Mathematics at Montsaye

Overview:

The aim of Mathematics is to allows our students to achieve a sustained, deep, conceptual understanding of the subject, in order for them to exceed their expectations and be successful. Through high quality and inclusive lessons, we aim to create a sense of excitement and curiosity around mathematics as well as a rigour to prepare them for their examinations. Children are encouraged to make links between what they are learning and the world around them. They will become fluent in their mental and written calculation skills, reason and explain mathematically the maths that they are learning and be able to solve problems using and applying their mathematical knowledge in a range of contexts. We aim to inspire students to tackle all problems with logic, efficiency and resilience and utilise these skills in all aspects of their future lives.
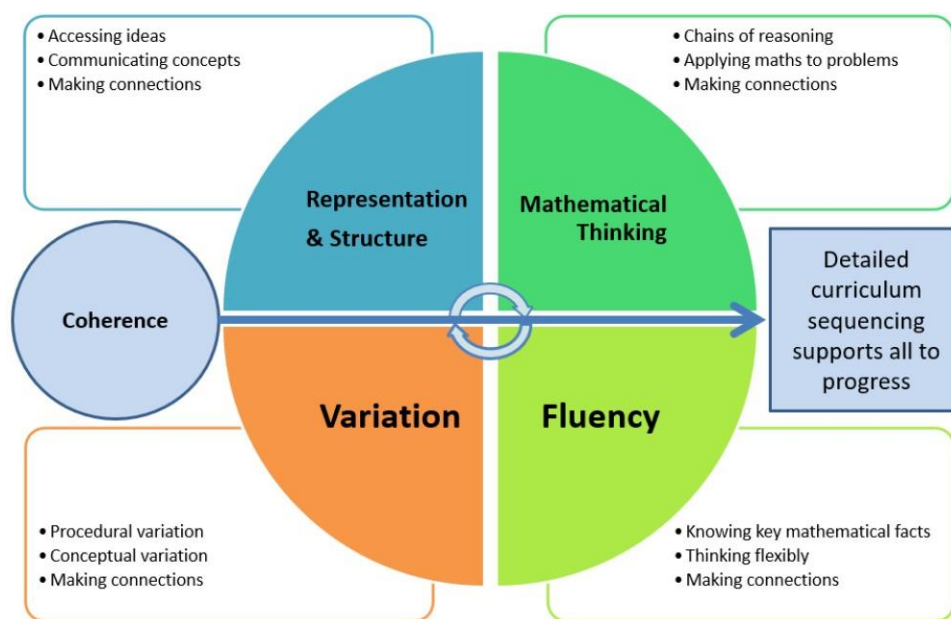
Intent:

The Mathematics department at Montsaye Academy aims to develop problem solvers who can attempt to approach any challenges presented in a logical and educated way. With a combination of teacher led delivery, independent work and collaboration with peers we aim to complement the skills that they are developing in other subject areas to prepare them for the everyday world and take a curiosity for mathematics with them.

Our scheme of work adopts Teaching for Mastery practices, the essences of these are:
- Whole-class interactive teaching, where the focus is on all students working together on the same lesson content at the same time.
- Students master concepts before moving to the next part of the learning cycle, allowing no student to be left behind.
- Early intervention to ensure students keep up (not catch up).
- Lesson design focuses on small steps through a carefully sequenced learning journey.
- Typical lesson content includes questioning, short tasks, explanation, demonstration, and discussion.
- Procedural fluency and conceptual understanding are developed in tandem through intelligent practice.
- Significant time is spent developing deep knowledge of the key ideas needed to underpin future learning.
- Structures and connections are emphasised.
- Key facts are learnt to avoid cognitive overload and to enable students to focus on new concepts.
- Correct Mathematical language is used at all times.
- Staff are trained with TfM principles and two TfM advocates are nominated to represent Montsaye Academy at Maths Hub meetings.

Teaching for Mastery

- Accessing ideas
- Communicating concepts
- Making connections

Representation & Structure

- Chains of reasoning
- Applying maths to problems
- Making connections

Mathematical Thinking

Coherence

Detailed curriculum sequencing supports all to progress

Variation

- Procedural variation
- Conceptual variation
- Making connections

Fluency

- Knowing key mathematical facts
- Thinking flexibly
- Making connections

Every lesson should contain all 5 big ideas if it is going to help students make the most progress over time.

The 5 big ideas are:

Representation & Structure - concrete pictorial and abstract. Learners can access abstract ideas through manipulating objects to derive enactive knowledge. Then diagrams help them acquire iconic knowledge to act as a bridge to formal symbolic knowledge.
Concrete: Counters, multi-link cubes, Cuisenaire rods/dienes blocks, money, algebraic tiles...
Visual: Diagrams of counters, Bar modelling, number lines (horizontal and vertical)

Mathematical Thinking - Chains of Reasoning. Making Connections Longer time for pupils to discuss, improve, agree, generalise.
More questioning and Intelligent practice to ensure DEEP thinking, especially about misconceptions.

Fluency - Number Facts, Table Facts, Making Connections
Students need the ability to look for connections and relationship between the mathematics therefore look for the most efficient ways to answer the questions.
Cutting down on the thinking by making connections between the things I already know.

Coherence - Small steps are easier to take. One Key Learning Point Shorter steps in each lesson, so that each one is secure & fluent. Mathematical Language Make connections with earlier ideas. Once deeply understood, use it in the next steps.

Variation - Understanding concepts from multiple perspectives.
Introducing concepts with concrete and visual approach before upgrading to the abstract level.
Highlighting the essence of a concept by contrasting a non-standard figure
Non-concept - what is and what is not. Different methods used to solve a problem and the connections between these methods and other problems.

Student Vision:

- To recognise and develop relationships between concepts and procedures.
- To encourage mathematical reasoning by following lines of enquiry, generalising and justifying using mathematical language.
- To apply mathematical understanding to problem solving by breaking down problems into simpler steps and persevering in seeking solutions using a range of strategies.
- To develop resilience, confidence and enthusiasm about mathematics
- To provide 'purposeful maths' through application of mathematical skills and knowledge to the world around them.
- To link the transferable skills in the course to their next steps in life

Exam Board: AQA

Assessment Method: 100% Examination

The team:

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