

Numeracy Policy

Updated September 2025

Guiding Principle

The development of numeracy does not lie solely with the Mathematics Department – just as every teacher is a teacher of literacy, every teacher is, where appropriate, a teacher of numeracy. Our students use and apply mathematics every day – often without realising it; our focus is making this use and application explicit in a positive way. All conversations with students regarding numeracy should be positive and aim to inspire students to embrace the skills and techniques that they need to use to fulfil their future potential.

Purpose

The aim of this policy is to standardise the approaches to numeracy across the curriculum to enable students to recognise mathematics in a wider variety of situations and thus allow them to transfer their numeracy skills to the wider curriculum. Through a consistent approach, stemming from a common understanding of numeracy as agreed by the Mathematics Department, student's standards in numeracy will rise.

This rise in standards will be reflected both in increased outcomes in all year groups, and all subject disciplines where mathematical skills are used. It will also be reflected in an increase in the confidence and fluency in using mathematical techniques and skills outside the usual Mathematics classroom.

Consistency of Approach

The Mathematics Department will:

- Ensure that the Mathematics Scheme of Work is available to all Directors to enable them to identify when certain aspects/skills are taught within the Mathematics Curriculum.
- Produce a "How To..." guide for key skills to ensure the agreed approach within mathematics is communicated across the school to ensure all staff are supported in delivering numeracy within their own curriculum.

Other Departments should:

- Explicitly identify within Schemes of Work the opportunities/need for numeracy to be developed.
- As a department, ensure that the numeracy is referenced within Schemes of Work and used in lessons.
- Seek guidance from the Mathematics Department where necessary to ensure the consistent approaches that have been agreed support success in each subject.

Numeracy coordinator will:

- Support staff with guidance in teaching specific numeracy concepts within other subject areas.
- Regularly meet with department numeracy representatives.
- Annually audit the school to ensure updates to schemes of work / programs of study include numeracy.

Knowing the Level of the Mathematics

As students are exposed to mathematical skills and techniques in all areas of the school curriculum it is important as teachers that we are able to, when planning, identify areas of the lesson that may need differentiating to ensure all students can access the work and achieve the desired learning outcomes. For this to be effective, all teachers need to be aware of the level of any mathematics that is being used within each subject area.

Teachers Should:

- Use the level ladders (see appendix 1) provided by the Mathematics Department to identify the level of numeracy that is required in a lesson using numeracy.
- Seek support to ensure that numeracy content of work is suitable to allow all students to reach the desired learning outcomes.

Departments Should:

- Identify within Schemes of Work appropriate resources to scaffold mathematical techniques to allow students to progress within the lesson.
- Liaise with the numeracy representative to seek further guidance when needed.
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Numeracy coordinator will:

- Support numeracy representatives in ensuring that delivery of their department's curriculum is not hindered by poor numeracy skills and knowledge.

Supporting Numeracy During Tutor Time

To help students develop their numeracy skills, confidence and appreciation of its relevancy, students will be involved with numeracy during tutor time.

- In years 7-10 students will use the Ten Quick Questions website once per week in tutor time
- In year 11 pupils will focus more directly on GCSE preparation in tutor time using their Pinpoint learning review questions

Form Tutors Should:

- Ensure that they are prepared for the numeracy session in advance by referring to the weekly numeracy focus.
- Lead the session positively and promote the importance of numeracy.
- identify students who are a cause for concern and liaise with the Head of Mathematics to ensure that appropriate intervention takes place.

Heads of Year Should:

Monitor that the numeracy sessions are being carried out during the allocated slots

Supporting Staff to Deliver Quality Numeracy

The mathematics and mathematical techniques that students are expected to use in 21st Century are increasingly different from those expected in the 20th Century – therefore as a department we are committed to supporting staff who wish to refresh their mathematics.

Staff who would like support should contact the numeracy coordinator and will be guided toward specific resources to increase their confidence.

