Mathematics Year 7		***Curriculum Checkpoints: What do students know and what can they do?***				***MW Clips (KS3)***	Knowledge Organiser
Summative Comment		**Developing**	**Securing**	**Mastering**	**Excelling**		
AF1	**Sequences**	Recognise, generate and describe linear number sequences	Generate terms of a sequence from a term-to-term rule Recognise and use sequences of triangular, square and cube numbers, simple arithmetic progressions	Generate terms of a sequence from either a term-to-term or a position-to-term rule	Deduce expressions to calculate the nth term of linear sequences.	A11 a/b/c A22	Sequences
AF2	**Algebraic Notation**	Simplify and manipulate algebraic expressions by collecting like terms and multiplying a single term over a bracket	Use and interpret algebraic notation, including: ab in place of $a \times b$, $3y$ in place of $y + y + y$ and $3 \times y$, a^2 in place of $a \times a$, a^3 in place of $a \times a \times a$, a/b in place of $a \div b$, brackets	Use and interpret algebraic notation, including: a^2b in place of $a \times a \times b$, coefficients written as fractions rather than as decimals	Simplify and manipulate algebraic expressions by taking out common factors and simplifying expressions involving sums, products and powers, including the laws of indices	A2 A4 A7 a/b	Algebraic-manipulation
AF3	**Place Value**	Read, write, order and compare numbers up to 10 000 000 and determine the value of each digit	Understand and use place value (e.g. when working with very large or very small numbers, and when calculating with decimals)	Round numbers and measures to an appropriate degree of accuracy (e.g. to a specified number of decimal places or significant figures)	Interpret standard form A x 10n, where $1 \leq A < 10$ and n is a positive and negative integer	N1 a/b/c	Place value, Integers-and-Decimals
AF4	**FDP**	Solve problems which require knowing percentage and decimal equivalents of $^1/_2$, $^1/_4$, $^1/_5$, $^2/_5$, $^4/_5$ and those fractions with a denominator of a multiple of 10 or 25.	Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts	Associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, $^3/_8$]	Work interchangeably with terminating decimals and their corresponding fractions (such as 3.5 and 7/2 or 0.375 or 3/8)	N32	FDP-equivalence

AF5	Fractions and Percentages	Write percentages as a fraction with denominator 100, and as a decimal	Recall and use equivalences between simple fractions and percentages, including in different contexts	Interpret percentages and percentage changes as a fraction and interpret these multiplicatively	Interpret fractions and percentages as operators	N23a/b/c N24 N39 a/b	Fractions-and-percentages-of-amounts
AF6	Geometry	Draw 2-D shapes using given dimensions and angles	Use conventional terms and notations: points, lines, vertices, edges, planes, parallel lines, perpendicular lines, right angles, polygons, regular polygons and polygons with reflection and/or rotation symmetries	Apply the properties of angles at a point, angles at a point on a straight line, vertically opposite angles	Derive and use the sum of angles in a triangle (e.g. to deduce and use the angle sum in any polygon, and to derive properties of regular polygons)	G10 a/b/c G13 G16 G17 G18	Constructing--Measuring-and-using-geometric-notation
			Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles				Geometric-Reasoning
AF7	Four Operations inc. problem solving	Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication	Apply the four operations, including formal written methods, to integers, decimals and simple fractions (proper and improper), and mixed numbers	Apply the four operations, including formal written methods, to integers, decimals and simple fractions (proper and improper), and mixed numbers – all both positive and negative	Recognise and use relationships between operations, including inverse operations (e.g. cancellation to simplify calculations and expressions	N3 N4 N5 N6 N13 N14 N15 N16	Solving-problems-with-addition-and-subtraction
		Divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context			Estimate answers; check calculations using approximation and estimation, including answers obtained using technology		Solving-problems-with-multiplication-and-division

AF8	Directed Number	Use negative numbers in context, and calculate intervals across zero	Use the four operations, including formal and written methods, applied to integers, both positive and negative Substitute numerical values into formulae and expressions, including scientific formulae	Understand and use the concepts and vocabulary of expressions, equations, inequalites, terms and factors	Confidently simplify and manipulate algebraic expressions to maintail equivalence	N19	Operations-with-directed-numbers
AF9	Fractions	Compare and order fractions Use the symbols =, <, > with positive integers, decimals and fractions	Move freely between different numerical, grphical and diagrammatic representations (for example, equivalent fractions, fractions and decimals) Express one quantity as a fraction of another, where the fraction is less than 1 and greater than 1	Use the four operations, including formal and written methods, applied to integers, decimals, proper and improper fractions, and mixed numbers, all both positive and negative	Work interchangeably with terminating decimals and their corresponding fractions (such as 3.5 and 7/2 or 0.375 or 3/8)	N23 N33 N35 N36 N37 N41 N42	Addition-and-subtraction-of-fractions
AF10	Sets and Probability	Interpret and construct tables, charts, diagrams, i Use Venn diagrams to identify common factors, common multiples, highest common factor and lowest common multiple	Record, describe and analyse the frequency of outcomes of simple probability experiments involving randomness, fairness, equally and unequally likely outcomes, using appropriate language and the 0-1 probability scale Enumerate sets, unions/intersections of sets systematically, using tables, grids and Venn diagrams	Generate theoretical sample spaces for single and combined events with equally likely and mutually exclusive outcomes and use these to calculate theoretical probabilities	Understand the infinite nature of the sets of integers, real and rational numbers Record, describe and analyse the frequency of outcomes of probability exeriments using tables and frequency trees	P1 P2 P3 P5 P7	Sets-and-Probability
AF11	Prime and Proof	Use Venn diagrams to identify common factors, common multiples, highest common factor and lowest common multiple	Use the concepts and vocabulary of prime numbers, factors (or divisors), multiples, common factors, common multiples, HCF, LCM, prime factorisation, including product notation.	Use integer powers and associated real roots (square, cube and higher), recognise powers of 2,3,4 & 5	Make and test conjectures about patterns and relationships; look for proofs or counterexamples. Begin to reason deductively in number and algebra	N30	Prime-numbers-and-proof

AF12	**Number Sense**	Select and use appropriate calculation strategies to solve incresingly complex problems using fractional thinking	Consolidate numerical and mathematical capability form key stage 2 and extend their understanding of the number system and place value to include decimals, fractions, powers and roots	Select and use appropriate calculation strategies to solve increasingly complex problems	Begin to reason deductively in number and algebra	N22	Number-Sense