GEORGE DIXON ACADEMY

NUMERACY POLICY

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Reviewed By:	I.Aujla, Head of Mathematics
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What is 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.

(National Framework for Teaching Mathematics – DfES 1999)

Why Is Numeracy Important?

Numeracy is a fundamentally important life skill which enables students to make informed decisions in a variety of contexts throughout their lives. When students have secure Numeracy skills, they are empowered to become effective citizens.

Like Literacy, Numeracy is a cross-curricular discipline; it is an important aspect of virtually all subjects and can enhance understanding of them. Mathematical skills can be consolidated and enhanced when pupils have opportunities to apply and develop them across the curriculum. At George Dixon Academy, our goal is to ensure that every student develops the confidence to improve their Numeracy skills so that they are able to apply these skills across the curriculum and in their everyday lives when necessary.

Research shows* that good Numeracy skills are closely linked with positive employment outcomes. Put simply, students with competent Numeracy skills are more likely to secure gainful employment, have better health outcomes

and earn more than those without. On the other hand, Poor Numeracy Skills can hold back Pupils' progress and can lower self-esteem. To improve these skills is a whole-school matter.

We must therefore ensure that every student at George Dixon Academy is encouraged to develop confidence and competence in Numeracy.

Aims of this Policy

- To improve standards in Numeracy across the school for all George Dixon Academy students.
- To establish and maintain consistency including notation, vocabulary and methods among staff and parents/carers.
- To assist the transfer of students' knowledge, skills and understanding between subjects.
- Make numeracy teaching an overt part of every curriculum area
- To ensure that all departments identify the contribution it makes towards numeracy and other mathematical skills so that pupils become confident at tackling mathematics in any context.

Vision Statement

- Numeracy will be regarded as an entitlement for all students, not a privilege for some. It should always be presented in a positive way by staff and parents/carers and regarded as an enabling (problem solving) tool leading to a rise in students' self-confidence and measurable improvements in their applied Numeracy skills. All departments' shall identify the contribution it makes towards numeracy communicating this with pupils on a regular basis. Additional exposure of numeracy will aid the transfer of numeracy skills between subjects enhancing pupil's confidence in numeracy.

Each Department will:

Contribute to the raising of numeracy standards within their curriculum area by:

- The provision of high-quality exemplar materials
- The use of ICT to promote numeracy where possible
- Displaying examples of numeracy within curriculum-based contexts
- Creating/Highlighting opportunities for the use of numeracy within their subject area

Teachers of all subjects should…

- Work towards raising achievement in Numeracy at the Academy by motivating, challenging and inspiring students to believe in their ability to succeed and achieve their very best.
- Present any numerical information in a positive way. Language is a powerful tool and we have the capacity to reframe students thinking where necessary by emphasising Numeracy's key role in improving their life chances.
- Link the Numeracy being learned to a real-life application where possible. In doing so, we help to bring it to life.
- Encourage parents and carers to support the reinforcement of these skills at home at every possible opportunity.

Consistency of Practice

The Mathematical Association recommend that teachers of Mathematics and teachers of other subjects co-operate on agreed strategies. In particular that:

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 tackle the GCSE syllabus.

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 level of numeracy skills required specific to the key stage within their subject.

(Mathematics Association 2015-2018)

Guidance for Teachers and Parents/Carers

When performing calculations in all subject areas, students should be given clear guidance on how to approach this.

All working should follow a logical progression and be clearly set out. Students should pay careful attention to the development of Mathematical vocabulary and the use of correct terminology and notation.

Students should always be encouraged to estimate answers before finding an exact answer. Do now activities are designed to consider the retrieval of key numeracy skills. These activities are aimed at building procedural fluency in number.

Graphs and charts should, where possible, be completed in pencil and drawn using a ruler where appropriate. A suitable scale should be used, and it should be clearly labelled with a title related to the question clearly written on the diagram. All graphs should include an element of interpretation or analysis.

Students will be encouraged to fully understand the data. It will be presented in context and the relative benefits of different measures of average will be considered where appropriate.

Students will be actively encouraged to develop their problem-solving skills at the start of key Stage 3 and throughout key stage 4. This is a crucial aspect of developing secure numeracy skills. They must be encouraged to see problem solving as an integral and exciting part of life. We must therefore encourage them to describe and explain their reasoning through careful use of questioning to enhance and develop their analytical thinking skills.

