Year 7 – Unit Intent All students to improve mathematical knowledge by developing their understanding of mathematical concepts, key words, command verbs, mathematical notation, interpreting mathematical information and use effective methods to solve mathematical problems.

**Please note each cluster of lessons according to ability, feed forward to the next lesson intent. If students complete set clusters, extension activities follow.**

| Autumn Term 1 Topic | Group A | Group B | Group C |
|---|---|---|---|
| Number 1 | 1-17 | 1-16 | |
| Number 2 | 1-21 | 1-17 | |
| Handling Data 1 | 1-11 | 1-9 | |

**Number 1: Group A feeds forward to Autumn 2- decimals, fractions and percentages and all of the topics by developing and securing basic number and calculation skills required to be embedded and strengthened in order to be fluent in calculation skills in all areas of maths.**

| Autumn Term 2 Topic | Group A | Group B | Group C |
|---|---|---|---|
| Algebra 1 | 1-10 | 1-9 | |
| Shape, Space and Measures 1 | 1-9 | 1-7 | |
| Algebra 2 | 1-6 | 1-6 | |

| Spring Term 1 Topic | Group A | Group B | Group C |
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| Shape Space and Measures 2 | 1-16 | 1-12 | |
| Algebra 3 | 1-12 | 1-12 | |
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| Spring Term 2 Topic | Group A | Group B | Group C |
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| Shape, Space and Measures 3 | 1-8 | 1-8 | |
| Shape, Space and Measures 4 | 1-8 | 1-8 | |
| Number 3 | 1-12 | 1-12 | |

| Term | Lesson Intent and Knowledge | Vocabulary / Daily Retrieval | Activities/Asse ssment | Hwk/Litera cy Map |
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| Autumn 1 - Number<br>10 lessons | 1. To know how to add using column method – integers.<br>2. To know how to subtract using column method – integers.<br>3. To know how to multiply integers (and by 10, 100, 1000).<br>4. To know how to divide by 10, 100, 1000.<br>5. To know how to use all 4 non calc and calc operations with integers in worded applications.<br>6. To know how to use BIDMAS (order of operations).<br>7. To know how to understand = and identity.<br>8. To know how to order positive and negative integers<br>9. To know how to round to units, 10s, 100s, 1000s.<br>10. To know how to recognise square and cube numbers.<br>11. To know how to recognise factors and multiples of integers.<br>12. To know how to round to decimal places and significant figures AND understand truncation. | Do it now activities based on prior learning, checking for knowledge.<br><br>**Keywords**<br>**Integer**<br>**Square**<br>**Cube**<br>**Factor**<br>**Truncate**<br>**Estimate**<br>**Multiple**<br>**Square root**<br>**Cube root**<br>**Index** | Activelearn, worksheet based activities, Numeracy Ninja booklets.<br><br>Assessment completed at the end of the term. | Hegarty Maths tasks or TT Rockstars<br><br>Learning of key words /times tables and formulae |

| | | Standard Form Sum Product | | |
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| | 13. To know how to estimate numbers.<br>14. To know how to square root and cube root numbers.<br>15. To know how to understand Index notation (particularly for square roots and cube roots) NOT ALGEBRAIC. **Feeds forward to Autumn topic 2 Standard Form as students will know how to add, multiply, subtract and divide powers to support their learning.**<br>16. To know how to calculate with numbers in standard form with applications.<br>17. To know how to recognise integers which satisfy inequalities.<br>18. To know how to use index notation including fractional indices.<br>19. To know how to estimate powers and roots of any given number.<br>20. To know how to recognise surds.<br>21. To understand and recognise negative indices.<br>22. To know how to understand negative fractional indices<br>23. To know how to calculate upper and lower bounds including error intervals.<br>24. To know how to recognise, understand and calculate with surds.<br>25. To know how to rationalise the denominator.<br>**Feeds forward to Autumn topic 2, Number 2 and Autumn Term 1 in Year 8, Year 9 and GCSE Unit 1 covered in Years 10 and 11.** | | | |
| A1 Number 2<br>10 lessons | 1. To know how to compare fractions and percentages (using 100 square grid).<br>2. To know how to write equivalent fractions and decimals of 1%, 10%, 25%, and 50%.<br>3. To know how to express one quantity as a percentage of another (including less than 1 and greater than 1.<br>4. To know how to compare 2 quantities using percentages.<br>5. To know how to find percentage increase and decrease.<br>6. To know how to work with percentages greater than 100.<br>7. To know how to read and interpret mixed and improper fractions.<br>8. To know how to multiply fractions (including mixed numbers). | Do it now activities based on prior learning, checking for knowledge.<br><br>**Keywords**<br>**Fraction**<br>**Percentage**<br>**Decimal** | Activelearn, worksheet based activities, Numeracy Ninja booklets.<br><br>Assessment completed at the end of the term. | Hegarty Maths tasks or TT Rockstars<br><br>Learning of key words /times tables and formulae |

