

Numeracy policy

2017-2018

Date Agreed	5 th October 2017
Review Date	October 2018

Headteacher: **Mrs J Gray, MSc, NPQH**

St Michael's Church of England High School • Rowley Learning Campus • Curral Road • Rowley Regis • West Midlands • B65 9AN
Telephone: **0121 561 6881** • Fax: 0121 561 6882 • email: contact.staff@st-michaels.sandwell.sch.uk

Contents

Statement of Intent

1. Definition of Numeracy
2. Expected Numeracy Capabilities
3. Raising the profile of numeracy across the curriculum
4. Objectives
5. The Numerate Student
6. Delivery of Numeracy
7. Roles and Responsibilities
8. A Policy on the Use of Calculators
9. Evaluation

Statement of Intent

St Michael’s Church of England High School is committed to raising the standards of numeracy of all of its students; we want our pupils to be confident and capable in the use of numeracy to support their learning in all areas of the curriculum and to acquire the skills necessary to help achieve success in further education, employment and adult life.

St Michael’s Church of England High School is committed to raising the standard of numeracy of all 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 continuing education, employment and adult life. Numeracy will be consolidated and enhanced through opportunities to apply and develop numeracy skills across the curriculum. Poor numeracy skills hold back students’ progress and can lower their self- esteem. All teachers and support staff will have a role to play in supporting students’ progress in numeracy.

Signed by:

_____	Headteacher	Date: _____
_____	Chair of governors	Date: _____

1. Definition of Numeracy

The development of the concept of "numeracy":

1959 - (*Crowther report*) - Numeracy is defined as a word to represent the mirror image of literacy.

1982 - (*Cockcroft report*) - A numerate pupil is one who has the ability to cope confidently with the mathematical needs of adult life. There should be an emphasis on the wider aspects of numeracy and not purely the skills of computation.

1995 - (*OED*) – numerate means acquainted with the basic principles of mathematics.

There are a number of definitions. This is what we believe are the most appropriate:

- “Numeracy is a proficiency, which involves confidence and competence with numbers and measures. It is more than an ability to do basic arithmetic requiring an understanding of the number system, a range of mathematical techniques and an inclination and ability to solve quantitative or spatial problems in a range of contexts. It demands an understanding of the ways in which data are gathered by counting and measuring, and presented in graphs, diagrams, charts and tables”.
(*National Numeracy Strategy*)
(*Framework for Teaching Mathematics - yrs. 7 to 9 - DfES*)
- “Mathematical literacy is an individual’s capacity to identify and understand the role that mathematics plays in the world, to make well-founded judgements and to use and engage with mathematics in ways that meet the needs of that individual’s life as a constructive, concerned and reflective citizen”. (*PISA*)

Context

Numeracy is not the sole responsibility of the mathematics department. All subjects can contribute to the development and enhancement of students' numeracy skills including their ability to describe and explain their strategies and reasoning.

Where students enter St Michael's Church of England High School having made limited progress throughout KS2 it is mainly because of lower than average literacy and numeracy skills. As a result, it must be ensured that these students aim to make accelerated progress throughout their secondary school experience that allows them to catch up with their peers nationally.

St Michael's Church of England High School has formed working parties to develop numeracy within its particular setting. As a consequence, tutor time has been redesigned to ensure that there is a numeracy element of the tutorial time for all years between 7 and 10. Tutor time for year 11 is geared towards their mathematics GCSE's.

Work is in progress with feeder primary schools to ensure there is continuity between year 6 and year 7 in reference to the *no wasted years* document.

Does numeracy matter?

Yes, and more than might be expected.

Low numeracy is linked to narrowed life chances, but mostly in terms of outcomes relating to physical and financial health (Rowlands, 2009). Innumeracy increases vulnerability from everyday things like pay, taxes, utilities, etc. to accessing the job market to the ease with which you can be exploited or manipulated. (*About 26% of skills shortage vacancies result from a lack of numeracy skills, according to UKCES in 2014*)

For example, someone with low numeracy might not appreciate how significant an APR of 5.8% or 5853% actually is, or might find it hard to contextualise the annual spend on unemployment benefit (£4.91bn in 2011-12) in terms of overall welfare spending (£159bn in 2011-12). More positively, high numeracy facilitates access to mathematical fluency (which opens up a host of opportunities in terms of social and economic participation and general utility).

2. Expected Numeracy Capabilities

At St Michael's Church of England High School, we intend that all of our pupils should:

- have a sense of the size of a number and where it fits into the number system
- be able to use strategies successfully to solve number related problems mentally
- apply an appropriate method to help solve a problem, e.g. mental, oral and written methods
- make sense of number problems and identify and use the required operations to solve them
- restrict their reliance on using a calculator and use them only when it is appropriate to do so
- develop their skills in estimation and approximation and have strategies for checking the reasonableness of their answers
- be able to explain their methods and reasoning using consistent language and mathematical terminology
- be able to make and use sensible estimates of a range of measures in everyday situations
- be able to interpret, explain and make predictions from information given in graphs, charts and tables
- improve their general problem solving skills.

