



**ENERGY COAST
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DRAFT

Whole School Numeracy Policy 2023

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Ongoing review

RJH 21st Sept 2023

Mathematics is an interconnected subject in which pupils need to be able to move fluently between representations of mathematical ideas. The programme of study for key stage 4 is organised into apparently distinct domains, but pupils should develop and consolidate connections across mathematical ideas. They should build on learning from key stage 3 to further develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. They should also apply their mathematical knowledge wherever relevant in other subjects and in financial contexts.

(Mathematics programmes of study: Key stage 4)

I: What is 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)

- It requires practical understanding and an ability to cope with the mathematical demands of everyday life.
- It encourages problem solving in a variety of contexts.
- It develops and enhances an analytical approach in dealing with measurement and handling data.

II: Purpose of a Whole School Numeracy Policy

Numeracy is a key skill in students' learning and all students are entitled to quality experiences in this area. The teaching of numeracy is the responsibility of all staff and the school's approaches should be as consistent as possible across the curriculum.

Our aim is to raise the achievement of all pupils and students by seeking to develop their numeracy skills by consistent and accurate application across the curriculum. This will involve the following;

- To ensure that pupils receive positive messages about numeracy when used across the curriculum. This will be utilised through the use of **#IcandoMaths** trending across the curriculum.
- To secure high standards of numeracy across the school. This is will be ensured through CPD sessions focused on Numeracy as well as the usage of Energy Coast UTC's Maths retrieval practice booklet by students in form time, as well greater use of Numeracy intervention will encourage higher standards of Numeracy by pupils.
- Through CPD set out the school's agreed approach to the teaching of numeracy skills.
- To record methods, vocabulary and notation that have been agreed.
- To assist the transfer of pupils' knowledge, skills and understanding between subjects through the use of the Numeracy logo in all subjects.
- To indicate areas for collaboration between subjects and process for facilitating such collaboration.
- To fulfil a current OFTSED requirement.

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III: Teacher guidelines

All teachers will:

1. Have the highest expectations of the pupils and ensure that the numerical content is of a high standard.
2. Discourage students from writing down answers only and encourage students to show their working out within the main body of their work.
3. Encourage the use of estimation particularly for checking work.
4. Encourage students to write mathematically correct statements.
5. Recognise that there may be more than one method and students will be encouraged to develop their own correct methods, where appropriate.
6. Allow and encourage students to 'vocalise' their maths - a necessary step towards full understanding for many students.
7. Help students to understand the methods they are using or being taught - students gain more and are likely to remember much more easily if they understand rather than are merely repeating by rote.
8. Encourage students to use non-calculator methods, whenever possible.
9. Encourage students to use the correct language.
10. If problems with numeracy are identified then the mathematics department will work with teachers and pupils to strength understanding.

IV: Department Guidelines

Departments should contribute to the raising of numeracy standards within their curriculum area by

- The provision of high-quality exemplar materials
- The use of ICT
- Displaying examples of numeracy within curriculum-based contexts
- Highlighting opportunities for the use of numeracy within their subject area with the usage of the Energy Coast UTC Numeracy logo on resources as well as schemes of work.
- Encourage positive messages on Numeracy utilising the hashtag '#IcandoMaths'
- Endeavouring to ensure that materials presented to students will match their capability both in subject content and in numerical demands

V: Areas of Collaboration:

1. Mental Arithmetic Techniques

- There is an acceptance that pupils are able to tackle the same questions with a variety of methods. These approaches rely on mixing skills, ideas and facts; this is done by pupils drawing on their personal preferences and the particular question.

- All departments should give encouragement to pupils using mental techniques but must also ensure that they are guided towards efficient methods and do not attempt convoluted mental techniques when a written or calculator method is required.

2. Written Calculations

- When appropriate pupils must be encouraged to show their working out for Maths problems.
- Pupils must write their working out in steps, ensuring that they carry out multi step operations via BIDMAS.

3. Role & Use of Calculators

In deciding when pupils use a calculator in lessons, we should ensure that:

- pupils have sufficient understanding of the calculation to decide the most appropriate method: mental, written 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 recognise which to use to solve a particular problem;
- when using a calculator, pupils are aware of the processes required and are able to say whether their answer is reasonable;
- 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 $(3.2 - 1.65) \times (15.6 - 5.77)$.

4. Vocabulary

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

- Use of 'Word' walls
- Using a variety of words that have the same meaning e.g. add, plus, sum
- 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 Maths from everyday life

e.g. take away, 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.

Pupils should become confident that they know what a word means so that they can follow the instructions in a given question or interpret a mathematical problem. For example, a pupil reading a question including the word perimeter should immediately recall what that is and start to think about the concept rather than struggling with the word and then wondering what it means and

losing confidence in his / her ability to answer the question. The instant recall of vocabulary and meanings can be improved through decoding key vocabulary during the start of each lesson

5. Shape, Space and Measures

We know this is an area that we need to help pupils with so that they can use all the divisions of a metre confidently, converting between them and, perhaps most importantly, having a sense of the relative size of them and visualising what a particular dimension looks like. Opportunities whereby pupils are using measuring equipment will be highlighted through similar methods.

6. Handling Data

Many subjects use graphical representation and we want to be consistent in our messages to staff and pupils. All graphs drawn by pupils using pencil and ruler should have axis and scales appropriately labelled. Bar charts should be used to represent discrete data with spaces between them.

7. Transfer of Skills

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

Subject areas are being made more aware of the underlying maths skills and approaches that go with the applications that they use. In particular we are in the process of making better links with;

- ENGLISH – comparison of 2 data sets on word and sentence length. Iambic pentameter in Shakespeare
- COMPUTING – representing data, iterative loops and the application of iteration, algorithms and problem solving
- SCIENCE – calculating with formulae, using and interpreting data as well as graphs and trends.
- Engineering
- Construction

CPD sessions are being planned for teachers in different areas of Mathematics in order to ensure greater consistency in term of approach towards numerical techniques and use of vocabulary as well as to enhance teacher confidence in teaching numerical aspects of their subjects.