

February 2019



EastbrookSchool

Numeracy Policy & handbook for teachers

Numeracy Policy

The aims of this policy: Numeracy across the curriculum

All teachers at Eastbrook School are teachers of numeracy. We recognise that Numeracy is a life skill – necessary to allow each of us to make informed choices and decisions in all aspects of everyday life. Being numerate goes beyond simply 'doing sums'; it means having the confidence and competence to use numbers and think mathematically in everyday life. Everyone needs to be numerate to maximise their life chances and to make a positive contribution to society.

Our aims are to raise achievement through a whole school approach to numeracy which reflects our ethos: "together we learn".

Roles and responsibilities: promoting and supporting numeracy

- Senior leaders and middle leaders: support a high profile for numeracy across the curriculum.
- Lead teacher for Numeracy: is responsible for the monitoring and evaluation of the Numeracy provision at Eastbrook school across the curriculum.
- Teachers: provide a consistent approach to students' development of numeracy skills & take every opportunity to realise and deploy numeracy in every lesson.
- Support staff: support teachers in the delivery of a consistent approach to numeracy; contribute to intervention strategies and respond to individual numeracy needs
- Parents and carers: encourage students to consider their own use and learning of numeracy as an ongoing and lifelong journey.
- Students: take increasing responsibility for recognising and responding to numeracy needs.

Teachers support numeracy across the curriculum

Students should be taught in all subject areas to explicitly recognise and apply their numeracy skills and knowledge in all the varied contexts of their subject. They need to be able to solve problems, interpret information and make informed choices through being numerate. All subject areas have a responsibility to support the active teaching of numeracy skills by:

- Embedding numeracy in schemes of work
- Using a consistent approach to teaching reasoning skills, problem solving and decision making (and where possible; use of the number system, handling information, working with shapes & measures and confidently using operations in routine calculations)
- Making use of inset and dedicated department time to expand and secure pedagogy, seeking support from the numeracy lead teacher.
- Using assessment and feedback/marking to check student work for the quality of numeracy skills demonstrated in pupil work.
- Understanding of what it means to be numerate
- Promote reasoning, problem solving and decision making in all lessons

A numerate student should:

- Understand and be able to explicitly state how they have used a numerate skill in lesson
- Use numeracy skills in context of their subject, being mindful that this may bear little resemblance to their concept of traditional mathematics
- Be determined in their subject context to find a solution that makes sense, to be flexible in the approaches they adopt and not to give up at the first point of difficulty
- Be an effective problem-solver by recognising the need to be systematic and take logical steps
- Be able to make decision by identifying relevant information and choosing appropriate strategies.

The National Curriculum for England & Wales, for key stages 1 through to 4, states that;

