



The White Hills Park Federation Trust
A Culture of Excellence

Numeracy Policy

Updated: September 2017
Review: September 2018

Aims:

All teachers are teachers of numeracy. The White Hills Park Federation Trust is committed to raising the standards of numeracy of all its students, so 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.

Our aim is to:

- Develop, maintain and improve standards in numeracy across the Federation.
- Ensure consistency of practice including methods, vocabulary, notation, etc.
- Indicate areas for collaboration between subjects.
- Assist the transfer of students' knowledge, skills and understanding between subjects.
- Promote numeracy as an important life skill and recognise its development as a basic entitlement for every pupil.

Rationale:

- Raising standards in numeracy across our academy cannot be solely judged in increased test percentages. There is a need to evaluate the students' ability to transfer mathematical skills into other subject areas and during tutor time, applying techniques to problem solving.
- Numeracy skills enable students to understand and interpret numerical and graphical information. This facilitates improvement in students' abilities to make their own judgements and to draw sensible conclusions from information.
- All subjects depend on students having competence in basic numeracy skills.
- If students' numeracy skills are not developed and used they may well be denied the opportunity to develop the level of understanding of some topics or subjects at the level expected for their age.
- Developing basic numeracy skills builds confidence, self-esteem and allows the learner to develop independence.
- Students must be confident in areas such as arithmetic, ratios and proportion. Students will also be encouraged to apply themselves in different ways to non-routine problems, solve real-world problems and demonstrate financial literacy.

What is Numeracy?

The Framework for **Teaching Mathematics DfES** states that '*Numeracy is a proficiency that 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. Numeracy 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 is gathered by counting and measuring, as presented in graphs and diagrams, charts and tables.*'

In addition, the **New National Curriculum 2014** (page 10) states that: *Teachers should use every relevant subject to develop students' mathematical fluency. Confidence in numeracy and other mathematical skills is a precondition of success across the national curriculum.*

Teachers should develop students' numeracy and mathematical reasoning in all subjects so that they understand and appreciate the importance of mathematics. Students should be taught to apply arithmetic fluently to problems, understand and use measures, make estimates and check their work. Students should apply their geometric and algebraic understanding, and relate their understanding of probability to the notions of risk and uncertainty. They should also understand the cycle of collecting, presenting and analysing data. They should be taught to apply their mathematics to both routine and non-routine problems, including breaking down more complex problems into a series of simpler steps.

The numerate pupil:

- Has a sense of the size of a number and where it fits into the number system.
- Will be able to formalise written methods of calculation.
- Will be able to use ratio, proportion and rates of change.
- Will be able to provide clear mathematical arguments.
- Will focus on problem-solving, which may require multi-step solutions.
- Reads numbers correctly from a range of meters, dials and scales.
- Knows basic number facts and recall them quickly and confidently.
- Uses what is known to work out answers mentally.
- Uses calculators and other ICT resources appropriately and effectively to solve mathematical problems.
- Makes sense of number problems, recognises the operation(s) needed and can work confidently with numbers.
- Knows when answers are reasonable and gives results to an appropriate degree of accuracy.
- Is able to manipulate algebraic expressions and simple formulae.
- Understands and uses correct mathematical notation and terminology.
- Is able to explain methods, reasoning and conclusions.
- Uses units of measurement of length, angle, mass, capacity and time; can suggest suitable units for measuring, makes sensible estimates of measurements and measures accurately using a range of instruments.
- Understands and uses compound measures and rates.
- Uses simple formulae and substitutes numbers in them.
- Measures and estimates measurements, choosing suitable units and calculate simple perimeters,

areas and volumes.

- Draws plane figures to given specifications and appreciates the concept of scale in geometrical drawings and maps.
- Understands the difference between the mean, median and mode and the purpose for which each is used.
- Collects data, discrete and continuous and draws, interprets and predicts from graphs, diagrams, charts and tables.
- Understands concepts of probability and risk.