| | | Numerator |
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| | 9. To know how to divide fractions (including mixed numbers) (including cancelling). | **Numerator** |
| | 10. To know how to add and subtract fractions (same denominator or simply equivalence. | **Denominator** |
| | 11. To know how to add and subtract fractions with different denominators. | **Equivalent** |
| | 12. To know how to add with decimals. | **Terminating** |
| | 13. To know how to subtract with decimals. | **Compound** |
| | 14. To know how to multiply decimals. | **Simple** |
| | 15. To know how to divide decimals. | **Recurring** |

9. To know how to divide fractions (including mixed numbers) (including cancelling).
10. To know how to add and subtract fractions (same denominator or simply equivalence.
11. To know how to add and subtract fractions with different denominators.
12. To know how to add with decimals.
13. To know how to subtract with decimals.
14. To know how to multiply decimals.
15. To know how to divide decimals.
16. To know how to write equivalent fractions and decimals (terminating decimals and corresponding fractions e.g. 3.5 and 7/2, 0.375 and 3/8).
17. To know how to reverse percentage problems.
18. To know to how to use simple interest in financial maths (problem solving.
19. To know how to set up growth and decay problems (including compound interest) - relate to indices.
20. To know how to solve growth and decay problems (including compound interest) - relate to indices.
21. To know how to interpret growth and decay problems (including compound interest) - relate to indices.
22. To know how to convert recurring decimals to fractions where only one number is recurring.
23. To know how to change recurring decimals into their corresponding fractions and vice versa.

**This unit feeds forward to topic 3 in Autumn 1 as students are able to access knowledge learnt on adding, subtracting and multiplying fractions, when answering questions on probability.**

**Feeds forward to Autumn Term 1 in Year 8, Year 9 and GCSE Unit 1 covered in Years 10 and 11.**

**Numerator**
**Denominator**
**Equivalent**
**Terminating**
**Compound**
**Simple**
**Recurring**

| A1 handling Data 1 8 lessons | 1. To know how to use a probability scale using words.<br><br>2. To know how to use a probability scale using basic fractions/decimals (0,0.25, 0.5, 0.75,1).<br><br>3. To know how to describe and understand outcomes of simple experiments e.g. rolling a dice and flipping a coin.<br><br>4. To know how to conduct, record and analyse experiments.<br>5. To know how to read and interpret expected frequency and calculate outcomes of multiple future experiments.<br>6. To know how to list all possible outcomes using a variety of strategies (list, sample space, Venn diagrams, two-way tables).<br>7. To know how to apply knowledge that all probabilities of an exhaustive/mutually exclusive set of outcomes sum to one.<br>8. To know how to calculate theoretical probabilities using tables, grids, Venn diagrams and sample spaces.<br><br>9. To know that the more frequently an experiment is done the closer the results will tend towards the theoretical probabilities.<br><br>10. To know how to draw tree diagrams.<br><br>11. To know how to use the tree diagrams to calculate the probability of independent and dependent combined events. | Do it now activities based on prior learning, checking for knowledge.<br><br>**Keywords**<br>**Probability**<br>**Scale**<br>**Experiment**<br>**Sample space**<br>**Venn diagram**<br>**Exhaustive**<br>**Mutually exclusive**<br>**Tree diagram** | Activelearn, worksheet based activities, Numeracy Ninja booklets.<br><br>Assessment completed at the end of the term. | Hegarty Maths tasks or TT Rockstars<br><br>Learning of key words /times tables and formulae |