5. Numeracy and mathematics

5.1

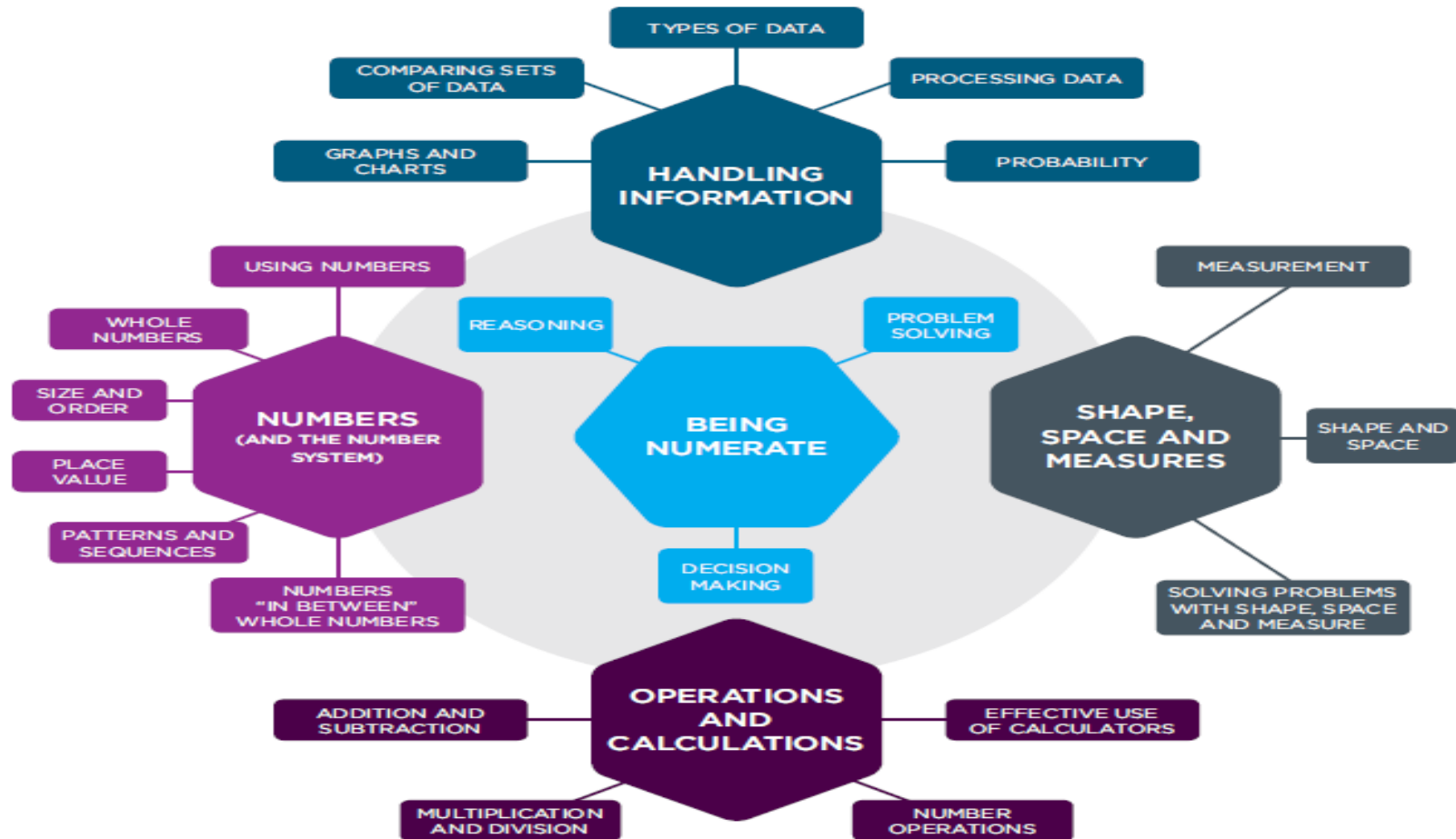
Teachers should use every relevant subject to develop pupils' mathematical fluency. Confidence in numeracy and other mathematical skills is a precondition of success across the national curriculum.

