the sides; (ii) finding the length of a missing side & or the area;</p>		
<p>Term 2 Week 10 Further Geometric Concepts Solids</p>	<p>3. 1 (a) further examination of 3-D figures in the environment: (i) identification & description of <i>faces, edges, vertices, space between edges, base, height length, cross-section</i> (ii) properties of <i>rectangular prisms, cubes, cylinders</i>; ;</p>		
<p>Term 2 Week 11 Trigonometric ratios: <i>Sine, cosine and tangent</i></p>	<p>5.1 (a) for the right-angled triangle: (i) use of trigonometric ratios of the lengths of the sides, where the 'legs' are related to one of the acute angles, <i>sine, cosine, tangent</i>; - finding missing sides and/or angles;</p>		
<p>Term 2 Week 12 Further Geometric Concepts Solids</p>	<p>3. 1 (b) nets of solids named at (a)(ii); (c) representation of 3-D figures on plane (2-D) surfaces</p>		

Term:3 Summer (April to July)

Topic: /Geometry and Trigonometry/Statistics/Algebra /Graphs and Measurements

Duration: 13 weeks (max: 60 contact periods)

Date	Objectives		
<p>Term 3 Week 1</p> <p>Further Geometric Concepts <i>:3 dimensional shapes</i></p>	<p>3.2</p> <p>(a) measurements associated with three-dimensional shapes:</p> <ul style="list-style-type: none"> (i) the volume or space occupied by an object or container: (ii) measurement of the space in cubic units; relationship between the area of the base, the height/length/depth and the volume; (iii) preferred shapes for packaging goods; <p>(b) the capacity of a container / the amount it can hold when full:</p> <ul style="list-style-type: none"> (i) relationship between volume (ii) capacity, when affected by the thickness of the material that makes the container~ the volume of the material~ (iii) (ill) calculation of capacity 		
<p>Term 3 Week 2</p> <p>Trigonometry <i>(Solving Right-angled triangles)</i></p>	<p>5.1</p> <p>(a) for the right-angled triangle:</p> <ul style="list-style-type: none"> (iii) problem-solving which requires <ul style="list-style-type: none"> - making sketches and diagrams to represent information given verbally; - choice of trigonometric ratio that links known to unknown; - efficient use of the scientific calculator; - rounding answers to the nearest degree and appropriate number of dec. places or sig. figs. 		
<p>Term 3 Week 3</p> <p><i>Mass, Weight, Volume and rate</i></p>	<p>(c) the mass of an object / the quantity of matter in the object:</p> <ul style="list-style-type: none"> (i) distinction between <i>mass</i> and <i>weight</i> [terms are often used interchangeably]~ (ii) relationship between volume and mass: <ul style="list-style-type: none"> (i) unrelated units of measure: volume(cm³), mass(grams) 		

Date	Objectives		
Term 3 Week 4 Trigonometry <i>(finding height, distances and angles)</i>	5.1 (a) for the right-angled triangle: () (b) use of trig. ratios to find heights and distances in simple three-dimensional situations :		
Week 5	Monthly Test 3		
Term 3 Week 6 Statistics <i>Data Collection, Organisation and Storage</i>	2.1 -(a) (i) at the national level: issues of national and international significance -(b) collection of data from a very large population: (i) use of polls and large scale surveys -(c) (ii) use of a frequency table for <i>grouped data</i> ; attention to: size & number of groups ± class intervals and class boundaries		
Term 3 Week 7 Algebra <i>Symbolic Representation and Arithmetic Type Operations</i>	1.1 (b) evaluation of (i) terms written in index form with integral indices e.g. the value of ofp^{-3} when $p = 2$; (ii) terms which are written with powers of powers e.g. the value of $(y^4)^2$ when $y = 2$; -- c) simplification of algebraic expressions involving: (i) operations with terms with integral indices; expansion of terms such as $(p - 3)(x + 4)$, $(x \pm 2)^2$, $(x - 3)(x + 4)$		
Term 3 Week 8 Statistics <i>Graphical Presentation and Interpretation of Data</i>	3.1 -(a) (i) use of line graphs: one or more lines as needed (ii) use of histograms to show ungrouped and/or grouped data (equal classes) (iii) use of frequency polygons (grouped data in equal class intervals) -(c) (i) identification of what might be misleading in the representation (ii) use of the data shown on graphs to make inferences and predictions		

Date	Objectives		
Term 3 Week 9 Algebra <i>Change of subject</i>	2.3 (b) (i) the concept: <i>subject of a formula</i> ; (ii <u>changing</u> the subject of a formula including formulae with roots and powers		
Term 3 Week 9 Statistics <i>Data Analysis and Interpretation</i>	4.1 -(a) (i) computation of the mean from a frequency distribution with grouped data, where, X, in the formula previously used, is the mid-point of the interval		
Term 3 Week 11 <i>All Topics</i>	Revision		
Week 12	End of Year Examination		
Week 13	End of Year Examination		