Only with a mathematically confident staff can the development of Numeracy across the Curriculum truly become a positive experience for staff and students.

Appendix 1 – Numeracy Level ladders

	Number and the number system	Calculating
Beginner	• Read, write, count and order whole numbers up to 100. • Recognise odd and even numbers • Round to the nearest 10,100 and 1000 • Recognise negative numbers and decimals in context • Use fraction notation and represent fractions pictorially	• Add and subtract up to 2 digit numbers mentally • Add and subtract 3 digit numbers using a written method • Multiply or divide 2 digit numbers by a 1 digit number • Recall multiplication facts up to 12 x 12
Intermediate	• Order negative numbers • Order and compare fractions, decimals and percentages • Use 4 operations with fractions • Calculate fractions and percentages of a quantity • Round to decimal places	• Recall multiplication facts up to 12 x 12 • Multiply and divide 3 digit numbers by 2 digit numbers • Describe and apply order of operation • Divide into a quantity • Substitute into a formula • Use trial and improvement
Advanced	• Calculate compound percentage change • Calculate reverse percentage change • Round to significant figures	Derive and manipulate formulae from real life situations

	Using and applying mathematics	Shape and space
Beginner	• Name and use basic mathematical operations • Describe the role of the equals sign • Follow given instructions to solve a problem	• Name 2D and 3D shapes • Recognise and perform rotations and reflections • Describe what an angle is • Name the different types of angles
Intermediate	• Break down substantial problems into smaller steps and solve • Select an appropriate degree of accuracy for solutions • Check results, considering whether they are appropriate	• Find the area and perimeter of rectangles and triangles • Find the volume of cuboids • Draw 2D and 3D shapes • Enlarge 2D shapes from a centre of enlargement • Measure and draw angles
Advanced	Systematically approach open, more complex problems by selecting from a variety of skills	Understand the difference between formula for perimeter, area and volume by considering dimensions.

	Measures	Data handling
Beginner	• Give times in 12 and 24 hour forms • Know standard metric units of length, capacity and mass	• Collect and record data in lists, tally charts, pictograms and bar charts • Read data form lists, tally charts, pictograms and bar charts • Sort objects into a simple Venn diagram
Intermediate	Use a variety of measuring instruments Estimate length, capacity and mass Convert between metric units of length, capacity and mass	• Use and interpret coordinates in four quadrants • Know the difference between discrete and continuous data • Group data where appropriate • Design and use a questionnaire ▪ Record data in line graphs, pie charts and scatter graphs ▪ Interpret data from line graphs, pie charts and scatter graphs ▪ Compare data using mean, median, mode and range
Advanced		Find the probability of a single event as a fraction

KEY NUMERACY THINGS TO WATCH OUT FOR

Number

- Many students do not understand big numbers. Try to write numbers in both word and digit form, for example for the population of the UK, 61 million and 61 000 000.
- Initially, it is better to present sums in a horizontal format, to encourage some form of mental calculation or estimation.
- Use language involving plus/positive and minus/negative regularly, as they often cause confusion.
- When referring to decimals, say “five point three one” rather than “five point thirty-one”.
- In a line of working, an “equals sign should appear only once. Working should develop down the page, with equals signs in line (the following is **poor** practice: $8 \times (4 + 2) = 6 = 8 \times 6 = 48$, as students are equating unequal things.)
- Emphasise the link between fractions, decimals, ratios and percentages.
- The % button needs to be used with care as students may forget how to calculate percentages on paper.
- e.g. $\times 100$ could be replaced by shift %
- the correct written form of numbers in standard form must be used, ie a calculator display is 2.5873^{04} must be written as 2.5873×10^4

Algebra

- Take care when using terms like “cross multiply” and “swap sides – swap signs” as these can lead to misunderstanding. Instead, use the balance method.
- Running through a formula with “easy” numbers may aid student understanding.
- Trial and improvement *is* an acceptable mathematical method.

