

## The importance of numeracy and mathematics

Angle, symmetry and transformation	
Why is it important?	<p>Being able to follow and give directions is a necessary life skill that allows local areas and destinations to be efficiently navigated. It also develops basic map reading skills.</p> <p>A knowledge of angles is required for the understanding of position and geometrical properties of shapes. Investigating symmetrical patterns and designs enhances an understanding and appreciation of the natural world and art. It is also fundamental to developing skills associated with geometrical reasoning.</p>
How is this used in real life contexts?	<p>Bearings are essential for the daily safety of millions when travelling on planes or ships at sea.</p> <p>Scale is essential when interpreting contexts such as maps, plans and modelling.</p> <p>Locating seats on planes or trains, participating in games such as battleships or locating buildings in cities.</p> <p>Symmetry is all around us e.g. in nature such as flowers, leaves, butterflies, stag's antlers etc.</p>

Data and analysis	
Why is it important?	In real life situations information is provided in a variety of ways. To interrogate the information enables choices and decisions to be made. Drawing conclusions from data to help make informed choices.
How is this used in real life contexts?	<ul style="list-style-type: none"> <li>- Understanding statistics and data presented every day in the news on important topics e.g. health, education, politics etc.</li> <li>- Food labels provide a table of data informing consumers of the content of the food/drink e.g. amount of calories, sugar, fats, protein etc. You can consider this data to help make informed choices about food.</li> </ul>

## The importance of numeracy and mathematics

Estimation and rounding	
Why is it important?	Early estimation skills allow for comparisons and approximations to be made. The ability to round numbers helps carry out mental calculations. It also allows for quick estimations to be made in calculations and to check the reasonableness of a solution. In different contexts there will be varying degrees of accuracy required.
How is this used in real life contexts?	<p>Estimating how much money will be needed for a weekend away.</p> <p>Estimating the duration of a journey.</p> <p>Estimating the number of cups of juice you will be able to get from a bottle.</p> <p>The newspaper said 63,467 tickets have been sold for the game at Murrayfield – round this to the nearest 10, 100, 1000.</p> <p>Estimate how long will it take to drive/walk/cycle to...</p>

Expressions and equations	
Why is it important?	<p>Understanding that numbers, and operators, can be replaced by pictures or symbols is fundamental to all algebraic thinking. Finding the unknown quantity, or operator, is an essential step in developing the ability to work with expressions and solve equations.</p> <p>Many problems involve a number of algebraic terms. Being able to simplify the combination of terms makes solving the problem considerably less challenging.</p> <p>Being able to use formulae is essential in many areas of the curriculum and supports the type of problem solving skills needed in many jobs in the modern world.</p>
How is this used in real life contexts?	Computers were invented to solve equations over and over again instead of humans doing the calculations.

## The importance of numeracy and mathematics

	<p>In order to make effects and digital images look so real in computer games, mathematicians and software developers make and use complicated equations of how human motion works. The software for computer games has more equations in it that you could possibly imagine.</p> <p>Internet searching – use of equations are used to bring back refined searches in search engines.</p>
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Fractions, decimal fractions and percentages	
Why is it important?	<p>Fractions are regularly used in the world of work and daily life.</p> <p>Decimal fractions are important for conversions in measurement and money and understanding what proportion of a whole is represented. It is also important when interpreting answers on calculators.</p> <p>Percentages: used in a wide variety of contexts, many of which are used in everyday life.</p> <p>The ability to interchange between a fraction, decimal fraction and percentage is a skill that allows for different ways to solve problems efficiently, including mental calculations.</p>
How is this used in real life contexts?	<p>Fractions - sharing a birthday cake equally amongst a group, <math>\frac{1}{2}</math> price offers, amount of fuel in car tank, following recipes with fractional amounts (<math>\frac{1}{2}</math> cup of flour).</p> <p>Decimal fractions – Used when converting currencies.</p> <p>Percentages - Statistics, special offers in shops/supermarkets, test results, 25% off, 50% extra free, buy one get one free (work out where to find the best value).</p>

## The importance of numeracy and mathematics

Ideas of chance and uncertainty	
Why is it important?	Identifying, predicting and analysing outcomes of familiar events supports the development of critical thinking skills. This enables consideration of alternative options when making choices and decisions.  Calculating theoretical probability helps build an understanding of the consequences of events and likelihood of an event occurring.
How is this used in real life contexts?	The chance of rain, snow etc is often given as a percentage - 'there is a 50% chance of rain today.'  Playing lotteries – understanding the chances of winning e.g. 1 in 14 million

Mathematics – its impact on the world, past, present and future	
Why is it important?	It is important that learners recognise the place of mathematics in their environment as it provides the foundations for exploring the use of mathematics in their everyday lives. It is also important learners know the origins of their own number system through exploring those from the past to understand how they have evolved, changed and improved.  <a href="#">Understand how a large number of mathematicians have contributed to present day mathematics</a> and evaluate how mathematical discoveries were, and still are, important in daily life.  Promoting awareness and interest in careers involving mathematics, such as science, engineering and technology, is of vital importance for economic development.
How is this used in real life contexts?	Mathematics is used in many vocations including hairdressers, bakers, construction industry etc. It is also used by those in STEM (science, technology, engineering and mathematics) careers such as computing engineers, technicians, analysts, architects, chemists, scientists, software developers and many more.

