Queen Elizabeth High School

Scheme of Work SUBJECT: Mathematics YEAR: 7 Autumn term 1

	Topic : **Numbers and the number system**	Topic : **Counting, comparing and calculating**	Topic
Core (Set 2) (Stage 6)	• Understand (order, write, read) place value in numbers with up to eight digits • Multiply & divide numbers with up to three decimal places by 10 (100, 1000) • Understand and use negative numbers when working in other contexts • Know the meaning of a common multiples & factors of two numbers • Identify common multiples & factors of two numbers • Know how to test if a number up to 120 is prime	• Combining the four operations when completing calculations mentally • Multiply a four-digit number by a two-digit number using long multiplication • Solve multi-step problems involving addition, subtraction and/or multiplication • Know that addition and subtraction have equal priority • Know that multiplication and division have equal priority • Know that multiplication and division take priority over addition and subtraction • Use short division to divide • Understand and use methods of long division • Know how to write and use the remainder at each step of the division • Write the remainder to a division problem as a whole number or a fraction • Extend beyond the decimal point to write the remainder as a decimal	

		• Identify when division is needed to solve a problem • Extract the correct information from a problem and set up a written division calculation • Interpret a remainder when carrying out division	
Themes	**Understanding properties of numbers**	**Importance of basic calculations and order of operations**	
Challenge (Set 1) (Stage 7)	• Recall prime numbers up to 50 • Know how to test if a number up to 150 is prime • Highest common factors and lowest common multiples • Understand the use of notation for powers • Recall the first 15 square numbers • Recall the first 5 cube numbers • Identify the first 10 triangular numbers • Know the meaning of the square root symbol (√) • Use a scientific calculator to calculate powers and roots • Make the connection between squares and square roots (and cubes and cube roots)	• Ordering positive and negative numbers • Order fractions by writing over a common denominator • Order a set of numbers including a mixture of fractions, decimals and negative numbers • Make correct use of the symbols = and ≠ • Use knowledge of place value to calculate with decimals • Use knowledge of inverse operations when dividing with decimals • Be fluent with long multiplication and division • Know the order of operations for the four operations • Use brackets in problems involving the order of operations • Understand and apply the fact that addition and subtraction have equal priority • Understand and apply the fact that multiplication and division have equal priority	

Support (Set 3) (Working towards stage 6)	• Order, write and read numbers up to and including 4 digits • Know and identify multiples and factors of a given number • Find the 'common factor' of two numbers • Know the meaning of 'prime number' and recall the prime numbers less than 20 • Know the prime factors of a given number • Know how to test if a number up to 100 is prime • Know and identify square numbers • Know and identify cube numbers	• Understand the concept of a negative number • Compare and order numbers with one decimal place • Compare numbers with two decimal places • Order numbers with two decimal places • Find 1000 more/less than a given number • Use column addition and subtraction methods for numbers up to four digits • Solve two-step problems involving addition and/or subtraction • Understand place value in numbers with up to seven digits • Order, read and write numbers up to and including those with seven digits • Count forwards and backwards in whole number steps with positive and negative numbers, including through zero • Understand and use negative numbers in context, including temperatures below 0°C	
Literacy focus	Spelling of key words	Spelling of key words	
Cross-curricular links			
SMSC & MBV			
ASSESSMENTS	Assessment 1 ~ December	Assessment 1 ~ December	
Out of school learning	Weekly homework based on work covered in class	Weekly homework based on work covered in class	

Queen Elizabeth High School

Scheme of Work SUBJECT: Mathematics YEAR: 7 Autumn term 2

	Topic : **Visualising and constructing**	Topic : **Investigating properties of shapes**	Topic : **Algebraic proficiency: pre-algebra skills**
Core (Set 2) (Stage 6)	• Use a protractor to draw angles • Use a ruler to draw lines to the nearest millimetre • Complete tessellations of given shapes • Know the names of common 3D shapes • Use mathematical language to describe 3D shapes • Construct 3D shapes from given nets • Draw accurate nets for common 3D shapes • Find all the nets for a cube • Use a net to visualise the edges (vertices) that will meet when folded	Know the definitions of special triangles • Know the definitions of special quadrilaterals • Classify 2D shapes using given categories; e.g. number of sides, symmetry • Know the angle sum of a triangle • Know the angle sum of a quadrilateral • Know how to find the angle sum of a any polygon • Use the angle sum of a triangle to find missing angles • Find the missing angle in an isosceles triangle when only one angle is known • Use the angle sum of a quadrilateral to find missing angles	• Recognise a simple formula written in words • Interpret the information given in a written formula • Substitute numbers into a one-step and two step formulas written in words • Create a one-step and two step formulas from given information • Use symbols to represent variables in a formula

