KS3 MATHEMATICS THRESHOLD DESCRIPTORS – NUMBER (Incl. RATIO & PROPORTION)

FOUNDATION (1-2)	DEVELOPING (3-4)	SECURE (5-6)	EXCELLENCE (7-9)

Topic	Concepts and skills
Integers	Read, write, order and compare positive integers up to 1000
	Add and subtract positive integers
	Know multiplication and division facts up to 10 × 10
	Know and use the correct order of operations and inverse operations
	Round positive integers to the nearest 10, 100 and 1000
	Understand negative numbers and use a number line to order, add and subtract negative numbers
	Read, write, order and compare positive and negative integers of any size
	Read, write and use index notation for small positive integer powers
	Use a calculator efficiently
	Multiply and divide positive integers by 10, 100, 1000
	Multiply and divide positive integers (single digit multiplier and divisor for non-calculator section)
	Add, subtract, multiply and divide integers of any size
	Multiply and divide using negative integers
	Understand and use multiples, factors, common factors and prime numbers
	Find the Highest Common Factor and Lowest Common Multiple of any two positive integers
	Read, write and use squares, cubes and square roots
	Know and use rules for multiplying and dividing using indices
	Raise to a further power and know effect of zero index
Decimals	Read, write, order and compare decimals up to two decimal places and understand place value
	Add and subtract decimals up to two decimal places
	Multiply decimals with up to two decimal places (single digit whole number multiplier for non-calculator section)
	Divide decimals with up to two decimal places, using a calculator
	Multiply decimals with up to two decimal places (two digit multiplier and divisor for non-calculator section)
	Change recurring decimals to fractions
	Write numbers in standard form
	Round decimals to two decimal places
	Calculations using numbers in standard form
Approximation	Check solutions to questions and problems by considering whether the answer is sensible
	Check solutions to questions and problems by using suitable approximations
	Round off numbers
	Estimate answer to calculations
	Calculate errors in measurement
	Know and use bounds of accuracy
Fractions	Read, write, order and compare fractions and mixed numbers
	Convert simple fractions to decimals (up to 2 decimal places) and vice versa and multiples of these fractions
	Use equivalent fractions
	Write fractions in their simplest form
	Add and subtract simple fractions with the same denominator, excluding mixed numbers

	Multiply a fraction by a positive integer, and find a fraction of a whole number quantity (positive integers only)
	Express one number as a fraction of another
	Read, write, order and compare fractions and mixed numbers
	Add and subtract fractions with different denominators and mixed numbers
	Use fractions to compare quantities
	Multiply fractions, including mixed numbers
	Divide fractions, including mixed numbers, using a calculator
	Add, subtract, multiply and divide simple algebraic fractions
Percentages	Read, write, order and compare simple percentages
	Use equivalencies between decimals (up to 2 decimal places) fractions and percentages
	Work out percentages of quantities, including VAT
	Find percentages of quantities of any value
	Calculate percentage increase and decrease
	Express one number as a percentage of another
	Calculate reverse percentages
	Calculate simple interest
Ratio & Proportion	Use direct proportion in simple problems
	Use ratio notation
	Use inverse proportion to solve problems
Money	Read, write, order and compare money
	Convert between currencies
	Add, subtract, multiply and divide quantities of money, household finance, utility bills, shopping bills, interest (for 1 year)
	Calculate simple interest
	Round money in calculations to the nearest penny
	Calculate wages and salaries, including national insurance and tax deductions
Time	Read, measure and record time using digital and analogue clocks in 12-hour and 24-hour format
	Read, measure and record events on calendars
	Work out intervals of time
	Convert units of time including seconds, minutes, hours, days, weeks, months and years

KS3 MATHEMATICS THRESHOLD DESCRIPTORS – GEOMETRY

FOUNDATION (1-2)	DEVELOPING (3-4)	SECURE (5-6)	EXCELLENCE (7-9)

Measures

FOUNDATION (1-2)
Know and use units of measure for length, weight, angles, capacity, temperature, including metric and imperial units and degrees eg imperial units include miles, inches, feet, pounds, gallons and pints

DEVELOPING (3-4)
Add and subtract measures

Convert units of measure in its same systems

Read integer scales
Show the locus of a point
Properties of quadrilaterals and triangles
Calculate and use bearings

SECURE (5-6)
Draw lines and angles, accurate to the nearest cm and degree

Read decimal scales
Solve problems involving speed, distance and time
Solve problems involving density, rates of exchange and various compound measures
Describe and carry out reflections, rotations, enlargements and translations
Calculate interior and exterior angles of polygons
Find angles in a variety of shapes
Convert between metric and imperial units eg   5 miles = 8 km,
12 inches = 1 foot = 30 cm, 2.2 pounds = 1 kg, 8 pints = 1 gallon = 4.5 l

EXCELLENCE (7-9)
Use Pythagoras' Theorem to solve problems
Use vectors to describe translations
Find an angle or a side in a right angled triangle using trigonometry
Find the length of the hypotenuse
Use trigonometry to solve problems based on real life situations.

