



# Numeracy Policy

(ratified by the Full Governing Body on 19<sup>th</sup> December 2017)

Review Cycle: 2 Years - Summer Term

Review By: Leadership Team, HR/Standards Sub-Committee

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# **Numeracy across the curriculum policy 2017-2018**

## **Our Mission Statement:**

“Alcester Academy 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.”



**Alcester  
Academy**

TO BE THE BEST THAT WE CAN BE

# Introduction & Contextual Information

## **The purpose of this policy:**

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

## **Context:**

Along with literacy, numeracy needs to be at the forefront of every pupils learning. The messages sent around the academy need to be positive, consistent and in line with methods derived from the Mathematics Department.

## **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)

## **Aims:**

For effective numeracy, students should:

- Understand mental strategies and use them to successfully break down questions;
- Write legibly, putting mental strategies onto paper;
- Have a growing mathematics vocabulary to aid with more wordy questions;
- Ensure all scales/graphs/charts are fully checked before starting the questions;
- Apply the skills of mental/written/graph work to other subjects;
- Develop in confidence and self-expression.

# Practice at Alcester Academy

## I Raising Standards

### The 'Numeracy Community':

A community of dedicated and inspirational 'Numeracy Leaders' has been developed. The Numeracy Leaders support in lessons, contribute to resources and teach numeracy skills to their peers.

### Roles and Responsibilities:

**All teachers and in-class support staff across the curriculum:** Contribute to students' development of numeracy, owing to the fact that mathematical skills are integral to many lessons around the academy.

**Numeracy Coordinator:** Supports departments in the embedding of strategies to support the growth of numeracy development. Manages the implementation of new numeracy initiatives alongside ensuring current numeracy provision is maintained and effective in its aims.

**The Mathematics Department:** Provides pupils with initial knowledge. Acts as a support unit for those teachers who identify their own numeracy needs and seek to improve these in order to promote high levels of numeracy to the students they teach effectively.

**Pupils - Numeracy Leaders:** Students who have the confidence and high-level numeracy skills to demonstrate and train others with, are given the opportunity to excel and to lead in this area. They are identified by the Mathematics faculty from their work in the classroom and they are selected to ensure that the student community is represented. It is essential that numeracy leading is used to raise the aspirations and skills of students from all backgrounds.

Student numeracy leaders have a role in the subjects that they study across the curriculum. Typically, they might support their peers in terms of the specific numeracy skills that are required to complete a certain task, progress towards a certain level or achieve a specific goal. Departments have their own numeracy policies that outline how numeracy leaders are used within each subject.

Numeracy leaders are identified by pin badges and displays - all teachers are aware of which leaders they have in each of their classes as highlighted on their class context sheets and students are aware of whom, amongst their peers, the leaders are. The leaders are selected through liaison with the English department, who have literacy leaders for similar purposes.

The Mathematics department are at the heart of numeracy across the curriculum and are keen for their skills to be shared across the academy. Numeracy skills are taught explicitly in Years 7 and 8, with schemes of work and resources being based around the practice of these skills. This continues throughout the GCSE years.

### **Additional Resources:**

- **SEND**

Students identified as SEND are supported very closely with their numeracy needs. They have learning support assistants in their lessons and attend 'booster' classes throughout the year. One to one support is in place for students who are struggling with numeracy and this is built into their 1:1 tuition programs. The results of this have proved very positive in terms of preparing students for the demands of GCSE.

- **Most Able**

The Numeracy Leaders that have recently been introduced are generally 'Most Able' in Mathematics. By the mentoring of other students, their own learning is being stretched to its fullest capacity. The focus of numeracy across the curriculum is based around the effective transfer of skills across subjects and enables students to set their own challenges and to progress towards a better understanding at a faster rate.

- **VLE**

The VLE is an important tool for teachers to interact with their students, but it is also vital for the sharing of skills and good practice for numeracy across the curriculum. The VLE for Mathematics is growing rapidly.

## **II Consistency of Practice**

### **Assessing numeracy across the curriculum:**

All departments have completed a numeracy audit which is regularly reviewed by the Numeracy Coordinator. The findings from these audits dictate the training needed for the Numeracy Leaders.

Teachers are aware of the numeracy policy and numeracy booklet and to use appropriate strategies for addressing numeracy in their subject areas. When an opportunity arises in lessons, numeracy leaders can be used to help other pupils and even the teachers in some scenarios.