		• Know how to find the size of one angle in any regular polygon	
Themes	**Visualising and constructing 2D and 3D shapes**	**Quadrilaterals and triangles**	**Introduction to algebra**
Challenge (Set 1) (Stage 7)	• Know the meaning of faces, edges and vertices • Use correct notation for describing lengths, angles and parallel lines • Know the meaning of 'perpendicular' and identify perpendicular lines • Know the meaning of 'regular' polygons • Identify line and rotational symmetry in polygons • Use ruler and protractor to construct triangles	• Know the vocabulary of 3D shapes • Know the connection between faces, edges and vertices in 3D shapes • Visualise a 3D shape from its net • Recall the names and shapes of special triangles and quadrilaterals • Know the meaning of a diagonal of a polygon • Know the properties of the special quadrilaterals (including diagonals) • Apply the properties of triangles to solve problems • Apply the properties of quadrilaterals to solve problems	• Know the meaning of expression, term, formula, equation, function • Know basic algebraic notation (the rules of algebra) • Use letters to represent variables • Identify like terms in an expression • Simplify an expression by collecting like terms • Know how to multiply a (positive) single term over a bracket (the distributive law) • Substitute positive numbers into expressions and formulae • Given a function, establish outputs from given inputs • Use a mapping diagram (function machine) and expressions to represent a function
Support (Set 3) (Working towards stage 6)	**Calculating: multiplication and division** • Recall and use multiplication and division facts from times tables • Know the effect of multiplying by 1 or 0 and by dividing by 1 • Multiply a number by a single digit	• Identify a line of symmetry • Use a line of symmetry to create symmetrical patterns and shapes • Know that a shape and its reflection are congruent	**Using formula** • Count forwards and backwards in tens, hundreds and thousands from any positive number up to 1 000 000 • Use BiDMAS for simple two step calculations

	• Multiply and divide by 10, 100 and 1000 • Multiply a number by a double digit • Divide by a single digit **Visualising and constructing** • Identify 3D-shapes from photographs, sketches and nets • Construct diagrams of 3D-shapes on isometric paper	• Know and use the names of special types of triangle and quadrilaterals • Compare and classify 2D shapes • Use the properties of rectangles to find missing lengths and angles • Know the difference between a regular and an irregular polygon	• Use word formulae in context (e.g. area of rectangles)
Literacy focus	Spelling of key words	Spelling of key words	Spelling of key words
Cross-curricular links			
SMSC & MBV			
ASSESSMENTS	Assessment 1 ~ December	Assessment 1 ~ December	Assessment 1 ~ December
Out of school learning	Weekly homework based on work covered in class	Weekly homework based on work covered in class	

Queen Elizabeth High School

Scheme of Work SUBJECT: Mathematics YEAR: 7 Spring term 1

	Topic : **Exploring fractions, decimals and percentages**	Topic : **Proportional reasoning**	Topic : **Pattern sniffing (sequences)**	Topic : **Measuring space**
Core (Set 2) (Stage 6)	• Identify equivalent fractions • Simplify a fraction • Compare fractions • Understand that a fraction is also a way of representing a division • Know standard fraction / decimal / percentage • Use the equivalence between fractions, decimals and percentages when solving problems	• Identify when a comparison problem can be solved using multiplication • Identify when a comparison problem can be solved using division • Identify when a comparison problem requires both division and multiplication • Find the value of a single item in a comparison problem • Use the value of a single item to solve a comparison problem • Understand the meaning of enlargement • Understand the meaning of scale factor	• Use the vocabulary of sequences • Recognise a linear sequence • Describe a number sequence • Find the next term in a linear sequence • Find a missing term in a linear sequence • Generate a linear sequence from its description	• Convert between non-adjacent metric units; e.g. kilometres and centimetres • Use decimal notation up to three decimal places when converting metric units • Convert between Imperial units; e.g. feet and inches, pounds and ounces, pints and gallons • Solve problems involving converting between measures • State conclusions using the correct notation and units

