Year 10   **Higher Curriculum Overview**   **Subject: Mathematics**

Year 10 Overview:

Autumn Term

Outline of Key Learning	Hegarty Code	Lesson
Perimeter, Area & Circles (7a) a. Calculate the area and perimeter of compound shapes made from triangles, rectangles, trapezia and parallelograms using a variety of metric measures b. Recall and use formulae for the circumference of a circle and the area enclosed by a circle c. Calculate arc lengths, angles and areas of sectors of circles d. Find radius or diameter, given area or circumference of circles in a variety of metric measures	555, 551 534-535, 539-541 544-545 542	Area and Perimeter Parts of a Circle 1
3D forms and volume (7b) a. Recall and use the formula for the volume of a cuboid or prism made from composite 3D solids using a variety of metric measures b. Convert between metric measures of volume and capacity, e.g. 1 ml = 1 cm^3 c. Find the volume and surface area of a cylinder and pyramid d. Use the formulae for volume and surface area of spheres and cones; e. Solve problems involving more complex shapes and solids, including segments of circles and frustums of cone	570-571 702, 703 583 576 - 582	Volume 1 Volume cylinder Volume 2
Accuracy & Bounds (7c) a. Calculate the upper and lowers bounds of numbers given to varying degrees of accuracy b. Find the upper and lower bounds of calculations involving perimeters, areas and volumes of 2D and 3D shapes c. Use inequality notation to specify an error interval due to truncation or rounding	137 – 140 774, 775	Upper and Lower Bounds

Quadratic, cubic graphs (6c)		[Linear and Quadratic Graphs](#)
a. Recognise a linear, quadratic, cubic, reciprocal and circle graph from its shape	299, 300	
b. Generate points and plot graphs of simple quadratic functions, then more general quadratic functions	251, 257	[Cubic and Reciprocal graphs](#)
c. Draw graphs of simple cubic functions using tables of values	298	[Quadratic graphs](#)
d. Draw circles, centre the origin, equation $x^2 + y^2 = r^2$.		[Quadratic Graphs 2](#)
	778, 779	[Circle graphs](#)
Equations and Inequalities (9a, 9b)		
f. Solve quadratic equations by factorisation and completing the square	230, 231	[Factorise and solve](#)
g. Solve quadratic equations by using the quadratic formula	238, 239	[Completing the Square/Using the formula](#)
	241, 242	

h. Find the exact solutions of two simultaneous equations in two unknowns
   i. Set up and solve a pair of linear simultaneous equations in two variables, including to represent a situation
   j. Solve two linear inequalities in x, find the solution sets and compare them to see which value of x satisfies both solve linear inequalities in two variables algebraically
	191 – 193
	
	195
		[Simultaneous equations](#)

Teach for Understanding

Probability (10)

	Hegarty Code	Lesson
a. Work out probabilities from Venn diagrams to represent real-life situations and also 'abstract' sets of numbers/values	383, 384	[Venn Diagrams](#)
b. Use union and intersection notation	387, 388	[Set notation](#)
c. Find a missing probability from a list or two-way table, including algebraic terms	424	[Two way tables](#)
d. Understand conditional probabilities and decide if two events are independent		
e. Draw a probability tree diagram based on given information, and use this to find probability and expected number of outcomes	361, 362	[Probability 2](#)
f. Calculate the probability of independent and dependent combined events	364 - 367	
g. Compare experimental data and theoretical probabilities		

Spring Term		
Outline of Key Learning	**Hegarty Code**	**Lesson**
Representing Data (14a, 14b)		
a. Understand how different sample sizes may affect the reliability of conclusions drawn	394, 395	[Sampling](#)
b. Construct and interpret cumulative frequency tables		
c. Compare the mean and range of two distributions, or median and interquartile range, as appropriate	437 – 439	[Cumulative Frequency and Box Plots](#)
d. Interpret box plots to find median, quartiles, range and interquartile range and draw conclusions	434 – 436	
e. Construct and interpret histograms from class intervals with unequal width	442 - 448	[Histograms](#)
f. Estimate the mean from a histogram		
g. Estimate the median from a histogram with unequal class widths or any other information from a histogram, such as the number of people in a given interval		

