**Curriculum Content Map**

**Year group: 9**

**Subject: Maths**

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|  | **Term 1** | **Term 2** | **Term 3** |
| Month | **September** | **October** | **November** | **December** | **January** | **February** | **March** | **April** | **May** | **June** | **July** |
| Virtue | **Friendliness & Civility** | **Justice & Truthfulness** | **Courage** | **Generosity** | **Gratitude** | **Good Speech** | **Good Temper & Humour** | **Self-Mastery** | **Compassion** | **Good Sense** |
| Skill | **Listening** | **Leadership** | **Problem-Solving** | **Creativity** | **Staying Positive** | **Speaking** | **Staying Positive** | **Aiming High** | **Speaking** | **Teamwork** |
| Curriculum Content | Indices & Standard Form | Continuing Expressions & Formulae | Dealing with Data | Multiplicative Reasoning | Constructions | Sequences, Inequalities, Equations & Proportion | Circles, Pythagoras & Prisms | Graphs | Probability |
| Expressions & Formulae | Comparing Shapes |
| National Curriculum area | “use integer powers and associated real roots (square, cube and higher), recognise powers of 2, 3, 4, 5 and distinguish between exact representations of roots and their decimal approximation”“interpret and compare numbers in standard form A x 10n 1≤A”“use approximation through rounding to estimate answers and calculate possible resulting errors expressed using inequality notation a<x≤b” | “substitute numerical values into formulae and expressions, including scientific formulae”“simplify and manipulate algebraic expressions to maintain equivalence by: collecting like terms multiplying a single term over a bracket taking out common factorsexpanding products of two or more binomials”“understand and use standard mathematical formulae; rearrange formulae to change the subject”“use algebraic methods to solve linear equations in one variable (including all forms that require rearrangement)” | “describe, interpret and compare observed distributions of a single variable through: appropriate graphical representation involving discrete, continuous and grouped data; and appropriate measures of central tendency (mean, mode, median) and spread (range, consideration of outliers)”“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” | “draw and measure line segments and angles in geometric figures, including interpreting scale drawings”“identify and construct congruent triangles, and construct similar shapes by enlargement, with and without coordinate grids” | “solve problems involving percentage change, including: percentage increase, decrease and original value problems and simple interest in financial mathematics”“use compound units such as speed, unit pricing and density to solve problems” | “derive and use the standard ruler and compass constructions (perpendicular bisector of a line segment, constructing a perpendicular to a given line from/at a given point, bisecting a given angle); recognise and use the perpendicular distance from a point to a line as the shortest distance to the line”“identify and construct congruent triangles, and construct similar shapes by enlargement, with and without coordinate grids” | “recognise arithmetic sequences and find the nth term”“recognise geometric sequences and appreciate other sequences that arise”“recognise and use relationships between operations including inverse operations”“solve problems involving direct and inverse proportion, including graphical and algebraic representation” | “calculate and solve problems involving: perimeters of 2-D shapes (including circles), areas of circles and composite shapes”“apply angle facts, triangle congruence, similarity and properties of quadrilaterals to derive results about angles and sides, including Pythagoras’ Theorem, and use known results to obtain simple proofs”“use Pythagoras’ Theorem and trigonometric ratios in similar triangles to solve problems involving right-angled triangles”“use the properties of faces, surfaces, edges and vertices of cubes, cuboids, prisms, cylinders, pyramids, cones and spheres to solve problems in 3-D”“use approximation through rounding to estimate answers and calculate possible resulting errors expressed using inequality notation a<x≤b” | “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”“use linear and quadratic graphs to estimate values of y for given values of x and vice versa and to find approximate solutions of simultaneous linear equations” | “enumerate sets and unions/intersections of sets systematically, using tables, grids and Venn diagrams”“generate theoretical sample spaces for single and combined events with equally likely, mutually exclusive outcomes and use these to calculate theoretical probabilities.” |
| “substitute numerical values into formulae and expressions, including scientific formulae”“simplify and manipulate algebraic expressions to maintain equivalence by: collecting like terms multiplying a single term over a bracket taking out common factorsexpanding products of two or more binomials”“understand and use standard mathematical formulae; rearrange formulae to change the subject”“use algebraic methods to solve linear equations in one variable (including all forms that require rearrangement)” | “identify and construct congruent triangles, and construct similar shapes by enlargement, with and without coordinate grids”“use Pythagoras’ Theorem and trigonometric ratios in similar triangles to solve problems involving right-angled triangles” |