Shape Spaces and Measures

- The word “similar” in mathematics is used to describe objects that are exactly the same shape, but not necessarily the same size – one object is an exact scaled version of the other.
- Work is done in mathematics on common imperial units and their metric equivalents. Design & technology needs students to be particularly familiar with centimetres and 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 – use the term mass instead of 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, ie the compression due to 10N reads as 1 kg on the display. This is the simplest way of determining mass.

We use the following principles for bearings:

- Bearings always start with 0° from north
- Bearings are always measured clockwise
- Bearings need the $^{\circ}$ (degree) symbol
- Bearings are read as a 3 figure number e.g. 035°

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 interpreting graphs, make sure students know what each "small square" represents on each axis.
- Encourage students to always consider whether an information graph axis should or should not start from zero in a particular case; and the implication of this.
- Bar charts are used to display discrete data (data which is counted). Histograms have no gaps and are used to display continuous data (data which is measured).

Cross Curricular numeracy examples

<u>English</u> - Frequency of words (e.g. Shakespeare vs. bacon.) - Bar charts, Pie charts Surveys - Line graphs – charting emotional response. Beats and syllables in poetry. - Media – The golden ration in film. Reading – murderous Maths. <u>Geography</u> - Solving a variety of problems involving decimals, fractions, percentages & ratio. - Analyse 3-D shapes using 2-D projections. - Using coordinates, maps & scales - Graphs and charts of all kind. - Population growth. 4 figure (or more) grid references. - Using statistics. <u>Music</u> - Doubling frequencies (powers of 2). Golden section used by Debussy and Schubert. - Statistics – aleatory music (using dice to compose). Popularity of music. - Sequence – recurring phrases. - Circle of 5ths for key signatures. - Following rules for harmony, - counterpoint, chords, intervals & modulation.	<u>Science</u> - Solving a variety of problems involving decimals, fractions, percentages & ratio. - Standard form. Use of formulae. - Golden ratio. Fibonacci sequence. - Graphs and charts of all kinds. Length, area and volume. - Speed, density, pressure etc. - Using statistics. - Balancing chemical equations. <u>History</u> - Using the number line effectively. - Ideas of large numbers, wealth, decimals, percentages & ratios. - Measures of weight, length, time. - Interrogating databases. - Coordinates, graphs and charts of all kinds. - Population changes. - Using statistics. <u>PE</u> - Speed/distance/ time, units, weights. - Calculations of energy expended. - Using statistics, graphs and charts. - Calculate pulse rates after 15 seconds my multiplying by 4 Use of loci for positional play	<u>Art</u> - Islamic art, shape in 2-D and 3-D. Simple ratios. - Perspective and golden ratio. - Escher – tessellations - The art of Wasilly Kandinsky, Piet Mondrian, Theo Doesburg and others. - Cubism – geometrical shapes <u>ICT</u> - Using spreadsheet, interrogating databases. - Using computer formulae sequences. - Flowcharts. <u>RE</u> - Shape – e.g. pentagon – 5 pillars of Islam. - Octagon – eightfold path. - Circle. Examples of π e.g. 1 kings chapter 7 verse 23 $\pi=3$. - Dates AD and BC Calendar years and years of other faiths. <u>Drama</u> - Length, area, volume, using scale drawings, plans & elevations. - Time-lines for cues, prompts, lighting, music etc. - Use of loci for position cues in a performance	<u>Design and Technology</u> - Solving a variety of problems involving decimals, fractions, percentages & ratio. - Nutritional values for food, energy calculations. - Use of formulae. - Graphs and charts of a kind. - Construction and measure of 2-D and 3-D shapes. - Nets - Scale drawings plans & elevations - Drawing symmetrically. <u>Modern Foreign Languages</u> - Measures of length/distance, time and weight, counting, tables. - Exchange rates, money/costs. - Speeds, <u>B&E</u> Budgeting Graphs and statistics <u>Health and social care</u> - Using statistics, - graphs and charts. Percentages, power/weight ratios. - Research methods.
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