Area & Perimeter

FOUNDATION (1-2)
Work out the perimeter of rectangles and shapes made from rectangles

DEVELOPING (3-4)
Work out the area of rectangles and shapes made from rectangles

SECURE (5-6)
Work out the area and perimeter of rectangles, triangles, circles and semi-circles

EXCELLENCE (7-9)
Work out areas of composite shapes made from rectangles, triangles, circles and/or semi-circles
Identify congruent triangles
Constructions using a ruler and compasses
Recognise similar shapes
Solve a range of problems involving similar shapes
Geometric constructions to show locus of a point

Volume

SECURE (5-6)
Volumes of prisms and cylinders
Draw 3D objects using isometric dot paper
Draw different views of an object
Solve puzzles involving 3D objects
Planes of symmetry

Tables & Charts

FOUNDATION (1-2)
Read, write and use everyday tables, charts eg mileage charts, bar charts, line graphs, currency conversion tables and timetables (bus, train and airlines)

SECURE (5-6)
Draw and interpret pie charts and frequency tables

KS3 MATHEMATICS THRESHOLD DESCRIPTORS – ALGEBRA

FOUNDATION (1-2)	DEVELOPING (3-4)	SECURE (5-6)	EXCELLENCE (7-9)

Topic	Concepts and skills
Roles of symbols	Distinguish between the roles played by letter symbols in algebra using the correct notation Distinguish in meaning between the words equation, formula and expression Write an expression to represent a situation in 'real life'
Algebraic manipulation	Collect like terms
	Multiply a single term over a bracket
	Factorise algebraic expressions by taking out all common factors Use index laws for multiplication, division and raising a power to a power Multiply pairs of expression in brackets
	Proof
Formulae	Substitute numbers into a formula
	Change the subject of a formula where the subject only appears once
Linear equations	Solve linear equations with integer coefficients where the variable appears on either side or on both sides of the equation
	Solve linear equations which include brackets, those that have negative signs occurring anywhere in the equation, those with negative and fractional solutions and those with fractional coefficients
	Solve real-life problems using algebra Solve simultaneous equations algebraically Solve problems using simultaneous equations
Graph sketching	Sketch graphs of quadratic functions, considering orientation and labelling the point of intersection with the y-axis, considering what happens to y for large positive and negative values of x
Linear inequalities	Show inequalities on a number line, using solid circles to show inclusive inequalities and open circles to show exclusive inequalities Write down an inequality shown on a number line
	Solve simple linear inequalities in one variable
	Solving inequalities with two variables
Number sequences **(in Unit 6 of 8H textbook)**	Generate terms of a sequence using term-to-term definition or using position-to-term definition
	Find and use the nth term of a linear arithmetic sequence Find and use the nth term of a quadratic sequence Find and term and the common ratio of a geometric sequence
Gradients of straight line graphs	Find the gradient of a straight line graph Find the y-intercept of a straight line graph Interpret the gradient of real-life graphs
	Recognise, plot and draw graphs of the form $y = mx + c$

Straight line graphs	Given a straight line graph, find its equation Solve simultaneous equations with a graph
Graphs for real-life situations	Draw curved graphs Understand that straight and curved graphs can represent real-life situations Draw, and interpret information from graphs of real-life situations Learn to solve difficult equations approximately using graphs
Simple quadratic functions	Plot graphs of simple quadratic functions Find approximate solutions of a quadratic equation from the graph of the corresponding quadratic function
Distance-time and speed-time graphs	Draw distance-time graphs and speed-time graphs Interpret distance-time graphs and speed-time graphs Understand that the gradient of a distance-time graph represents speed Find speed and distance from information on a travel graph

KS3 MATHEMATICS THRESHOLD DESCRIPTORS – STATISTICAL METHODS

FOUNDATION (1-2)	DEVELOPING (3-4)	SECURE (5-6)	EXCELLENCE (7-9)

Topic	Concepts and skills
Data	Understand and use discrete, continuous and categorical data
	Design and use simple data collection sheets for discrete and continuous data, using tallies including grouped frequencies
	Understand reliability (including the significance of the number of trials)
Displaying data	Draw pictograms, bar charts, line graphs,
	dual bar charts, two-way tables, pie charts,
	simple time-series graphs and scatter graphs
	Identify simple misuse of visual representations
	Find totals, mean, mode, median and range for lists of data Draw frequency polygons Collect data and design questionnaires
Calculating with data	Find range and mode from a stem and leaf diagram
	Read and interpret data presented in tables Calculate the mean of data presented in groups Collect own data to solve a problem
Interpreting data	Find totals and modes from frequency tables or diagrams
	Interpret pictograms, bar charts, line graphs, dual bar charts, two-way tables, pie charts, simple time-series graphs, and scatter graphs
	Describe correlation in scatter graphs Draw and use a line of best fit.
	Compare data using frequencies, totals, mean, median, mode and range
	Make comparisons and predictions from data and representations of data
	Identify trend in time-series graphs Identify bias in data collection
Probability	Use and interpret a probability scale
	Write down theoretical/experimental probabilities
	Estimate probabilities from practical situations
	Add two probabilities (including $1- p$)
	ist outcomes in theoretical and practical situations