| Link to Virtue | Students will demonstrate friendliness and civility as they work together in their functional skills task. Students will also need to support each other with friendliness as they work on standard form | Students will look at balancing an equation and how this idea of the ‘scale’ links with the scales of justice | Students will look at data regarding courage and courageous people / acts. | Students will look at generosity of shapes as they enlarge shapes through integer and fractional scale factors | Students will be grateful for the prior knowledge and basic skills they have learned in Y7 and Y8 to prepare them for the variety of topics that all use multiplicative reasoning | Students needs to be able to interpret spoken instructions in order to construct accurately. | Students will channel good temper when working on quadratic sequences as a development of their previous sequencing skills.  | Students will be mastering the use of Pi in formulae. Students will also develop their understanding of 3D shapes to fully master volume and surface area. | Students will need compassion for each other as they work on solving simultaneous equations using a graph | Students will need to use good sense to make decisions about probability and ensure their answers make sense with regards to the question |
| Students will demonstrate friendliness and civility as they support each other in solving more difficult equations | Students will need to use good sense when deciding with ratio to use in trigonometry as well as which arrangement of the trigonometric formula they need to solve the problem |
| Link to Skill | Students will need to listen to each other during the group work activity. Students will also need to listen to peer explanations of methods of working | Students will lead on carousel sessions to support each other in developing skills with rearranging equations | Students will use problem solving to compare data as well as understanding how to analyse data to present a report | Students will use creativity with enlargements to create pictures and words by enlarging shapes | Students will need to stay positive as they work through what feels like wide variety of topics in order to be able to see the common thread | Students needs to be able to interpret spoken instructions in order to construct accurately. | Students will need to stay positive when developing their solving equation skills to work on equations with fractions and powers on one or both sides. | Students will aim high when they investigate Pythagoras’ Theorem to better understand where it originates from and not just knowing the theorem. Students will aim high when looking at upper and lower bounds as, although linked to rounding, it can be a difficult topic to grasp. | Students will need to communicate well in order to instruct another student on the content of the graph. Students will also need to explain how they have calculated the outputs for the table of values in a quadratic graph | Students will use teamwork to discuss and pull together ideas about how to solve probability problems and which probability technique is most appropriate |
| Students will need to listen to each other to support each other to rearrange equations using balancing | Students will need to use teamwork to discuss and justify whether a question should be solved using Pythagoras or Trigonometry |
| Image result for skills iconSequencing | Builds from Y8:Simplifying Algebraic ExpressionsExpanding BracketsEstimation | Builds from Y7:SubstitutionWriting formulaeBuilds from Y8:Solving Equations – function machines and balancingFactorise linear expressions | Builds from Y7:Line GraphsBuilds from Y8:Frequency TablesScatter GraphsStem & Leaf Diagram | Builds from Y7:Transformations | Builds from Y7:Multiplication SkillsDirect ProportionBuilds from Y8:PercentagesFormulaeProportionBuilds from Y9:Rearranging Formulae | Builds from Y7:Constructing TrianglesAngle RulesScale DrawingsBuilds from Y8:Properties of 2D ShapesAngles in Polygons | Builds from KS2:InequalitiesBuilds from Y7:SequencesDirect ProportionBuilds from Y8:Solving equationsDirect proportion graphs | Builds from KS2 & Y7:RoundingBuilds from Y8:Area of TriangleArea of ParallelogramArea of TrapeziumVolume of CuboidsNetsSurface Area of CuboidsBuilds from Y9:Inequalities | Builds from Y7:Linear GraphsUsing a table of valuesSubstitutionBuilds from Y8:y=mx+cBuilds from Y9:Inverse proportion graphs | Builds from Y7:Calculating ProbabilityExperimental ProbabilityBuilds from Y8:Venn Diagrams |
| Further develops in Y10: |
| Further develops in Y10: | Further develops in Y10: | Further develops in Y10: | Further develops in Y10: | Further develops in Y10: | Further develops in Y10: | Further develops in Y10: | Further develops in Y10: | Further develops in Y10: |
