H3

CURRICULUM MAP

SUBJECT AREA:	Mathematics	YEAR / GROUP:	10 aimed at grade 4 – 5 **aimed at grade 6 - 9**

BRIEF SUMMARY OF CURRICULUM INTENT

At H3 our Maths vision is to ensure every pupil feels supported and confident to achieve their maximum potential as we lay the foundations in algebra, number, geometry, and data handling for work at GCSE level. We promote mathematical fluency as an essential life skill and create a positive culture of deep understanding, confidence, independence, and competence. Lessons are carefully planned and sequenced to meet the individual needs of our students with special educational needs, and /or disabilities. 1:1 TA support may be appropriate.

Assessment of progress is made based on the teachers' classroom questioning, the review of pupils' work, and their performances in tests. Feedback is given to pupils orally, in written form in exercise books and as part of analysis of tests. Feedback focuses on positive aspects and corrects misconceptions.

It is the intent that the mathematics curriculum at HPRS is:

- To set ambitious targets with high expectations of all students
- To offer a variety of approaches to teaching and learning to engage and motivate students
- Coherently planned and sequences
- Successfully adapted, designed and developed for students with special educational needs, and/or disabilities
- Broad and balanced for all students

The curriculum delivery in mathematics relies on:

- Embedding quality teaching and learning opportunities in lessons
- Verbal and/ or written weekly feedback focused on positive aspects of the student in lessons
- Marking in such a way that it is personalised to identify and correct misconceptions in student friendly language
- Assessing progress regularly and reporting this to parents/carers each term
- Comparing student progress with their individual learning profiles
- 1 to 1 conversations focused on personal ability, progression, self-reflection and support
- Supporting students who are struggling to work in the mathematics room by offering 1 : 1 support with a TA
- Purposeful questioning allowing for development in mathematical through reasoning and discussion within the lessons.
- A baseline assessment that exposes knowledge gaps. Developing a personalised plan

Re-engaging students in Mathematics at H3 will be established by:

- Using the BKSB Functional Skills Baseline Assessment to expose knowledge gaps, attitude, anxieties and development needs towards maths.
- Initially removing formal aspects of maths lessons from the learning
- Trusted staff members investigating the student's apprehension towards maths and development needs
- Designing a personalised plan that focuses on building personal and mathematical resilience and targets key skills in the gaps in their knowledge
- Through verbal discussion and maths games highlighting and recording student's strengths
- Developing strategies to access support at H3 and understanding the importance of making mistakes
- A methodical progression of integrating formal aspects of learning back into lessons; a workbook, lesson objectives, assessment terminology

Due to pupils being on a part-time timetable, coverage of this curriculum map will be proportional to the amount of time spent covering the subject and differentiated to meet their SEN needs and best ways of working. Pupils arrive at H3 with significant gaps in their learning and individual learning programmes (often from lower year groups or key stages) are developed to meet their needs.

An induction period of two weeks to precede the curriculum map below.

How SMSC and British Values are delivered in this subject

Spiritual – using maths as a tool to make sense of the world around us. Encourage interest in the power of mathematics in everyday life and use spiritual examples to exemplify this – Rangoli patterns in symmetry and tessellation, Fibonacci sequence and the golden ratio etc.

Moral – teachers provide good role models on how to interact with each other and students are encouraged to value the contributions of other students without judgement. Handouts and worked examples avoid stereotypes regarding gender, race, sexual orientation through the use of OFQUAL approved past papers questions.

Social – students in seating plan to facilitate good working practise, collaboration and the opportunity to work with students from a variety of different backgrounds. Students will learn to support each other with the complexities of maths and provide self and peer reviews. Work within the British values of rule of law, individual liberty and mutual respect of each other.

Cultural – students are taught methods for mathematics from around the world such as the Singapore Bar Method, the Chinese lattice method of multiplication etc. Students learn about the traditional methods of mathematics which their parents/grandparents/carers may have been taught as part of the "teaching for mastery" initiative.

KEY DATES / NOTES

Assessment will be a mixture of on-going formative assessments and summative assessments at the end of specific topics.

Questioning throughout lessons will take place to allow students to gain a deeper understanding of topics through reasoning and discussion, marking will be timely and detailed.