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| | 12. To know how to use the product rule for counting strategies.<br>13. To know how to use conditional probability with two-way tables, tree diagrams and Venn diagrams.<br><span style="color:purple">This feeds on from Term 1, Number 2, Fractions, decimals and percentages, students knowing equivalent fractions, decimals and percentages and also how to add, subtract and multiply fractions.</span><br>**<span style="color:green">Feeds forward to Autumn Term 1 topic 3, Handling Data 1 in Year 8, Year 9 and GCSE Unit 1 covered in Years 10 and 11.</span>** | | | |
| <u>A2</u><br><u>10 lessons</u> | 1. To know how to read and interpret the use of letters.<br>2. To know how to use algebraic notation including: ab in place of a × b, 3y in place of y + y + y and 3 × y, $a^2$ in place of a × a, $a^3$ in place of a × a × a, $a^2b$ in place of a × a × b, a/b in place of a ÷ b.<br>3. To know how to use and understand vocabulary within expressions, equations, formulae, identities inequalities, terms and factors.<br>4. To know how to collect like terms.<br><br>5. To know how to multiply a single term over a bracket.<br>6. To know how to take out common factors. **<span style="color:purple">This feeds on from Autumn 1, Number 1, factors of numbers.</span>**<br>7. To know how to multiply two bracke and 3 binomials.<br>8. To know the laws of indices.<br>9. To know how to factorise quadratic expressions.<br>10. To know how to factorise quadratic expressions with a not equal 1.<br>11. To know how to solve the difference of squares.<br><br>12. To know the laws of indices - fractional and negative indices. | Do it now activities based on prior learning, checking for knowledge.<br><br>**Keywords**<br>**Variable**<br>**Term**<br>**Expression**<br>**Equation**<br>**Identity**<br>**Formulae**<br>**Identity**<br>**Factor** | Activelearn, worksheet based activities, Numeracy Ninja booklets.<br><br>Assessment completed at the end of the term. | Hegarty Maths tasks or TT Rockstars<br><br>Learning of key words /times tables and formulae |

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| | 13. To know how to simplify algebraic fractions.<br>14. To know the difference between an equation and identity.<br>15. To know how to argue mathematically to show algebraic expressions are equivalent.<br>16. To know how to use algebra to support and construct arguments.<br>17. To know how to use algebra to construct and support proofs.<br><br>**This unit feeds on from Autumn Term 1 Number 1 – indices and its application to algebra.**<br><br>**Feeds forward to Autumn Term 2, topic 3, Algebra 2, by ensuring students are clear about algebraic notation and know what the terms mean and it feeds into Autumn Term 2 topic 1, Algebra 1 in Year 8, Year 9 and GCSE Unit 1 covered in Years 10 and 11.** | | | |
| A2<br>10 lessons | 1. To know how to identify and interpret rotational symmetry.<br>2. To know how to identify and describe lines of symmetry.<br>3. To know how to complete reflection given a mirror line.<br>4. To know how to translate a shape given a worded description.<br>5. To know how to enlarge a shape without a point of origin.<br>6. To know how to rotate a shape given a point of origin.<br>7. To know how to translate a shape with vectors.<br>8. To know how to reflect on a graph with linear lines. | Do it now activities based on prior learning, checking for knowledge.<br><br>**Keywords**<br>**Symmetry** | Activelearn, worksheet based activities, Numeracy Ninja booklets.<br><br>Assessment completed at | Hegarty Maths tasks or TT Rockstars<br><br>Learning of key words /times |

