


TIBSHELF COMMUNITY SCHOOL NUMERACY POLICY

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(Tibshelf Policy)





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Numeracy Intervention: Anna Clarke / Maths

“Maths is like a Pizza – you can’t put a whole pizza in your mouth at once to fully appreciate it”

R Hepworth

Mission Statement:

Tibshelf Community School is committed to raising the standards of numeracy of all of its students, so that 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.

Whole School Numeracy Policy

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Introduction:

The purposes of our whole-school numeracy policy:

1. to develop, maintain and improve standards in numeracy across the school
2. to ensure consistency of practice including methods, vocabulary, notation, etc.
3. to indicate areas for collaboration between subjects
4. to assist the transfer of pupils' knowledge, skills and understanding between subjects

Contextual Information:

The development of the concept of "numeracy":

1959 – (Crowther report) - Numeracy is defined as a word to represent the mirror image of literacy.

1982 – (Cockcroft report) - A numerate pupil is one who has the ability to cope confidently with the mathematical needs of adult life.

There was an emphasis on the wider aspects of numeracy and not purely the skills of computation.

1995 (OED) – numerate means acquainted with the basic principles of Mathematics

A current definition of numeracy:

Numeracy is a proficiency which is developed mainly in mathematics but also in other subjects. It is more than an ability to do basic arithmetic. It involves developing confidence and competence with numbers and measures. It requires understanding of the number system, a repertoire of mathematical techniques, and an inclination and ability to solve quantitative or spatial problems in a range of contexts. Numeracy also demands understanding of the ways in which data are gathered by counting and measuring, and presented in graphs, diagrams, charts and tables. (Framework for Teaching Mathematics – yrs 7 to 9 – DfES)

1. Raising Standards

Raising Standards in Numeracy across our 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. Pupil and teacher interviews along with work sampling will be the main processes for evaluating the success of our practice. In order to promote success in whole school numeracy there will be increased 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.


2. Consistency of Practice


The Mathematical Association recommends that teachers of Mathematics and teachers of other subjects co-operate on agreed strategies.

Teachers of mathematics should:

1. 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.
2. provide information to other subject teachers on appropriate expectations of students and difficulties likely to be experienced in various age and ability groups.
3. through liaison with other teachers, attempt to ensure that students have appropriate numeracy skills by the time they are needed for work in other subject areas.
4. seek opportunities to highlight topics and potential examination questions from other subjects in mathematics lessons.

Teachers of subjects other than mathematics should:

1. ensure that they are familiar with correct mathematical language, notation, conventions and techniques relating to their own subject, and encourage students to use these correctly.
 2. be aware of appropriate expectations of students and difficulties that might be experienced with numeracy skills.
 3. provide information for mathematics teachers on the time at which specific numeracy
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skills will be required for specific groups.

4. provide resources for mathematics teachers to enable them to use examples of applications of numeracy relating to specific subjects in mathematics lessons.

3. Our Areas of Collaboration:

Mental Arithmetic Techniques

Pupils should be able to tackle a specific question using a variety of methods. These approaches rely on mixing skills, ideas and facts. This is done by pupils drawing on their own personal experience and preferences. All departments should promote the use of effective mental strategies, but also stress the importance of showing accurate, logical and structured working out.

Whole school Policy on the use of calculators

The school expects all pupils to bring their own scientific calculator to all lessons. In deciding when pupils use a calculator in lessons, we should ensure that:

- pupils' first resort should be to use mental methods
- pupils have sufficient understanding of the calculation to decide the most appropriate method: mental, pencil and paper or calculator
- pupils have the technical skills required to use the basic facilities of a calculator constructively and efficiently, the order in which to use keys, how to enter numbers as money, measures, fractions, etc.
- pupils understand the four arithmetical operations and understand which to use to solve problems
- when using a calculator, pupils are aware of the processes required and are able to say whether their answer is sensible
- pupils can interpret the calculator display in context e.g. 5.3 is £5.30 in money calculations
- we help pupils, where necessary, to use the correct order of operations – especially in multi-step calculations, such as $(3.2 - 1.65) \times (15.6 - 5.77)$, or the strategy of substituting negative numbers into formulae
- We remind pupils to press the $\frac{\text{S}}{\text{D}}$ button on Casio calculators to toggle between fractional and decimal solutions, and the format button on newer models

Vocabulary


The following are all important aspects of helping pupils with the technical vocabulary of

Mathematics:

