

Numeracy Policy

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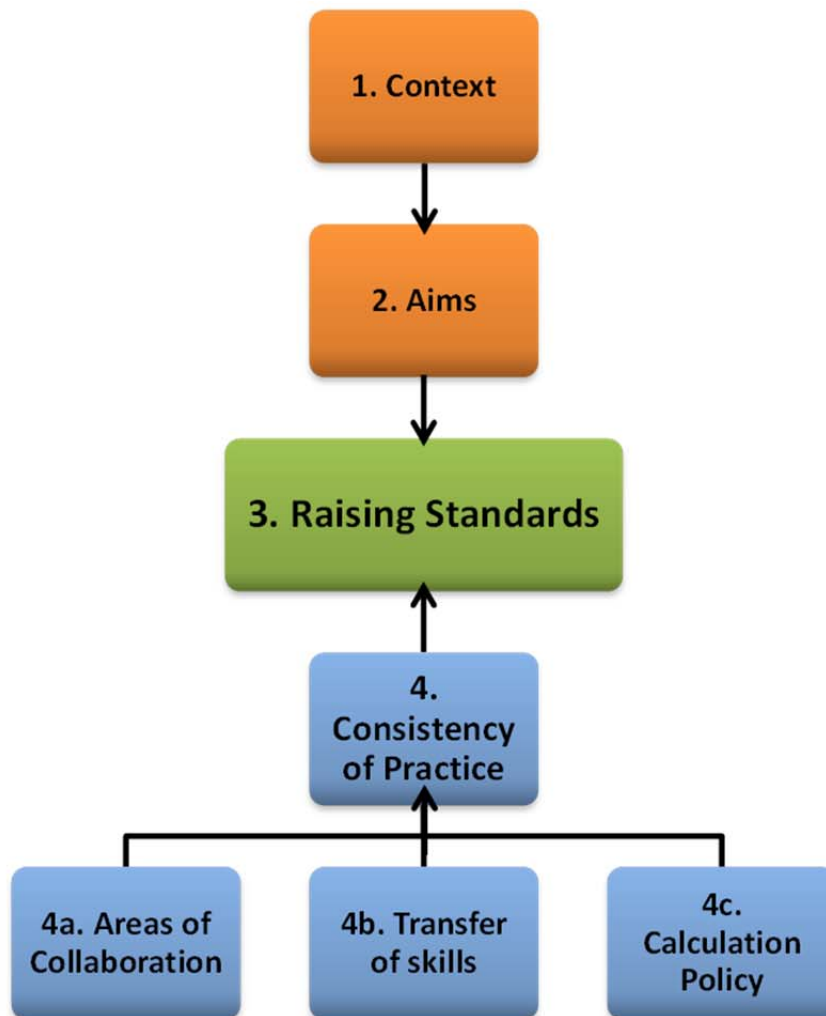
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What is Numeracy?

“The ability to understand and work with numbers”. (Oxford English Dictionary)

Numeracy is the fluency with numbers and the ability to make use of mathematical skills, enabling a person to cope with the practical mathematical demands of everyday life. A numerate student should be able to appreciate and understand some of the ways in which mathematics can be used as a means of communication.



1. Context

Students typically enter Stephenson Studio School having made limited progress throughout KS2 and KS3 because of lower than average literacy and numeracy skills. As a result, in order to ensure accelerated progress throughout KS4 that allows students to catch up with their peers nationally, the school has developed a reading writing and mathematics strategy that is supported by the numeracy and literacy policies.

2. Aims

- To develop students' skills and application of numeracy across the curriculum in order that students are able to make accelerated progress.
- To raise the standards of numeracy of all students, so they develop the ability to use numeracy skills effectively in all areas of the curriculum and the skills necessary to cope confidently with the demands of further education, employment and adult life.
- To ensure consistency of practice including methods, vocabulary, notation, etc.
- To indicate areas for collaboration between subjects.
- To encourage learners to transfer Mathematical skills and apply them in everyday and unknown contexts.
- To adopt a whole-school approach to Numeracy across the curriculum in order to raise standards of attainment for all learners.
- To recognise the importance of Numeracy in all subjects across the curriculum.
- To identify similarities and differences in Mathematical teaching in different curriculum areas and develop a common approach.
- To encourage staff to take responsibility for the development of numeracy in each subject area.
- To raise staff and pupil awareness of key Numeracy strategies.