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| | 9. To know how to enlarge from a point including fractional enlargement.<br>10. To know how to describe transformations.<br>11. To know how to identify and describe congruence and invariant points.<br>12. To know how to complete negative enlargement.<br>13. To know how to identify similar shapes with triangles.<br><br>14. To know how to identify Similar shapes involving area and volume.<br>15. To know how to describe combinations of transformations<br>**Feeds forward to Autumn Term 2 topic 2, Shape, Space and Measures 1 in Year 8, Year 9 and GCSE Unit 1 covered in Years 10 and 11.** | **Origin**<br>**Enlargement**<br>**Reflection**<br>**Rotation**<br>**Translation**<br>**Congruence**<br>**Congruent**<br>**Similar** | the end of the term. | tables and formulae |
| <u>A2</u><br><u>6 lessons</u> | 1. To understand notation of expressions with relation to BIDMAS e.g. 3a + b.<br><br>2. To know how to substitute positive numbers into simple expressions.<br>3. To know how to understand and use vocabulary related to expressions, equations, formulae.<br>4. To know how to substitute numbers (including negative) in formulae.<br><br>5. To know how to substitute into standard mathematical expressions.<br>6. To know how to identify and describe the difference between an equation and identity. | Do it now activities based on prior learning, checking for knowledge.<br><br>**Keywords**<br><br>**Equation**<br>**Identity**<br>**Substitute**<br>**Formulae**<br>**Formula** | Activelearn, worksheet based activities, Numeracy Ninja booklets.<br><br>Assessment completed at the end of the term. | Hegarty Maths tasks or TT Rockstars<br><br>Learning of key words /times tables and formulae |

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| | **Feeds forward to Spring 1, topic 1, Shape, space and measures 2, where students use formulae for shapes and are able to substitute into formulas easily to reduce cognitive load. Also feeds forward to Autumn Term 1 topic 3, Algebra 2 in Year 8, Year 9 and GCSE Unit 1 covered in Years 10 and 11.** | | | |
| Spring Term 1 Topic 1 10 lessons | 1. To know how to work out area by counting squares. 2. To know how to work the perimeter by counting squares. 3. To know to work out the area and perimeter of rectangles. 4. To know how to work out the area of compound shapes (two rectangles). 5. To know how to apply and use the formula for area of a parallelogram and a triangle. 6. To know how to apply and use the formula for area of a trapezium. 7. To know how to find the perimeter of a circle – to know the formula and calculate. 8. To know to find the area of a circle –to know the formula and calculate. **This feeds forward to Spring 1, Topic 1.** 9. To know how to find the area of more complicated compound shapes (including circles and triangles etc). <br><br> 10. To know how to find the volume of cube and cuboid. 11. To know how to apply the formula for volume of prisms inc. cylinder. 12. To know to find missing lengths, given perimeter. 13. To know how to find missing lengths given area or volume. 14. To know how to find the perimeter and area of semicircles, quarter circles etc. <br><br> • To know how to calculate arc lengths. • To know how to calculate areas of sectors. | Do it now activities based on prior learning, checking for knowledge. **Keywords Area Perimeter Compound Radius Diameter volume Prism Arc Cylinder** | Activelearn, worksheet based activities, Numeracy Ninja booklets. Assessment completed at the end of the term. | Hegarty Maths tasks or TT Rockstars Learning of key words /times tables and formulae |

15. To know to find the surfaces area of cubes and cuboids.
16. To know how to find surface area of cylinder and triangular prism.
17. To know how to find the hypotenuse using Pythagoras theorem.
18. To know how to find the shorted side using Pythagoras theorem.
19. To know how to use Trigonometric ratios - sin, cosine and tangent.

20. To know how to use simple trigonometry - finding a side in right angle triangle.
21. To know to use Simple trigonometry - finding an angle in right angle triangle.
22. To know how to use Pythagoras in 3D.
23. To Know exact values for $\sin\theta$, $\cos\theta$, $\tan\theta$ for $\theta$ = 0, 30, 45, 60, 90 (90 not required for $\tan\theta$).
24. To Know and apply formula for surfaces area of sphere, cone, pyramid and composite solids.
25. To know how to use simple trigonometry in 3D.
26. To know how to use Pythagoras' Theorem and trigonometric ratios in similar triangles to solve problems involving right-angled triangles.
27. To Know and apply Area of a triangle 0.5absinC to calculate area, sides and angles.
28. To Know how to use and apply the sine rule.
29. To Know how to use apply the cosine rule.

