



STEP Academy Trust

Maths Policy

July 2015

Review: July 2018

Rationale

Mathematics is a body of skills and knowledge that is crucial for a successful life. Innumeracy is just as unacceptable as illiteracy, and all children must leave STEP academies with a secure understanding of, and operational proficiency in, maths. This policy seeks to define a set of parameters for all STEP academies to work within when planning, teaching and assessing maths, which are based on sound pedagogical evidence. A degree of consistency across academies is essential, although this must be balanced with the individual contexts and needs of each academy.

To be read in conjunction with the following policies: Teaching and Learning, Assessment, Marking and Presentation, EYFS, English, Science, Computing, Arts, PE, RE, MfL, SRE and relationships, RRS and Homework.

Aims of Maths Teaching

All STEP Academies follow the National Curriculum for mathematics. Our curriculum 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.

Principles

The following principles underpin maths teaching in STEP Academies:

Everyone is a mathematician.

It is sometimes believed that mathematics is something that one either 'gets' or not, or that there is such a thing as a natural mathematician. While some children may pick up concepts more quickly than others, everyone has the ability to learn maths and to be a successful mathematician.

Concrete learning precedes conceptual learning.

Evidence shows that children learn by first working in the concrete, with real physical objects, before they can understand something conceptually. It is, therefore, essential to ensure that all children have access to concrete resources (manipulatives) in maths lessons, especially when learning a new concept, ie: Numicon.

Procedural ability is not enough.

We live in a world where calculators are carried in pockets; a simple ability to calculate will not effectively prepare children for the future in which they will live. Knowing how to calculate without understanding the process or being able to apply it is not sufficient; a deep understanding of mathematical concepts will allow children to apply their knowledge to real life situations and make them confident mathematicians for life.

Depth is preferable to breadth.

When children have successfully learned a new concept, rather than quickly moving children on to the next topic, they can be allowed to go 'deeper' into what they are learning, providing them with the opportunity to master concepts. This depth will create mathematicians with a firm grasp of the concepts which they have learned.

Investigating and problem solving are essential.

Mathematics is not simply a body of knowledge for children to learn; it is also a set of skills which children must be able to apply effectively. Therefore, it is essential that teaching involve as diverse a range of problem solving and investigation as possible, as often as possible.

Provision

It is imperative that classrooms are well resourced with a variety of manipulatives to support the teaching of mathematics to children at all stages. All children must have the chance to learn through the use of manipulatives, not just lower-ability children (as most commonly happens). Possible manipulatives could include:

- Diennes (hundreds, tens and ones),
- Multilink cubes,
- Place value cards,
- Beaded strings,
- Cuisenaire rods,
- Bundling sticks,
- Counters,
- Dice,
- Measuring equipment
- Numicon
- Measuring equipment

This is not a compulsory list, nor is it exhaustive; rather, it is a guide to be used by SLTs, maths leaders and class teachers when planning provision and classroom resources.

Planning

Planning, first and foremost, is for the teachers who will be using it. Long-term plans are drawn from the National Curriculum document to ensure correct coverage in each year group. Medium and short-term plans may be organised according to the teacher's professional judgment and the needs of their class. Learning objectives must be clear and precise, and planning will identify key questions and common misconceptions, both of which are central to effective maths teaching.

Mathematical Oracy

In addition to written mathematical work, children must be able to talk confidently about the mathematics that they are working on, using the correct vocabulary. This will follow from staff being fluent in mathematical concepts and language themselves, and modeling correct usage at all times. This mathematical oracy will feed into children's ability to reason, which is a key mathematical skill that is often overlooked. Children must be able to cogently and concisely explain their thinking and working in maths,

going from simple description and explanation at first, through to complex justifications and proofs in time.

Assessment

Both formative and summative assessment will take place in maths across all STEP Academies. Formative assessment allows teachers to plan learning effectively, ensuring that children are taught what they need to know. Formative assessment feeds into discussions at end of year, ensuring that the next teacher is aware of any additional areas that they may need to focus on or cover. A coordinated approach between year groups is essential to ensure complete coverage of the National Curriculum for maths. When assessing a child's mathematical ability, it is important to speak to and question them. While books are a useful indicator of the work a child has covered and is capable of, they are not as evidential in the way an English or Discovery Time book may be; it is not a reliable way to assess a child in isolation. This should be communicated to external visitors making judgments on the children's maths: the most important evidence of a child's mathematical ability is the child: pupil voice.