A combination of these, along with teacher judgement, will form a half termly grade for each subject on the assessment tracker and a comment explaining overall progress will be reported back to parents/carers at the end of each term

If it is deemed beneficial to an individual student, we will have them sit Functional Skills Level 2 Maths qualification in the Autumn Term. In our experience the confidence gained from achieving a Maths exam qualification early in the year, increases self-confidence and resilience in students of all abilities.

Assessments will be a combination of Corbett maths past papers, Dr FrostMaths, Chapter reviews, BKSB assessments and AQA past papers

Timing	**Key Skills** *What pupils are learning to do*	**Teaching & Learning Themes & Styles** *Topics, Activities, Learning Styles*	**Assessment Focus** *including dates and suggested assessments and methods of assessment*	**Additional Features** • Literacy Elements • Curriculum Links • Visits / Events
AUTUMN Half term 1	Review Number • estimate powers and roots of any given positive number • calculate with roots, and with integer and fractional indices • calculate exactly with surds • apply and interpret limits of accuracy, including upper and lower bounds Geometry and Measures • make links to similarity (including trigonometric ratios) and scale factors • know the exact values of sinθ and cosθ for θ = 0°, 30°, 45°, 60° and 90°; know the exact value of tanθ for θ = 0°, 30°, 45° and 60° • know the trigonometric ratios, sinθ = opposite/hypotenuse, cosθ = adjacent/hypotenuse, tanθ = opposite/adjacent • apply it to find angles and lengths in right-angled triangles in two dimensional figures	Teaching & Learning Themes Number • Estimate with powers and roots • Calculate with powers and roots • Explore the impact of rounding Geometry and Measures • Investigate similar triangles • Explore trigonometry in right-angled triangles • Set up and solve trigonometric equations • Use trigonometry to solve practical problems • Explore enlargement of 2D shapes • Investigate the transformation of 2D shapes Teaching & Learning Styles • Teacher led new content, through Modelling and Scaffolding • Visuals and Images • Paired Learning • Group Discussion • Collaborative Learning	Summative Assessment • End of unit tests relevant to the topics covered this half term. • 1:1 discussion following the completion of an end of topic assessment. • Written Feedback following the completion of an end of topic assessment. Formative Assessment • Paired and small group assessment tasks focusing on reasoning and discussion to develop mathematical language. • Opportunities to self-assess and assess peers to further understanding and identify progress • Verbal feedback throughout lessons	Literacy Elements • Spelling • Definitions • understanding of mathematical vocabulary • developing the ability to read and understand mathematical language • use mathematical language and representations to communicate problems and solutions • use mathematics in a range of contexts • develop exam technique

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	• identify, describe and construct similar shapes, including on coordinate axes, by considering enlargement (including fractional scale factors) • make links *between* similarity and scale factors • describe the changes and invariance achieved by combinations of rotations, reflections and translations	• Independent Learning • ICT and Online Learning • Game Based Learning • Inquiry Based Learning • Personalised Learning • Repetition and Reinforcement • Differentiated Lessons using multiple intelligences.		
AUTUMN Half term 2	Algebra • find approximate solutions to equations numerically using iteration • solve two linear simultaneous equations in two variables algebraically • simplify and manipulate algebraic expressions involving algebraic fractions • manipulate algebraic expressions by expanding products of more than two binomials • simplify and manipulate algebraic expressions (including those involving surds) by expanding products of two binomials and factorising quadratic expressions of the form $x^2 + bx + c$, including the difference of two squares • manipulate algebraic expressions by factorising quadratic expressions of the form $ax^2 + bx + c$ Ratio and Proportion • interpret equations that describe direct and inverse proportion • recognise and interpret graphs that illustrate direct and inverse proportion	Teaching & Learning Themes Algebra • Find approximate solutions to complex equations • Solve simultaneous equations • Solve problems involving simultaneous equations • Manipulate algebraic fractions • Manipulate algebraic expressions Ratio and Proportion • Explore differences between direct and inverse proportion • Investigate ways of representing proportion in situation • Solve problems involving proportion Teaching & Learning Styles • Teacher led new content, through Modelling and Scaffolding • Visuals and Images • Paired Learning • Group Discussion • Collaborative Learning • Independent Learning • ICT and Online Learning • Game Based Learning • Inquiry Based Learning • Personalised Learning	Summative Assessment • Assessments before week beginning the 28th of November • Students will sit a full GCSE paper • Students may sit a Functional Skills Past Paper • Students may be entered for Functional Skills exam • End of unit tests relevant to the topics covered this half term. • 1:1 discussion following the completion of an end of topic assessment. • Written Feedback following the completion of an end of topic assessment. Formative Assessment • Paired and small group assessment tasks focusing on reasoning and discussion to develop mathematical language. • Opportunities to self-assess and assess peers to further understanding and identify progress.	Literacy Elements • Spelling • Definitions • understanding of mathematical vocabulary • developing the ability to read and understand mathematical language • use mathematical language and representations to communicate problems and solutions • use mathematics in a range of contexts • develop exam technique