5.2

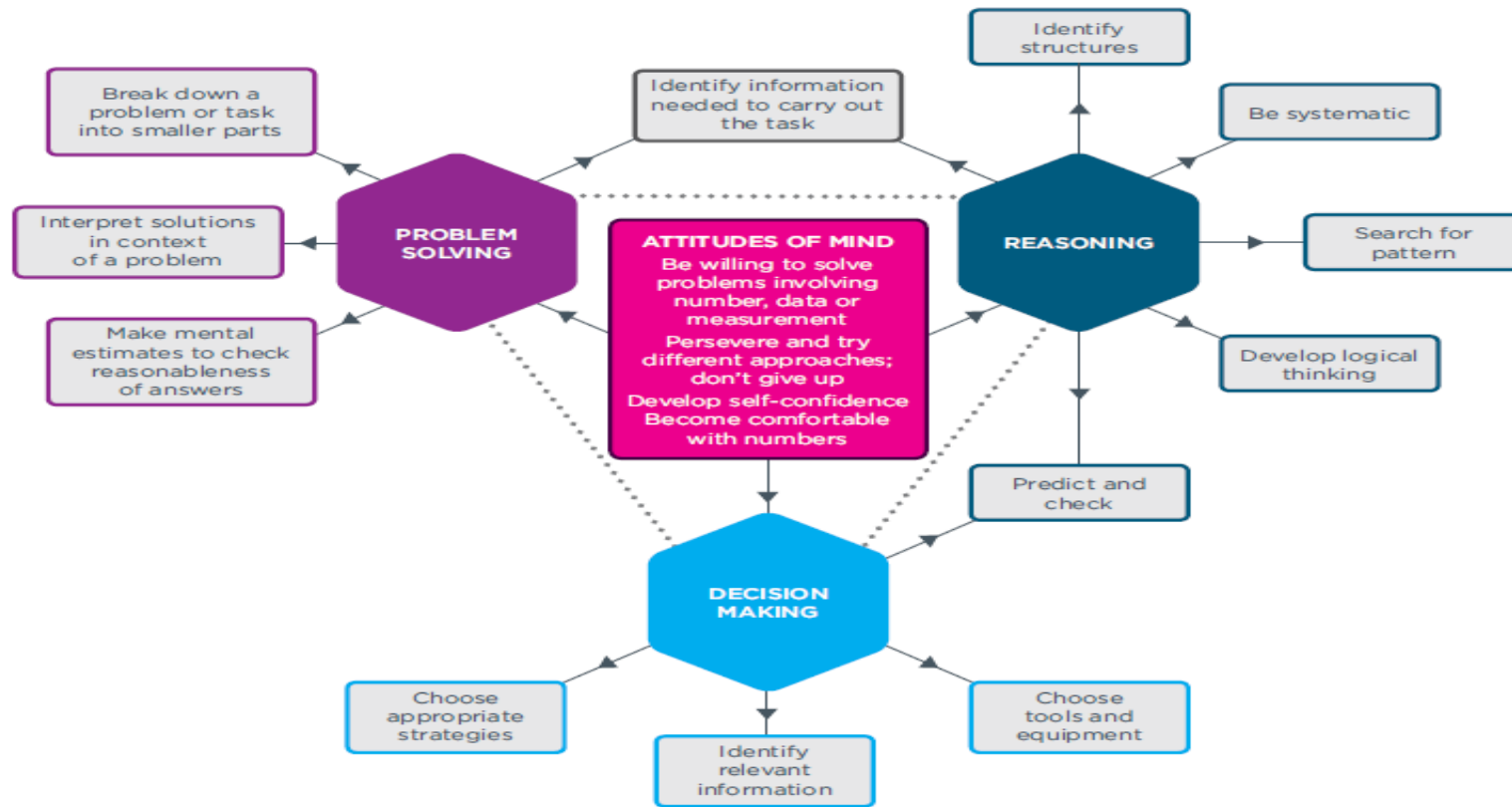
Teachers should develop pupils' numeracy and mathematical reasoning in all subjects so that they understand and appreciate the importance of mathematics. Pupils should be taught to apply;

- arithmetic fluently to problems
- understand and use measures
- make estimates and sense check their work
- their geometric and algebraic understanding
- relate their understanding of probability to the notions of risk and uncertainty
- understand the cycle of collecting, presenting and analysing data
- apply their mathematics to both routine and non-routine problems
- breaking down more complex problems into a series of simpler steps.

Essential core Numeracy skills for all



Cognitive Numeracy skills for all



Realising opportunity within every lesson to deliver numeracy

Art

Specific KS3 opportunities

- Explore the colour circle.
- Measurement skills; construction, radius, circumference, equilateral triangles.
- Use of proportions.
- Understanding composition.
- Perspective diagrams.
- Use of distance and height.
- Understand and apply concepts related to number, motifs, patterns, repetition, variation, counting, rhythm, symmetry, angle.

Specific KS4 opportunities

- Perspective diagrams.
- Use of proportions.
- Use of distance and height.
- Explore natural objects through basic geometrical shapes
- Use of symmetry.
- Use of the Golden ratio.
- Use of the Vitruvian man.
- Understand and apply concepts related to number, motifs, patterns, repetition, variation, counting, rhythm, symmetry, angle.

