

# 2. CURRICULUM IMPLEMENTATION OVERVIEW PLAN

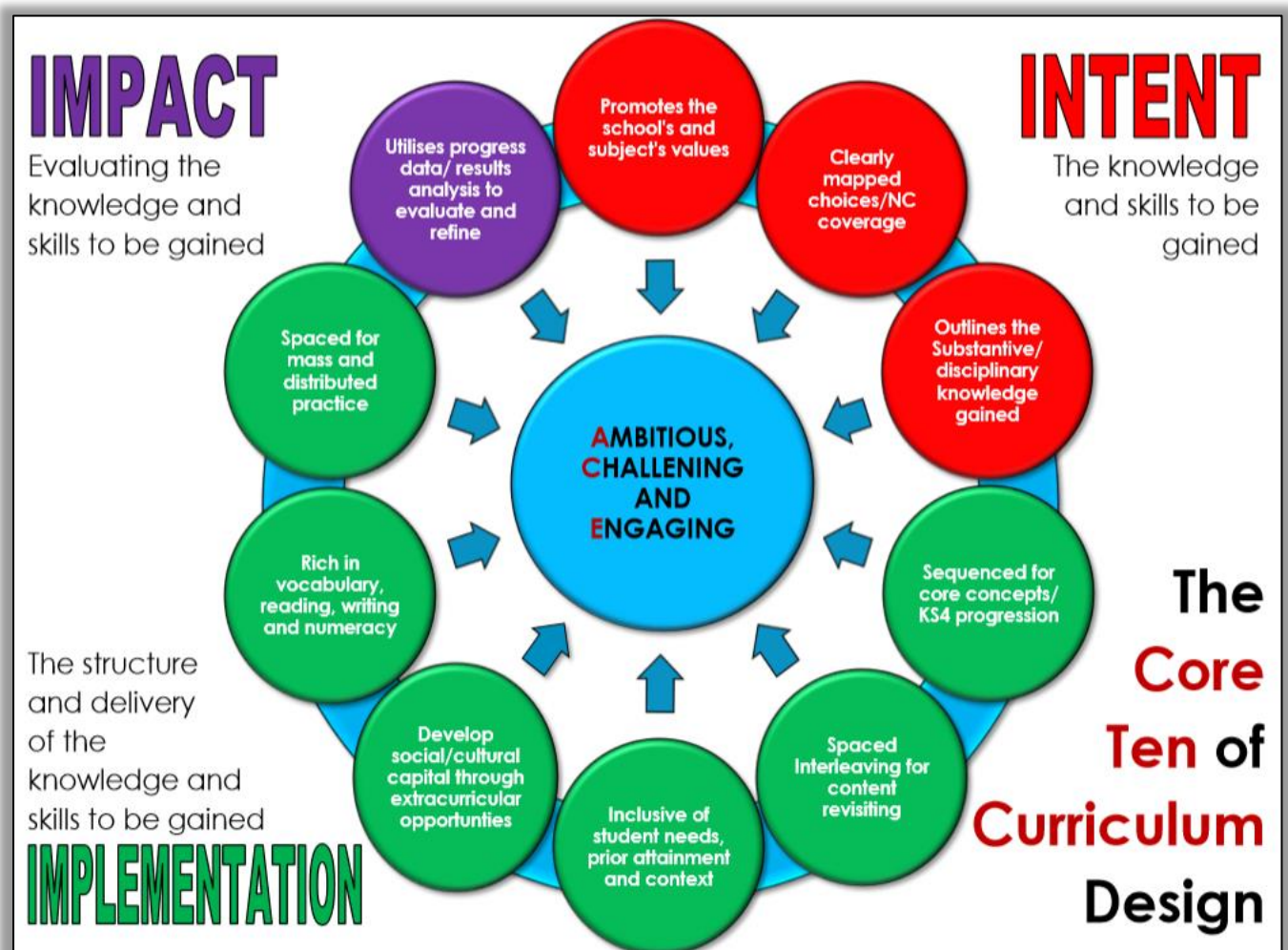
## Key Stage 4

Subject: Mathematics

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Document(s) which inform this Curriculum Implementation are:

1. Curriculum Intent Overview Plan (KS4)

## THINKING PROCESS - CURRICULUM IMPLEMENTATION OVERVIEW PLAN – KS4

### IMPLEMENTATION – SEQUENCING AND PRACTICE

How are your topics sequenced below so as to ensure the following:

- key concepts are ordered and taught, so as to support progression to more challenging material
- content and concepts ordered to support progression from KS3 and to KS5
- topics are spaced between unrelated topics, to allow thinking time; then revisited and furthered
- mass practice (end of topic assessments) are used to evaluate the knowledge and skills gained
- distributed practice (mini assessments) are used where content/topics are reassessed in shortened versions, at later spaced out intervals

YEAR	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6	
10	<b>Unit/Topic</b>	2.1 Estimating Roots (3) 5.1 Expanding Brackets (3) 2.3 Bounds (3) 1.1 <b>SOHCAHTOA</b> (8) 6.1 <b>Proportional Problems</b> (4) 5.2 Factorising (5) 4.1 Transformations (4)	2.2 Index Laws & Surds (6) 14.1 Venn Diagrams (3) 8 Graphical Inequalities (6) 12.1 Recurring Decimals (3) 7 Non-linear Sequences (4) 15.1 <b>Sampling</b> (3) 9.1 <b>Cones, Spheres &amp; Pyramids</b> (6)	5.4 <b>Rearranging</b> (3) 6.2 <b>Compound Measures</b> (3) 11.1 Non-linear Graphs (4) 1.2 <b>Bearings</b> (3) 3.2 Simultaneous Equations (5) 12.2 <b>Compound Interest</b> (3)	11.3 <b>Graphs in Context</b> (3) 14.2 Probability Problems (3) 10.1 Circle Theorems (8) 13.1 Solving Quadratics (4)	4.2 Similar Triangles (3) 15.2 <b>Box Plots</b> (4) 5.3 Algebraic Fractions (4) 9.2 Length, Area, Volume SFs (4) 16.1 Perpendicular Lines (3) 15.3 <b>Cumulative Frequency</b> (5) 13.2 Quadratic Graphs (4)	10.2 Geometric Proof (4) 11.2 Gradients & Rates of Change (5) 17 Vectors (4) 16.2 Circles & Tangents (3) 3.1 Iteration (4)
	<b>Specification/ Assessment Objective</b>	N2, N8, A1, A11, R1, R3, G1, G2, G10, G14,	N3, N4, A1, A15, N6, A4, A16, A17, G8, S1, P4,	A1, A2, A12, R2, R6, G6,	A4, A8, G4, P1, P2, P3	A1, A1, A5, G9, S4, S5,	A9, A10, R4, R5, G15
	<b>Powerful Knowledge</b>	<ul style="list-style-type: none"> <li>• SOHCAHTOA</li> <li>• Proportion (in context)</li> </ul>	<ul style="list-style-type: none"> <li>• Sampling</li> <li>• Volume &amp; surface area of cones, spheres and pyramids</li> </ul>	<ul style="list-style-type: none"> <li>• Rearranging formulae</li> <li>• Speed, Density &amp; Pressure</li> <li>• Bearings</li> </ul>	<ul style="list-style-type: none"> <li>• Contextual graphs</li> </ul>	<ul style="list-style-type: none"> <li>• Box plots</li> <li>• Data analysis &amp; comparisons</li> <li>• Cumulative frequency graphs</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>
	<b>Mass Practice</b>	Exit ticket / topic test completed a <b>minimum</b> of a week after topic completion for all topics (see Appendix A & B). These may be completed in topic pairs to reduce teacher workload. Exit tickets will be used as formative assessment, marked by class teachers and given detailed feedback, with dedicated time for student reflection / improvement. These will not be graded as topics in maths are no longer categorised by grade but will instead be measured against the expected outcomes for a topic.					
	<b>Distributed Practice</b>	Topics are revisited in DNAs on a cycle. Each week there will be at least 1 DNA that takes the form of “last lesson, last week, last month” to encourage recall and revisiting of topics (see Appendix C). In addition to this, topics are often revisited when they link to new topics or when the unit is revisited for further development later in the PoS. (see Appendix D). <a href="#">Low stakes quizzes will be used to revisit knowledge and concepts throughout the year (see Appendix K)</a> All year groups will have at least 3 assessment points in the year which will be cumulative of content as the year progresses. <a href="#">Engage with GCSE papers as assessments throughout the year where topics are interleaved and spaced.</a>					