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	• understand that X is inversely proportional to Y is equivalent to X is proportional to 1/Y	• Repetition and Reinforcement • Differentiated Lessons using multiple intelligences.	• Verbal feedback throughout lessons	
SPRING Half term 3	Algebra • deduce expressions to calculate the nth term of quadratic sequences • recognise and use simple geometric progressions (r^n where n is an integer, and r is a rational number > 0) • solve linear inequalities in two variables • represent the solution set to an inequality using set notation and on a graph Geometry and Measures • calculate surface area and volume of spheres, pyramids, cones and composite solids • apply the concepts of congruence and similarity, including the relationships between length, areas and volumes in similar figures	Teaching & Learning Themes Algebra • Explore quadratic sequences • Investigate geometric progressions • Understand and use set notation • Solve inequalities • Represent inequalities on a graph Geometry and Measures • Calculate surface areas of solids • Calculate volumes of solids • Solve problems involving enlargement and 3D shapes Teaching & Learning Styles • Teacher led new content, through Modelling and Scaffolding • Visuals and Images • Paired Learning • Group Discussion • Collaborative Learning • Independent Learning • ICT and Online Learning • Game Based Learning • Inquiry Based Learning • Personalised Learning • Repetition and Reinforcement • Differentiated Lessons using multiple intelligences.	Summative Assessment • End of unit tests relevant to the topics covered this half term. • 1:1 discussion following the completion of an end of topic assessment. • Written Feedback following the completion of an end of topic assessment. Formative Assessment • Paired and small group assessment tasks focusing on reasoning and discussion to develop mathematical language. • Opportunities to self-assess and assess peers to further understanding and identify progress • Verbal feedback throughout lesson	Literacy Elements • Spelling • Definitions • understanding of mathematical vocabulary • developing the ability to read and understand mathematical language • use mathematical language and representations to communicate problems and solutions • use mathematics in a range of contexts • develop exam technique

SPRING Half term 4	Geometry and Measures • apply and prove the standard circle theorems concerning angles, radii, tangents and chords, and use them to prove related results	Teaching & Learning Themes Geometry and Measures • Investigate geometric patterns using circles • Explore circle theorems • Make and prove conjectures	Summative Assessment • Assessments before week beginning the 20th of March • Students will sit a full GCSE paper.	Literacy Elements • Spelling • Definitions • understanding of mathematical vocabulary