**Feeds on from Autumn 2, Topic 3, 'Substituting into a Formula', where students learnt how to substitute numbers into a formula.**

**Feeds forward to Spring 1 (Year 8) - 'Shapes, Space and Measures 2, where students will deepen their understanding of concepts taught.**
**Feeds forward to Spring 1 (Years 7, 8 and 9 + GCSE), Topic 2 – 'Algebra 3' – where students use their knowledge of area and volume to be able to help them solve equations.**

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| Spring Term Topic 2 10 lessons | 1. To know how to use and understand the equal sign.<br><br>2. To know how to solve equations with one step addition and subtraction.<br>3. To know how solve equations with one step multiplication and division ONLY.<br>4. To know how to solve equations with two step combination of addition, subtraction and multiplication.<br>5. To know how to solve equations with two step combination of addition, subtraction and division. | Do it now activities based on prior learning, checking for knowledge.<br>**Keywords**<br>**Solve**<br>**Equation**<br>**Variable**<br>**Equals**<br>**Brackets** | Activelearn, worksheet based activities, Numeracy Ninja booklets.<br><br>Assessment completed at the end of the term. | Hegarty Maths tasks or TT Rockstars<br><br>Learning of key words /times tables and formulae |

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| | 6. To know to solve equations with one unknown involving brackets.<br>7. To know to find approximate solutions using a graph.<br><br>8. To know how to derive and apply formulae to calculate and solve problems involving: perimeter and area of triangles, parallelograms, trapezia and volume of prisms.<br><br>9. To know how to solve linear equations with the unknowns on both sides.<br><br>10. To know solve linear equations with the unknown on both sides and brackets on one and both sides.<br>• To know how to rearrange the formula/change the subject (linear).<br>• To know to rearrange the formula/change the subject (brackets).<br>• To know how to rearrange the formula/change the subject with roots and indices.<br><br>• To know how to rearrange when the variable is given twice (including factorising).<br><br>11. To know how to solve linear inequalities in one variable.<br><br>12. To know how to represent the solution set of inequalities on a number line Inequalities on a number line (including 'or equal to').<br>13. To know how to solve two linear equations simultaneously.<br>14. To know how to derive an equation in two variables and solve simultaneously and interpret the results.<br><br>15. To know how to solve quadratic equations by factorising.<br><br>16. To know how to solve quadratic equations (include those which require rearrangement) by factorising.<br>17. To know how to solve linear inequalities in two variables (graphically).<br>18. To know how to solve two simultaneous equations in two variables (linear and quadratic).<br>19. To know how to solve quadratic inequalities in one variable. | **Term**<br>**Expression**<br>**Identity**<br>**Linear**<br>**Formula** | | |

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| | 20. To know how to use linear and quadratic graphs to estimate values of y for given values of x and visa versa. <br><br> 21. To know how to use linear and quadratic graphs to find approximate solutions of simultaneous linear and quadratic equations. <br><br> 22. To know how to find approximate solutions to contextual problems from given graphs of a variety of functions, including price-wise linear, exponential and reciprocal graphs. <br><br> 23. To know how to solve quadratic equations by completing the square and using the quadratic formula. <br> 24. To know how to where appropriate, interpret simple expressions as functions with inputs and outputs; interpret the reverse process as the 'inverse function'; interpret the succession of two functions as a 'composite function'. <br><br> **This feeds on from Autumn 2, Topic 1 – 'Algebra 1' – where students use knowledge learnt in this unit to be able to solve equations accurately.** <br> **This feeds forward to Spring 2, Topic 1 – 'Shapes, Space and Measures 3' – where students apply their knowledge of solving equations in order to solve equations involving area and volume.** | | | |
| **Spring Term 2 Topic 1** <br> **8 lessons** | 1. To know how to name angles. <br> 2. To know how to measure lines. <br> 3. To know how to draw and measure angles. <br> 4. To know how to draw triangles. <br> 5. To know how to draw net. <br> 6. To know to how to draw plans and elevations of 3D shape. <br><br> 7. To know how to interpret maps and scale. <br> 8. To know how to interpret and draw simple bearings. | Do it now activities based on prior learning, checking for knowledge. <br> **Keywords** <br> **Net** <br> **Angle** <br> **Plan** <br> **Elevation** | Activelearn, worksheet based activities, Numeracy Ninja booklets. <br><br> Assessment completed at the end of the term. | Hegarty Maths tasks or TT Rockstars <br><br> Learning of key words /times tables and formulae |