		• Recognise when one shape is an enlargement of another • Use a scale factor to complete an enlargement • Find the scale factor for a given enlargement • Use knowledge of fractions to solve a sharing (or grouping) problem • Use knowledge of multiples to solve a sharing (or grouping) problem		
Themes	**Consolidation of prior knowledge of fractions, decimals and percentages**	**Using mathematical knowledge to make comparisons**	**Sequences**	**Understand the metric system of measurements**
Challenge (Set 1) (Stage 7)	• Write one quantity as a fraction of another • Write a fraction in its lowest terms by cancelling common factors • Convert between mixed numbers and top-heavy fractions • Understand that a percentage means 'number of parts per hundred' • Write a percentage as a fraction	• Use ratio notation to describe a comparison of more than two measurements or objects • Convert between different units of measurement and state as a ratio • Simplify a ratio • Find the value of a 'unit' in a division in a ratio problem • Divide a quantity in two parts in a given ratio	• Use a term-to-term rule to generate sequences • Find the term-to-term rule for a sequence • Solve problems involving the term-to-term rule for a sequence	• Use a ruler and protractor to accurately measure lines and angles to the nearest millimetre or degree • Convert fluently between metric units of length/mass/capacity • Convert fluently between units of time/money • Solve practical problems that involve converting between units

Support (Set 3) (Working towards stage 6)	• Recognise tenths and hundredths • Calculate with tenths and hundredths • Divide whole numbers by 10 and 100 • Know and use the decimal equivalents to $^1/_4$, $^1/_2$, $^3/_4$ • Compare and order fractions whose denominators are multiples of the same number • Identify equivalent fractions represented using tenths and hundredths • Write decimals a fractions • Recognise that thousandths arise from dividing a number (or object) into one thousand equal parts and dividing hundredths by ten • Solve problems involving number up to three decimal places • Compare and order a set of numbers with a mixed number of decimal places • Understand that percent relates to number of parts per hundred • Write any percentage as a fraction with a denominator of 100	• Recognise tenths and hundredths • Calculate with tenths and hundredths • Divide whole numbers by 10 and 100 • Know and use the decimal equivalents to $^1/_4$, $^1/_2$, $^3/_4$ • Compare and order fractions whose denominators are multiples of the same number • Identify equivalent fractions represented using tenths and hundredths • Write decimals a fractions • Recognise that thousandths arise from dividing a number (or object) into one thousand equal parts and dividing hundredths by ten • Solve problems involving number up to three decimal places • Compare and order a set of numbers with a mixed number of decimal places • Understand that percent relates to number of parts per hundred • Write any percentage as a fraction with a denominator of 100	**Measuring space** • Convert between metric units of measure • Convert between metric units of weight and capacity • Solve measurement and money problems • Solve measurement and money problems involving decimals to two decimal places • Use decimal notation when converting between metric units of length, mass and volume / capacity • Know approximate equivalencies between metric and imperial units	• Convert between metric units of measure • Convert between metric units of weight and capacity • Solve measurement and money problems • Solve measurement and money problems involving decimals to two decimal places • Use decimal notation when converting between metric units of length, mass and volume / capacity • Know approximate equivalencies between metric and imperial units

	• Write any percentage as a decimal	• Write any percentage as a decimal		
Literacy focus	Spelling of key words	Spelling of key words	Spelling of key words	Spelling of key words
Cross-curricular links				
SMSC & MBV				
ASSESSMENTS	Assessment 2 ~ February	Assessment 2 ~ February	Assessment 2 ~ February	Assessment 2 ~ February
Out of school learning	Weekly homework based on work covered in class	Weekly homework based on work covered in class	Weekly homework based on work covered in class	Weekly homework based on work covered in class

