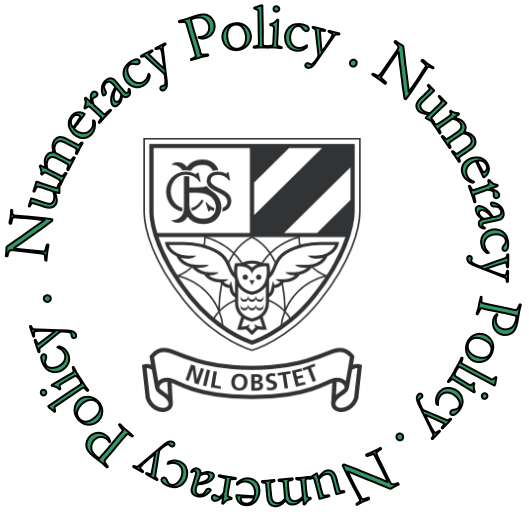
BLOOMFIELD COLLEGIATE SCHOOL

Numeracy Policy



Approved by the Board of Governors 15 December 2022

CONTENTS

SECTION 1: POLICY **PAGE**

SECTION 2: APPENDICES

1.1 Principles

In Bloomfield Collegiate we believe the development of numeracy skills and competence is a basic entitlement for all. Numeracy involves the application of knowledge, skills and understanding, essential for everyday life and for life-long learning. A solid foundation in numeracy is vital to ensure our pupils emerge as young people who can contribute effectively to the economy and society in general.

Numeracy should be promoted through purposeful, relevant and enjoyable activities which should provide both a challenge and a sense of achievement for all pupils.

Competence and understanding in numeracy is important for progress in other areas of study, therefore numeracy is the responsibility of all teachers who should endeavour to promote numeracy in a manner that builds pupils' self-confidence and self-esteem.

1.2 Definition

The school's numeracy policy is informed by the following:

- **a.** The Department of Education for Northern Ireland; the school improvement policy document, *Every School a Good School* published in April 2009;
- **b.** The D.E.N.I strategy document which gives specific guidelines as to how Literacy and Numeracy can be improved - *Count, Read: Succeed*;
- **c.** The Northern Ireland Curriculum for Key Stage 3 descriptors for the cross-curricular skill of Using Mathematics. It is statutory to report on Using Mathematics in Levels for Year 10. This is the responsibility of the Mathematics department;
- **d.** Education Endowment Foundation report *Improving Mathematics in Key Stages 2 and Key Stage 3,* 2017;
- **e.** Baseline testing which is carried out using CAT (Cognitive Ability Test), PTE (Progress Through English), PTM (Progress Through Mathematics) and NGRT (New Group Reading Test) tests to measure several skills including the numeracy skills of quantitative and spatial ability.

It is important that there is a *shared understanding* among the whole staff of the term 'numeracy'.

Numeracy has been defined as follows:

DENI (Every School a Good School) (2009)

> Numeracy is the confidence and competence to apply mathematical skills in routine and unfamiliar contexts. It involves having the mathematical skills necessary to be a full contributor to society and the economy, including those central to personal financial literacy, and having the disposition to think mathematically in everyday situations, including those arising in future employment. It involves the development of an understanding of key mathematical concepts and inter-connectedness, the systematic development of reasoning and problem-solving skills, the proficient and appropriate use of methods and procedures (formal and informal, mental and written), and active participation in the exploration of mathematical ideas and models.

DENI (Count Read Succeed)

> The term numeracy is also used in a wide and inclusive way.
>
> The appropriate application of the term will vary with context and includes 'Mathematics and Numeracy' when considering the revised curriculum, as well as the cross-curricular skill of Using Mathematics.

National Numeracy Project (1996)

- Knowing about numbers and number operations.
- Having an ability and inclination to solve numerical problems, including those involving money or measures.
- It also demands a familiarity with the ways in which numerical information is gathered by counting or measuring, and is presented in graphs, charts and tables.

Cockcroft Report (1982)

- An 'at-homeness' with numbers.
- Ability to make use of mathematical skills to cope with the practical mathematical demands of everyday life.
- Ability to estimate and approximate number in a range of situations.
- Appreciation and understanding of information presented in mathematical terms (in graphs, charts or tables).

