

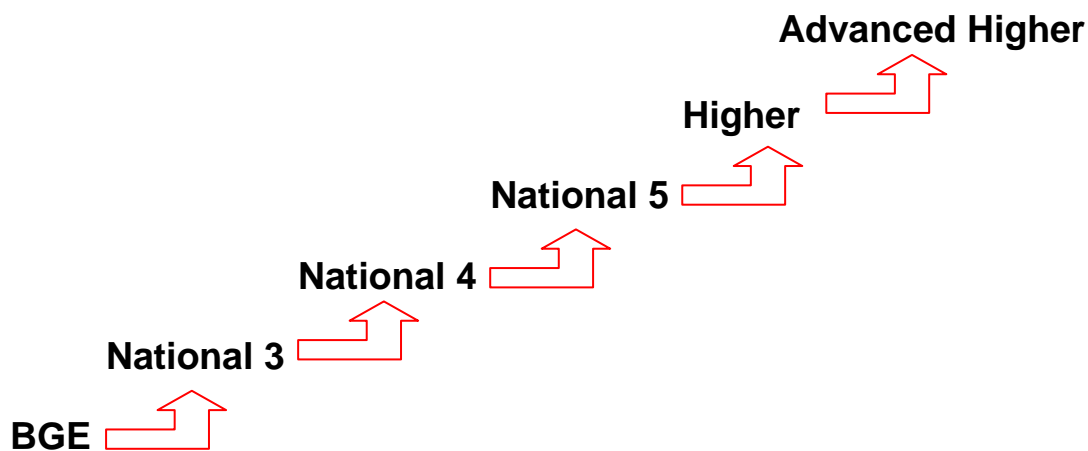
Learning in Mathematics

Putting mathematical knowledge and understanding to constructive use has been one of the decisive factors in shaping societies. Engineering, science, technology and business rely upon mathematics and continue to find new applications for mathematics. Cultural development and artistic endeavour are influenced by mathematics. Each of us uses mathematical skills and concepts in everyday life. To face the challenges of the 21st century, each pupil needs to have confidence in using mathematical skills, and Scotland needs both specialist mathematicians and a highly numerate population.

Learning through mathematics will enable pupils to:

- develop essential numeracy skills, including arithmetical skills, which allow them to participate fully in society
- develop a secure understanding of the concepts, principles and processes of mathematics and apply these in different contexts, including the world of work
- have an understanding of the application of mathematics, its impact on our society past and present, and its potential for the future develop an appreciation of aesthetic and cultural values, identities and ideas
- establish firm foundations for further specialist learning, including for those who will be the mathematicians of the future.

As pupils progress through their Broad General Education and into the Senior Phase, they will follow curricular pathways to meet their needs and aspirations which will recognise and accredit their attainment and achievements.



NB: In addition to their chosen pathway all pupils will work towards completion of the Numeracy Unit at their appropriate level.

There will be a continued emphasis on participation in well-planned experiences in all 4 contexts of learning – within the curriculum areas; interdisciplinary learning; ethos and life of the school; opportunities for personal achievement.

The main lines of development for all courses within Mathematics will be:

- Information handling
- Number, money and measurement
- Shape, position and movement

Lifeskills Mathematics

Courses will allow pupils to acquire and develop skills for learning, skills for life and skills for work, as well as the attributes and capabilities of the four capacities. For example: success in mathematical learning and activity leads to increased confidence as an individual in everyday situations; being numerically capable, especially in financial matters, helps towards becoming a responsible citizen; and being able to plan and organise will help in becoming an effective contributor.

The skills that pupils gain by successfully completing Lifeskills Mathematics courses are underpinned by numeracy, and designed to develop pupils' mathematical reasoning skills relevant to learning, life and work will be valuable for life in the 21st Century. Pupils will:

- select and apply mathematical techniques to tackle a range of real-life problems and situations
- develop the ability to analyse a range of real-life problems or situations with some complex features involving mathematics
- develop confidence and independence in the subject and a positive attitude towards the use of mathematics in real-life situations
- develop the ability to select, apply, combine and adapt mathematical operational skills to new and unfamiliar situations in life and work
- develop the ability to use mathematical reasoning skills to generalise, build arguments, draw logical conclusions, assess risk, make informed decisions
- develop the ability to use a range of mathematical skills to analyse, interpret and present a range of information
- communicate mathematical information in a variety of forms
- develop the ability to think creatively and in abstract ways

The Learner journey through all levels of the course will be coherent and provide challenge and enjoyment. The courses will enable pupils to think through real-life situations involving mathematics and to form a plan of action based on logic. Pupils will develop confidence and independence in being able to handle information and mathematical tasks in both personal life and in the workplace. The Courses allow pupils to draw conclusions, assess risk and justify decisions based on data presented in a variety of forms. The structure of courses will ensure clear pathways and progression from BGE courses onwards through the national qualifications.

National 4 Lifeskills Mathematics

The course consists of 3 mandatory Units and the Added Value Unit. Each of the component Units of the Course is designed to provide progression to the corresponding Unit at National 5.