Realising opportunity within every lesson to deliver numeracy

Art Photography

Specific KS3 opportunities

- Use of aperture and shutter speed.
- Understand the 'rule of third'.

Specific KS4 opportunities

- Use of aperture and shutter speed.
- Understand the 'rule of third'.
- Understand and apply skills related to ratio, golden triangle, aspect etc.

Realising opportunity within every lesson to deliver numeracy

Catering – Food

Specific KS3 opportunities

- Weighing ingredients.
- Measure liquids.
- Temperature control in cooking processes.
- Timing control in cooking processes.

Specific KS4 opportunities

- Weighing and measuring substances.
- Numerical analysis, e.g. RDI %.
- Temperature and time control during cooking processes.
- Understanding bacterial growth rates.

Realising opportunity within every lesson to deliver numeracy

Child Development

Specific KS4 opportunities

- Reference skills when quoting sources in bibliography.
- Sequencing – pattern developments from ages 0-5.
- Understand of stages of development.
- Pupils teach numeracy at EYFS – Early Learning Goals.
- Decision making skills – selecting the correct information/knowledge required to meet standards for the CACHE course.
- Breaking problems into smaller parts, especially in drafting essays.
- Reasoning skills – using key concepts to describe and explain.
- Predict and check – students work in pairs.

Realising opportunity within every lesson to deliver numeracy

DT

Specific KS3 opportunities

Measure using a ruler starting at zero.

Convert between units of measures

Recognise 3D objects and structures

Specific KS4 opportunities

Draw plan, side and front view – orthogonal diagrams

Draw arcs and circles.

Realising opportunity within every lesson to deliver numeracy

English

Specific KS3 opportunities

- Summarise information.
- Prediction of how stories end.
- Comparing list of arguments, leading to debating.
- Create tables, use of rulers to form tables.
- Sentence structure using a formula of three parts.
- Creating space for feedback in pupil books.
- Counting syllables in words.
- Discussing root words relating to numeracy, e.g. root of the word 'qua'
- Discussing statistics in articles.
- Structures of archaeology associated to subject, i.e. globe theatre is actually octagonal.

Specific KS4 opportunities

- Working with dates specific to texts from 19th and 20th century.
- Adding/subtraction skills while working with ages of poets.
- Solve problems such as understanding why a writer used specific themes.
- Identifying sentence structures.
- Predicting outcomes.
- Search for rhythm/rhyme and patterns.
- Sequencing events.
- Using statistics to support idea.
- Using reasoning skills to respond to a range of text styles.

Realising opportunity within every lesson to deliver numeracy

ESOL

Specific KS3 opportunities

- Spelling and saying numbers, specially ordinals.
- Following directions; using logical words and time markers to navigate text.
- Learning and using connective words and how they contribute logically to a text.
- Describing properties of objects, including data.
- Comparative and superlative adjectives and adverbs.
- Understanding text types and patterns in words and types of language based on formality and written/spoken texts.
- Using appropriate plans to organise information in a text.
- Predicting outcomes in a text based on logic and reasoning.

Specific KS4 opportunities

- Using logical words and time markers to navigate text.
- Learning and using connective words and how they contribute logically to the organisation of text.
- Describing properties of objects, including data.
- Comparative and superlative adjectives and adverbs.
- Understanding text types and patterns in words and types of language based on formality and written/spoken texts.
- Using appropriate plans to organise information in a text.
- Predicting multiple possible outcomes in a text based on logic and reasoning.
- Synthesizing information to write an effective text according to task.

Realising opportunity within every lesson to deliver numeracy

Finance

Specific KS4 opportunities

- Calculating a percentage change.
- Calculating amounts from Finance related problems.
- Rank information in order of given hierarchy.
- Use of ratio.
- Analysis of financial information.
- Use of graphs and statistics.