1.3 Purposes

Numeracy is to feature prominently in the School Development Plan, in whole school policies and in every department's policies and schemes of learning. Numeracy will consistently be promoted as a whole school priority.

This numeracy across the curriculum priority will have the following aims:-

- To promote numeracy at all levels throughout the school;
- To raise standards in numeracy by enhancing the quality of learning and teaching;
- To provide appropriate staff development to ensure a shared understanding of, and consistent approach to, numeracy throughout the school;
- To ensure that a range of strategies is employed to suit the abilities of pupils; to assist those with difficulties and to provide a challenge for more able pupils;
- To determine intervention strategies for those pupils encountering problems in numeracy;
- To incorporate ICT appropriately across the curriculum to help support and develop numeracy;
- To establish procedures for monitoring and evaluating numeracy across the curriculum;
- To encourage staff to take responsibility for the development of numeracy in their subject areas and to ensure that pupils have the opportunity to apply their mathematical skills in a variety of relevant and appropriate contexts;
- To develop a positive ethos and approach to numeracy and Mathematics across the curriculum.

Criteria for Success

This numeracy across the curriculum priority will aim to develop numerate pupils who will:-

- approach mathematical learning with confidence and competence;

- use a range of mathematical, statistical, problem-solving and data analysis skills to access all elements of their curriculum;
- transfer their mathematical skills across the curriculum;
- embrace problem-solving activities and draw upon practised strategies to complete tasks with efficiency and success;
- explain their logical, incremental approaches to mathematical tasks and evaluate the effectiveness of their methodology.

1.4 STRATEGIES

- To include numeracy and the application of numeracy within the various programmes of study.
- To make mathematical concepts as interesting and relevant as possible and ensure that learning occurs through interactive and collaborative activities.
- To challenge the pupil's understanding, through skilful questioning which requires the pupils to draw conclusions and justify their thinking.
- To use a variety of activities, including ICT and practical equipment, that entails pupils working individually, in pairs or in groups.
- Encourage the pupils to make inter-connections within Mathematics and relate their work to other areas of the curriculum.
- Provide opportunities for pupils to solve problems both in class and through various external challenges and competitions.
- Integrate, when appropriate, mental mathematical strategies.
- Place a greater focus on Mathematics in the workplace and identification of real world examples.
- To provide additional tuition via the peer tutoring programme to address underachievement at KS3.
- To offer support to any pupil that is observed to be of in need of assistance during classroom teaching and/or through the use of data.
- To audit departments on their contribution to numeracy and meeting their needs with regard to support.

1.5 Roles and Responsibilities

All staff should:

- ensure that they are familiar with the specific numeracy demands of their subject and ensure sufficient coverage of these skills in their lessons;
- aim to use consistent approaches to numeracy skills where appropriate whilst allowing a degree of flexibility in the teaching of mathematical principles in order to satisfy each department's needs;
- be able to identify a pupil's numeracy strengths and weaknesses and know how to build upon these in order to promote pupil progress;
- report on a pupil's standard of numeracy at Parental Consultation Events, as appropriate.

- be familiar with the KS3 Using Mathematics Levels of Progression;
- use assessment to build on pupils' existing knowledge and understanding;
- use manipulatives and representations to help pupils engage with mathematical concepts;
- teach pupils strategies for solving problems;
- enable pupils to develop a rich network of relevant mathematical knowledge;
- develop pupils' independence, motivation and confidence when approaching mathematical tasks;
- use scaffolded tasks and resources to challenge and support pupils' mathematics;
- use structured interventions to provide additional support;
- support pupils to make successful transitions and links between curricular disciplines and key stages.

Heads of Department:

- should ensure that 'subject specific numeracy' is clearly identified in schemes of learning and that there is obvious progression through the key stages;
- should seek to find opportunities to liaise with the Mathematics Department and the Head of Mathematics to provide continuity;
- should monitor the work of the department with regard to the inclusion of subject specific numeracy strategies in lesson planning;
- should encourage models of good practice e.g. modelling and close collaboration between colleagues in different learning areas in order to promote numeracy developments;
- should use available assessment data to identify appropriate numeracy strategies.

The Mathematics Department

- should lead the development of numeracy skills through the teaching of Mathematics;
- should monitor and encourage the pupils' numeracy skills by integrating a variety of activities in their lessons designed to development problem-solving, mental Mathematics and analytical thinking;
- should report to parents, in writing, on numeracy skills/Using Mathematics.

