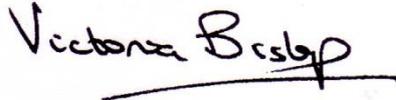




# Sir Christopher Hatton Academy

A Member of Hatton Academies Trust



<b>Title</b>	<b>Numeracy Policy</b>
<b>Reviewed</b>	<b>April 2017</b>
<b>Next Review</b>	<b>April 2019</b>
<b>Associated Policies</b>	<b>Curriculum Policy Teaching &amp; Learning Policy</b>
<b>Originator</b>	<b>B Joshi</b>
<b>Approved</b>	



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## NUMERACY POLICY

### 1. Mission Statement

Sir Christopher Hatton Academy is committed to raising the standards of Numeracy of all its students, so that they develop the ability to use Numeracy skills in all areas of the curriculum and the skills necessary to cope confidently with the demands of further education, employment and adult life.

### 2. Rationale

It is important that all students develop the ability to apply numerical understanding and skills confidently to solve problems in a variety of curriculum contexts and to cope with the practical mathematical demands of everyday life.

The focus on Numeracy skills is not just the responsibility of the Mathematics department. All subjects where students are expected to apply numerical skills should be taking positive steps to develop students' Numeracy skills and provide opportunities for them to acquire the mathematical language crucial to understanding mathematical knowledge. This is particularly relevant in response to the changing, more demanding content of the new GCSE qualifications in a number of subjects.

The improvement of Numeracy skills raises students' mathematical attainment and interpretation of data, which promotes high standards in other subjects.

Students with poor Numeracy skills are at a disadvantage when they try to enter employment. They frequently struggle to enter full time employment and often fail to stay in employment long term.

### 3. Definition

Numeracy is: The ability to cope confidently with the mathematical demands of further education, employment and adult life. It 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.

It also includes:

- The ability to carry out basic calculations efficiently and accurately, either mentally or with pencil and paper as appropriate.



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- The ability to apply knowledge of number to both familiar and new circumstances and to use it in the solution of problems.
- The ability to understand and use units of measurement of length, mass, capacity and time.
- The ability to understand and use information presented in mathematical forms, including graphs, tables and charts.

Numerate students:

- Have a sense of the size of a number and where it fits into the number system.
- Read numbers correctly from a range of meters, dials and scales.
- Know basic number facts and recall them quickly and confidently.
- Use what is known to work out answers mentally.
- Use calculators and other ICT resources appropriately and effectively to solve mathematical problems.
- Make sense of number problems, recognise the operation(s) needed and are able to work confidently with numbers.
- Know when answers are reasonable and give results to an appropriate degree of accuracy.
- Are able to manipulate algebraic expressions and simple formulae.
- Understand and use correct mathematical notation and terminology.
- Are able to explain methods, reasoning and conclusions.
- Use units of measurement of length, angle, mass, capacity and time; can suggest suitable units for measuring, make sensible estimates of measurements and measure accurately using a range of instruments.
- Understand and use compound measures and rates.
- Use simple formulae and substitute numbers in them.
- Measure and estimate measurements, choosing suitable units and calculate simple perimeters, areas and volumes.
- 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.
- Understand probability and risk.

## 4. Raising Standards of Numeracy

A whole academy strategy for raising standards of numeracy involves:

- Increasing awareness of secondary teachers of the teaching strategies used in primary schools and the mathematical skills acquired by students.
- Identifying the Numeracy needs of different subjects.
- Providing information on appropriate expectations of particular groups.



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- Increasing teacher awareness of how students are taught particular skills in mathematics lessons, so that students can be encouraged to utilise these skills in various subjects.
- Increasing teacher awareness of differences that exist, in similar topics, between mathematics and other subjects, so that these differences can be explained to students to aid understanding.
- Developing a consistent approach to learning and using Numeracy skills in all subjects.
- Increasing the awareness of students of the transferability of skills, so that they can make effective use of the Numeracy they have, in a range of contexts.

It is the responsibility of the Mathematics Department to teach basic skills, but by working more effectively with other teachers in the school standards should be raised for all students.

This should mean that:

- The need for teachers of subjects other than Mathematics to teach basic Numeracy skills will be reduced, and more focus can be given to subject-specific techniques.
- Achievement in those aspects of the curriculum which involve the use of basic Numeracy skills, will be raised.
- The ability of all students to work correctly and confidently with mathematics in a variety of contexts will improve.
- Students leaving the school will be better prepared for further education and employment and able to deal more confidently with the mathematical demands of adult life.

Displays in relevant areas around the school should challenge students' Numeracy, and questions will be displayed to encourage students to think through how Numeracy problems can be solved. The Mathematics Department will mainly take responsibility for this.

In order to maintain consistency in numeracy marking across the academy, numeracy marking codes will be used in all departments when giving feedback to students. These codes will be on display in all Maths classrooms and in department bases. The numeracy marking codes are as follows:

(W) = Show full working

(U) = Use correct units / remember missing units

(C) = Clear layout and communication needed (clear answer, clear structure of method)

(A) = Accuracy/calculation error

(M) = Method error

(S) = Simplify your answer fully

(L) = Label axes



## 5. Department Numeracy Framework

Departments will plan their approach to Numeracy under the following criteria. Not all departments are expected to teach under every heading. Departments will look at areas of their subject curriculum that allow the teaching of Numeracy and plan how to deliver Numeracy through their own subject areas.