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| | 9. To know how to complete constructions (perpendicular bisector of a line segment, constructing a perpendicular to a given line from/at a given point, bisecting a given angle).<br>10. To know how to draw diagrams from written description including bearings.<br>11. To know how to solve and complete loci problems.<br><br>**This feeds on from Spring 1, Topic 1 – 'Shapes, Space and Measures/Area and Volume' - where students use the knowledge of area and volume to have an understanding of how to draw nets, plans and elevations of 3D shapes.**<br>**This feeds forward to Spring 2 (Years 8, 9 + GCSE), Topic 1 – 'Shapes, Space and Measures/Angles'.**<br>**This feeds forward to Spring 2 – Topic 2 – 'Shapes, Space and Measures/Angles 2'.** | **Scale**<br>**Bearing** | | |
| **Spring Term 2 Topic 2**<br>**8 lessons** | 1. To know how to Properties of 2D shapes.<br>2. To know the properties of 3D objects.<br>3. To know angles on a straight line, around a point and vertically opposite.<br>4. To know angles in a triangle. Include angles in isosceles triangles.<br>5. To know angles in quadrilaterals.<br>6. To know how to find angles between parallel lines.<br><br>7. To know how to find the sum of interior and exterior angles of polygons.<br>8. To know how to find missing angles in irregular polygons include algebraic expressions.<br>9. To know the Circle theorems and be able to identify them<br>10. To know how to construct and support proofs using Circle theorems.<br><br>**This feeds on from Spring 2 (Years 7, 8, 9 + GCSE), Topic 1 – 'Shapes, Space and Measures/Angles') where students apply their knowledge of measuring angles and the drawing of bearings to be able to solve angle problems.**<br>**This feeds forward to Spring 2 (Years 8, 9 and GCSE), Topic 2 – 'Shapes, Space and** | Do it now activities based on prior learning, checking for knowledge.<br>**Keywords**<br>**Isosceles**<br>**Quadrilateral**<br>**Parallel**<br>**Interior**<br>**Exterior**<br>**Regular**<br>**Irregular** | Activelearn, worksheet based activities, Numeracy Ninja booklets.<br><br>Assessment completed at the end of the term. | Hegarty Maths tasks or TT Rockstars<br><br>Learning of key words /times tables and formulae |

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| | **Measures 2'.** | | | |
| **Spring Term 2 Topic 3 6 lessons** | 1. To know odd and even numbers.<br><br>2. To know factors of a number.<br>3. To know multiples of a number.<br>4. To know prime numbers.<br><br>5. To know square and cube numbers.<br><br>6. To know Square & cube roots and triangle numbers.<br><br>7. To know how to use a calculator and other technologies to calculate results accurately and then interpret them appropriately.<br><br>8. To know how to understand the meaning of prime numbers, factors (divisors), multiples, common factors, common multiples, highest common factor, lowest common multiple, prime factorisation, including using product notation and the unique factorisation theorem.<br>9. To know how to calculate HCF.<br>10. To know how to calculate LCM<br><br>11. To know to complete prime factorisation<br>12. To know how to recognise and use sequences of triangular, square and cube numbers.<br><br>**This feeds on from Autumn 1 (Year 7), Topic 1 – 'Number' 1- where students use their knowledge of number to help them strengthen their knowledge of factors, multiples, primes, squares and square roots.**<br>**This feeds forward to Summer 2 (Year 7), Topic 2 – 'Algebra' 4 (Sequences) – where students use their knowledge of square, cube and triangle numbers to develop their knowledge of sequences.** | Do it now activities based on prior learning, checking for knowledge.<br>**Keywords**<br>**Square**<br>**Cube**<br>**Root**<br>**Prime**<br>**Factor**<br>**Multiple**<br>**HCF**<br>**LCM**<br>**Factorisation**<br>**Triangular**<br>**Product** | Activelearn, worksheet based activities, Numeracy Ninja booklets.<br><br>Assessment completed at the end of the term. | Hegarty Maths tasks or TT Rockstars<br><br>Learning of key words /times tables and formulae |