Lifeskills Mathematics: **Manage Money and Data**

Lifeskills Mathematics: **Shape, Space and Measures**

Numeracy Unit

Lifeskills Mathematics: **Test (Added Value Unit)** Part 1- Non-calculator question paper
Part 2- calculator question paper

National 5 Lifeskills Mathematics

The course consists of 3 mandatory Units and the Course Assessment.

Lifeskills Mathematics: **Managing Finance and Statistics**

Lifeskills Mathematics: **Geometry and Measures**

Numeracy Unit

Lifeskills Mathematics: **Course Assessment** Part 1 – Non-calculator question paper
Part 2 – Case Study

Mathematics

Courses allow pupils to acquire and develop the attributes and capabilities of the four capacities. For example: success in mathematical learning and activity leads to increased confidence as an individual; being able to think logically helps towards being a responsible citizen; and being able to understand, use and communicate mathematical ideas will help in becoming an effective contributor.

The skills that pupils gain from by successfully completing Mathematics courses will be valuable for learning, life and work. Pupils will:

- select and apply mathematical techniques in a variety of mathematical and real-life situations
- develop confidence in the subject and a positive attitude towards further study in mathematics
- develop skills in manipulation of abstract terms in order to solve problems and to generalise
- interpret, communicate and manage information in mathematical form; skills which are vital to scientific and technological research and development
- use mathematical language and explore mathematical ideas
- develop skills relevant to learning, life and work in an engaging and enjoyable way

The Learner journey through all levels of the course will be coherent and provide challenge and enjoyment. The courses will enable pupils to think through real-life situations involving mathematics. Pupils will develop confidence and independence in being able to handle mathematical tasks in both personal life and in the workplace. The structure of courses will ensure clear pathways and progression from BGE courses onwards through the national qualifications.

National 4 Mathematics

The course consists of 3 mandatory Units and the Added Value Unit. Each of the component Units of the Course is designed to provide progression to the corresponding Unit at National 5.

Mathematics: **Expressions and Formulae**

Mathematics: **Relationships**

Numeracy Unit

Mathematics: **Test (Added Value Unit)** Part 1- Non-calculator question paper

Part 2- calculator question paper

National 5 Mathematics

The course consists of 3 mandatory Units and the Course Assessment. Each of the component Units of the Course is designed to provide progression to the corresponding Unit at Higher.

Mathematics: **Expressions and Formulae**

Mathematics: **Relationships**

Mathematics: **Applications**

Mathematics: **Course Assessment** Part 1- Non-calculator question paper

Part 2- calculator question paper

Home Learning in Mathematics

All pupils will be required to continue their learning at home. All Numeracy and Mathematics course will require additional input at home in order for targets to be met and to develop skills. Tasks may include:

- independent research
- statistical projects
- personal finance tasks
- measurement tasks
- written work

Ways in which parents/ carers can support pupils include:

- regular practise of multiplication tables and other mental arithmetic opportunities
- ensuring pupils show full working to communicate their solution strategies as opposed to just writing an answer
- encouraging pupils to check answers, read over solutions and to complete full corrections
- following the common language and methodology for Numeracy and Mathematics as outlined in pupil planners and the school website.
- discussing relevant topics including their financial understanding
- aiding them with research
- checking and signing planners
- ensuring they have all materials for class including, where possible, a CASIO scientific calculator
- checking nightly and hand-in homework exercises
- encouraging pupils to present their work neatly, using a ruler

Supporting Pupils in Mathematics

Throughout the course pupils will benefit from individual support from teachers.

Support strategies will include:

- discussion of overall individual strengths, areas of improvement, next steps and progress
- negotiation of individual targets and plans of actions to achieve success
- feedback on specific pieces of work
- opportunities for supported study
- learning resources which are available in the Mathematics and Numeracy faculty page of the school website
- using Glow Groups which have been established for each course. They contain: homework exercises, class notes, assessment practice questions, model papers and solutions, exam technique modules, post exam analysis and a contents checklist booklet to assist pupils in identifying next steps in learning and formulating an individual study plan.

Careers in Mathematics and Numeracy

Numeracy and Mathematics develop skills which are required in many careers.

| | | |
|---------------------------|------------------------|-------------------|
| Accountancy | Engineering | Manufacturing |
| Aerospace & Defence | Environment | Medicine |
| Automotive | Exploration Geophysics | Metals & Minerals |
| Biosciences | Financial Services | Pharmaceuticals |
| Business support services | Food & Drink | Academic Research |
| Chemicals | Government | Science |
| Construction | Healthcare | Telecoms |
| Consultancies | Insurance | Transport/Travel |
| Education | IT & Computing | Utilities |

Please see below for a list of websites for further information:

Maths Careers

www.mathscareers.org.uk

More Maths Grads

www.moremathsgrads.org.uk

Operational Research Society

www.theorsociety.com

Institute of Mathematics and its Applications

www.ima.org.uk

Royal Statistical Society

www.rss.org.uk