Hampshire Services
HIAS SCHOOL IMPROVEMENT

HIAS Maths Team

Year 7 Autumn Term 2020 Scheme of Learning

An outline plan designed to take account of the national school closures between March 2020 and June 2020.

May 2020
Final version

Hampshire County Council

Introduction

This learning schedule is based on the Hampshire Mathematics Scheme of Learning and is designed to take account of the national school closures between March 2020 and July 2020. Learners will begin a new academic year in need of catch-up and consolidation, together with some new learning from the previous academic year that has been missed. This document focusses on the core skills , knowledge and understanding that an 'on-track' learner would be expected to bring to the next stage of their learning and acknowledges that, for many, the habits of learning and the facility to recall previously embedded knowledge will need attention. For this reason, the first elements of this Autumn Term plan address the end of year objectives from the previous year. As the term progresses, the plan seeks to integrate expected prior learning, previously assumed and now no longer can be, into the standard units from the original scheme. In this way, the aim is to build on what is known and recalled in a moderately accelerated way to help learners get back on track for the end of the 20/21 academic year.

Teachers will need to adapt this schedule to the needs of their learners and to the number of hours study allocated in the timetable to mathematics.

The Hampshire Mathematics team full scheme of learning for KS3 (Y7-Y9) offers long and medium-term maps plus linked units of work with key tasks and teaching points. This is available to schools subscribing to Moodle Plus (for further information, please click here).

Year 7

Week commencing	Unit	Area of study	Objectives	Key teaching points/ facts focus/ 'Big Ideas'
Thurs 03-09-2020	**START OF NEW ACADEMIC YEAR**			
Mon 07-09-2020	**6.10** **6.14** **6.15**	**Arithmetic (four rules): whole numbers -secure and revisit formal and informal methods**	**Solve problems involving addition, subtraction, multiplication and division, deciding which operations and methods to use and why** **Use knowledge of the order of operations to carry out calculations involving the four operations** **Identify common factors, common multiples and prime numbers.**	**Revisit and embed informal strategies for addition and subtraction using complements to 10,100,1000.** *Use number-lines as a visual consolidation* **Revisit multiplication tables and associated facts** *Use arrays and bar models as visual consolidation to support transition from Y6 to Y7* **Model formal methods** *with models and images to remind learners of how and why a method works.*
Mon 14-09-2020	**6.15** **6.17** **6.18**	**Negative numbers** **Arithmetic (four rules): Decimals – secure and revisit formal and informal methods in context (measure)**	**Use negative numbers in context and calculate intervals across zero** **Solve problems involving the calculation and conversion units of measure (g/kg; ml/l) using decimal notation up to three decimal places**	**Number-line work bridging zero** **Problem solving in context** *(e.g. Temperature graphs)* **Review informal methods for working with decimals in context** *e.g. use of complements to 1 and number-lines as a visual*

				Model formal methods with decimals *with models and images to remind learners of how and why a method works* **Revisit and embed key conversion facts for measure and link to powers of 10 in context.**
Mon 21-09-2020	**6.16** **6.19**	**Fractions: equivalence and arithmetic** **Percentages: equivalence and calculation**	**Add and subtract fractions with different denominators and mixed numbers using the concept of equivalent fractions** **Multiply simple pairs of proper fractions (show on an array), writing the answer in its simplest form e.g. ¼ x ½ = 1/8** **Divide proper fractions by whole numbers e.g. 1/3 ÷ 2 = 1/6** **Solve problems involving the calculation of percentages, e.g. 15% of 360**	**Ensure times tables and division facts are secure.** **Ensure multiples and factors are understood and can be independently generated** *Use arrays and bar models to support learners who are not yet secure* **Generate equivalent fractions and explore the multiplicative connection between the denominator and the numerator** *(for all halves, the numerator is half the denominator)* **so that learners do not need to rely on patterning to generate equivalences.** **Solve problems in context and model how and why a procedure works.** *(e.g. one third divided by two is the same as half of one third ~ use a bar model to see that this is one sixth rather than relying on a procedure)*.