The Head of Mathematics (Numeracy Co-ordinator)

- should support departments in the implementation of the school's Numeracy Policy;
- should advise the school's Leadership Team on numeracy issues;
- should lead in the award of end of Key Stage 3 attainment levels;
- should co-ordinate KS3 numeracy initiatives;
- should liaise with the SENCO about pupils attaining below level 3;
- should help to monitor the impact of the Numeracy Policy on standards.

Leadership Team

- should accept overall responsibility for the delivery of the school's Numeracy Policy;
- should provide opportunities for staff training about numeracy issues to take place on INSET days or during other times;
- should support the numeracy across the curriculum initiatives;
- should monitor departments' implementation of the Numeracy Policy;
- should be role models in employing numeracy strategies in their own teaching and monitor examination and assessment outcomes to ensure that no group is disadvantaged with respect to race or ethnicity or gender.

The SENCO

- should liaise with the Head of Mathematics about pupils attaining below target grades;
- should communicate with all subject staff about those pupils who have numeracy difficulties and give advice on what staff can do to help these pupils in their subject;
- should monitor pupils with numeracy difficulties through individual numeracy interventions, programmes and review meetings;
- should be familiar with the KS3 Mathematics Framework objectives of the Northern Ireland Curriculum.

Dates of Policy Review

Nature of Review	Date Review Completed	Date Ratified by Board of Governors
New Policy	June 2015	24 September 2015
Minor amendment	September 2016	29 September 2016
Minor amendments	December 2017	22 February 2018
No changes	October 2019	28 November 2019
No changes	January 2021	
Additonal bullet points to: definitions, criteria for success, roles and responsibilities	October 2021	2 December 2021
Minor amendment	October 2022	15 December 2022

APPENDIX 1: Using Mathematics / Numeracy Audit

Pupils are likely to acquire and consolidate their mathematical knowledge, concepts and skills within the area of learning for Mathematics and Numeracy.

However, they should be given opportunities to transfer their understanding, as appropriate, to other contexts across the curriculum.

Using Mathematics / Numeracy Audit DEPARTMENT: _____

Across the curriculum, at a level appropriate to their ability, pupils should be enabled to:	**Where your subject gives pupils the opportunity to use Mathematics or Numeracy, tick box and give evidence as required:**	
choose the appropriate materials and equipment		
work systematically and check their work		
develop methods and strategies		
explore ideas, make and test predictions and think creatively		
identify and collect information		
read, interpret, organise and present information in tables and graphs		
Work with formulae		
Work with symmetry		
Identify patterns		
Any other		

APPENDIX 2: Key Stage 3 Using Mathematics Levels of Progression and Descriptors

Levels of Progression in USING MATHEMATICS across the curriculum: Key Stage 3

For First Use 2012/13

The colours used in this document provide a means by which progression in the Requirements may be tracked across the levels.