The DfE's KS3 Mathematics Strategy has identified the following priorities for cross-curricular development work:

- to improve accuracy in measurement, calculation and graphical work
- to improve interpretation and presentation of graphs, charts and diagrams
- to improve reasoning and problem-solving

3. Raising the Profile of Numeracy Across the Curriculum

We will use of range of activities to raise the profile of numeracy across the curriculum, including:

- mathematics teachers leading INSET on teaching particular mathematical topics
- developing liaison with feeder schools
- illustrating the importance of mathematics/numeracy, for example:
 - Pupils being able to make sense of information in chart/graphical form and be able to describe the 'story' behind the graph.
 - Pupils being able to make sense of calculation answers, check the reasonableness of an answer and select the most appropriate method of solution.
- key word posters e.g. the language of operations, pre-fixes
- posters produced in other subjects displayed in maths rooms:
 - e.g. pupils work in DT illustrating the use of mm in measurement
 - sign posts around school giving the distance to other places e.g. the hall, specific classrooms, the headteachers office etc.
 - stickers giving measurements of doors, windows, desks etc. in imperial & metric units.
- laminated cards made available in non-mathematics lessons to help students with key maths skills e.g. drawing a pie chart
- providing online support for students with numeracy problems in other subjects through the use of Safebook sessions and other platforms
- examples and exercises used in mathematics lessons based on examples and the schemes of work of other subjects
- key vocabulary/key facts to be provided in student planners
- glossary of maths terms to be available in all teaching rooms (*subject specific*)
- maths problem for the week for use in tutor periods for form groups in years 7-10
- key maths words for the week supporting the Associate Assistant Headteacher for Literacy with literacy across the curriculum
- an evening for parents explaining calculation methods or have these provided on the school website
- to implement and develop the use of 'numeracy VIVOs' across the school

4. Objectives

St Michael's Church of England High School will adopt a whole school approach to numeracy

Short-term objectives

- to promote opportunities for numeracy throughout the curriculum
- to develop cross-curricular use of numeracy by building opportunities for numeracy into all schemes of work both curricular and pastoral
- to raise the profile of numeracy across the school
- to provide staff training where necessary
- to build upon the work done in feeder primary schools and the use of KS2 SATs question level analysis
- to implement and develop the use of 'numeracy VIVOs' across the school

Long-term objectives

- to raise standards of numeracy by enhancing the quality of teaching and learning
- to ensure that students reach and exceed their expected targets in all areas of the curriculum
- develop schemes of work across subjects to ensure quality first teaching of numeracy is embedded into every 9-1 curriculum at both KS3 and KS4
- support departments to create schemes of work that include specific numeracy objectives. These objectives will inform what is taught, how it is taught, what is learnt and how it is learnt
- support staff in developing the foci of numeracy and encouraging participation through numeracy representatives
- develop suitable assessments to create an output that demonstrates a review process and progress being made.

5. The Numerate Student

The following guidelines taken from the National Numeracy Strategy summarise the numeracy skills students, of different abilities, should have.

a. All students should:

- have a sense of the size of a number and where it fits into the number system
- be able to do simple addition, subtraction, multiplication and division using either a mental or written method
- make estimates of measurement and be able to identify different units of measurement
- have a knowledge of the times tables either by recall or by adding on

b. More-able students should:

- be able to use mental methods to perform calculations involving addition, subtraction, multiplication and division of numbers including simple decimals
- be able to convert between metric units
- have a knowledge of simple equivalent fractions, decimals and percentages
- be able to find a simple percentage of a quantity
- be able to perform simple fractions by cancelling common factors
- be able to read information from simple diagrams, charts and graphs
- make sense of number problems and be able to identify the operations required to solve the problem

c. High ability students should:

- calculate accurately using a variety of strategies using both mental and written methods, including two and three digit numbers and decimals
- be able to identify equivalent fractions, as well as their related decimals and percentages
- be able to find the percentage of a quantity with or without a calculator and understand problems involving percentage increase and decrease
- explain their methods and reasoning for solving a problem using mathematical language
- judge whether their answers are reasonable and have a range of strategies for checking their answers
- explain and interpret charts, diagrams, graphs and tables

At St Michael's Church of England High School we aim to develop the numeracy skills identified in section c above with all students to avoid putting a ceiling on achievement.

Students in all lessons should:

- make correct use of mathematical vocabulary when providing oral and written answers or asking questions
- present ideas and information they have collected in the form of displays of charts and tables
- interpret, describe and explain their work and not simply reproduce graphs, tables and charts or statements concerning percentages and other numerical data
- set their work out systematically and with care

Where there are calculations these should always be set out so the method used is clear. Where there are graphs these should always show a suitable scale, be correctly labelled and have a title.