Realising opportunity within every lesson to deliver numeracy

(GCSE) PE

Specific KS3 opportunities

Warm up lead count in 3 sets of 8's for each warm up

Use different units of time, count down from....

Specific KS4 opportunities

Spatial awareness – being equidistant from other participants.

Develop strategy by predicting outcomes from experimental data

Common ideas to both KS3 and 4

Stand in a semi-circle for warm up

Realising opportunity within every lesson to deliver numeracy

Geography

Specific KS3 opportunities

- Using maps, understand grid reference, coordinates.
- Reading and interpreting graphs.
- Playing card games which contain mathematical themes.
- Using keys to describe land features and rivers.
- Put processes into order, e.g. water cycle.
- Order geographical landmarks in order of size.
- Measuring distances.
- Drawing graphs and pie charts.

Specific KS4 opportunities

- Use of averages; mean, median, mode, range.
- Collecting data.
- Displaying data.
- Analysis of data.

Realising opportunity within every lesson to deliver numeracy

History

Specific KS3 opportunities

- Place historical events in chronology order.
- Reasoning outcomes of historical events such as wars/battles.
- Looking at shapes of historical artefacts.
- Making story boards of historical events.
- Breaking down events into smaller parts.
- Plotting events on a timeline.
- Understand cause and consequence.
- Identify key information and analyse.

Specific KS4 opportunities

- Place events on graphs to analyse importance
- Place historical events in chronology order.
- Reasoning outcomes of historical events such as wars/battles.
- Making story boards of historical events.
- Breaking down events into smaller parts.
- Plotting events on a timeline.
- Understand cause and consequence.
- Identify key information and analyse

Realising opportunity within every lesson to deliver numeracy

Mathematics

Specific KS3 opportunities

- Collect data.
- Use mathematical operators, addition subtraction etc.
- Creating tables.
- Estimate and check errors.
- Place value.
- Solve money problems.
- Understand directed numbers.
- Calculate using mental methods.
- Work out a percentage of an amount.

Specific KS4 opportunities

- Use of percentages.
- Measurement skills.
- Solve real life problems through mathematical modelling.
- Written calculation methods.
- Working with fractions.

Common ideas to both KS3 and 4

- Converts between different unit.
- Solve money problems.

Realising opportunity within every lesson to deliver numeracy

Media

Specific KS4 opportunities

- sequencing camera shots in film editing
- ratio/ symmetry/balance in framing and composition
- duration/ ellipsis – considering the use of time in film editing
- interpreting statistics – analysing financial data in media industries e.g. sales figures, profit margins, costs
- audience segmentation – analysing data in order to understand different audience groups
- ratio in print production
- numerical aspects of software e.g. Photoshop values and weightings
- historical context – timeline - consideration of the changes in media products over time

Realising opportunity within every lesson to deliver numeracy

MFL (French & Spanish)

Specific KS3 opportunities

- Basic arithmetic in the target language.
- Counting to 100 in TL.
- Telling the time.

Specific KS4 opportunities

- Converting currencies.
- Use of quantities in TL.
- Counting to 1000.
- Understanding percentages.

Realising opportunity within every lesson to deliver numeracy

Religious Studies (& ECS)

Specific KS3 opportunities (ECS)

- Analyse data from sources.
- Use graphs and information from charts etc.
- Solve problems arising from social issues.
- Search for patterns in human behaviour.

Realising opportunity within every lesson to deliver numeracy

Science

Specific KS3 opportunities

- Use of formulae to calculate forces, pressure etc.
- Calculation of RDA – under digestive systems topic.
- Calculate breathing rate

Specific KS4 opportunities

- Calculate rates of reactions.
- Calculate rate of bacterial multiplication.
- Transformation calculations.
- Calculate magnetic flux
- Calculate pressure, forces, motion
- Plotting graphs

Realising opportunity within every lesson to deliver numeracy

Sociology

Specific KS4 opportunities

- Analysis of statistical diagrams and information.
- Ordering factors to social issues in given hierarchies.
- Comparing year on year trends.
- Predicting trends.