Level 3	Level 4	Level 5
In structured activities, in familiar and accessible contexts, pupils can:	**In activities with some structure, in familiar and some unfamiliar contexts and situations, pupils can:**	**In activities with some structure, in familiar and some unfamiliar contexts and situations, pupils can:**
• suggest different ways an activity might be approached; • select and use the appropriate materials, equipment and mathematics required;	• decide how an activity might be approached and compare their approaches with others; • identify and use appropriately the materials, equipment and mathematics required;	• plan and decide how an activity might be approached; • identify and use efficiently the materials, equipment, mathematics and strategies required;
• use a range of appropriate mathematical notation; • organise their work and know how to check its accuracy;	• use a range of appropriate mathematical techniques and notation; • organise their own work and work systematically; • review their work and check for accuracy;	• use a range of appropriate mathematical techniques and notation; • plan and work systematically and efficiently; • review their work, considering if their findings are reasonable and making changes where appropriate;
• use mathematics to solve simple two-stage problems; • use a range of mental calculation strategies;	• use a range of problem-solving strategies; • use a range of efficient mental calculation strategies;	• use a range of problem-solving strategies, suggesting and trying out different approaches when difficulties arise;
• identify and explain patterns and relationships and make predictions;	• investigate patterns and relationships, using their findings to make predictions; • investigate general statements to see if they are true;	• make and test predictions; • make general statements based on findings and test using new examples; • summarise their findings;
• identify, collect and record the information required; • present their findings clearly using a range of appropriate mathematical formats; • explain their findings;	• find, organise and interpret relevant information; • present information clearly; • compare methods of presentation;	• identify, obtain, process and interpret information appropriate and sufficient for the activity; • present information accurately and appropriately including the use of mathematical language, symbols and diagrams;
• use appropriate mathematical language to discuss and describe their way of working and respond to questions;	• use appropriate mathematical language to discuss their work and explain their thinking;	• use appropriate mathematical language to express and communicate ideas accurately;
• understand, use, add and subtract whole numbers up to at least 1000; • understand and use the concept of place value in whole numbers; • use quick recall of number facts up to 20; • add and subtract mentally two 2-digit numbers within 100; • approximate to the nearest 10 or 100; • identify and describe simple number patterns within the 100 square; • know 2, 3, 4, 5 and 10 multiplication facts; • understand that multiplication is commutative; • explore and use division in practical situations; • understand and use simple fractions in context; • use number skills in the context of money up to £10;	• read, write and order whole numbers within 10 000; • use knowledge of place value to multiply and divide whole numbers by 10 and 100; • understand place value to two decimal places; • approximate within 10 000 to the nearest 10, 100 and 1000; • estimate answers to calculations and approximate by rounding; • add, subtract, multiply and divide whole numbers using a range of mental, written and calculator methods; • add and subtract numbers with up to two decimal places; • use the relationship between addition and subtraction to check calculations; • know multiplication facts up to 10 × 10 and derive associated division facts; • understand and use multiples and factors; • use fractions to describe quantities; • perform simple calculations involving unitary fractions; • understand equivalence of fractions; • understand and use simple percentages; • interpret and apply simple rules expressed in words; • interpret a calculator display when solving money problems; • make choices about spending and value for money; • know different ways in which payments for goods can be made;	• read, write and order whole numbers of any size; • use knowledge of place value to multiply and divide numbers by 10, 100 and 1000; • understand place value to three decimal places; • round decimals to the nearest whole number; • multiply and divide numbers with up to two decimal places by a whole number; • check calculations by applying inverse operations; • understand and use negative numbers in practical contexts; • understand and use square, cube and prime numbers; • understand the relationship between common fractions, decimals and percentages; • calculate fractions and percentages of quantities, including money; • use understanding of equivalence to add and subtract fractions; • devise and use rules for generating sequences in words and/or symbolic form; • express and use formulae in words and/or symbolic form; • make informed choices about personal budgeting and spending;
• choose and use appropriate standard units to estimate, measure and record length, capacity, volume, 'weight', time and temperature; • read simple measuring instruments with an appropriate degree of accuracy; • find the area of shapes by counting whole and half squares; • read and interpret a calendar; • read digital and analogue clock displays; • recognise, name and describe common 2-D and 3-D shapes; • recognise one line of symmetry in common 2-D shapes; • recognise tessellations through practical activities; • recognise right angles in the environment and understand angle as a measurement of turn; • use grid references in practical situations;	• estimate and measure length, 'weight'/mass, time and temperature, working to an appropriate degree of accuracy; • understand the relationship between metric units; • add and subtract common measures; • estimate area and volume of shapes by counting squares/cubes; • work out perimeters of simple shapes; • understand and use digital and analogue clock displays, using am, pm and 24-hour notation; • explore the properties of common 2-D and 3-D shapes; • explore the relationship between 2-D and 3-D shapes; • recognise and draw lines of symmetry in a variety of 2-D shapes; • know the eight points of the compass; • understand and use the language of line, angle and location; • use coordinates in the first quadrant;	• convert from one metric unit to another; • use the four operations to solve problems related to measures; • calculate areas of squares, rectangles and right-angled triangles and volumes of cubes and cuboids; • calculate perimeters of a range of shapes; • understand and use scale in the context of simple maps and drawings; • read and interpret timetables; • describe the properties of regular and irregular 2-D shapes in terms of sides, angles, symmetry and tessellations; • reflect 2-D shapes in a line; • describe the properties of 3-D shapes in terms of faces, edges and vertices; • draw nets of 3-D shapes; • estimate, measure, draw and label angles up to 360 degrees;
• collect and record relevant data for a given activity; • draw and label pictograms and bar charts; • read and interpret information from tables, pictograms, diagrams, lists, bar charts, simple pie charts and databases.	• collect, group, record and present data with given class intervals; • present and interpret data using a range of graphs, tables, diagrams, spreadsheets and databases; • understand and use the language of probability.	• collect, organise, record and represent data; • design and use a data collection sheet; • construct, label and interpret a range of graphs, tables, diagrams, spreadsheets and databases; • understand, calculate and use mean and range; • place events in order of likelihood.