Within our expectations of Numeracy, students across the academy should:

- Have a sense of the size of a number and where it fits into the number system.
- Confidently apply number facts such as number bonds, multiplication tables and double and halves in order to aid mental Maths calculations.
- Calculate accurately and efficiently, using both mental and written methods, drawing on a range of calculation strategies.
- Recognise when it is appropriate to use a calculator and be able to do so effectively.
- 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 and vocabulary.
- Judge their answers are reasonable and have strategies for checking them where necessary.
- Suggest suitable units for measuring and make sensible estimates of measurements.
- Explain and make predictions from the numbers in graphs, diagrams, chart and tables.
- Be able to recall and use key subject-specific formulae.
- Show all steps of a written method and ensure that all processes are clear.
- Understand the meaning behind their methods and calculations to ensure a deeper and more fluent grasp of concepts.
- More advice on this can be found in the appendix.



## 6. Monitoring and Evaluation

This policy and the academy's efforts to improve standards of Numeracy will be monitored and evaluated by:

- The Numeracy coordinator who will work with all curriculum areas to ensure that Numeracy is addressed.
- The Numeracy coordinator will report back to the Mathematics department on the progress being made and will provide the department with cross-curricular material to be used in Maths lessons.
- Numeracy to be (when appropriate) put on the agenda at department meetings.
- The Numeracy coordinator will raise the profile of Numeracy throughout the school, offering whole school training as needed.
- The Numeracy coordinator will provide training/support for colleagues who wish to develop their own numeracy skills in relation to their day-to-day responsibilities such as tracking students' data.
- The Numeracy coordinator will provide mathematical activities across the school to engage pupils and support their understanding of numeracy.

## 6. Whole School Roles and Responsibilities

Role	Responsibility	Staff responsible	Line Manager
<b>VP with responsibility for Numeracy across the curriculum</b>	An identified senior manager will lead and give a high profile to numeracy development and be responsible for monitoring progress across the academy and assessing standards of students' numeracy	AM	AW



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<b>Head of Mathematics</b>	The head of Mathematics will support the Numeracy Coordinator and the department in the consistent implementation of the numeracy policy	BJ	AM
<b>Numeracy Coordinator</b>	Supports departments in the implementation of numeracy strategies and encourages departments to learn from each other's practice by sharing ideas.	SY	BJ
<b>Maths Department</b>	Provides students with the knowledge, skills and understanding they need to be numerate and calculate with numbers effectively and play a key role in identifying cross curricular numeracy priorities, targets and objectives.	Maths teachers & HLTA	BJ
<b>Teachers across the curriculum</b>	Contribute to students' development of numbers by developing general numeracy skills in lessons and during form time in with the House Maths Challenge.	ALL TEACHING STAFF	SY, BJ, all CLs, Form Tutors



<b>Parents</b>	Encourage their children to use the range of numeracy strategies they have learnt to improve their levels of numeracy.	ALL PARENTS	SY, BJ & Form Tutors
<b>Students</b>	Take increasing responsibility for recognising their own numeracy needs and making improvements.	STUDENT BODY	All staff

## **APPENDIX**

### **General advice for all departments**

#### **A. Calculators**

In order to improve numeracy skills, it is essential that students should be encouraged to use non-calculator methods whenever possible. However, departments should ensure students have access to calculators when they are necessary. It is recognised that where calculators are to be used their correct use may have to be taught.

#### **B. Working out**

Students should be encouraged to show all steps and processes in their working out and present this with attention to place value and neat column keeping.

In a line of workings, an equals sign should only appear once.

This is poor practice:  $£3.50 \times 0.85 = 2.975 + 3.50 = 6.475 = £6.48$

This is good practice:  $£3.50 \times 0.85 = 2.975$



$$2.975 + 3.50 = 6.475$$

$$= \text{£}6.48$$

## C. Language

- When referring to decimals, teachers should say “three point one four “ and not “three point fourteen”.
- Teachers should read numbers out in full to emphasise place value, so say three thousand four hundred and sixty seven rather than three four six seven.
- Teachers should be specific when working with averages so as not to confuse students about which average they are using. For example, they should say “We have calculated the mean average” rather than “We have calculated the average”.
- Teachers should make sure they are using the correct mathematical word rather than using similar words interchangeably. For example in algebra, expression, equation, identity, function and formula all mean different things but are often used to mean the same thing.

## D. Checking answers

Students should be encouraged to check any calculations they have made mentally and using a calculator are reasonable by using estimation. For example, if a student is working out  $327 \times 42$  and given an answer of 78239, they should recognise that the calculation they have performed is roughly  $300 \times 40$  and therefore should give an answer closer to 12000.

## E. Symbols

Teachers in all departments should recognise the meaning and importance of symbols and the operations or meanings they represent. This includes the basic operation signs of addition (+), subtraction (-), multiplication (x) and division ( $\div$ ) but also extends, not exhaustively, to the following:

- In a fraction, the line between a numerator and denominator is a division, so  $\frac{2}{5}$  means  $2 \div 5$ . Teachers should also be encouraged to write fractions as one number directly above another as shown above, and not as  $2/5$ .
- For inequalities, teachers should know the meaning of  $<$  (less than),  $>$  (greater than),  $\leq$  (less than or equal to),  $\geq$  (greater than or equal to),  $\ll$  (much less than) and  $\gg$  (much greater than). The last two symbols are not used regularly in Mathematics but are readily used in Science.
- Students should be comfortable using the equals sign to show that two things have equal value, but also comfortable using the approximately equal to sign ( $\approx$ ) and the not equal to sign ( $\neq$ ). These symbols are particularly useful when it comes to expressing metric or imperial conversions or currency conversions.