

Curriculum Area Intent



Mathematics

At Huntcliff School we believe that everyone can succeed in mathematics through hard work and resilience, irrespective of their starting point. We encourage our pupils to explore their potential without fear of making mistakes, understanding that progress is made by trying, perseverance and determination. Our department is clear that mathematics is the key to unlocking a variety of rich and varied career pathways. We aim to raise the aspirations of all pupils and strive to fully exploit opportunities for links between the pupils' learning and its application within a range of science, technology, engineering and mathematics careers. Our intent is to prepare our students for their next challenge, whether that is to study for A Levels, to start an apprenticeship or to give them the skills to deal with everyday mathematics and improve their potential of success.

1.1 Rationale

Aims

The national curriculum for mathematics aims to ensure that all pupils:

- become fluent in the fundamentals of mathematics, including through varied and frequent practice
 with increasingly complex problems over time, so that pupils develop conceptual understanding and the
 ability to recall and apply knowledge rapidly and accurately
- reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- can solve problems by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions

The rationale for Sequencing (Scope and Rigour)

Mathematics is an interconnected subject in which pupils need to be able to move fluently between representations of mathematical ideas. Mathematics is a cornerstone of any outstanding education. The programmes of study are, by necessity, organised into apparently distinct domains, but pupils should make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. They should also apply their mathematical knowledge to science and other subjects.

WHY?

The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. However, decisions about when to progress should always be based on the security of pupils' understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems before any acceleration through new content. Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on.

Maths is vital for a variety of careers including becoming an investment analyst, a software developer, an engineer or a financial manager. Maths allows students to develop a range of transferable skills such as, data analysis, critical thinking, time management and problem solving.

As students gain an understanding of mathematics, they become more able to see how the content is applicable to everyday life in increasingly complex scenarios, and if they dig beneath the surface, they will gain an appreciation that maths underpins much of what they see in the world at large.

Research informing the Sequencing decisions.

Both Rosenshine's Principles of Instruction and Cognitive Load Theory have informed our curriculum sequencing and implementation. Both recognise the importance of memory in building schemas required to develop mastery and retention. Our schemes of work are sequenced so that students revisit skills and build upon prior learning over time, chunking more complex concepts into smaller parts. A scaffolded approach, combined with modelling and step by step success criteria means students are exposed to new skills and concepts gradually, building strong foundations and links across texts and skills.

Broader Themes:

Through the mathematics content, students should be taught to develop fluency within the subject. Whilst using the national curriculum as the basic framework, students are expected to develop their reasoning mathematically in the subject. They should:

- Extend their understanding of the number system; making connections between number relationships, and their algebraic and graphical representations
- Extend and formalise their knowledge of ratio and proportion in working with measures and geometry, and in formulating proportional relations algebraically
- Identify variables and express relationships between variables algebraically and graphically
- Make and test conjectures about patterns and relationships; look for proofs or counter-examples
- Reason deductively in geometry, number and algebra, including using geometrical constructions
- Interpret when the structure of a numerical problem required additive, multiplicative or proportional reasoning
- Explore what can or cannot be inferred in statistical and probabilistic settings, and express their arguments formally
- Generate theoretical sample spaces for single or combined events and use these to calculate theoretical probabilities.