| Builds from Y7:SubstitutionWriting formulaeBuilds from Y8:Solving Equations – function machines and balancingFactorise linear expressions | Builds from Y7:CongruencyBuilds from Y8:Scale DrawingsRatioBuilds from Y9:Pythagoras |
| Further develops in Y10: | Further develops in Y10: |
| Retrieval C:\Users\meltynegate\Pictures\icons for booklet\cloud.png | Simplifying Algebraic ExpressionsExpanding BracketsEstimation | Solving EquationsFactorise linear expressions | Scatter GraphsLine GraphsStem & Leaf Diagrams | Enlargement of a shape | MultipliersRearranging formulaeDirect proportion | Constructing TrianglesScale Drawings | Finding Nth TermGeometric sequencesInequality symbolsSolving equations with unknown on both sidesSolving equations with fractionsDirect proportion | Volume of CuboidSurface Area of CuboidRoundingInequalities | Plotting a graph using y=mx+cUsing a table of valuesInverse Proportion Graphs | Experimental ProbabilityTwo-Way TablesVenn Diagrams |
| Solving EquationsFactorise linear expressions | Enlargement |
| New Learning C:\Users\meltynegate\Pictures\icons for booklet\steps.png | Index LawsEstimation with roots and powersStandard Form | Solving equations involving fractionsSolving equations with unknowns on both sidesSubstitution involving roots & indicesUsing formulaeRearranging formulaeCollecting like terms involving indicesFactorise linear expressions involving indicesExpanding double brackets | Types of DataPlanning ResearchQuestionnaireAverages from tablesAverages from grouped dataBack-to-back stem & leaf diagrams | Enlargement from a pointEnlargement using a fractional scale factorEnlargement using a negative scale factor | Percentage changeReverse percentagesSimple & Compound InterestCompound Measures (SDT, DMV, PFA)Best Buy | Perpendicular BisectorAngle BisectorBisecting from a PointConstructing triangles using bisectorsConstructing polygons | Using Nth TermQuadratic SequencesInequalities on a Number LineSatisfying Inequalities (integers)Solving equations with fractions and powers on one or both sidesInverse proportion graphsDirect & Inverse proportion formulae | Circumference of a CircleArea of a CirclePythagoras’ TheoremVolume of PrismSurface Area of PrismVolume of CylinderSurface Area of CylinderUpper & Lower BoundsError Intervals | Parallel line equations (y=mx+c)Cover Up MethodSimultaneous Equations on graphsQuadratic graphs | Mutually Exclusive EventsTheoretical ProbabilitySample Space DiagramsVenn NotationProbability from Venn Diagrams |
| Solving equations involving fractionsSolving equations with unknowns on both sidesSubstitution involving roots & indicesUsing formulaeRearranging formulaeCollecting like terms involving indicesFactorise linear expressions involving indicesExpanding double brackets | Congruent TrianglesSimilar ShapesSimilar TrianglesTrigonometry |
| Independent Practice  | Functional Skills task on estimation of water bills and making students aware of energy costs | Various activities to practice rearranging equations using balance and ensure students cement their understanding of this skill | Functional Skills tasks:Types of DataSheep FarmerFootballInterpreting DataAre we living longer? | Create a Word Activity using all 3 types of scale factor | Functional Skills tasks:Loans & APRSavings & Interest Rates | Functional Skills task on map reading linked to scale drawings / using scales | Various activities to practice solving equations and also using direct and inverse proportion to ensure students understand the different ways in which this skill can present | Circle Investigation to understand pi and relationship between circumference and diameterFunctional skills task to design garden utilising scale drawing and area of 2d shapes including circlesPythagoras’ Theorem investigation to understand the origins of the theorem | Students will spend more than one lesson on graphs for simultaneous equations and quadratic graphs to ensure they fully understand how to draw a graph using a table of values and a correct scale | Various activities to practice solving probability problems including when to choose the most appropriate probability method |
| Various activities to practice rearranging equations using balance and ensure students cement their understanding of this skill | Students will work together to problem solve Trigonometry vs. Pythagoras questions ensuring they cement their understanding of when to use each method |
| Misconceptions |  |  |  |  |  |  |  |  |  |
| Vocabulary and Comprehension | IndicesRootEstimationStandard Form | RearrangeChange the subject ofBinomials | DiscreteContinuousPrimarySecondaryQuestionnaireBack-to-back | EnlargementScale FactorCentre | SpeedDistanceTimeDensityMassVolumeValueReverseProfit / Loss | PerpendicularBisectorEquidistant | QuadraticInequalityInverse Proportion | CircumferenceRadiusDiameterPiVolumeSurface AreaBoundsError Interval | ParallelSimultaneous | Mutually ExclusiveTheoreticalSample SpaceVenn |
| RearrangeChange the subject ofBinomials | CongruentSimilarScale FactorTrigonometry |