<p><b>What are the key concepts to be covered?</b></p>	<ul style="list-style-type: none"> <li>• Manipulate fractional indices</li> <li>• Solve problems involving direct and inverse proportion</li> <li>• Convert between recurring decimals and fractions</li> <li>• Solve equations using iterative methods</li> <li>• Manipulate algebraic expressions by factorising a quadratic expression of the form <math>ax^2 + bx + c</math></li> <li>• Solve quadratic equations by factorising</li> <li>• Link graphs of quadratic functions to related equations</li> <li>• Interpret a gradient as a rate of change</li> <li>• Recognise and use the equation of a circle with centre at the origin</li> <li>• Apply trigonometry in two dimensions</li> <li>• Calculate volumes of spheres, cones and pyramids</li> <li>• Understand and use vectors</li> <li>• Analyse data through measures of central tendency, including quartiles</li> </ul>
<p><b>What prior knowledge, at KS3, are you assuming they have?</b></p>	<ul style="list-style-type: none"> <li>• Know how to interpret the display on a scientific calculator when working with standard form</li> <li>• Know the difference between direct and inverse proportion</li> <li>• Know how to represent an inequality on a number line</li> <li>• Know that the point of intersection of two lines represents the solution to the corresponding simultaneous equations</li> <li>• Know the meaning of a quadratic sequence</li> <li>• Know the characteristic shape of the graph of a cubic function</li> <li>• Know the characteristic shape of the graph of a reciprocal function</li> <li>• Know the definition of speed</li> <li>• Know the definition of density</li> <li>• Know the definition of pressure</li> <li>• Know Pythagoras' theorem</li> <li>• Know the definitions of arc, sector, tangent and segment</li> <li>• Know the conditions for congruent triangles</li> </ul>

	<p><b>What knowledge do they need to have a successful start to Year 11?</b></p>	<ul style="list-style-type: none"> <li>• Know the convention for labelling the sides in a right-angle triangle</li> <li>• Know the trigonometric ratios, <math>\sin\theta = \text{opposite/hypotenuse}</math>, <math>\cos\theta = \text{adjacent/hypotenuse}</math>, <math>\tan\theta = \text{opposite/adjacent}</math></li> <li>• Know exact values of <math>\sin\theta</math> and <math>\cos\theta</math> for <math>\theta = 0^\circ, 30^\circ, 45^\circ, 60^\circ</math> and <math>90^\circ</math></li> <li>• Know the exact value of <math>\tan\theta</math> for <math>\theta = 0^\circ, 30^\circ, 45^\circ</math> and <math>60^\circ</math></li> <li>• Know that <math>a^{1/n} = n\sqrt[n]{a}</math></li> <li>• Know that <math>a^{-n} = 1/a^n</math></li> <li>• Know the information required to describe a transformation</li> <li>• Know the special case of the difference of two squares</li> <li>• Know how to set up an equation involving direct or inverse proportion</li> <li>• Know set notation</li> <li>• Know the conventions for representing inequalities graphically</li> <li>• Know the formulae for the volume of a sphere, a cone and a pyramid</li> <li>• Know the formulae for the surface area of a sphere, and the curved surface area of a cone</li> <li>• Know the circle theorems</li> <li>• Know the characteristic shape of the graph of an exponential function</li> <li>• Know the meaning of roots, intercepts and turning points</li> <li>• Know the definition of acceleration</li> <li>• Know how to construct a box plot</li> <li>• Know the conditions for perpendicular lines</li> </ul>
	<p><b>How are topics spaced between unrelated topics?</b></p>	<p>Units are split up throughout the year, previous topics from a unit should be recapped when beginning the next topics (usually they form pre-requisites for the next topic). (see Appendix D)</p>

<b>11 F</b>	<p><b>Unit/Topic</b></p>	<p>2.1 <b>Calculations</b> (4) 5.1 Expanding Brackets (3) 2.3 <b>Rounding &amp; Bounds</b> (3) 1.1 <b>SOHCAHTOA</b> (8) 6.1 <b>Ratio Problems</b> (4) 5.2 Factorising (4) 4.1 Transformations (3)</p>	<p>2.2 Index Laws (3) 6.2 <b>Proportion Problems</b> (3) 12.1 <b>Analysing Data</b> (3) 10.1 Linear Graphs (4) 9.1 <b>FDP</b> (4) 7 Non-Linear Sequences (3) 12.2 <b>Sampling</b> (3) 8.1 <b>Surface Area</b> (5)</p>	<p>5.3 <b>Rearranging Formulae</b> (3) 6.3 Algebraic Proportion (3) 10.2 Quadratic Graphs (6) 1.2 <b>Bearings</b> (3) 3.1 Simultaneous Equations (4) 8.2 <b>Volume</b> (4)</p>	<p>13 Vectors (5) 3.2 <b>Equations in Context</b> (4) 4.2 Similar Shapes (3) 11 Solving Quadratics (4) Mocks &amp; Revision</p>	<p>Revision &amp; GCSE Papers</p>
	<p><b>Specification/ Assessment Objective</b></p>	<p>N7, N8, A1, G1, G2, G10, G11, G14,</p>	<p>N3, A4, A16, A17, R2, R3, R4, R6, G3, G8, S1, S4, S5, S6</p>	<p>A1, A5, A6, A7, A12, G3, G5, G8,</p>	<p>A11, A14, R1, G9, G15</p>	

<b>Powerful Knowledge</b>	<ul style="list-style-type: none"> <li>• Calculation methods</li> <li>• Rounding</li> <li>• SOHCAHTOA &amp; Pythagoras Ratio</li> </ul>	<ul style="list-style-type: none"> <li>• Proportion</li> <li>• Fractions, decimals and percentages</li> <li>• Sampling methods</li> <li>• Surface area</li> </ul>	<ul style="list-style-type: none"> <li>• Bearings</li> <li>• Volume</li> <li>• Rearranging formulae</li> </ul>	Equations in context	
<b>Mass Practice</b>	Exit ticket / topic test completed a <b>minimum</b> of a week after topic completion for all topics (see Appendix A & B). These may be completed in topic pairs to reduce teacher workload. Exit tickets will be used as formative assessment, marked by class teachers and given detailed feedback, with dedicated time for student reflection / improvement. These will not be graded as topics in maths are no longer categorised by grade but will instead be measured against the expected outcomes for a topic.				
<b>Distributed Practice</b>	Topics are revisited in DNAs on a cycle. Each week there will be at least 1 DNA that takes the form of "last lesson, last week, last month" to encourage recall and revisiting of topics (see Appendix C). In addition to this, topics are often revisited when they link to new topics or when the unit is revisited for further development later in the PoS. (see Appendix D). <a href="#">Low stakes quizzes will be used to revisit knowledge and concepts throughout the year (see Appendix K)</a> All year groups will have at least 3 assessment points in the year which will be cumulative of content as the year progresses. <a href="#">Engage with GCSE papers as assessments throughout the year where topics are interleaved and spaced.</a>				
<b>What are the key concepts to be covered?</b>	<ul style="list-style-type: none"> <li>• Solve problems involving direct and inverse proportion</li> <li>• Solve quadratic equations by factorising</li> <li>• Apply trigonometry in two dimensions</li> <li>• Calculate volumes of spheres, cones and pyramids</li> <li>• Understand and use vectors</li> </ul>				
<b>What knowledge do they need to have a successful start to Year KS5?</b>	<ul style="list-style-type: none"> <li>• Know the convention for labelling the sides in a right-angle triangle</li> <li>• Know the trigonometric ratios, <math>\sin\theta = \text{opposite/hypotenuse}</math>, <math>\cos\theta = \text{adjacent/hypotenuse}</math>, <math>\tan\theta = \text{opposite/adjacent}</math></li> <li>• Know the exact values of <math>\sin\theta</math> and <math>\cos\theta</math> for <math>\theta = 0^\circ, 30^\circ, 45^\circ, 60^\circ</math> and <math>90^\circ</math></li> <li>• Know the exact value of <math>\tan\theta</math> for <math>\theta = 0^\circ, 30^\circ, 45^\circ</math> and <math>60^\circ</math></li> <li>• Know the information required to describe a transformation</li> <li>• Know the special case of the difference of two squares</li> <li>• Know set notation</li> <li>• Know the formulae for the volume of a sphere, a cone and a pyramid</li> <li>• Know the formulae for the surface area of a sphere, and the curved surface area of a cone</li> <li>• Know the meaning of roots, intercepts and turning points</li> </ul>				
<b>How are topics spaced between unrelated topics?</b>	Units are split up throughout the year, previous topics from a unit should be recapped when beginning the next topics (usually they form pre-requisites for the next topic). (see Appendix D)				