Levels of Progression in USING MATHEMATICS across the curriculum: Key Stage 3

For First Use 2012/13

The colours used in this document provide a means by which progression in the Requirements may be tracked across the levels.

Level 6	Level 7
Through discussion, solving routine and non-routine problems with increasing independence in a wide range of familiar and unfamiliar contexts and situations, pupils can:	**Through discussion, solving routine and non-routine problems with increasing independence in a wide range of familiar and unfamiliar contexts and situations, pupils can:**
• plan for an activity by identifying and sequencing component steps; • consider and identify a range of materials/equipment, mathematical techniques and problem-solving strategies required to meet the purpose of activities;	• plan an activity, explaining their reasons for their chosen structure and approach; • consider and identify, with some justification, the materials/equipment, mathematical techniques and problem-solving strategies required;
• use a range of appropriate mathematical techniques and notation; • work systematically and efficiently to a given degree of accuracy; • review their work, using appropriate checking procedures and evaluating their effectiveness at each stage;	• use a range of appropriate mathematical techniques and notation; • critically review to what extent they succeeded in carrying out activities, checking if the level of accuracy and their findings are appropriate and making an assessment of any limitations;
• adapt their approach as needed;	• consider alternative approaches and adapt them as required;
• make and test predictions, make general statements and draw conclusions;	• make and test predictions and justify their generalisations;
• obtain, process and interpret information from a range of sources; • use a range of suitable ways to present findings, following accepted conventions;	• consider, identify, obtain and analyse data/information from more than one source; • select and use the most appropriate methods to present findings, following accepted conventions;
• use appropriate mathematical language/notation to communicate and explain their work for a wider audience;	• use appropriate mathematical language/notation to explain and justify their findings or solutions;
• carry out calculations with whole numbers of any size; • add, subtract, multiply and divide decimals; • round to a given number of decimal places; • understand and use order of precedence in numerical calculations, including the use of brackets; • understand and calculate square roots; • understand, use and calculate ratio and proportion; • add and subtract fractions, including mixed numbers; • use equivalences between fractions, decimals and percentages to solve problems; • calculate percentage increase and decrease in relevant contexts; • use appropriate formulae; • use conventional notation in algebra; • use and interpret graphs from real situations; • apply mathematical concepts to a range of financial situations;	• use the advanced functions on a calculator to perform complex calculations; • round to an appropriate number of decimal places and significant figures; • use the four operations with fractions; • calculate the original quantity given the result of a percentage change; • calculate repeated proportional change; • formulate linear equations; • manipulate simple algebraic expressions, equations and formulae; • solve two linear equations simultaneously by a graphical method; • make informed decisions involving money;
• use, convert and calculate measures involving metric and, where appropriate, imperial units; • calculate perimeters and areas of composite shapes involving squares, rectangles and triangles; • calculate surface area and composite volumes of cubes and cuboids; • calculate the circumference and area of circles; • work out dimensions using scale; • understand and use compound measures; • recognise 2-D representations of 3-D shapes; • use coordinates in all four quadrants;	• perform length and area calculations on a composite shape including those involving the circle; • solve complex problems involving perimeter, surface area and volume; • understand that measurements have an error margin of half the given unit; • enlarge a 2-D shape by a given scale factor; • use three figure bearings to define direction; • understand and apply Pythagoras' Theorem;
• collect and record discrete and continuous data using a variety of methods; • construct and interpret a variety of diagrams and graphs for discrete and continuous data; • work out and use the median and mode; • work out the mean, median and mode of a frequency distribution; • use one of the measures of average to compare two sets of data; • understand and use the probability scale from 0 to 1 to express likelihood or comparability.	• pursue their own lines of enquiry, using appropriate methods of data collection, and interpret and present their findings; • construct and interpret frequency tables and diagrams for sets of continuous data; • estimate the mean of a set of grouped data and identify the limits of the median and modal group; • choose the most • understand and u • apply their know