	Algebra • plot and interpret graphs (including exponential graphs) and graphs of non-standard functions in real contexts, to find approximate solutions to problems such as simple kinematic problems involving distance, speed and acceleration • 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 • interpret the gradient at a point on a curve as the instantaneous rate of change • identify and interpret roots, intercepts, turning points of quadratic functions graphically	Algebra • Explore exponential graphs • Create and use graphs of non-standard functions • Investigate gradients of graphs • Find and interpret areas under graphs • Investigate features of quadratic graphs Teaching & Learning Styles • Teacher led new content, through Modelling and Scaffolding • Visuals and Images • Paired Learning • Group Discussion • Collaborative Learning • Independent Learning • ICT and Online Learning • Game Based Learning • Inquiry Based Learning • Personalised Learning • Repetition and Reinforcement • Differentiated Lessons using multiple intelligences.	• End of unit tests relevant to the topics covered this half term. • 1:1 discussion following the completion of an end of topic assessment. • Written Feedback following the completion of an end of topic assessment. Formative Assessment • Paired and small group assessment tasks focusing on reasoning and discussion to develop mathematical language. • Opportunities to self-assess and assess peers to further understanding and identify progress • Verbal feedback throughout lessons	• developing the ability to read and understand mathematical language • use mathematical language and representations to communicate problems and solutions • use mathematics in a range of contexts • develop exam technique
SUMMER Half term 5	Number • change recurring decimals into their corresponding fractions and vice versa • set up, solve and interpret the answers in growth and decay problems, including compound interest Algebra • solve quadratic equations algebraically by factorising • solve quadratic equations (including those that require rearrangement) algebraically by factorising • find approximate solutions to quadratic equations using a graph • deduce roots of quadratic functions algebraically Probability	Teaching & Learning Themes Number • Explore the links between recurring decimals and fractions • Solve problems involving repeated percentage change • Solve problems involving exponential growth and decay Algebra • Solve quadratic equations • Use graphs to solve equations Probability • Understand and use the product rule for counting • Use Venn diagrams to represent probability situations • Use two-way tables to represent probability situations	Summative Assessment • End of unit tests relevant to the topics covered this half term. • 1:1 discussion following the completion of an end of topic assessment. • Written Feedback following the completion of an end of topic assessment. Formative Assessment • Paired and small group assessment tasks focusing on reasoning and discussion to develop mathematical language. • Opportunities to self-assess and assess peers to further understanding and identify progress • Verbal feedback throughout lessons	Literacy Elements • Spelling • Definitions • understanding of mathematical vocabulary • developing the ability to read and understand mathematical language • use mathematical language and representations to communicate problems and solutions • use mathematics in a range of contexts • develop exam technique

	• apply systematic listing strategies including use of the product rule for counting • calculate and interpret conditional probabilities through representation using expected frequencies with two-way tables, tree diagrams and Venn diagrams	• Solve probability problems involving combined events Teaching & Learning Styles • Teacher led new content, through Modelling and Scaffolding • Visuals and Images • Paired Learning • Group Discussion • Collaborative Learning • Independent Learning • ICT and Online Learning • Game Based Learning • Inquiry Based Learning • Personalised Learning • Repetition and Reinforcement • Differentiated Lessons using multiple intelligences.		
SUMMER Half term 6	Statistics • infer properties of populations or distributions from a sample, whilst knowing the limitations of sampling • construct and interpret diagrams for grouped discrete data and continuous data, i.e. cumulative frequency graphs, and know their appropriate use • interpret, analyse and compare the distributions of data sets from univariate empirical distributions through appropriate graphical representation involving discrete, continuous and grouped data, including box plots • interpret, analyse and compare the distributions of data sets from univariate empirical distributions through appropriate measures of central tendency including quartiles and inter-quartile range Algebra • use the form $y = mx + c$ to identify perpendicular lines • recognise and use the equation of a circle with centre at the origin	Teaching & Learning Themes Statistics • Construct and interpret cumulative frequency graphs • Construct and interpret box plots • Analyse distributions of data sets Algebra • Investigate features of straight line graphs • Know and use the equation of a circle with centre at the origin • Solve problems involving the equation of a circle Geometry and Measures • Explore the concept of a vector • Solve problems involving vectors Teaching & Learning Styles • Teacher led new content, through Modelling and Scaffolding • Visuals and Images • Paired Learning • Group Discussion • Collaborative Learning • Independent Learning	Summative Assessment • Assessments before week beginning the 26th of June • Students will sit a full GCSE paper. • End of unit tests relevant to the topics covered this half term. • 1:1 discussion following the completion of an end of topic assessment. • Written Feedback following the completion of an end of topic assessment. Formative Assessment • Paired and small group assessment tasks focusing on reasoning and discussion to develop mathematical language. • Opportunities to self-assess and assess peers to further understanding and identify progress • Verbal feedback throughout lessons	Literacy Elements • Spelling • Definitions • understanding of mathematical vocabulary • developing the ability to read and understand mathematical language • use mathematical language and representations to communicate problems and solutions • use mathematics in a range of contexts • develop exam technique

	• find the equation of a tangent to a circle at a given point Geometry and Measures • apply addition and subtraction of vectors, multiplication of vectors by a scalar, and diagrammatic and column representations of vectors	• ICT and Online Learning • Game Based Learning • Inquiry Based Learning • Personalised Learning • Repetition and Reinforcement • Differentiated Lessons using multiple intelligences.		