<b>11 H</b>	<b>Unit/Topic</b>	2 Surds (6) 10 Histograms (3) 1.1 <b>Right Angled Triangles in 3D</b> (8) 3.1 Completing the Square (6) 6 <b>Proportion</b> (5) 4 Transformations (3)	5 Functions (5) 11 Vectors (4) 3.2 Quadratic Formula (3) 1.2 <b>Sine &amp; Cosine Rules</b> (4) 7 Geometric Progressions (5) 1.3 <b>Triangle Problems</b> (4) 8.1 Quadratic Inequalities (3)	3.3 Iteration (3) 9.1 <b>Non-Linear Graphs</b> (4) 8.2 Simultaneous Equations (5) 9.2 Rates of Change (3) <b>F4 Further Trigonometry (6)</b> <b>F1.1 Binomial Expansion (3)</b>	<b>9.3 Further Straight-Line Graphs (4)</b> <b>F1.2 Complex Factorising (3)</b> <b>9.4 Circle Equations (4)</b> <b>F1.3 Algebraic Fractions (3)</b> <b>F1.4 Polynomials (3)</b>	<b>F2 Calculus (10)</b> <b>F3 Matrices (5)</b> Revision	Revision & GCSE Papers
	<b>Specification/ Assessment Objective</b>	N4, A1, R3, G1, G2, G10, G14, S1, S, S4, S5  <b>1.3, 2.2, 2.3, 2.4, 2.5, 2.11, 6.4,</b>	A3, A15, A6, A17, G6, G10, G11, G13, G15  <b>2.17, 6.2, 6.3, 6.4, 6.5,</b>	A12, A13, A14, R5, G2, G12, G13  <b>2.6, 2.7, 2.14, 2.15, 6.6, 6.7, 6.8, 6.9, 6.10</b>	A1, G3, G4,  <b>2.8, 2.9, 2.10, 2.11, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8, 3.9,</b>	<b>4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 4.9, 5.1, 5.2, 5.3, 5.4</b>	
	<b>Powerful Knowledge</b>	<ul style="list-style-type: none"> <li>SOHCAHTOA and Pythagoras</li> <li>Proportion</li> </ul>	<ul style="list-style-type: none"> <li>Sine rule</li> <li>Cosine rule</li> <li>Solving problems with triangles</li> </ul>	<ul style="list-style-type: none"> <li>Non-linear graphs</li> </ul>			
	<b>Mass Practice</b>	Exit ticket / topic test completed a <b>minimum</b> of a week after topic completion for all topics (see Appendix A & B). These may be completed in topic pairs to reduce teacher workload. Exit tickets will be used as formative assessment, marked by class teachers and given detailed feedback, with dedicated time for student reflection / improvement. These will not be graded as topics in maths are no longer categorised by grade but will instead be measured against the expected outcomes for a topic.					
	<b>Distributed Practice</b>	Topics are revisited in DNAs on a cycle. Each week there will be at least 1 DNA that takes the form of "last lesson, last week, last month" to encourage recall and revisiting of topics (see Appendix C). In addition to this, topics are often revisited when they link to new topics or when the unit is revisited for further development later in the PoS. (see Appendix D). <a href="#">Low stakes quizzes will be used to revisit knowledge and concepts throughout the year (see Appendix K)</a> All year groups will have at least 3 assessment points in the year which will be cumulative of content as the year progresses. <a href="#">Engage with GCSE papers as assessments throughout the year where topics are interleaved and spaced.</a>					
	<b>What are the key concepts to be covered?</b>	<ul style="list-style-type: none"> <li>Simplify surds, including rationalising the denominator of a surd expression</li> <li>Manipulate quadratic expressions by completing the square</li> <li>Deduce roots and turning points of quadratic functions</li> <li>Understand the concept of an instantaneous rate of change</li> <li>Sketch translations and reflections of given functions</li> <li>Solve quadratic inequalities in one variable</li> <li>Use the sine and cosine rules to solve problems</li> </ul>					

<p><b>What knowledge do they need to have a successful start to Year KS5?</b></p>	<ul style="list-style-type: none"> <li>• Know that <math>\sqrt{(a \pm b)} \neq \sqrt{a} \pm \sqrt{b}</math>, <math>\sqrt{(a/b)} = \sqrt{a}/\sqrt{b}</math> and <math>\sqrt{(a \times b)} = \sqrt{a} \times \sqrt{b}</math></li> <li>• Know the formula for solving quadratic equations</li> <li>• Know function notation</li> <li>• Know graphs of exponential and trigonometric functions</li> <li>• Know the sine rule, <math>a/\sin A = b/\sin B = c/\sin C</math></li> <li>• Know the cosine rule, <math>a^2 = b^2 + c^2 - 2bc \cos A</math></li> <li>• Know area of triangle = <math>\frac{1}{2}ab \sin C</math></li> <li>• Know that histograms should be plotted using frequency density when groups are of unequal widths</li> </ul>
<p><b>How are topics spaced between unrelated topics?</b></p>	<p>Units are split up throughout the year, previous topics from a unit should be recapped when beginning the next topics (usually they form pre-requisites for the next topic). (see Appendix D)</p>

Purple bold topics are Further Maths exclusive (aimed at HPA students)

### IMPLEMENTATION – STUDENT NEEDS AND SUPPORT

**How is student learning supported below so as to ensure the following:**

- extracurricular/career opportunities which develop social and cultural capital
- key vocabulary, reading, writing and numeracy opportunities
- support for SEND and students with Low Prior Attainment, as well as challenge for students with High Prior Attainment

YEAR		Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
10	<b>Social/ Cultural Capital</b>	<p>Social capital will be built through class dynamics, where teachers create a safe learning environment, where students feel comfortable in sharing their knowledge, suggestions and solutions. Students will also gain social capital through group work and project work, such as team games and class competitions. It is expected that all staff in the maths department will create a culture of community in their classroom and foster an attitude of learning as a group/team who work together to achieve a common goal.</p> <p>Cultural capital will be built by exploring powerful knowledge in the relevant topics (these are highlighted above and also on the SOWs). Students will be encouraged to explore how the mathematics is used in real life, and given opportunities to explore the contextual problems associated with the mathematics to build their understanding of its importance in life and society. Students will be encouraged to engage with pop culture references to mathematics and may have discussions with their class teacher about how maths has had an impact on their life experiences. <i>In addition to this, students in Year 10 will have the opportunity to qualify to compete the in UK Maths Intermediate challenge. There will also be 4 opportunities throughout the year to engage with Maths 4 Girls or Founders 4 Schools which allows local business leaders to come in and speak about their experiences to students with the aim to inspire them to take maths beyond GCSE.</i></p>					
	<b>Tier 2/3 Vocabulary</b>	<p>Students will experience direct explicit vocabulary teaching in most maths lessons. This may be through discussion, copying of definitions, knowledge recall tasks, spelling tests or the use of Frayer models (see appendix H). This will usually focus on key language for a topic (Tier 3 vocabulary) or command words (Tier 2 vocabulary). Command words are exemplified in the Teachers Guide to Exam Command Words produced by Edexcel (appendix F).</p> <p>All units of work include a specific list of language that is associated with that unit (Tier 3, see Appendix D)</p> <p>At least 1 literacy display in department (corridor) and aim to put up other literacy walls/displays in most classrooms (over half)</p>					