Roles and Responsibilities:

Every maths teacher, in collaboration with the Federation mathematics' departments, will:

- Work together to ensure there is consistency of practice across the Federation.
- Use INSET and coaching to support other staff to gain a better understanding of key numeracy and problem solving skills and mathematical techniques which need to be promoted so that a correct and consistent approach is used in all subjects.
- Will share information with other subject teachers on appropriate expectations of students and difficulties likely to be experienced in various age and ability groups.
- Will seek opportunities to use topics and examination questions from other subjects in mathematics lessons.

Teachers of subjects other than mathematics:

- Will ensure they are familiar with correct mathematical language, notation, conventions and techniques, relating to their own subject, and encourage students to use these correctly.
- Will be aware of appropriate expectations of students and difficulties that might be experienced with numeracy skills.
- Will provide information for mathematics teachers on the stage at which specific numeracy and problem solving skills will be required for particular groups.
- Will provide resources for mathematics teachers to enable them to use examples of applications of numeracy relating to other subject in mathematics lessons.
- Will encourage clear and accurate presentation of solutions to problems as it supports logical thinking.
- Will use ICT to support students' numeracy skills.
- Where appropriate use methods and procedures consistent with the Maths Department.
- Will encourage the development of problem solving skills, such as, logical thinking, systematic procedures and sound reasoning.

All Form Group Tutors:

- Will follow the Numeracy Ninjas resource programme provided to support the development of basic numeracy and increased fluency and efficiency of arithmetic in tutor time.
- Will promote a positive image of mathematics and the impress upon all pupils the importance and relevance of being numerate in society, even with the increased availability of technology.
- Will strive to utilise the skills of the most numerate pupils to share good practice and to support the development of numeracy skills with the less proficient pupils in the group.

Examples of use of numeracy in other subjects:

Business Studies

Basic financial terms calculating profit and loss. Interpreting simple cash flow statements. The importance of cash flow statements. Identifying solutions to cash flow problems.

Design & Technology

Various arithmetical calculations on decimals and fractions including ratio, use of formulae, percentages. Graphs and charts of all kinds. Construction and measure of 2D and 3D shapes. Development castings.

Art

Islamic art and design; shape in 2D and 3D; simple ratios; perspective; Golden ratio. Escher tessellations. The art of Wassily Kandinsky and others use geometrical shapes.

Approach to Teaching

Teachers should strive to:

- Use effectively the data handling policy and measurement glossary to promote consistency of vocabulary and methodology.
- Build students' confidence when they are struggling with a calculation.
- Encourage students to understand the methods that they are using.
- Use mathematical language accurately and consistently within the department and across the school.
- Value students' different methods for calculation and regularly ask 'How did you do that?' and 'Did anyone do that a different way?'

Approach to Learning

Students should be encouraged to:

- Try all calculations and problem solving tasks themselves.
- Use mental calculation as the first step when faced with any calculation.
- Explain any calculation they have done by showing all their working out.
- Estimate before a calculation is done whenever possible.
- Consider the reasonableness of their answers after a calculation has been done.
- Use the appropriate method of presentation for the data.
- Correctly label a graph/chart.
- Know how to use all the relevant buttons on their calculator efficiently and effectively when it is appropriate and to be able to interpret the display.
- Choose and use appropriate units of measure.

Monitoring and Evaluating:

Monitoring and evaluating numeracy in the curriculum will be the responsibility of the Federation senior management team and the Heads of Mathematics, who together will establish effective procedures for monitoring numeracy within the school. Numeracy will be monitored and evaluated through:

- Review of schemes of work, lesson plans and students' work.

- Pre and post testing; end of term tests and end of year tests. All this data will feed into Go4Schools for analysis and action. It will also inform teaching.
- Analysis of GCSE and A-level examination result.

Students with Learning Needs:

- Students with specific learning difficulties in the area of numeracy will negotiate targets for improvement with their subject teacher.
- Where teachers feel they have identified a pupil who is experiencing significant numeracy difficulties that have not improved despite support given, they will contact the TA/SENCO to ensure the child is suitably tested to identify underlying learning difficulties.
- Progress in Maths results will also be analysed by subject teachers in order to identify students with a specific numeracy difficulty.
- Able students will be given the right to enter examinations early, so as to move onto A Level in KS4.