Assessment of teachers' use of numeracy in lessons is conducted through departmental self-evaluation and sharing good practice. This good practice is identified through lesson observations, learning walks, sharing resources and work scrutiny. Further monitoring of numeracy occurs through work scrutiny and through lesson observations.

### **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 use topics and 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 stage at which specific numeracy skills will be required for particular groups.
4. Provide resources for mathematics teachers to enable them to use examples of applications of numeracy relating to other subjects in mathematics lessons.

### III Our Areas of Collaboration and Transfer of Skills

The Mathematics team will deliver the National Curriculum knowledge, skills and understanding through the Numeracy Strategy Framework using direct interactive teaching, with a focus predominantly on “The Learning Pathway”. 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.

The transfer of skills is something that many pupils find difficult. It is essential to start from the basis that pupils realise it is the same skill that is being used; sometimes approaches in subjects differ so much that those basic connections are not made.

We are in the process of making links with all subject areas; in particular we are focusing on:

ART – Symmetry; use of paint mixing as a ratio context, mathematical art and impossible drawings.

ENGLISH – comparison of 2 data sets on word and sentence length, visual representations of emotions and behaviour throughout a story, structuring written pieces using flow charts etc.

FOOD TECHNOLOGY – recipes as a ratio context, reading scales,

GEOGRAPHY – representing data, use of spreadsheets

HISTORY – timelines, sequencing events

ICT – representing data; considered use of graphs not just pretty ones!

MFL – Dates, sequences and counting in other languages; use of basic graphs and surveys to practice foreign language vocabulary and reinforce interpretation of data.

MUSIC – addition of fractions, timings of notes and half beats etc.

PHYSICAL EDUCATION – collection of real data for processing in Maths such as sports day timings

PHILOSOPHY AND ETHICS – interpretation and comparison of data gathered from secondary sources (internet) on e.g. developing and developed world, displaying data systematically.

SCIENCE – calculating with formulae, 3 way relationships, balancing equations, standard form and distances to stars and galaxies.

TEXTILES – scale, practical equipment, proportion, measurements.

Signed \_\_\_\_\_ Headteacher

Signed: \_\_\_\_\_ Chair of Governors

Date: \_\_\_\_\_

# Appendices

Upon arrival to the academy these are the expected start points:

- have a sense of the size of a number and where it fits in the number system
- know number bonds by heart e.g. tables, doubles and halves
- use what they know by heart to work out answers mentally
- calculate accurately & efficiently using a variety of strategies, both written & mental
- recognise when AND when not to use a calculator; using it efficiently if needs be
- make sense of number problems, including non-routine problems, and recognise the operations needed to solve them
- explain their methods and reasoning using correct mathematical terms
- judge whether their answers are reasonable, and have strategies for checking
- suggest suitable units for measuring
- make sensible estimates for measurements
- explain and interpret graphs, diagrams, charts and tables
- use the numbers in graphs, diagrams, charts and tables to predict.

(taken from DfE guidance)

# Appendices

## 1.1 Year 9 pupils should:

- have a sense of the size of a number and where it fits into the number system;
- recall mathematical facts confidently;
- calculate accurately and efficiently, both mentally and with pencil and paper, drawing on a range of calculation strategies;
- use proportional reasoning to simplify and solve problems;
- use calculators and other ICT resources appropriately and effectively to solve mathematical problems, and select from the display the number of figures appropriate to the context of a calculation;
- use simple formulae and substitute numbers in them;
- measure and estimate measurements, choosing suitable units and reading numbers correctly from a range of meters, dials and scales;
- calculate simple perimeters, areas and volumes, recognising the degree of accuracy that can be achieved;
- understand and use measures of time and speed, and rates such as £ per hour or miles per litre;
- draw plane figures to given specifications and appreciate the concept of scale in geometrical drawings and maps;
- understand the difference between the mean, median and mode and the purpose for which each is used;
- collect data, discrete and continuous, and draw, interpret and predict from graphs, diagrams, charts and tables;
- have some understanding of the measurement of probability and risk;
- explain their methods, reasoning and conclusions, using correct mathematical terms;
- judge the reasonableness of solutions and check them when necessary;
- give their results to a degree of accuracy appropriate to the context.