Teach for Understanding

Trigonometry & Pythagoras (5b) a. Understand, recall and use Pythagoras' Theorem in 2D b. Understand, use and recall the trigonometric ratios sine, cosine and tan, and apply them to find angles and lengths in general triangles in 2D figures c. Use the trigonometric ratios to solve 2D problems finding angles of elevation and depression d. Know the exact values of sin θ and cos θ for θ = 0°, 30°, 45°, 60° and 90°; know the exact value of tan θ for θ = 0°, 30°, 45° and 60°	501 – 504 509 – 515 306	Trigonometry for lengths Trigonometry for angles Trigonometry Exact Values
Circle Theorems and Geometry (16a, 16b) a. Understand and apply giving reasons for, all the circle theorems b. Find the equation of a tangent to a circle at a given point, by: finding the gradient of the radius that meets the circle at that point (circles all centre the origin), finding the gradient of the tangent perpendicular to it and using the given point c. Recognise and construct the graph of a circle using $x^2 + y^2 = r^2$ for radius r centred at the origin of coordinates	594 – 606 592 314 - 320	Circle Theorems 1 Circle Theorems 2 Circle Graphs
Multiplicative reasoning (11) a. Solve proportion problems using the unitary method b. Work out which product offers best value and consider rates of pay c. Express a multiplicative relationship between two quantities as a ratio or a fraction, e.g. when $A{:}B$ are in the ratio 3:5, A is $\frac{3}{5}$ B. When $4a = 7b$, then $a = \frac{7b}{4}$ or $a{:}b$ is 7:4 d. Use kinematics formulae from the formulae sheet to calculate speed, acceleration	330-338 763-772 716 – 724 738	Ratio 1 Ratio 2 and Best Buy Compound Measures

Summer Term		
Outline of Key Learning	**Hegarty Code**	**Lesson**
Similarity and Congruence (12) a. Understand and use SSS, SAS, ASA and RHS conditions to prove the congruence of triangles using formal arguments, and to verify standard ruler and pair of compasses constructions b. Solve angle problems by first proving congruence c. Understand similarity of triangles and of other plane shapes, and use this to make geometric inferences d. Prove that two shapes are similar by showing that all corresponding angles are equal in size and/or lengths of sides are in the same ratio/one is an enlargement of the other, giving the scale factor e. Identify the scale factor of an enlargement of a similar shape as the ratio of the lengths of two corresponding sides, using integer or fraction scale factors f. Find missing lengths, areas and volumes in similar 3D solids g. Solve problems involving frustums of cones where you have to find missing lengths first using similar triangles	608 – 621 680 – 690 576 – 578 583	Enlargement and Similarity Similarity and missing lengths Volume of cones Volume of Frustums and problem solving
Direct & Inverse proportion (19b) a. Set up and use equations to solve word and other problems involving direct proportion b. Use y = kx to solve direct proportion problems, including questions where students find *k*, and then use *k* to find another value c. Solve problems involving inverse proportionality d. Set up and use equations to solve word and other problems involving direct proportion or inverse proportion.	339 - 348	Direct and Inverse Proportion
Transformations (8a) a. Rotate 2D shapes using the origin or any other point (not necessarily on a coordinate grid) b. Reflect 2D shapes using specified mirror lines including lines parallel and not parallel to the axes and also $y = x$ and $y = -x$ c. Recognise and describe single translations using column vectors on a coordinate grid	649 639, 640	Rotation and Enlargement Reflection

Teach for Understanding

d. Translate a given shape by a vector	638, 650	Translations
e. Describe and transform 2D shapes using enlargements by a positive integer, positive fractional, and negative scale factor	643 – 646	Enlargement and Similarity
f. Use congruence to show that translations, rotations and reflections preserve length and angle, so that any figure is congruent to its image under any of these transformations	681	
g. Describe and transform 2D shapes using combined rotations, reflections, translations, or enlargements		
h. Describe the changes and invariance achieved by combinations of rotations, reflections and translations	656, 657	Combining transformations