Queen Elizabeth High School

Scheme of Work SUBJECT: Mathematics YEAR: 7 Spring term 2

	Topic : **Investigating angles**	Topic : **Calculating with fractions, decimals and percentages**	Topic : **Solving equations**
Core (Set 2) (Stage 6)	• Identify angles that meet at a point • Identify angles that meet at a point on a line • Identify vertically opposite angles • Know that vertically opposite angles are equal • Use known facts to find missing angles • Explain reasoning	• Add & subtract fractions and mixed numbers • Multiply & divide fractions • Multiply decimals by whole numbers • Find 10% of a quantity • Use non-calculator methods to find a percentage of an amount • Use decimal or fraction equivalents to find a percentage of an amount where appropriate • Solve problems involving the use of percentages to make comparisons	• Solve missing number problems expressed in words • Find a solution to a missing number problem with two unknowns • Find all combinations of two variables that solve a missing number problem with two unknowns • Know the basic rules of algebraic notation • Express missing number problems algebraically • Solve missing number problems expressed algebraically • Solve one-step & two-step equations, when the solution is a whole number
Themes	**Basic angle properties**	**Developing and consolidating skills of calculations with fractions and decimals**	**Introduction to solving equations focusing on using inverse operations**
Challenge (Set 1) (Stage 7)	• Identify fluently angles at a point, angles at a point on a line and vertically opposite angles • Identify known angle facts in more complex geometrical diagrams • Use knowledge of angles to calculate missing angles in geometrical diagrams • Know that angles in a triangles total 180°	• Apply the four operations to fractions and mixed numbers • Use calculators to find a percentage of an amount using multiplicative methods • Calculate percentage increase and decrease using the multiplier method • Compare two quantities using percentages	• Choose the required inverse operation when solving an equation • Identify the correct order of undoing the operations in an equation • Solve one-step & two-step equations, when the solution is a whole number/decimal or fraction

	• Find missing angles in triangles • Find missing angles in isosceles triangles • Explain reasoning using vocabulary of angles	• Calculate percentage change	• Check the solution to an equation by substitution
Support (Set 3) (Working towards stage 6)	• Identify types of angles (Acute, obtuse, right angles and reflex) • Know that angles are measured in degrees and estimate acute, obtuse and reflex angles • Know that a reflex angle is greater than 180° • Identify and find angles at a point and on a straight line • Use a protractor to measure and draw angles (acute, obtuse and reflex)	• Add & subtract fractions with the same denominator • Calculate a fraction of an amount when the answer is a whole number • Identify and calculate equivalent fractions	
Literacy focus	Spelling of key words	Spelling of key words	Spelling of key words
Cross-curricular links			
SMSC & MBV			
ASSESSMENTS	Assessment 3 ~ Easter	Assessment 3 ~ Easter	Assessment 3 ~ Easter
Out of school learning	Weekly homework based on work covered in class	Weekly homework based on work covered in class	Weekly homework based on work covered in class

Queen Elizabeth High School

Scheme of Work SUBJECT: Mathematics YEAR: 7 Summer term 1

	Topic : **Calculating space**	Topic : **Checking, approximating and estimating**	Topic : **Mathematical movement**
Core (Set 2) (Stage 6)	• Recognise that shapes with the same areas can have different perimeters and vice versa • Know and apply the formulas for areas of triangles and parallelograms • Know and apply the formula for the volume of a cuboid • Estimate the volume of cubes and cuboids • Choose appropriate units of volume • Convert between metric units of area in simple cases • Convert between metric units of volume in simple cases	• Approximate any number by rounding to the nearest 1 000 000 • Understand estimating as the process of finding a rough value of an answer or calculation • Estimate multiplication or division calculations that involve multiplying or dividing up to four-digit numbers by a two-digit number • Estimate multiplication calculations that involve multiplying numbers with up to two decimal places by whole numbers	• Use coordinates to describe/write the position of a point in all four quadrants • Construct a 2-D coordinate grid (all four quadrants) • Plot coordinates on a coordinate grid (four quadrants) • Use coordinates to plot a set of points to construct a polygon • Solve problems involving coordinates • Carry out a translation • Carry out a reflection using one of the axes as a mirror line
Themes	**Area and perimeter of 2D shapes & volume of cuboids**	**Understand the rounding or estimating makes checking calculations easier**	**Reflections and translations**
Challenge (Set 1) (Stage 7)	• Recognise that the value of the perimeter can equal the value of area • Use standard formulae for area and volume • Find missing lengths in 2D shapes when the area is known • Know and apply the formula for the area of a trapezium	• Approximate by rounding to any number of decimal places • Approximate by rounding to the first significant figure in any number • Understand estimating as the process of finding a rough value of an answer or calculation	• Write the equation of a line parallel to the x-axis or the y-axis • Identify the lines y = x and y = -x • Carry out a reflection in a diagonal mirror line (45° from horizontal) • Find and name the equation of the mirror line for a given reflection • Describe a translation as a 2D vector