How the Maths Department is going to improve Numeracy across all Key Stages

Do Now Tasks – D.N.A's designed at KS3 to practice key numeracy skills from ks2 and previous years, and build procedural fluency in numeracy. Tasks also designed to address weaknesses from end of year assessments and strengthen numeracy skills needed as a prerequisite to other topics in maths.

Homework – Weekly homework to be set on Sparxmaths, the A.I intuitive learning platform generates questions based on the learner's ability. With regular retrieval and consolidation factored into homework tasks, the platform can quickly identify misconceptions and gaps in learning, this helps development of numeracy skills. Homework is set in line with the Scheme of Work which allows practice to be meaningful. Additional numeracy tasks will be set to those individuals/ classes who require further intervention indicated from assessments/ homework's.

SEN one-to-one support – Identified SEN pupils to receive one-to-one coaching/tutoring on fundamental numeracy skills.

Maths Club – The department will run a weekly club in which pupils can receive support or be challenged depending on their need.

Numeracy in real life (days) - Pupils to be given exposure to mathematics in real life, adding to their cultural capital. One session will be about managing finances, one session will be maths in sport, and one session will be on maths in technology. This will allow pupils to make connections between numeracy and real life.

Targeted Numeracy activities – Activities to be delivered where teacher feels it is appropriate to do so in the SOW and to be based on AO1 GCSE questions and EOY QLAs. These activities are set according to the ability of the class giving additional exposure and repetition to exam style questions whilst increasing pupils' numeracy abilities.

How Numeracy is currently being used across The Curriculum

English

Frequency of words.

Bar charts, pie charts, Venn diagrams.

Surveys terminology for descriptive writing. Line graphs. Mathematical vocabulary.

Percentages.

Science

Various arithmetical calculations with decimals, fractions, ratio, formulae and percentages. Graphs and charts of all kinds. 2 and 3 D shapes. Golden ratio/Fibonacci sequence.

Religious Education

Shape eg. symmetry and rotational symmetry in religious symbols.

Time/timelines – calendar years and years of other faiths.

DT

Various arithmetical calculations involving decimals, fractions and ratio, use of formulae and percentages.

Graphs and charts of all kinds. Construction and measure of 2 and 3D shapes.

ICT

Spreadsheets, databases, algebra, flowcharts.

Collecting and classifying data.

Measurement of distance and angle control systems.
Production of graphs and charts.

Music

Pythagorean intervals.

Fractions, square roots; doubling of frequencies.

(Powers of 2); aleatory music (using dice to compose);

Golden section e.g. used by composers Eric Satie, Bartok, Debussy, Schubert.

History

Graphs and charts of all kinds. Percentages, manipulation of large numbers, wealth statistics; measures of length, weight and time. (Including time lines) Different number systems used across the ages.

Art

Islamic art and design. Shape in 2 and 3 dimensions; simple ratios; perspective; Golden ratio. Escher tessellations. The art of Wassilly Kandinsky, Piet Mondrian, Theo Doesburg and others using geometrical shapes.

PE

Shape, distance, time units, weight, graphs and charts, percentages.

Power/weight ratios.

Calculations of energy expended. Symmetry, movement and direction.

Modern Foreign Languages

Measures of length/distance, time and weight.

Time-tables, exchange rates.

Money/costs, speeds, distance.

Drama

Time and time frames. Time lines for events.

Spatial awareness;

Staging, perimeters, areas, ratios, height;

Speed, velocity, weights, measures,

Food Technology

Using scale and accuracy when measuring.

Ratio and percentage in recipes

Interpreting nutritional analysis.

Geography

Graphs and charts of various kinds. Fractions, ratios and percentages. Population growth. Four figure (or more) grid references. Study of maps, angles and position.

References:

*Data sources

Skills for Life 2011: "*Does Numeracy Matter?*" Evidence from the National Child Development Study on the Impact of Poor Numeracy on Adult Life, Basic skills Agency.

https://www.ma.org.uk/resources/MA_ATM_Response_to_NC_Review_2012.doc (National Curriculum review - Mathematics Association, 2012)

Monitoring and review

The Governing Body will review this policy every year.

Any changes made to this policy will be communicated to all members of staff.