<b>Reading</b>	Students will be given chances to read aloud and read to themselves in lessons when experiencing worded problems, investigations or activities that require students to unpick the information provided. This will be regularly modelled by the class teacher and will include work on comprehension through metacognition and unpicking problems to find out the key information and the command of the question/task.
<b>Writing</b>	All students will be required to use full sentences when writing definitions and in some cases when responding to questions or tasks (especially if they are asked to predict or make conjectures). Sometimes students will be encouraged to write in bullet points. Literacy might be "live marked" in lessons by the teacher, or highlighted for correction on their marked pieces of work. The main focus will be on key language specific to maths, but other errors may also be highlighted. Staff will be encouraged to check literacy in all lessons when circulating to support students. Incorrect spellings of key words will be clearly marked in purple pen and students will be asked to rectify this in green pen, with help if required. This should be common practice in most lessons, but may be more evident in lessons where students have written key definitions or are exploring reasoning topics / tasks.
<b>Numeracy</b>	Real world applications and skills will be explored where they link to the topics studied. Students will take part in activities involving numeracy during lessons on National Numeracy Day and World Maths Day, as well as numeracy starters shared for religious festivals.
<b>How does the PoS support students with SEND needs?</b>	<p>SEN students will be provided with any concessions required and individual support where necessary.</p> <p>Where possible, KS4 catch up interventions may be offered during tutor time to support students with the highest needs to catch up and be able to access the main PoS. Students with the most complex needs, could be offered the opportunity to complete the Entry Level Certificate in Mathematics, if this is suitable based on their ability and their needs, which will be discussed with the SENCO upon entry into Year 10.</p> <p>SEND department have an intervention room to support lowest ability students to close the gap with key maths skills such as calculation methods and telling the time, etc.</p> <p>One member of the maths team will be nominated as a SEN rep to engage with SEND department and share strategies and techniques for teaching and supporting SEN students</p> <p>All staff to have seating plans with SEND students clearly marked as well as class teacher folder with SEND passports and support plans. All staff are expected to know the needs of their students and to be using the strategies highlighted on the passports to best support them</p> <p>Lessons will be differentiated based on the needs of the students so that all students of all abilities and needs can access the main schemes of learning and outcomes. This may include scaffolding, use of signposting and set structures in lessons, labelling of resources, dual coding of key vocabulary with pictures, chunking of lessons, instructions provided verbally and written (with bullet points or numbered where possible), use of mnemonics, stories, cartoon strips and highlighting.</p> <p>Retrieval practice built into the SOLs to foster long term memory and recall.</p> <p>Spiral curriculum design (learning small amounts in lots of areas each year to build towards a final goal) is beneficial for SEND students to support retrieval and reduce overloading</p> <p>Specific fonts are used in planning to better support students with sensory needs and Autism to reduce cognitive overload (Century Gothic, Gill Sans, Arial, Cambria Math – coordinated with English)</p>



<p><b>How does the PoS support students with low prior attainment/challenge those with high prior attainment?</b></p>	<p>Students who join in Year 7 with below expected standard at Year 6 SATs will be supported with a foundation version of PoS which supports students to fill gaps in knowledge and skills from primary school. This is with the view that by the time they reach Year 11 they will have covered all foundation tier GCSE content and should be aiming for grades 4+ (<b>Progress of this group will be closely monitored throughout to ensure ambitions and outcomes are not limited.</b> Nature of the SOL is designed as a “spiral” progression where each area is developed in small chunks across the 5 years and it may be possible at times to use a blend of the foundation and mainstream SOLs when teaching this group to reduce the gaps in knowledge) In Year 10 this will be the Year 9 SOL and in Year 11 this will be the 11F SOL.</p> <p>Where possible, KS4 catch up interventions may be offered during tutor time to support students with the highest needs to catch up and be able to access the main PoS</p> <p>PoS is designed to stretch HPA students by aiming to have the majority of students sitting the higher tier GCSE aiming for grades 6+.</p> <p>HPA students will be offered the opportunity to also sit the AQA Level 2 Certificate in Further Mathematics in addition to the GCSE Mathematics paper. This is designed to support those students in stretching further and to have significant success in A Level maths, should they wish to proceed in this way.</p> <p>Challenge tasks will be available in every lesson for all students but HPA students will be actively encouraged to engage with these (see Appendix G)</p>
<p><b>How does the PoS offer contextual content appropriate to Amington students?</b></p>	<p>Based on contextual information from 2018 for Staffordshire (Appendix E)</p> <ul style="list-style-type: none"> <li>• Increased financial stress experienced – PoS looks to explore finances in multiple topics (negative numbers, percentages, decimals) and students will be encouraged to explore these with financial sense and knowledge to better prepare them for adulthood</li> <li>• Less residents from ethnic minorities – PoS and numeracy policy will develop knowledge of other cultures and religions by doing numeracy related activities to coincide with these events (eg Diwali, Ramadan)</li> <li>• Nearly half of students in Tamworth do not get pass in maths &amp; English – PoS designed for full coverage by Year 11 and support in place for students with the highest needs to attain a 4+ by the end of Year 11</li> <li>• Over 10% of the local population have no qualifications – Entry Level will be offered to students with the highest needs and lowest prior attainment to be able to gain a maths equivalent qualification which is more accessible (in addition to GCSE maths)</li> <li>• 3% of 16-24 year olds claim unemployment benefits – students will be encouraged to explore how maths relates to careers of all varieties and supported in developing transferable skills to boost success in obtaining a job after leaving school.</li> <li>• Over 20% of the local population do not have private transport – students will be taught how to read timetables for local bus companies and plan their journeys using local available public transport, taking into account the costs</li> </ul>

11	<b>Social/ Cultural Capital</b>	<p>Social capital will be built through class dynamics, where teachers create a safe learning environment, where students feel comfortable in sharing their knowledge, suggestions and solutions. Students will also gain social capital through group work and project work, such as team games and class competitions. It is expected that all staff in the maths department will create a culture of community in their classroom and foster an attitude of learning as a group/team who work together to achieve a common goal.</p> <p>Cultural capital will be built by exploring powerful knowledge in the relevant topics (these are highlighted above and also on the SOWs). Students will be encouraged to explore how the mathematics is used in real life, and given opportunities to explore the contextual problems associated with the mathematics to build their understanding of its importance in life and society. Students will be encouraged to engage with pop culture references to mathematics and may have discussions with their class teacher about how maths has had an impact on their life experiences. <a href="#">In addition to this, students in Year 11 will have the opportunity to qualify to compete the in UK Maths Intermediate challenge.</a></p>
	<b>Tier 2/3 Vocabulary</b>	<p>Students will experience direct explicit vocabulary teaching in most maths lessons. This may be through discussion, copying of definitions, knowledge recall tasks, spelling tests or the use of Frayer models (see appendix H). This will usually focus on key language for a topic (Tier 3 vocabulary) or command words (Tier 2 vocabulary). Command words are exemplified in the Teachers Guide to Exam Command Words produced by Edexcel (appendix F).</p> <p>All units of work include a specific list of language that is associated with that unit (Tier 3, see Appendix D)</p> <p>At least 1 literacy display in department (corridor) and aim to put up other literacy walls/displays in most classrooms (over half)</p>
	<b>Reading</b>	<p>Students will be given chances to read aloud and read to themselves in lessons when experiencing worded problems, investigations or activities that require students to unpick the information provided. This will be regularly modelled by the class teacher and will include work on comprehension through metacognition and unpicking problems to find out the key information and the command of the question/task.</p>
	<b>Writing</b>	<p>All students will be required to use full sentences when writing definitions and in some cases when responding to questions or tasks (especially if they are asked to predict or make conjectures). Sometimes students will be encouraged to write in bullet points. Literacy might be "live marked" in lessons by the teacher, or highlighted for correction on their marked pieces of work. The main focus will be on key language specific to maths, but other errors may also be highlighted. Staff will be encouraged to check literacy in all lessons when circulating to support students. Incorrect spellings of key words will be clearly marked in purple pen and students will be asked to rectify this in green pen, with help if required. This should be common practice in most lessons, but may be more evident in lessons where students have written key definitions or are exploring reasoning topics / tasks.</p>
	<b>Numeracy</b>	<p>Real world applications and skills will be explored where they link to the topics studied.</p> <p>Students will take part in activities involving numeracy during lessons on National Numeracy Day and World Maths Day, as well as numeracy starters shared for religious festivals.</p>