				Link percentages to fractions with a denominator of 100 as well as division by 10 and 100 *(15 hundredths of three hundred and sixty)* **Use visual models and images such as number-lines and bar models to secure conceptual understanding**
Mon 28-09-2020	**6.11**	**Geometry: position and direction**	**Compare and classify geometric shapes based on their properties and sizes and find unknown angles.** **Describe positions on the full coordinate grid (all four quadrants)** **Draw and translate simple shapes on a coordinate plane and reflect them in the axes.**	**Use all four quadrants on the coordinate plane to explore properties of 2-D shape and simple transformations (translations and reflections only)** **Use Venn diagrams and Carroll diagrams to classify shapes (2-D and 3-D)** **Revise missing angle problems around a point, on a straight line, in a triangle and in a quadrilateral.** **Ensure that 'parallel' and 'perpendicular' are secure**
Mon 05-10-2020	**7.1**	**Algebra: notation and simplifying**	**Use and interpret algebraic notation including: ab in place of a x b, 3y in place of y + y + y and 3 x y, a2 in place of a x a, a3 in place of a x a x a, a2 b in place of a x a x b, a/b in place of a ÷ b and the correct use of brackets.** **Understand and use the concepts and vocabulary of**	**Y6:** **Express missing number problems algebraically** **Y7:** **Revise and link to the laws of arithmetic and how they apply to algebraic conventions: Commutative, distributive and associative laws linked to 'BIDMAS'.**

			expressions, equations, inequalities, terms and factors. **Simplify and manipulate algebraic expressions to maintain equivalence by collecting like terms and multiplying a single term over a bracket.**	
Mon 12-10-2020	**7.1**	**Algebra: Sequences**	**Y6:** **Generate and describe linear sequences** **Y7:** **Recognise arithmetic sequences** **Generate terms of a sequence from a term-to-term rule** **Introduce position-to-term rules for simple arithmetic sequences, linked to multiplication tables**	**Identify multiples and factors** **Be able to step count from any number.** **Recognise an arithmetic sequence is a linear progression.** **Develop the idea of the nth term**
Mon 19-10-2020	**7.2**	**Number and PV, including rounding and approximation**	**Y6:** **Use estimation to check answers to calculations and determine, in the context of a**	**Work with basic and more complex calculations that require an estimate before calculating. Develop a sense of magnitude. (***About how much*

			problem, an appropriate degree of accuracy. **Round any whole number to a required degree of accuracy** **Identify the value of each digit to three decimal places and multiply and divide numbers by 10,100 and 1000 where the answers are up to three decimal places.** **Y7:** **Identify digits by their place value and develop a sense of number, particularly the 'size', or magnitude of number when calculating.** **Understand the significance of digits in a number when considering place value and use this to round and estimate the outcome of calculations.**	*are we expecting? What would be a reasonable estimate and why?)* **Contextual problems that require rounding in different ways to make sense of an answer.** **Powers of ten and how they link to rounding** **Powers of ten and how the magnitude of the largest digit is the most significant, followed by the others in descending order of powers of 10.**
Mon 26-10-2020	**HALF TERM**			

Mon 02-11-2020	**7.2**	**All four rules of arithmetic with integers and fractions**	**Use the four operations, including formal written methods, applied to integers and decimals** **Associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375 = 3/8)** **Recognise and use relationships between operations, including inverse operations** **Use the symbols = , ≠ , > , < , ≤, ≥, ≈**	**Laws of arithmetic and how they apply to integers and decimal numbers.** **Commutative, distributive and associative laws linked to 'BIDMAS'.** **Use of informal and formal written methods when calculating with integers and decimals. Know and use a range of symbols that denote equality and inequality.**
Mon 09-11-2020	**7.3**	**Geometry: Perimeters**	**Calculate and solve problems involving the perimeters of 2-D shapes**	**Ensure that learners know that the perimeter is the distance around the edge of a closed 2-D shape (Y6). This can be measured and described using standard and non-standard units of length. Examples of standard units include cm, m, miles and examples of non-standard units include 'number of matchsticks or rods required to surround the shape'.**
Mon 16-11-2020	**7.3**	**Geometry: Perimeters and formulae**	**Y6:** **Use simple formulae** **Recognise when it is possible to use formulae for area and volume of shapes**	**Ensure that learners know that the area is the amount of space inside a closed 2-D shape (Y6). This can be measured and described using standard and non-standard units of length. Examples of standard units include mm^2 , cm^2 , m^2 , km^2 and examples of non-standard units are 'counting squares' or other congruent shapes within the outer perimeter.**