3. Raising Standards

Raising standards in Numeracy across the school cannot be solely judged in increased test percentages. There is a need to evaluate the pupils' ability to transfer mathematical skills into other subject areas, applying techniques to problem solving. Their confidence in attempting this is initially as important as achieving the correct solution. The Senior Leadership Team also has a commitment to the implementation and evaluation of this work. They are aware of the need to create time for liaison to sustain the cross curricular links forged between subject areas. The effectiveness of these links will reduce the replication of work by teachers and pupils.

4. Consistency of Practice

Improving numeracy skills is a whole-school matter. Each department should identify the contribution it can make towards the teaching of numeracy and other mathematical skills. So that pupils become confident in tackling mathematics in any context. The teaching of numeracy is the responsibility of all staff and the school's approaches should be as consistent as possible across the curriculum.

Areas of Collaboration

Staff need to look for opportunities for drawing mathematical experience out of a wide range of children's activities. Mathematics contributes to many subjects of the curriculum, often in practical ways. Activities such as recording the growth of a plant or an animal, measuring temperature and rainfall, or investigating the cog wheels in a bicycle can provide data or starting points for discussion and the opportunities to apply

and use mathematics in real contexts. The key to making the most of all these opportunities is to identify the mathematical possibilities in your subject at the planning stage. All teachers should consider pupils' ability to cope with the numerical demands of everyday life and provide opportunities for students to:

- All departments have a responsibility for identifying aspects of their schemes of work that contribute to raising standards of Numeracy and highlighting these aspects, in their planning and making them explicit to learners.
- All staff should encourage and promote the use of problem solving.
- Raise the profile of Mathematics throughout the school promoting the use of numbers and measures whenever possible.
- Adopt a consistent approach to teaching numeracy skills.
- Be familiar with and use strategies to equip students with numeracy skills for life.
- Indicate in schemes of work where numeracy skills are taught.
- Handle number and measurement competently, mentally, orally and in writing;
- Use calculators accurately and appropriately;
- Interpret and use numerical and statistical data represented in a variety of forms.

Teachers of mathematics will:

Ensure consistency of practice as mentioned above, mathematics teachers and teachers of other subjects co-operate on agreed strategies;

Be aware of the mathematical techniques used in other subjects and provide assistance and advice to other departments, so that a correct and consistent approach is used in all subjects;

Provide information to other subject teachers on appropriate expectations of students and difficulties likely to be experienced in various age and ability groups;

- Liaise with other teachers, attempt to ensure that students have appropriate numeracy skills by the time they are needed for work in other subjects across the curriculum;
- Seek opportunities to use topics and examination questions from other subjects in mathematics lessons
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Teachers of subjects other than mathematics will:

It is important to recognise that all teachers are teachers of numeracy. It is the key for academic success and the long-term sustainable improvement in pupil attainment.

- Ensure they are familiar with correct mathematical language, notation, conventions and techniques, relating to their own subject, and encourage students to use these correctly;
- Be aware of appropriate expectations of students and difficulties that might be experienced with numeracy skills;
- Provide information for mathematics teachers on the stage at which specific numeracy skills will be required for particular groups;

- Provide resources for mathematics teachers to enable them to use examples of applications of numeracy relating to other subject in mathematics lessons.
- Encourage the use of mental work in the classroom and frequently ask learners to explain their answers. Providing opportunities for learners to discuss enabling them to share and compare ideas.
- Question learners on strategies undertaken and promote the use of problems solving. Discuss efficiency of calculations encouraging learners to develop their own methods.
- Regularly ask learners to consider 'rough' answers and invite them to estimate using these to provide a suitable check for their answers.
- Encourage the learning of facts and skills providing learners with opportunities to practice times tables.
- Use diagrams and equipment to aid understanding when possible.
- Use Mathematical words often to familiarise learners with their meanings and to develop their understanding.
- Support and encourage the use of the Numeracy policy throughout.

Transfer of Skills

The Mathematics Department will deliver the National Curriculum knowledge, skills and understanding through the Numeracy Framework using direct interactive teaching, predominantly in lessons consisting of several "episodes". They will make references to the applications of Mathematics in other subject areas and give contexts to many topics. The transfer of skills is something that many pupils find difficult – especially if the approaches in other subjects differ significantly from those in the Mathematics Department.