<p><b>How does the PoS support students with SEND needs?</b></p>	<p>SEN students will be provided with any concessions required and individual support where necessary. Where possible, KS4 catch up interventions may be offered during tutor time to support students with the highest needs to catch up and be able to access the main PoS. Students with the most complex needs, could be offered the opportunity to complete the Entry Level Certificate in Mathematics, if this is suitable based on their ability and their needs, which will be discussed with the SENCO upon entry into Year 10.</p> <p>SEND department have an intervention room to support lowest ability students to close the gap with key maths skills such as calculation methods and telling the time, etc.</p> <p>One member of the maths team will be nominated as a SEN rep to engage with SEND department and share strategies and techniques for teaching and supporting SEN students</p> <p>All staff to have seating plans with SEND students clearly marked as well as class teacher folder with SEND passports and support plans. All staff are expected to know the needs of their students and to be using the strategies highlighted on the passports to best support them</p> <p>Lessons will be differentiated based on the needs of the students so that all students of all abilities and needs can access the main schemes of learning and outcomes. This may include scaffolding, use of signposting and set structures in lessons, labelling of resources, dual coding of key vocabulary with pictures, chunking of lessons, instructions provided verbally and written (with bullet points or numbered where possible), use of mnemonics, stories, cartoon strips and highlighting.</p> <p>Retrieval practice built into the SOLs to foster long term memory and recall.</p> <p>Spiral curriculum design (learning small amounts in lots of areas each year to build towards a final goal) is beneficial for SEND students to support retrieval and reduce overloading</p> <p>Specific fonts are used in planning to better support students with sensory needs and Autism to reduce cognitive overload (Century Gothic, Gill Sans, Arial, Cambria Math – coordinated with English)</p>
<p><b>How does the PoS support students with low prior attainment/challenge those with high prior attainment?</b></p>	<p>Students who join in Year 7 with below expected standard at Year 6 SATs will be supported with a foundation version of PoS which supports students to fill gaps in knowledge and skills from primary school. This is with the view that by the time they reach Year 11 they will have covered all foundation tier GCSE content and should be aiming for grades 4+ (<b>Progress of this group will be closely monitored throughout to ensure ambitions and outcomes are not limited.</b> Nature of the SOL is designed as a "spiral" progression where each area is developed in small chunks across the 5 years and it may be possible at times to use a blend of the foundation and mainstream SOLs when teaching this group to reduce the gaps in knowledge) In year 10 this will be the Year 9 SOL and in Year 11 this will be the 11F SOL.</p> <p>Where possible, KS4 catch up interventions may be offered during tutor time to support students with the highest needs to catch up and be able to access the main PoS</p> <p>PoS is designed to stretch HPA students by aiming to have the majority of students sitting the higher tier GCSE aiming for grades 6+.</p> <p>HPA students will be offered the opportunity to also sit the AQA Level 2 Certificate in Further Mathematics in addition to the GCSE Mathematics paper. This is designed to support those students in stretching further and to have significant success in A Level maths, should they wish to proceed in this way.</p> <p>Challenge tasks will be available in every lesson for all students but HPA students will be actively encouraged to engage with these (see Appendix G)</p>

<p><b>How does the PoS offer contextual content appropriate to Amington students?</b></p>	<p>Based on contextual information from 2018 for Staffordshire (Appendix E)</p> <ul style="list-style-type: none"> <li>• Increased financial stress experienced – PoS looks to explore finances in multiple topics (negative numbers, percentages, decimals) and students will be encouraged to explore these with financial sense and knowledge to better prepare them for adulthood</li> <li>• Less residents from ethnic minorities – PoS and numeracy policy will develop knowledge of other cultures and religions by doing numeracy related activities to coincide with these events (eg Diwali, Ramadan)</li> <li>• Nearly half of students in Tamworth do not get pass in maths &amp; English – PoS designed for full coverage by Year 11 and support in place for students with the highest needs to attain a 4+ by the end of Year 11</li> <li>• Over 10% of the local population have no qualifications – Entry Level will be offered to students with the highest needs and lowest prior attainment to be able to gain a maths equivalent qualification which is more accessible (in addition to GCSE maths)</li> <li>• 3% of 16-24 year olds claim unemployment benefits – students will be encouraged to explore how maths relates to careers of all varieties and supported in developing transferable skills to boost success in obtaining a job after leaving school.</li> </ul> <p>Over 20% of the local population do not have private transport – students will be taught how to read timetables for local bus companies and plan their journeys using local available public transport, taking into account the costs</p>
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**How does the Implementation Plan meet the ACE curriculum design?**

<p><b>Ambitious</b></p>	<ul style="list-style-type: none"> <li>• Aiming for a majority sitting Higher tier, aiming for 6+</li> <li>• Support for LPA students to aim for a GCSE 4+ by providing support in filling gaps in knowledge</li> <li>• Looks to include additional elements on top of SOL objectives in all lessons in all year groups</li> </ul>
<p><b>Challenging</b></p>	<ul style="list-style-type: none"> <li>• Students challenged to study in a way that leads to Higher tier entry at GCSE</li> <li>• Challenge work will be provided in all lessons</li> <li>• Problem solving and abstract applications will be used where possible</li> <li>• HPA students have access to UK Maths Challenge competitions (aimed at highest achievers in Maths nationally)</li> <li>• HPA students have option to sit Further Maths qualification</li> </ul>
<p><b>Engaging</b></p>	<ul style="list-style-type: none"> <li>• Real life links included where possible</li> <li>• Additional opportunities are planned to coincide with national and local events</li> <li>• A range of activities used to consolidate, revisit and assess</li> <li>• Enrichment activities built into SOW</li> </ul>

**What are the current strengths of the Implementation Plan?**

The curriculum is ambitious in its design by aiming for higher GCSE entries for the majority (although these will be considered on a case by case basis in Year 11, and suitability of the curriculum for each teaching group will be reviewed at least twice yearly). It has taken into account research around developing a curriculum to support memory by utilising interleaving and spaced learning. It features a range of opportunities to enrich and explore cultural and societal links





**What specific actions have to be taken in response to the above? Please consider:**


- Core concept changes;
- Space interleaving changes;
- Modifications to ensure an ACE curriculum design;





- CPD for teachers in your subject area;
  - Additional research you have to consider as part of this review.
- Units (where appropriate) have been broken down into smaller chunks to allow spacing and interleaving
  - The 5 areas of maths are interleaved throughout the year (number, geometry & measure, algebra, proportional reasoning, data & statistics)
  - CPD focus (appendix I and J)
    - Blocking, spacing, interleaving and discrimination teaching – what is it, what are the differences, how to teach for discrimination, links to metacognition (Mon 15<sup>th</sup> June + revisit in Sept 2020)
    - Literacy – training on metacognition, how to teach reading for comprehension, using Frayer Models, teaching command words (dept. tasks w/c 6<sup>th</sup> July + revisit in Sept 2020)
    - Retrieval practice – how to quiz **knowledge** and **facts**; spacing practice through DNAs (Mon 22<sup>nd</sup> June)
    - Formative assessment practices – making your own exit tickets and topic check-ups (dept. tasks w/c 22<sup>nd</sup> June)
    - Metacognition – effective teaching strategies (Mon 6<sup>th</sup> July)
    - Meeting calendar and CPD to be planned in advance (ideally created and shared with JPM/WJS before summer holiday)
  - SEND focus
    - Member of team to be selected as SEND rep
    - CLA to arrange to liaise with Alison Campbell regarding SEND techniques and support within maths (timetabling of LSAs, use of intervention)
    - CLA to arrange to liaise with Alison Campbell regarding the use of LSA's in maths & possible CPD around numeracy and strategies
    - Meeting arranged 10am Thurs 11<sup>th</sup> June
    - Classrooms to be reorganised and tidied with clear expectations on cleanliness and tidiness
    - Classroom resources to be clearly labelled and dual coded – especially if key equipment
    - Maths staff to attend SEND training when provided
    - Maths staff to have “Class Teacher folder” for groups with seating plan, SEND support plans and SEND passports
    - QA to have SEND focus in at least 1 data capture per year per teacher
    - Discuss with AND, JPM & RAC possible use of RAC for “recovery” work with Year 11 (2020-21)
    - Maths staff to plan for use of LSAs in lessons and communicate regularly with LSAs
    - CLA to investigate possibility for Maths-SEND briefing once per Term
  - Policies & Handbooks
    - **Literacy policy** to be written and to include examples of Tier 2 and 3 vocabulary and teaching strategies to support literacy
    - **Numeracy policy** to be written and to include clear indicators of whole school opportunities and how staff CPD can be utilised
    - **Enrichment policy** to be written and included in dept. handbook. Responsibilities to be assigned to LEG and ANP for organising enrichment
    - Handbook to be shared with department before the end of the summer term
  - Cultural Capital
    - Organisation of Maths 4 Girls and Founders 4 Schools talks (Year 9 & 10)
    - Organisation of UK Maths Challenges
    - Explore other options for extra curricular opportunities / clubs within maths (RAC possibly)
    - Shared starters designed for Diwali, Easter and other religious festivals & shared whole school to be DNA for each of the 5 sessions
    - Shared starters / tutor time activities designed and distributed whole school for National Numeracy Day and World Maths Day
  - Data Analysis
    - QLA analysis to be completed regularly with Year 10 and 11 to allow refinements in SOL to prioritise the needs of students in our specific context through the 5-year PoS (initiate in Sept. with data analysis to follow and adjustments to be made following this)
    - Staff training on using QLA and importance of QLA for personalised learning for students and classes (September 2020)