## The importance of numeracy and mathematics

Measurement	
Why is it important?	Using standard units ensures a universal system of measurement which helps us to interpret, communicate and calculate measurements, including converting between units. Calculations involving perimeter, area and volume are needed in real life contexts and enable us to work out accurate amounts.
How is this used in real life contexts?	<p>Understand own body weight, height etc. These skills are important when using size charts or when monitoring healthy body weights/BMI for example.</p> <p>A tiler would calculate how many tiles were required for an area to be covered.</p> <p>Understand the importance of accurate measurements in construction, fashion design etc. It is also important to understand the consequences of inaccurate measurements.</p>

Money	
Why is it important?	<p>Understanding that money is valuable and there is a need to keep it safe is important. The ability to make decisions on spending and saving money is vital in order to balance lifestyle with the cost of living. Children and young people who budget wisely and plan for the future will be responsible citizens who manage finances effectively.</p> <p>Learning about recognising risks and rewards and making decisions based on informed thought will enable children and young people to contribute effectively to the development of Scotland's wealth.</p> <p>Understanding money can take a variety of forms in our ever changing digital world.</p>
How is this used in real life contexts?	<p>Paying for items in everyday life, as well as checking the correct change is given.</p> <p>Calculating the affordability of monthly payments.</p>

## The importance of numeracy and mathematics

	Exploring best value for money options e.g. high interest savings accounts, energy provider switch deals, free broadband for a year offer for new customers etc.
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Multiples, factors and primes	
Why is it important?	<p>Understanding of multiples and factors is essential to support work in fractions and also algebra. A clear understanding of the links within the multiplication tables and the use of inverse processes (e.g. multiplication and division) are essential.</p> <p>Prime numbers are the building blocks of the number system. The link with factors will establish that every whole number greater than one is either prime or is a product of prime numbers. This is the Fundamental Theorem of Arithmetic.</p>
How is this used in real life contexts?	<p>Knowing multiples of 2, 5, 10 helps when counting coins.</p> <p>Prime numbers are used to encrypt information through communication networks utilised by mobile phones and the internet.</p>

Number and number processes	
Why is it important?	<p>Being able to apply numeracy skills across a variety of real life contexts leads to being numerate and being able to function responsibly in everyday life, including within the world of work.</p> <p>It is important learners can work flexibly with the four operations; addition, subtraction, multiplication and division and work confidently with these in calculations, including the use of negative numbers.</p>

## The importance of numeracy and mathematics

<p>How is this used in real life contexts?</p>	<p>Organising a dinner for 10 people – calculating enough of each food item to serve equally e.g. slicing an apple pie or lasagne equally in to portions.</p> <p>Budgeting – adding and subtracting income and expenditure.</p> <p>Prescribing and making up medication – ratios often used too.</p> <p>Money is always calculated to 2 decimal places – need to be confident with this when budgeting, paying, receiving change etc.</p> <p>Athletic races are most often measured to tenths and hundredths of seconds in order to decide a winner in a very close race.</p> <p>Reading temperatures using a thermometer – understanding negative numbers on scale.</p>
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<b>Patterns and relationships</b>	
<p>Why is it important?</p>	<p>Recognising and using patterns and number patterns is an essential building block for understanding number-the foundation of many aspects of mathematics.</p> <p>Understanding number sequences allows us to generate algebraic formulae either pictorially, orally or using algebraic notation. Formulae are fundamental in developing mathematical modelling and underpin all graphical representation.</p> <p>Through the ability of allocating a numerical value to a gradient (slope), it allows limits to be placed for design and safety considerations.</p>
<p>How is this used in real life contexts?</p>	<p>When designing safety features such as a mobility ramp, access to buildings, slopes of roofs, incline of roads etc, the gradient of the slope needs considered to ensure it is safe to use.</p>

## The importance of numeracy and mathematics

Powers and roots	
Why is it important?	<p>Powers enable large numbers to be expressed more concisely.</p> <p>Roots are an essential tool when performing calculations and develop the understanding of the inverse operation of powers.</p> <p>Scientific notation enables large and small numbers to be written in a shorter form. Problems involving multiplication and division of large or small numbers become more manageable through the use of scientific notation.</p>
How is this used in real life contexts?	<p>Understanding Powers and roots is essential as they are used in lots of parts of our modern technological world such as computer games, engineering and finance.</p> <p>Knowing square numbers helps us to calculate areas of squares.</p> <p>Understanding of scientific notation helps us to write very small and very large numbers in a more efficient form.</p>

Properties of 2D shapes and 3D objects	
Why is it important?	<p>An understanding of the properties of 2D shapes and 3D objects will enable learners to appreciate how they fit together and how they are used in everyday life. Also it helps develop a problem solving approach to solving many geometric problems. This is important particularly in product design and efficient use of resources.</p>
How is this used in real life contexts?	<p>Efficient packing in business e.g. shapes which stack well together</p> <p>Construction of buildings</p> <p>Tiling in interior design</p>



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Time	
Why is it important?	<p>Developing an understanding of time and the passing of time supports the skills necessary for calculating durations, recording time and developing efficient time management.</p> <p>Converting between units of time is necessary when identifying and carrying out time calculations.</p>
How is this used in real life contexts?	<p>General time keeping in everyday lives.</p> <p>Working out durations of journeys in order to plan an event/day trip.</p> <p>Cooking durations/timers.</p> <p>Important in the workplace e.g. arriving on time, adhering to break times, meeting deadlines for submitting projects etc.</p>