			Y7: **Derive and apply formulae to calculate and solve problems involving perimeter and area of triangles, parallelograms and trapezia**	**The relationship between side lengths that defines the area of the shape can be described in a formula. This formula is an efficient and generalised way to calculate different areas.**
Mon 23-11-2020	**7.4**	**Ratio and Proportion: Fractional quantities**	**Express one quantity as a fraction of another, where the fraction is less than 1 and greater than 1** **Develop and formalise knowledge of ratio and proportion**	**Proportional relationships can be shown in a variety of ways such as bar model, on a number-line, by division, as a proper or improper fraction, as a proportion of an amount** **When writing one quantity as a fraction of another, the units must be the same. If they are different, you must convert units so that they are the same**
Mon 30-11-2020	**7.4**	**Calculation: Calculators, ordering and the order of operations**	**Use conventional notation for the priority of operations, including brackets** **Use a calculator and other technologies to calculate results accurately and then interpret them appropriately** **Order positive and negative integers, decimals and fractions** **Use the number-line as a model for the ordering of real numbers**	**Proper fractions can be expressed as decimal fractions and vice versa. Decimals are often useful for comparing fractional amounts. e.g. which is larger 2 3 or 7 10 can be expressed as 0.66666… and 0.7** **Negative numbers get smaller the further from zero they are, and positive numbers get larger. e.g. -23 is smaller than -1** **The convention for the order of operations is Brackets / Order (or Index) / Multiplication and Division (either order) / Addition and Subtraction (either order)**

Mon 07-12-2020	**7.5**	**Ratio and proportion: Conversion between standard units**	**Begin to reason deductively about proportionality** **Change freely between related standard units (for example, time, length, area, volume, capacity**	**Learners should be fluent with conversion facts:** **10mm=1cm;100cm=1m; 1000m=1km** **$1m^2 = (100)^2cm^2 = 10\ 000\ cm^2$** **1000ml=1litre** **$1ml = 1cm^3$** **$1m^3 = (100)^3cm^3 = 1\ 000\ 000\ cm^3$** **1000g = 1kg** **60 seconds= 1minute; 60 minutes= 1 hour etc.** **5 miles = 8 km** **Learners should develop the use of conversion graphs for such things as currency conversions .**
Mon 14-12-2020	**7.5**	**Factors, multiples and indices**	**Use the concepts and vocabulary of prime numbers, factors (divisors), multiples, common factors, common multiples, highest common factor and lowest common multiple** **Use integer powers and associated real roots (square, cube and higher), recognise powers of 2,3,4,5**	**A factor is a whole number which divides exactly into a whole number, leaving no remainder.** **A prime number has exactly two factors, 1 and itself. For example, 13 is a prime number because the only factors of 13 are 1 and 13. The number 8 is not prime because it has four factors: 1, 2, 4 and 8.** **A multiple is the product of multiplying two factors together (integers)** **The multiplicand is the size of the group and the multiplier is the number of groups, bother are factors and produce a product or multiple when multiplied together.**

				Arrays are the structural model for multiplication and division. **Number-lines and bar-models show us repeated addition to support arrays. When the multiplicand and the multiplier are the same, the product is a square number and produces a square array.** **When we multiply two numbers together, the product describes the area of a rectangle. When we multiply three numbers together, the product describes the volume of a cuboid. When these three numbers are equal, the product describes the volume of a cube and is a cube number.** **We can multiply any number of factors together to obtain a product. When all those factors are the same, we can write the product as an actual number or in terms of the factor in its index form e.g. 3 x 3 x 3 x 3 = 34 or 81.** **Roots are the inverse of squaring, cubing etc a number.** **For 7^2 = 7 x 7 = 49; the index is 2 and the root is 7. So the square root of 49 is 7. This can be written as $\sqrt{49} = 7$ (because $\sqrt{49} = \sqrt{(7x7)} = \sqrt{7} \times \sqrt{7} = 7$)**

				For 7^3 = 7 x 7 x 7 = 343; the index is 3 and the root is 7. So the cubed root of 343 is 7. This can be written as $\sqrt[3]{49} = 343$ **LCM: The least number which is exactly divisible by each of the given numbers is called the least common multiple of those numbers. E.g. The LCM of 3,31 and 62 = 186 (2 x 3 x 31)** **HCF: The largest number that divides two or more numbers is the highest common factor (HCF) for those numbers. E.g. The HCF of 30, 36, 42 and 45 is 3.**
Mon 21-12-2020	**CHRISTMAS**			

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