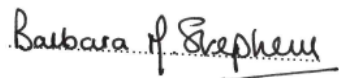




# **ENERGY COAST UTC NUMERACY POLICY 2019-2022**

**Approved:** Barbara Stephens, Chair of Governors



**Signed:**

**Date:** December 2019

**Date for Review:** December 2022

**Revision History:**

Revision	Date	Owner	Summary of Changes
0	2.9.19	ICR	First version
1	27.10.19	ICR	Simplified language after teacher feedback
2	December 2019	CBT	Updates
3			
4			

## Introduction

It is intended that this document will provide information and guidelines for a uniform approach to numeracy across the whole curriculum. It is not intended to be a prescription for teaching although some advice is given.

## Aims

The Energy Coast UTC is committed to raising the standards of numeracy of all of its students, so that they develop the ability to use numeracy & literacy 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.

### Purposes of a whole school Numeracy Policy:

- ◆ to ensure that students receive positive messages about numeracy when used across the curriculum
- ◆ to secure high standards in numeracy across the school
- ◆ to set out the school's agreed approach to the teaching of numeracy skills
- ◆ to provide a basis against which progress can be judged
- ◆ to record methods, vocabulary and notation that have been agreed
- ◆ to assist the transfer of pupil's knowledge, skills and understanding between subjects
- ◆ to indicate areas for collaboration between subjects and processes for facilitating such collaboration

Through developed numeracy skills students will be able to:

- ◆ Transfer knowledge, skills and understanding between subjects.
- ◆ Improve their interpretation and presentation of data.
- ◆ Improve their reasoning and problem solving.
- ◆ Increase their understanding of the application of numerical processes in a range of contexts.

### What is numeracy?

Numeracy is much more than just knowing about numbers and number operations. It requires practical understanding and encourages the inclination to problem solve. Numeracy develops and enhances an analytical approach in dealing with measurement and handling data.

Numeracy is a proficiency which is developed mainly in mathematics but also in other subjects. It is more than an ability to do a 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 is gathered by counting and measuring, and presented in graphs, diagrams, charts and tables.

Numerical skills are a whole school responsibility and teachers will be expected to exploit appropriate moments in their lessons to emphasise and practice numeracy skills.

Teachers of subjects other than mathematics should:

- ◆ 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.
- ◆ 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.

### Important points to note:

- ◆ Mental arithmetic should be recommended as a first resort. Teachers are encouraged to seek and compare a range of calculation methods, by asking students how they worked out a calculation and insisting everyone listens and responds positively to the responses. [link with Literacy across the curriculum.]
- ◆ As a result of the primary Numeracy initiative, students are far more confident in carrying out calculations mentally and should be encouraged to continue and develop these skills throughout KS4 and beyond.
- ◆ Students will gain more and remember much more if understanding is given prominence.
- ◆ Students should be helped to develop their own methods of calculation, rather than be taught different set procedures.
- ◆ Students are expected to have their own calculator, compass, ruler and protractor.

### **Links with other policies**

The policy for CEIAG supports and is itself underpinned by a range of key school policies especially those for teaching and learning, assessment, recording and reporting achievement, SMSC, PSHE, equal opportunities and diversity, Pupil Premium and SEND, to name but a few.

### **The policy in practice**

#### **Using mathematical vocabulary across the curriculum**

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. 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.

#### **Using and applying mathematics**

When using and applying mathematics to solve problems, students use a variety of thinking skills which should be transferable to other subject areas. These include:

- ◆ Breaking the problem down into more manageable parts.
- ◆ Logical deduction
- ◆ Hypothesising
- ◆ Predicting and testing

Key numeracy strategy statement: **“Estimate before you calculate”**

#### **Calculators**

- ◆ Use of calculators allows freedom from repetitive difficult calculations. Pupils should have open access to calculators (preferably their own) but be encouraged to use them sensibly e.g. not for working out simple calculations.
- ◆ It is good practice to always estimate answers before using a calculator.
- ◆ Sensible rounding is expected.
- ◆ Students should be encouraged to set down method working, whether using a calculator or not. Answers only are not acceptable.
- ◆ Care must be taken when students are using basic calculators as the order of operations is often not always in-built (BODMAS). New scientific calculators often do calculations in the order they are entered e.g.  $\sin 30$ ,  $\sqrt{50}$ , etc.

Key numeracy strategy statement: **“Estimate before you calculate”**

#### **Shape space and measures**

- ◆ Work is done in mathematics on common Imperial units and their metric equivalents. Engineering firms need students to be particularly familiar with millimetres.

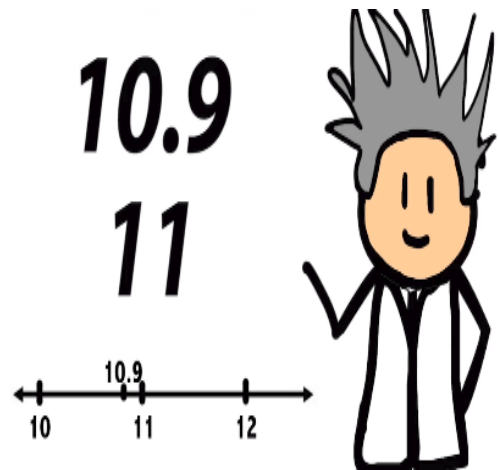
- ◆ Appropriate units must always be stated; e.g. in answers, graph axes etc.
- ◆ Try not to add to the confusion of mass and weight  
Mass is a measure of the amount of substance and is measured in kg. On planet Earth, 1 kg of anything exerts a force of 10N in the direction of the Earth - its weight. This is due to the gravitational pull of the Earth. On other planets or the Moon the gravitational pull will be different and so the force exerted by 1 kg will vary, e.g. in outer space there is virtually no gravitational pull, you would be 'weightless'. When you stand on the bathroom scales your weight, i.e. force, compresses a spring. The manufacturers create a display that converts the amount of compression into mass, i.e. the compression due to 10N reads as 1 kg on the display. This is the simplest way of determining mass.

Therefore, teachers should use the term **mass** instead of **weight**.

### Handling data

- ◆ Always use degrees when constructing pie charts; label sectors with the data or a key.
- ◆ All graphs should have a title and labelled axes, with units marked.
- ◆ When using the term "average" please say "mean average" (or mode or median).
- ◆ When reading off the gradient of a line, ensure that students have a full understanding of the scale on each axis.
- ◆ Line graphs should be straight lines drawn with a rule and pencil **or** smooth curves drawn with a pencil but without the use of a ruler!

# Estimate before you calculate.



# Estimate before you calculate.

≈ **B4U**