| C:\Users\meltynegate\Pictures\icons for booklet\glasses.pngLiteracy | Reading Link attached to each lesson.Understanding and interpreting information in functional skills task | Reading Link attached to each lesson.Reading all information, especially for questions involving algebra and shape | Reading Link attached to each lesson.Understanding and interpreting information in functional skills tasksPhrasing of questionnaire questions is highlighted in this task | Reading Link attached to each lesson.Reading of instructions relating to how to enlarge as well as description of enlargement, ensuring all key points are included | Reading Link attached to each lesson.Understanding and interpreting information in functional skills tasks | Reading Link attached to each lesson.Understanding and interpreting information in functional skills tasks | Reading Link attached to each lesson.Reading inverse and direct proportion questions carefully to ensuring any powers are including when calculating constant | Reading Link attached to each lesson.Understanding and interpreting information in functional skills tasks | Reading Link attached to each lesson. | Reading Link attached to each lesson. |
| Reading Link attached to each lesson.Reading all information, especially for questions involving algebra and shape | Reading Link attached to each lesson.Reading trigonometry worded questions carefully to ensure visual representation are accurate |
| Image result for numeracy iconNumeracy | Powers | AdditionSubtractionMultiplicationDivisionInverse Operations | DataAverages | ScaleMultiplicationDivision | Percentages | Understanding of 2D shapes | SequencesInequalities | AreaPerimeterMultiplicationRounding | Co-ordinatesSubstitution | Probability |
| AdditionSubtractionMultiplicationDivisionInverse Operations | Scale |
| Oracy |  |  | Discussions about each of the functional skills tasks |  |  |  | Opportunities for discussion about each new topic – especially quadratic sequences and inverse proportion |  |  |  |
| Careers |  | \*\*\*\*\* |  |  |  | Constructions – Careers in Landscaping |  |  |  | Trigonometry – Careers in Architecture / Design |
| Super Curricular Links | 16th September – International Day for Preservation of Ozone layer – links by showing Standard Form in real life | 4th – 10th October – World Space Week – looking at scientific formulae and linking with skills learned in maths | 15th – 21st November – Enterprise Week – looking at statistics relating to business15th – 21st November – Anti-Bullying Week – looking at statistics relating to bullying and the impact of bullying | Christmas Festival – enlarging pictures relating to christmas | 4th January – World Braille Day – looking at whether enough is done to ensure blind persons can also access value for money information | 14th – 21st February – National Nest Box Week – linked to construction of nest boxes and their importance | 7th March – World Maths Day | 30th April – 6th May – RSPCA Week – looking at size of cages for animals | 20th – 26th June – Refugee Week – looking at graphs relating to refugee statistics (especially those with increase in gradient) | 11th July – World Population Day – linked to probability of the country (and other countries) reaching certain peak populations in certain time frames |
| British valuesand SMSC | Rule of LawSocial | Individual LibertySocialCultural | ToleranceSocialMoral | Mutual RespectSocialCultural | DemocracySocialMoral | Mutual RespectSocialMoral | Rule of LawSocial | ToleranceSocialMoral | Individual LibertySocialMoral | DemocracySocialMoralCultural |
| Summative assessment |  |  |  |  |  |  |
| Scaffolding for LA | Modelled Examples given to students | Modelled Examples given to students | Modelled Examples given to studentsStep-by-step instructions to refer back toTables / graphs drawn initially | Modelled Examples given to studentsGraphs drawn where necessary | Modelled Examples given to studentsHighlighted key words in worded problemsScaffolded lay out for working | Modelled Examples given to studentsExamples to trace initially | Modelled Examples given to students | Modelled Examples given to studentsScaffolded examples to build understanding of relationship between diameter and radius | Modelled Examples given to studentsGraphs drawn for students initially | Modelled Examples given to studentsVenn diagrams and sample space diagrams to be provided initially |
| Challenge for HA✰ | HA students to follow use Depth Book for extension and challenge tasks | HA students to follow use Depth Book for extension and challenge tasks | HA students to follow use Depth Book for extension and challenge tasks | HA students to follow use Depth Book for extension and challenge tasks | HA students to follow use Depth Book for extension and challenge tasks | HA students to follow use Depth Book for extension and challenge tasks | HA students to follow use Depth Book for extension and challenge tasks | HA students to follow use Depth Book for extension and challenge tasks | HA students to follow use Depth Book for extension and challenge tasks | HA students to follow use Depth Book for extension and challenge tasks | HA students to follow use Depth Book for extension and challenge tasks |