	• Understand the meaning of and calculate surface area • Find missing lengths in 3D shapes when the volume or surface area is known	• Estimate calculations by rounding numbers to one significant figure • Use cancellation to simplify calculations • Use inverse operations to check solutions to calculations	• Carry out and describe a rotation using a given angle, direction and centre of rotation
Support (Set 3) (Working towards stage 6)	• Measure and calculate the perimeter of 2D shapes when dimensions are unknown • Find the area of rectangles and other shapes (including squares) by counting squares • Know and apply formula for calculating the area of rectangles • Calculate the perimeter of composite rectilinear shapes • Convert between square centimetres (cm^2) and square metres (m^2) • Estimate volume by using 1 cm^3 blocks to build cuboids, including cubes	• Approximate any number by rounding to the nearest 10, 100 or 1000 • Approximate any number with one decimal place by rounding to the nearest whole number • Understand checking as the process of working backwards from the answer to ensure that it makes sense • Understand estimating as the process of finding a rough value of an answer or calculation • Estimate calculations with up to four digits	• Read and plot points in the first quadrant using co-ordinates • Use coordinates to plot a set of points to construct a polygon • Solve problems involving coordinates • Carry out a translation described using mathematical language • Carry out a reflection using a mirror line parallel to the axes • Describe a reflection using mirror lines parallel to the axes • Understand that a translations and reflections produce a congruent image
Literacy focus	Spelling of key words	Spelling of key words	Spelling of key words
Cross-curricular links			
SMSC & MBV			
ASSESSMENTS	Assessment 4 ~ End of year	Assessment 4 ~ End of year	Assessment 4 ~ End of year
Out of school learning	Weekly homework based on work covered in class	Weekly homework based on work covered in class	Weekly homework based on work covered in class

Queen Elizabeth High School

Scheme of Work SUBJECT: Mathematics YEAR: 7 Summer term 2

	Topic : **Presentation of data**	Topic : **Measuring data**	Topic :
Core (Set 2) (Stage 6)	• Construct and interpret bar and pie charts • Identify the scale used on the axes of a graph • Read values from a line graph involving scaling • Use scaling when constructing line graphs • Answer two-step questions about data in line graphs (e.g. 'How much more?')	• Understand the meaning of 'average' as a typicality (or location) • Understand the mean as a measure of typicality (or location) • Interpret the mean as a way of levelling the data • Calculate the mean of a set of data • Choose an appropriate approximation when required • Use the mean to find a missing number in a set of data	
Themes	**Consolidation of methods of presenting data done at KS2**	**Averages**	
Challenge (Set 1) (Stage 7)	• Know the meaning of categorical/discrete data • Interpret and construct frequency tables • Construct and interpret pictograms (bar charts, tables) and know their appropriate use • Construct and interpret comparative bar charts • Interpret and construct pie charts and know their appropriate use	• Calculate and interpret the mode, mean and median for a set of data values • Use the mean to find a missing number in a set of data • Calculate the mean from a frequency table • Find the mode and median from a frequency table • Understand the range as a measure of spread (or consistency) • Calculate the range of a set of data	

	• Choose appropriate graphs or charts to represent data • Construct and interpret vertical line charts	• Analyse and compare sets of data • Appreciate the limitations of different statistics (mean, median, mode, range)	
Support (Set 3) (Working towards stage 6)	• Construct and Interpret a pictograms/bar charts • Create and interpret a time graph • Solve problems involving the data in charts and graphs • Understand the difference between a line graph and a bar-line chart • Read values from a line graph • Answer one-step and two-step questions about data in line graphs • Solve problems using information presented in a line graph	•	
Literacy focus	Spelling of key words	Spelling of key words	
Cross-curricular links			
SMSC & MBV			
ASSESSMENTS	Assessment 4 ~ End of year	Assessment 4 ~ End of year	
Out of school learning	Weekly homework based on work covered in class	Weekly homework based on work covered in class	Weekly homework based on work covered in class

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