## Appendices

### Appendix A – Examples of Exit Tickets

Exit Ticket	
Name:	Factorising
Factorise:	
(a) $3y + 15$	
(b) $18x - 12$	
(c) $4x^2 + 8x$	
Challenge:	
(d) $10c^3 - 20c^2 + 5c$	
How I feel about this work:	
<input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/>	

<input type="checkbox"/> I can factorise with positive numbers and a common numerical factor 
<input type="checkbox"/> I can factorise with negative numbers involved
<input type="checkbox"/> I can factorise with an algebraic common factor
<input type="checkbox"/> I can factorise with more than 2 terms
<input type="checkbox"/> I can factorise with an algebraic and numerical common factor

Exit Ticket	
Name:	Frequency Trees
80 people were asked which channel they preferred to watch. 7 of the 20 males said Channel 4 8 males and 12 females said BBC1 28 females said ITV. Draw a frequency tree using this information	
Challenge: What fraction of the females picked Channel 4?	
How I feel about this work:	
<input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/>	

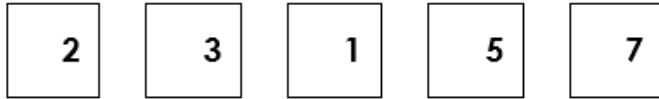
## Appendix B – Topic Test Examples

Year 7: Got It?

Autumn Term 1

### Week 3

Here are some number cards



- (a) Choose three different cards to make a three-digit prime number

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- (b) Choose three different cards to make a three-digit number that is a multiple of 5

--	--	--

James says:

“Adding two odd numbers always gives an odd number answer.”

Give an example to show that James is wrong.



Year 7: Got It?

Autumn Term 1

A famous mathematician claimed that:

Every **even** number greater than 4 can be written as the **sum of a pair of prime** numbers.

For example:

8 can be written as the sum of 3 and 5, and 3 and 5 are both prime numbers

- (a) Write a pair of **prime** numbers that **sum to 16**

\_\_\_\_\_ and \_\_\_\_\_

- (b) Now write a **different** pair of prime numbers than sum to 16

\_\_\_\_\_ and \_\_\_\_\_

- (c) Now choose an **even** number that is **greater than 16**, then write a pair of **prime** numbers that sum to your even number.

Complete the sentences below:

The even number \_\_\_\_\_ can be written as the sum of the prime numbers \_\_\_\_\_ and \_\_\_\_\_.



# Do now...

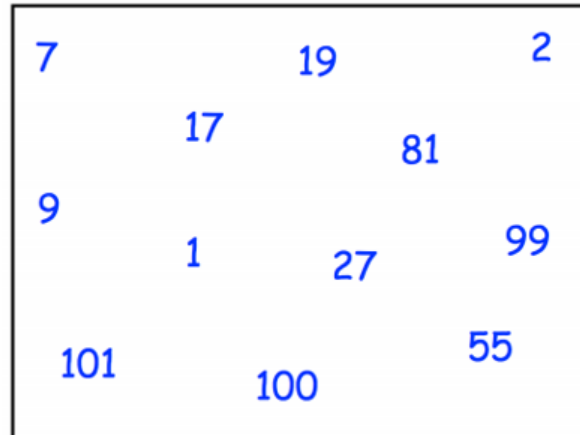
Write down the value of the underlined figure:

52.34

502.4

1.203

20.034



From the box, choose:  
 (a) the smallest prime number  
 (b) a prime number that is greater than 10  
 (c) an even prime number

Write down:

1. All the factors of 64
2. All the factors of 96
3. The highest common factor of 64 and 96

Last lesson

Last week

Last topic



### Last Lesson

I asked you to draw a triangle with sides 3cm and 5cm. Will the one you draw be congruent to the one your partner draws? If so, why? If not, why not and what extra info do you need?

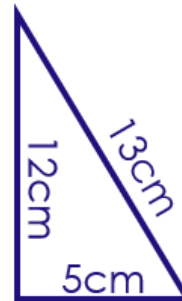
### Last Topic

A regular polygon has 12 sides, What is the size of one of its **exterior** angles?

## Do Now

Find the mode and the range:  
7, 6, 2, 7, 1, 3, 6, 4, 7, 1

If this triangle and rectangle have the same area, what is the value of  $x$ ?



### Last Term

### Last Year

## Appendix D – Scheme of Work Example

Unit 5: Algebra Skills		10 hours
<b>Pre-Requisites</b> <ul style="list-style-type: none"> <li>Know basic algebraic notation (the rules of algebra)</li> <li>Simplify an expression by collecting like terms</li> <li>Know how to multiply a single term over a bracket</li> <li>Substitute positive numbers into expressions and formulae</li> <li>Calculate with negative numbers</li> </ul>		<b>Key Concepts</b> (GCSE subject content statements) <ul style="list-style-type: none"> <li>use and interpret algebraic notation, including: <math>a^2b</math> in place of <math>a \times a \times b</math>, coefficients written as fractions rather than as decimals</li> <li>understand and use the concepts and vocabulary of factors</li> <li>simplify and manipulate algebraic expressions by taking out common factors and simplifying expressions involving sums, products and powers, including the laws of indices</li> <li>substitute numerical values into scientific formulae</li> <li>rearrange formulae to change the subject</li> </ul>
<b>Mathematical Language</b> Product, Variable, Term, Coefficient, Common factor, Factorise, Power, Indices, Formula, Formulae, Subject, Change the subject		
	<b>Topic 5.1 – Index Laws</b> 4 hours	<b>Topic 5.2 – Algebraic Manipulation</b> 6 hours
Skills to Revisit	Students should be proficient in: <ul style="list-style-type: none"> <li>expanding brackets</li> <li>simplifying expressions such as <math>a \times a \times a</math></li> </ul>	Students should be proficient in: <ul style="list-style-type: none"> <li>use of the balancing method to solve equations</li> <li>identifying highest common factors</li> <li>simplifying by collecting like terms</li> </ul>
Objectives	<ul style="list-style-type: none"> <li>Simplify expressions using the law of indices for multiplication</li> <li>Simplify expressions using the law of indices for division</li> <li>Simplify expressions using the law of indices for powers</li> <li><b>Know and use the zero index</b></li> </ul> <p><b>Powerful Knowledge</b>            This will link later to compound interest problems (such as loans, savings and interest rates)</p>	<ul style="list-style-type: none"> <li>Use and interpret algebraic notation, including: <math>a^2b</math> in place of <math>a \times a \times b</math>, coefficients written as fractions rather than as decimals</li> <li>Simplify an expression involving terms with combinations of variables (e.g. <math>3a^2b + 4ab^2 + 2a^2 - a^2b</math>)</li> <li>Factorise an algebraic expression by taking out common factors</li> <li>Substitute positive and negative numbers into formulae</li> <li><b>Change the subject of a formula when one step is required</b></li> <li><b>Change the subject of a formula when two steps are required</b></li> </ul>
Teaching Notes and Probing Questions	<p>Once the laws of indices have been established, all teachers refer to 'like numbers multiplied, add the indices' and 'like numbers divided, subtract the indices. They also generalise to <math>a^m \times a^n = a^{m+n}</math> etc.</p> <ul style="list-style-type: none"> <li>Convince me <math>a^0 = 1</math>.</li> <li>What is wrong with this statement and how can it be corrected: <math>5^2 \times 5^4 = 5^8</math>?</li> </ul>	<p>During this unit pupils should experience factorising a quadratic expression such as <math>6x^2 + 2x</math>.</p> <p>Collaborate with the science department to establish a list of formulae that will be used and ensure consistency of approach and experience.</p> <p>When changing the subject of a formula the principle of balancing (doing the same to both sides) must be used rather than a 'change side, change sign' approach.</p> <ul style="list-style-type: none"> <li>Jenny thinks that if <math>y = 2x + 1</math> then <math>x = (y - 1)/2</math>. Kenny thinks that if <math>y = 2x + 1</math> then <math>x = y/2 - 1</math>. Who do you agree with? Explain your thinking.</li> </ul>
Miscellaneous	<ul style="list-style-type: none"> <li>Many pupils may think that <math>a^0 = 0</math></li> </ul>	<ul style="list-style-type: none"> <li>Some pupils may misapply the order of operation when changing the subject of a formula</li> <li>Some pupils may not consider <math>4ab</math> and <math>3ba</math> as 'like terms' and therefore will not 'collect' them when simplifying expressions</li> </ul>