Calculation Policy

The calculation policy should be referred to as an accompaniment to this document to ensure that consistent approaches are being employed by staff and students around school and at home. The document provides an overview of strategies used to teach calculations. The methods are used in mathematics classrooms to support the learning of pupils and need to be remembered and employed by all staff when doing calculations. To support progress in the formal methods of calculations, students, parents and teachers must be aware of the starting points of the class.

GENERAL ADVICE:

1. Calculators:

In order to improve numeracy skills, it is essential that students should be encouraged to use non-calculator methods whenever possible. However departments should ensure students have access to calculators when they are necessary. It is recognised that where calculators are to be used their correct use may have to be taught.

2. Methods and Presentation:

Where a student is gaining success with a particular method it is important that s/he is not confused by being given another method. This does not disallow the possibility of introducing alternatives in order to improve understanding or as part of a lesson deliberately designed to investigate alternative methods, provided students can manage this without confusion.

3. Working out:

In all arithmetic, the importance of place value and neat column keeping should be stressed. In a line of workings an “equals” sign should only appear once.

This is poor practice:

$$£3.50 \times 0.85 = 2.975 + 3.50 = 6.475 = £6.48$$

This is good practice:

$$£3.50 \times 0.85 = 2.975$$

$$2.98 + 3.50 = £6.48$$

4. Language:

- When referring to decimals say “three point one four” rather than “three point fourteen”.
- Read numbers out in full, so say three thousand four hundred rather than three, four, zero, zero.
- Use a variety of words that have the same meaning e.g. add, plus, sum etc.
- Encourage pupils to be less dependent on simple words e.g. exposing them to the word multiply as a replacement for times
- Discuss that some words have different meanings in Mathematics from everyday life e.g. take away, volume, product etc.
- Highlight word sources e.g. quad means four, lateral means side, so that pupils can use them to help remember meanings. (This applies to both prefixes and suffixes to words.)
- Use correct mathematical notation consistently across the school e.g. £3.20 NOT £3:20 or £3.20p
- It is important to use the correct mathematical term for the type of average being

used, i.e. mean, median or mode.

Mean: Total of values of sample \div sample size. [The term average is commonly used when referring to the mean]

Median: Middle value of sample when sample values are arranged in size order.

Mode: Sample values which occur most frequently.

5. Checking:

- Encourage students to check divisions by multiplication and subtractions by adding.
- When constructing/ using graphs and charts students should be encouraged to:
 - Use a sharp pencil.
 - Label both axes and give a title
 - Use independent variable on x-axis, and dependent variable on the y-axis, e.g.: if graphing temperature of a cooling liquid, time should go on the x-axis and temperature on the y-axis. [The temperature of the liquid is dependent on the time of the reading.]
 - Label lines not spaces, unless a bar-chart with discrete data
 - Use equally spaced intervals
 - Use convenient scales
 - Mark points by a small cross not a dot
 - Draw graphs on squared or graph paper
 - To draw graphs of a sensible size (they tend to make them too small)
- Pupils should be exposed to Bar Charts, Pie Charts, Pictograms, Line graphs and Cumulative frequency curves. Histograms are only tackled by higher-level students.
- If axes do not start from zero, a break represented by a zig-zag line should be shown on the axis.
- Students need to be taught when each type of graph is appropriate. (This is very important as students will generally produce the type of graph they last met without much thought to appropriateness.)

6. Environment:

There should be a numeracy board on public display that is updated regularly. (all staff should reference this when appropriate)

All classrooms should have a clock that supports with 24 hr times.

Individual classrooms should try to incorporate numeracy into displays when appropriate.

Monitoring, Evaluation and Review

The whole school Numeracy Policy will be reviewed to ensure that it is in line with ongoing Numeracy developments.

Numeracy across the curriculum will be monitored through the whole school quality

assurance system including:

- Departmental meetings and reviews
- Work scrutiny exercises
- Lesson observations and learning walks
- Link leadership meetings

The Head of Mathematics and Numeracy Coordinator will meet regularly with other areas of learning in order to coordinate the timing and depth of treatment of Numeracy in their areas of learning and to coordinate the assessment and reporting of using maths.

The SMT, Head of Mathematics and Numeracy Coordinator will meet regularly each year to review and plan for Numeracy tasks and development. The numeracy policy will be reviewed alongside the calculation policy on the week beginning 11/06/16.