6. Delivery of Numeracy

Although it is essential that key numeracy skills are taught in mathematics lessons, there is a clear intention from the recent OFSTED Inspection handbook for these skills to be reinforced and applied across other subjects.

The guidance in the handbook states that inspectors must:

“ensure progress in literacy and mathematics are assessed by drawing on evidence from other subjects in the curriculum.”

“ensure the teaching of reading, writing, communication and mathematics is highly effective and cohesively planned and implemented across the curriculum.”

7. Roles and Responsibilities

It is the role of the School Leadership Team (SLT) to:

- support the development and implementation of cross curricular numeracy policy at the school
- determine the role of the Associate Assistant Head – numeracy
- evaluate the effectiveness of the cross curricular strategy in raising standards of achievement
- provide INSET opportunities and resources for teachers and support staff as appropriate, e.g., through working parties
- provide finance for material resources

At St Michael’s Church of England High School it is the role of the Associate Assistant Headteacher of Numeracy to:

- work with the SLT to determine a strategy for dealing with numeracy across the curriculum and to ensure the effective development of the whole school numeracy policy
- communicate with the school’s governing body to summarise the impact of the whole school numeracy policy
- evaluate the implementation of the whole school numeracy policy through schemes of work
- evaluate the effectiveness of the strategy and modify it as necessary
- evaluate the implementation of the whole school numeracy policy through departmental and pastoral learning walks and work scrutiny
- lead staff INSET on common practices and methods to be adopted across the whole school and provide exemplar materials for use in classroom
- work with departments and individual staff
- raise the profile of numeracy across the whole school and on the school website
- seek opportunities for topics from other subjects to be used in mathematics lessons
- develop a common language and provide guidance on mathematical methods to be used consistently across the school
- develop and coordinate whole school numeracy activities
- develop and coordinate tutor group numeracy activities
- organise numeracy weeks and focus days as appropriate
- ensure that there is constructive communication between St Michael’s Church of England High School and feeder primary schools
- lead and coordinate work with parents to help them support their children.

At St Michael's Church of England High School it is the role of the Numeracy Group, led by the Associate Assistant Headteacher for Numeracy to:

- provide INSET resources for teachers;
- provide opportunities for effective communication between departments, particularly Maths, Science, DT, ICT and Humanities;
- ensure students have a coherent learning plan so that there is understanding across these faculties;
- support and encourage staff involvement in promoting Numeracy within the school;
- work with SLT to determine a strategy for dealing with numeracy across the curriculum and to ensure the effective development and implementation of the numeracy policy and the calculations policy;
- establish and maintain line of communication to ensure there is constructive liaison between mathematics teachers and teachers of other subjects;
- establish lines of communication and ensure there is constructive liaison between mathematics teachers and feeder primary schools;
- monitor and evaluate the implementation of the Numeracy policy;
- facilitate amendments to the numeracy strategy in light of evaluation and curriculum change.

8. The Role of the Mathematics Department

It is essential that mathematics teachers provide students with the knowledge, skills and understanding they need to access other areas of the school curriculum with confidence.

9. The Role of Teachers and Teaching Assistants

In order for the cross curricular strategy to be effective, it is important that all staff:

- understand what numeracy is and are aware of how they can support the delivery of numeracy within their subject
- ensure that numerical tasks included in their lessons are age and ability appropriate and used accurately
- consider numeracy in their short and mid-term planning
- ensure that they are familiar with correct mathematical language, notations and techniques relevant to their subject and encourage students to use these effectively

10. The Role of Heads of Faculties and Heads of Departments

In order that the policy becomes whole school practice, it is important that Heads of Faculties and Departments ensure that:

- schemes of work have opportunities for numeracy included and identified
- lesson plans include relevant numeracy learning outcomes
- each department has a resource of relevant mathematical methods accessible to staff
- new staff are aware of the numeracy policy and its inclusion in the subject
- the promotion of numeracy in lessons is included in the regular evaluation of teaching and learning and departmental self-review.
- the Associate Assistant Headteacher of Numeracy is informed of the stage at which specific numeracy skills will be required for particular groups.
- mathematics teachers are provided with resources which will enable them to include applications of numeracy relating to other subjects in mathematics lessons.

11. A Policy on the Use of Calculators

All departments should make themselves aware of the school's calculation policy on the use of calculators. In addition, when using calculators in their own departments, teachers should consider the following issues:

- a) What is the mathematics department policy on the use of calculators? (Please see the calculations policy)
- b) What is the mathematics department policy on mental and written calculation methods?
- c) Does the practice in other departments support the development of pupils' mental and written calculation skills?
- c) Where in your subject do you expect pupils to be able to use a calculator?
- e) Are the calculator skills required of pupils in other subject areas in line with expectations in the Maths Strategy Framework?

12. Evaluation

The numeracy policy will be monitored and reviewed through:

- the School Development Plan
- lesson observations
- sampling of students' work
- discussion with staff, parents and governors
- reviewing planning
- analysing assessment data
- discussion of students and with students
- impact reports