## Appendix E – Local contextual information (compared to England)

### **Key Features** (taken from Stafford: Locality Profile Jan 2018)

- Larger percentage of the population is under 16
- Smaller percentage of the population is from minority ethnic backgrounds
- Over 20% of the population are in the second most deprived groups nationally
- Larger percentage of the population experiences financial stress
- 55% of students achieve A\*-C in GCSE Maths & English (or equivalent)
- 12% of adults have no qualifications
- 3% of 16-24 year olds claim unemployment benefits
- 60% of unplanned hospital visits are related to underage alcohol incidents
- 32% of girls 15-17 fall pregnant
- 11% of the adult population experience depression
- Women are more likely to die of alcohol related illness / incidents than men
- Women in our locality are twice as likely than nationally to die of alcohol induced illness / injury
- Lower than average life expectancy at birth (male & female)
- More likely to die of preventable diseases than national average
- Higher than average lone parent homes
- Higher than average levels of social housing
- 2% of the population have no central heating
- 3% of the population live in houses considered overcrowded
- 11% experience fuel poverty
- More than 20% of the population do not have access to private travel means
- More likely to experience crime and to fear crime
- Higher levels of sexual offences, violent crime and domestic violence than national average
- 37.5% of juvenile offenders reoffend

## GCSE Maths – Command words table – Teacher guide

Please note that this table is not exhaustive but uses the most commonly used command words.

Command words		What you need to know	Examples
1	Calculate	A calculator and some working will be needed.	<a href="#">Example 1</a> <a href="#">Example 2</a> <a href="#">Example 3</a>
2	Change	Usually convert from one unit to another; either using known metric unit conversions or the use of a conversion graph.	<a href="#">Example 1</a> <a href="#">Example 2</a> <a href="#">Example 3</a>
3	Complete	Fill in missing values. For example, on a probability tree diagram or a table of values.	<a href="#">Example 1</a> <a href="#">Example 2</a> <a href="#">Example 3</a>
4	Describe	Write a sentence that gives the features of the situation. For example, describing a transformation or trend in a graph.	<a href="#">Example 1</a> <a href="#">Example 2</a> <a href="#">Example 3</a>
5	Draw	Produce an accurate drawing (unless a sketch is being drawn). For example, draw a graph, draw an accurate elevation of a pyramid.	<a href="#">Example 1</a> <a href="#">Example 2</a> <a href="#">Example 3</a>
6	Draw a sketch of... Sketch	Produce a drawing that does not have to be drawn to scale or a graph that is drawn without working out each coordinate. For example, sketch a graph, sketch a cylinder.	<a href="#">Example 1</a> <a href="#">Example 2</a> <a href="#">Example 3</a>
7	Expand	Remove brackets.	<a href="#">Example 1</a>
8	Expand and simplify	Remove brackets and the collect like terms.	<a href="#">Example 1</a> <a href="#">Example 2</a> <a href="#">Example 3</a>

## Appendix G – examples of resources used for challenge questions / tasks

### Reasoning

*Modify, Interpret, Produce, Collect, Develop, Examine, Predict, Compare, Organise, Deconstruct, Outline, Structure, Integrate, Contrast, Distinguish, Connect, Select, Order, Sub-divide, Break-down, Illustrate, Check, Hypothesise, Critique, Experiment, Judge, Test, Detect, Monitor, Reframe, Order, Compare, Decide, Recommend, Summarise, Convince, Defend, Estimate, Find errors, Predict, Select, Argue, Conclude, Distinguish, Persuade*

Does this method always work?

Knowing this, what else can you work out?

Which would be the most efficient method for this question?

Give an example when this method wouldn't work

Why does this method work?

Are the sample responses correct / incorrect? Why

What misconceptions are held here? (sample piece of work)

What mistakes might someone make when answering this question?

Multiple choice answers: which is right, what have they done wrong, what misconceptions held?

Students produce multiple choice answers – justifying incorrect answers/misconceptions

Students write a test on the topic and mark scheme, focusing on where marks would be awarded

How does this link to what you already know? How is it similar / different? How does it extend your knowledge / understanding / why is it important to know?

Produce a learning activity for the topic

Sample responses: what advice would you give this person? What have they done wrong? How would you convince them they're wrong?

Order these best to worst (sample responses)

Always, Sometimes, Never

What would be a good wrong answer?

In all of the numbers below, the digit 6 is worth more than 6 hundredths.

3.6    3.06    3.006    6.23    7.761

True or False?

If it is false, can you change some of the numbers so it is true?

---

Kayleigh says;

***“The more decimal places a number has, the smaller the number is.”***

Do you agree? Explain why.

---

True or False: ***When you multiply a number with 2 decimal places by a whole number, the answer always has more than 2 decimal places.***

Prove it.

---

Stefan and Tilly are both calculating the answer to  $147 \div 4$

Stefan says, “The answer is 36 remainder 3”

Tilly says, “The answer is 36.75”

Who do you agree with?

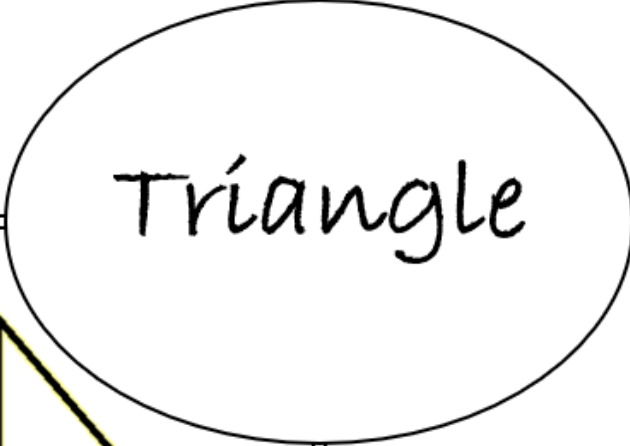
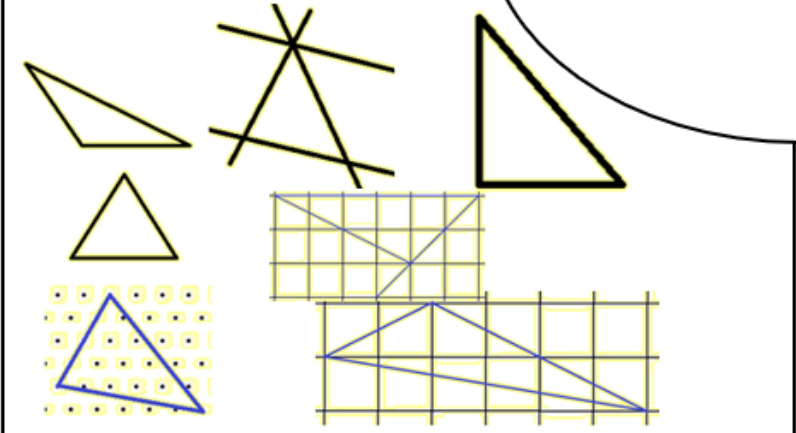
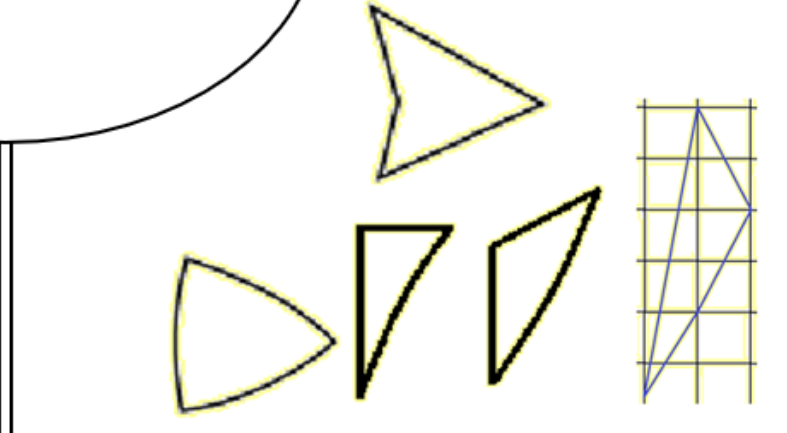
Explain your answer.

