

Maths curriculum enrichment

Sessions

Overview

Mathematics is a creative and highly interconnected discipline that has been developed over centuries, providing the solution to some of history's most intriguing problems. It is essential to everyday life, critical to science, technology and engineering and necessary for financial literacy.

A high quality mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics and a sense of enjoyment and curiosity about the subject.

Our aim is 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.
- 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

Breakdown of sessions for the numeracy workshops:

Session 1: Number

Learning opportunities include:

- Understand and use place value for decimals, measures and integers of any size
- Order positive and negative integers, decimals and fractions
- Recognise and use relationships between operations, including inverse operations
- Interpret fractions and percentages as operators

Session 2: Algebra

Learning opportunities include:

- Understanding and use standard mathematical formulae
- Model situations or procedures by translating them into algebraic expressions
- Work with coordinates in all four quadrants
- Interpret mathematical relationships both algebraically and graphically

Session 3: Ratio, proportion and rates of change

Learning opportunities include:

- Change freely between related standard units
- Use scale factors, scale diagrams and maps
- Divide a given quantity into two parts
- Relate the language of ratios and the associated calculations to the arithmetic's of fractions and to linear functions

Session 4: Geometry and measures

Learning opportunities include:

- Calculate and solve problems involving perimeters
- Draw and measure line segments and angles in geometric figures
- Derive and use the standard ruler and compass constructions
- Describe, sketch and draw using conventional terms and notations

Session 5: Probability

Learning opportunities include:

- Record, describe and analyse the frequency of outcomes of simple probability experiments involving randomness, fairness, equally and unequally likely outcomes
- Understand that the probabilities of all possible outcomes sum to 1
- Generate theoretical sample spaces for single and combined events with equally likely, mutually exclusive outcomes and use these to calculate theoretical probabilities

Session 6: Reason mathematically

Learning opportunities include:

- Extend and formalise their knowledge of ratio and proportion, including trigonometric ratios
- Extend their ability to identify variables and express relations between variables algebraically and graphically
- Make and test conjectures about the generalisations that underlie patterns and relationships

Session 7: Solving Problems

Learning opportunities include:

- Develop their mathematical knowledge, in part through solving problem and evaluating the outcomes, including multi-step problems
- Develop pupils use of formal mathematical knowledge to interpret and solve problems
- Make and use connotations between different parts of mathematics to solve problems
- Select appropriate concepts, methods and techniques to apply to unfamiliar and non-routine problem; interpret their solution in the context of the given problem

Session 7: Algebra

Learning opportunities include:

- Simplify and manipulate algebraic expressions
- Factorising quadratic expressions
- Know the difference between an equation and an identity
- Solve quadratic equations algebraically by factorising

Session 7: Probability

Learning opportunities include:

- Apply the property that the probabilities of exhaustive set of mutually
- Use a probability model to predict the outcomes of future experiments