| SM1<br>8 lessons | 1. To know how to use scale factors, scale diagrams and maps (2)<br>2. To know how to simplify ratio (2)<br>3. To know the relations between Ratio vs proportion (3)<br>4. To know how to relate ratios to fractions<br>5. To know how to interpret maps and scale drawings (3)<br>6. To know to express a multiplicative relationship between 2 quantities as a ratio or a fraction (3)<br>7. To know how to divide quantities into ratios (3)<br>8. To know how to apply ratio to real-life context e.g. Conversion, comparison, mixing concentrations, recipes (3)<br>9. To know how to compare lengths using scale factor (3)<br>10. To know how to compare area and volume using scale factor (3)<br>11. To know how to use and identify direct proportion (3)<br>12. To know how to use and identify inverse proportion (3)<br>13. To know how to identify similar shapes (including trig ratios) (5)<br>14. To know how to use algebraic representation of/constructing equations and solving direct proportion (5)<br>15. To know how to use algebraic representation of/constructing equations and solving inverse proportion (5)<br>16. To know how to interpret equations that describe direct and inverse proportion (5)<br>17. To know how to recognise and interpret graphs that illustrate direct and inverse proportion (5)<br>18. To know how to work with general iterative process (6?)<br>19. To know how to interpret the gradient of a straight line graph as a rate of change; recognise and interpret graphs that illustrate direct and inverse proportion<br>20. To know how to use the CAPTURE-RECAPTURE formula. | | | |
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| SM1<br>8 lessons | 1. To know how to tell the time using 12 hour clock - problem solving questions e.g. It is 12 midday and the minute hand moves 90degrees clockwise, what is the time (1?) | | | |

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| | 2. To know how to read simple scales (1?) | | | |
| | 3. To know how to use standard units of measure and related concepts (length, area, volume/capacity, mass, time and money) (2) | | | |
| | • To know how to use standard units of mass, length, time, money and other measures using decimal quantities (2?) | | | |
| | 4. To know how to use standard compound measures (speed, distance, time) (2?) <span style="color:red">include distance time graphs</span> | | | |
| | 5. To know how to change freely between related standard units e.g. Time, length, area, volume/capacity and mass (3) | | | |
| | 6. To know how to change freely between compound units e.g. Speed, rates of pay, prices, density and pressure (3) | | | |
| | 7. To know how to identify and interpret gradients and intercepts of linear functions graphically and algebraically (3) | | | |
| | 8. To know how to add and subtract vectors (4) | | | |
| | 9. To know how to apply multiplication of vectors by a scalar, and diagrammatic and column representations of vectors (5) | | | |
| | 10. To know how to prove that two vectors are parallel (6) | | | |
| | 11. To know how to use vectors to construct geometric arguments and proofs (7) | | | |
| | 12. To know how to calculate or estimate gradients of graphs and areas under graphs (including quadratic and other non-linear graphs), and interpret results in cases such as distance-time graphs, velocity-time graphs and graphs in financial contexts (8) | | | |
| | <span style="color:red">13. To know how to write upper and lower Bounds.</span> | | | |
| <u>Sm2</u><br><u>10 lessons</u> | 1. To how to read and interpret pictograms (1) | | | |
| | 2. To know how to read and interpret tally tables(1) | | | |
| | 3. To know how to identify simple scatter graphs relationships (2) | | | |
| | 4. To know how to construct bar charts, frequency tables grouped and ungrouped (2) | | | |

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| | 5. To know how to calculate mean, mode and median range (2)<br><br>6. To know how to apply statistics to describe a population including frequency table (3)<br><br>7. To know how to compare data sets (averages and spread) (3)<br><br>8. To know how to construct and interpret appropriate tables, charts, and diagrams, including frequency tables, bar charts, pie charts, and pictograms for categorical data, and vertical line (or bar) charts for ungrouped and grouped numerical data (3)<br><br>9. To know how to construct and plot data on scatter graph - using for estimation (3)<br><br>10. To know how to calculate mean, mode and median range for grouped data (4)<br>11. To know how to sample data(4)<br>• To know how to use the Capture-recapture formula<br><br>12. To know how to construct tables and line graphs for time series data (5)<br>13. To know how to interpret, analyse and compare the distributions of data using box plots (6)<br><br>14. To know how to interpret, analyse and compare the distributions of data using cumulative frequency diagram (7)<br><br>15. To know Interpret, analyse and compare the distributions of data using histograms (7)<br><br><span style="color:red">16. To know how to interpret the gradient at a point on a curve as the instantaneous rate of change; apply the concepts of average and instantaneous rate of change (gradients of chords and tangents) in numerical, algebraic and graphical contexts (8) (to be covered in Summer 2) Not sure what that means</span> | | | |
| <u>Sm2</u><br><u>10 lessons</u> | 1. To know how to use and read a timetable (1)<br><br>2. To know how to work with coordinates in one quadrant (1)<br><br>3. To know how to plot simple line equations. Find gradients of line equations.<br><br>4. To know how to find relationships between sequences (2)<br><br>5. To know how to recognise and use sequences of triangular, square and cube numbers, simple arithmetic progressions (3)<br><br>6. To know how to recognise arithmetic sequences and find the nth term (3) | | | |