---

True or False: ***The only number that divides to give an answer with 1 decimal place is 2***

Prove it.

**Task: Fill in the blank areas. Then answer the question at the bottom**

<b>DEFINITION</b>	<b>CHARACTERISTICS</b>
	
<b>EXAMPLES</b> 	<b>NON-EXAMPLES</b> 

**Why are these non-examples?**

Task: Fill in the blank areas. Then answer the question in blue

<b>DEFINITION</b>	<b>CHARACTERISTICS</b> <ul style="list-style-type: none"><li>• Any data that isn't numbers</li><li>• Also called "categorical data" as it sorts the subject of the data into categories.</li></ul> <p>Can you think of any other characteristics?</p>
<b>EXAMPLES</b>	<b>NON-EXAMPLES</b>

Q \_\_\_\_\_

D \_\_\_\_\_



Appendix I – outline of CPD for maths staff during remote working

**Maths Department Task – Weekly Overviews**

<b>Day</b>	<b>Task Outline</b>
Monday 20 <sup>th</sup> April	<b>Getting to Know You Qs</b> <i>A list of questions to answer so I can get to know you whilst socially distancing</i>
Tuesday 21 <sup>st</sup> April	<b>Working From Home Reflection Qs</b> <i>A set of questions with logistical follow up and wellbeing checks</i>
Wednesday 22 <sup>nd</sup> April	<b>Resource Review</b> <i>Q: Where do you go for resources?</i> <i>You will also receive a link to a website to explore</i>
Thursday 23 <sup>rd</sup> April	<b>Maths Activities</b> <i>You will be sent 3 activities and asked to complete any 2 of them by the end of the day.</i>
Friday 24 <sup>th</sup> April	<i>No task – wellbeing day</i> <i>Email me with any issues etc.</i>

<b>Day</b>	<b>Task Outline</b>
Monday 27 <sup>th</sup> April	<b>Reflection</b> <i>Probing questions around the maths activities completed previously</i>
Tuesday 28 <sup>th</sup> April	<b>Maths Activities</b> <i>You will be sent 3 activities and asked to complete any 2 of them by the end of the day</i>
Wednesday 29 <sup>th</sup> April	<b>Reflection</b> <i>Probing questions around the maths activities completed previously</i>
Thursday 30 <sup>th</sup> April	<b>Maths Activities</b> <i>You will be sent 3 activities and asked to complete any 2 of them by the end of the day</i>
Friday 1 <sup>st</sup> May	<b>Reflection</b> <i>Probing questions around the maths activities completed previously</i>

<b>Day</b>	<b>Task Outline</b>
Monday 4 <sup>th</sup> May	<b>Evaluation</b> <i>Planned learning episode provided, identify effective features and things that could be improved</i>
Tuesday 5 <sup>th</sup> May	<b>Evaluation</b> <i>Planned learning episode provided, identify effective features and things that could be improved</i>
Wednesday 6 <sup>th</sup> May	<b>Evaluation</b> <i>Planned learning episode provided, identify effective features and things that could be improved</i>
Thursday 7 <sup>th</sup> May	<b>Planning</b> <i>Objective provided, produce a learning episode</i>
Friday 8 <sup>th</sup> May	<b>Bank Holiday VE Day 75<sup>th</sup> Anniversary</b>

<b>Day</b>	<b>Task Outline</b>
Monday 11 <sup>th</sup> May	<b>Planning</b> <i>Objective provided, produce a learning episode</i>
Tuesday 12 <sup>th</sup> May	<b>Meeting Follow Up</b> <i>Directed task following Monday's meeting</i>
Wednesday 13 <sup>th</sup> May	<b>Planning</b> <i>Objective provided, produce a learning episode</i>
Thursday 14 <sup>th</sup> May	<b>Planning</b> <i>Objective provided, produce a learning episode</i>
Friday 15 <sup>th</sup> May	<b>Planning</b> <i>Objectives provided, produce a series of learning episodes</i>

<b>Day</b>	<b>Task Outline</b>
Monday 18 <sup>th</sup> May	<b>Planning</b> <i>Continue with Friday's task</i>
Tuesday 19 <sup>th</sup> May	<b>Literacy Focus</b> <i>Framer Models</i>
Wednesday 20 <sup>th</sup> May	<b>Solving Problems</b> <i>Work through a problem &amp; produce an animated worked solution Ppt</i>
Thursday 21 <sup>st</sup> May	<b>Engaging with Research</b> <i>Watch 2 videos, read an article &amp; answer some questions</i>
Friday 22 <sup>nd</sup> May	<b>Reflections</b> <i>Answer a few questions based on some of this week's activities</i>

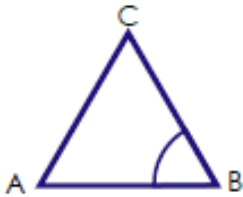

<b>Day</b>	<b>Task Outline</b>
Monday 1 <sup>st</sup> June	No task
Tuesday 2 <sup>nd</sup> June	<b>Meeting Follow Up</b> <i>Start to consider how you will assess students in your classes &amp; when</i>
Wednesday 3 <sup>rd</sup> June	<b>GCSE Exam Qs</b> <i>Do some maths &amp; thinking widely about questions</i>
Thursday 4 <sup>th</sup> June	<b>Metacognition in Action</b> <i>A novel approach to some questions</i>
Friday 5 <sup>th</sup> June	<b>Evaluating Student Responses</b> <i>A review of student work and providing feedback</i>

<b>Day</b>	<b>Task Outline</b>
Monday 8 <sup>th</sup> June	<b>Individual Reflections</b> <i>Prompt Qs to review your practice and development needs Self-RAG for Teaching Standards</i>
Tuesday 9 <sup>th</sup> June	<b>Meeting Follow Up</b> <i>Look through the SOLs shared in Monday's meeting Send Qs/Comments to CLA via email</i>
Wednesday 10 <sup>th</sup> June	<b>Planning</b> <i>Create a sequence overview for a NUMBER topic</i>
Thursday 11 <sup>th</sup> June	<b>Planning</b> <i>Create a sequence overview for a GEOMETRY topic</i>
Friday 12 <sup>th</sup> June	<b>Engaging with Research</b> <i>Watch a video, answer some questions</i>

Appendix J – Maths department meeting plan Summer Term 2

<b>Date</b>	<b>Focus</b>	<b>Lead By</b>
<b>8<sup>th</sup> June</b>	Introducing 2020 KS3 Curriculum	CLA
<b>15<sup>th</sup> June</b>	Interleaving, Spaced and Blocked Learning & Discrimination Teaching	CLA
<b>22<sup>nd</sup> June</b>	Retrieval Practice, DNAs, Knowledge vs Skills (Homework Policy?)	CLA
<b>29<sup>th</sup> June</b>	Introducing 2020 KS4 Curriculum / Recovery Curriculum	CLA
<b>6<sup>th</sup> July</b>	Metacognition (TBC)	CLA
<b>13<sup>th</sup> July</b>	Recovery Curriculum	CLA/LEG

Appendix K – Example of Low Stakes Quiz

Mathematics Quiz			
Name:	Example Quiz	Date:	Year 7 Week 6
1. Write down the definition of a prime number		2. Draw a diagram that shows the meaning of parallel lines	
Confidence rating: ____		Confidence rating: ____	
3. What is the value of the underlined digit <u>5</u> 9 285		4. Round 19.973 to 1 decimal place	
Confidence rating: ____		Confidence rating: ____	
5. Write down the correct way to refer to the angle shown below: 		6. Draw a diagram to show the first 3 triangular numbers	
Confidence rating: ____		Confidence rating: ____	
7. Multiply 6.25 by 100		8. Work out $23 \times 19$	
Confidence rating: ____		Confidence rating: ____	
9. Write down the order of rotational symmetry for the shape below: 		10. Divide 1984 by 1000	
Confidence rating: ____		Confidence rating: ____	

Score: \_\_\_\_ / 10