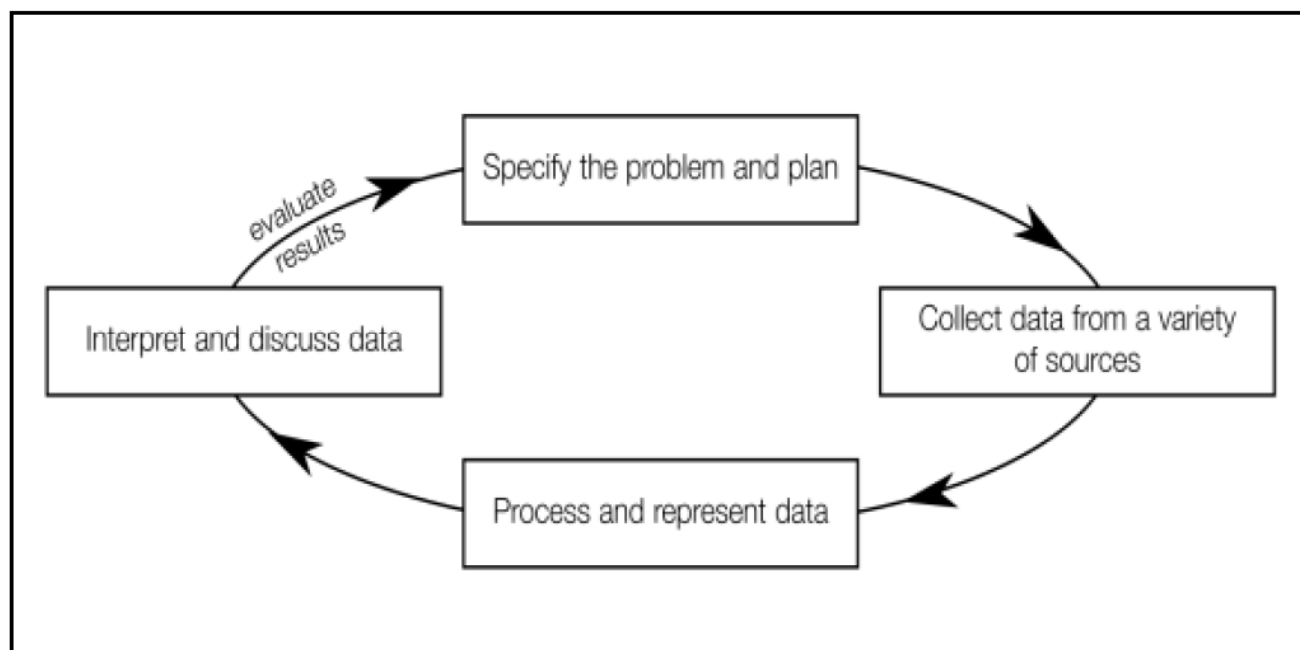
- Using a variety of words that have the same meaning e.g. add, plus, sum
- Avoid the word minus – to avoid confusion between the different meanings of the word. Use the words negative and subtract. E.g 3 subtract 4 equals negative 1, rather than 3 minus 4 equals minus 1.
- Encouraging pupils to be less dependent on simple words e.g. exposing them to the word multiply as a replacement for times
- Discussion about words that have different meanings in Mathematics from everyday life e.g. take away, volume, product etc
- Highlighting word sources e.g. quad means 4, lateral means side so that pupils can use them to help remember meanings. This applies to both prefixes and suffixes to words

Measures

In the world of work, millimetres and metres are most typically used. In Mathematics, students need to have a good understanding of all units of measure including centimetres, what they look like, and how to convert between them. It is important that this is highlighted by teachers in both mathematics and in technology subjects.



Handling Data



Pupils use this four stage cycle from Key Stage 1 through to Key Stage 4 in many subject areas. Our aim is to make it interesting and relevant.

We need to be consistent in our approach so that students get used to following the same process in all subjects. Say, “we are going to use the Data Handling Cycle to investigate...”.

4. Transfer of Skills:

“It is vital that as the skills are taught, the applications are mentioned and as the applications are taught the skills are revisited.”


The Mathematics team will deliver the National Curriculum knowledge, skills and understanding through the Numeracy Strategy Framework using direct interactive teaching, predominantly in “3+ part” lessons. They will make references to the applications of Mathematics in other subject areas and give contexts to many topics. Other curriculum teams will build on this knowledge and help pupils to apply them in a variety of situations.

Liaison between curriculum areas is vital to pupils being confident with this transfer of skills and the Maths team willingly offers support to achieve this.

Data Handling should be about all four stages of the cycle and combining stages from different subject areas is a powerful tool.

The Mathematics Department will work closely with other subjects to increased awareness of the underlying maths skills and approaches that go with the applications that they use. For example:

- ART – Symmetry; use of paint mixing as a ratio context.
- ENGLISH – use of venn diagrams to make comparisons between different characters in a book.
- FOOD TECHNOLOGY – recipes as a ratio context, reading scales.
- GEOGRAPHY – representing data, use of Spreadsheets.
- HISTORY – timelines, sequencing events.
- ICT – analysing data by selecting appropriate graphs.
- MFL – Dates, sequences and counting in other languages; use of basic graphs and
- surveys to practise foreign language vocabulary and reinforce interpretation of data.

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- PHYSICAL EDUCATION – collection and analysis of real data
 - RESISTANT MATERIALS – measuring skills, units of area and volume
 - SCIENCE – calculating with formulae
 - TEXTILES – scale, practical equipment, proportion