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7. To know how to generate terms of a sequence from either a term-to-term or a position-to-term rule (3)
8. To know how to work with coordinates in all four quadrants (3)
9. To know how to use and interpret scatter graphs of bivariate data; recognise correlation (3)
10. To know how to plot graphs of equations that correspond to straight-line graphs in the coordinate plane (3)
11. To know how to reduce a given linear equation in two variables to the standard form $y = mx + c$; calculate and interpret gradients and intercepts of graphs of such linear equations numerically, graphically and algebraically (3)
12. To know how to recognise, sketch and interpret graphs of linear functions, quadratic functions (3)
13. To know how to plot and interpret graphs (including reciprocal graphs and exponential graphs) and graphs of non-standard functions in real contexts (3)
14. To know the equation of a circle with centre at the origin, and how to find the equation of a tangent to a circle at a given point (8)
15. To know how to find approximate solutions to problems such as simple kinematic problems involving distance, speed and acceleration (3)
16. To know how to identify and interpret gradients and intercepts of linear functions graphically and algebraically (3)
17. To know how to describe, sketch and draw using conventional terms and notations: points, lines, parallel lines, perpendicular lines, right angles, regular polygons, and other polygons that are reflectively and rotationally symmetric (3)
18. To know how to find approximate solutions to equations numerically using iteration (6?)
19. To know how to recognise geometric sequences and appreciate other sequences that arise (4)
20. To know that correlation does not indicate causation; draw estimated lines of best fit; make predictions; interpolate and extrapolate apparent trends whilst knowing the dangers of so doing (4)

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| | 21. To know how to recognise and use Fibonacci type sequences, quadratic sequences, and simple geometric progressions ( r n where n is an integer, and r is a rational number > 0 (5) ) | | |
| | 22. To know how to find the equation of the line through two given points, or through one point with a given gradient (5) | | |
| | 23. To know how to identify and interpret roots, intercepts, turning points of quadratic functions graphically; deduce roots algebraically (5) | | |
| | 24. To know how to recognise, sketch and interpret graphs of simple cubic functions, the reciprocal function $y = 1/x$ with $x \neq 0$ (5) | | |
| | 25. To know how to plot and interpret graphs (including reciprocal graphs (5) ) | | |
| | 26. To know how to use the form $y = mx + c$ to identify parallel lines (5) | | |
| | 27. To know how to deduce expressions to calculate the nth term of quadratic sequences (6) | | |
| | 28. To know how to recognise, sketch and produce graphs of linear and quadratic functions of one variable with appropriate scaling, using equations in x and y and the Cartesian plane (6) | | |
| | 29. To know how to plot and interpret graphs (including exponential graphs (6)) | | |
| | 30. To know how to use the form $y = mx + c$ to identify perpendicular lines (6) | | |
| | 31. To know how to deduce turning points by completing the square (7) | | |
| | 32. To know how to recognise, sketch and interpret graphs of exponential functions = xyk for positive values of k, and the trigonometric functions (with arguments in degrees) $y = \sin x$ , $y = \cos x$ and $y = \tan x$ for angles of any size (7) | | |
| | 33. To know how to recognise and use simple geometric progressions ( r n where n is an integer, and r is a surd) and other sequences (8) | | |
| | 34. To know how to sketch translations and reflections of a given function (8) | | |
| | 35. To know how to calculate or estimate gradients of graphs and areas under graphs (including quadratic and other non-linear graphs), and interpret results in cases such as distance-time graphs, velocity-time graphs and graphs in financial contexts (8) | | |

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| | 36. To know how to interpret the gradient at a point on a curve as the instantaneous rate of change; apply the concepts of average and instantaneous rate of change (gradients of chords and tangents) in numerical, algebraic and graphical contexts (8) | | |