Numeracy Policy

Coleraine Grammar School

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NUMERACY IN CONTEXT

The vision of the Department of Education (DE) as stated in **Count, Read: Succeed (DENI 2010)**, is:

"To ensure that every learner fulfils his or her potential at each stage of his or her development."

In March 2011 DE published **'Count, Read: Succeed – A Strategy to Improve Outcomes in Numeracy'**. This strategy states that, 'A solid foundation in Numeracy is essential to ensure they (young people) can contribute effectively to the economy and society and live fulfilling lives.' It specifically outlines:

- Numeracy is at the very heart of the revised curriculum;
- Developing Numeracy must be a central element of a school's delivery of the revised curriculum and of the professional development of teachers in implementing the curriculum;
- The aim is to raise the levels of attainment for all young people and to close the gap between the highest and lowest achieving pupils. This will be achieved through high quality teaching for every child, along with early intervention and additional support for those children who are struggling with Numeracy;
- Schools should have a Numeracy Policy, linked to the School Development Plan and annual targets.

DEFINITION AND AIMS

At Coleraine Grammar School, we believe that pupils' numeracy skills, that is their ability to talk, listen, read, write and communicate effectively using numbers, is the key to educational progress, to social integration and to personal development and happiness. This policy document will outline the strategies and approaches we will use to support and develop each child so that they are equipped with the necessary language, knowledge, understanding and skills.

DEFINITIONS OF NUMERACY

A definition of Numeracy as set out by **'Count, Read: Succeed', March 2011** is:

"The ability to apply appropriate mathematical skills and knowledge in familiar and unfamiliar contexts and in a range of settings throughout life, including the workplace. It involves the development of:

- An understanding of key mathematical concepts and their inter-connectedness;
- Appropriate reasoning and problem-solving;
- 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."

AIMS OF THE NUMERACY POLICY

The staff of Coleraine Grammar School are committed to the development of numeracy skills. They recognise that each has a role in delivering teaching of numeracy within their subjects in order to enable our pupils to access the entire curriculum in a more meaningful and successful way. The aim of this policy (in accordance with **Every School a Good School (DENI 2009)**) is to assist all staff in providing a child-centred approach to numeracy in order:

- To promote numeracy developments at all levels in the school within the framework of the School Development Plan;
- To raise standards of numeracy by enhancing the quality of learning and teaching;
- To promote a more positive attitude towards numeracy amongst all staff, pupils and parents;
- To ensure that all staff are aware of the mathematical demands of their own subject and the range of mathematical knowledge and skills that pupils bring to their lessons;
- To provide opportunities for pupils to develop and apply their

mathematical knowledge and skills in all subjects and that this is reflected in schemes of work;

- To promote a common approach to the teaching of key mathematical ideas and processes in all subjects and to standardise common themes that may be taught in different ways by different subjects;

- To set targets for improving the performance of pupils with respect to numeracy;

- To ensure that a range of strategies is employed to suit the abilities of all pupils, assisting those with numeracy difficulties and providing a challenge for more able pupils;

- To provide appropriate staff development to ensure a shared understanding of, and consistent approach to, numeracy throughout the school.

Numeracy is a proficiency which is developed mainly in mathematics lessons but also through other subjects. By providing our pupils with a wide range of numeracy experiences across all subjects, we can help them realise that high standards of numeracy and learning will have a positive impact on their self-esteem, their motivation and their behaviour. It will allow them to become independent learners and to become empowered, as highlighted in paragraph 5.1 of **Count, Read: Succeed**. Through the implementation of our numeracy policy we aim that our pupils will develop the following skills by the end of Key Stage 4 and will be able to:

- Choose the appropriate materials, equipment and mathematics to use in a particular situation;

- Use mathematical knowledge and concepts accurately;

- Work systematically and check their work;

- Use mathematics to solve problems and make decisions;

- Develop methods and strategies, including mental mathematics;

- Explore ideas, make and test predictions and think creatively;

- Identify and collect information;

- Read, interpret, organise and present information in mathematical formats;

- Use mathematical understanding and language to ask and answer questions, talk about and discuss ideas and explain ways of working;

- Develop financial capability;
- Use ICT to solve problems and/or present their work.

PUPIL CENTRED PROVISION

As a school we promote a culture of achievement and continuous improvement with clear expectations so that all pupils can and will achieve to the very best of their abilities. We aim to 'develop the whole person' through a broad education pathway which includes a coordinated and effective cross-curricular emphasis on Numeracy.

CURRICULUM PROVISION FOR NUMERACY

The curriculum is delivered using the requirements in the Northern Ireland curriculum for Mathematics and Numeracy, and 'standards of pupil competence in Numeracy are measured through the cross-curricular skill of Using Mathematics.'

'Using Mathematics describes the ability to apply mathematical knowledge and skills in a range of meaningful contexts.'

(Guide to Assessment-Supporting schools in meeting Statutory Requirements for Assessment and Reporting, 2011)

In Coleraine Grammar School, teachers of all subjects help to develop and promote pupils' skills in Using Mathematics through a whole-school approach. Through their teaching and learning strategies, teachers place an emphasis on transferring and applying these skills effectively in a range of contexts.

CONTRIBUTION TO NUMERACY BY SUBJECT DEPARTMENTS

- Departments have numeracy embedded in their schemes of work and, when appropriate, in the departmental action plan, so that Numeracy is promoted in their subject.

- Departments develop and use Numeracy-rich tasks appropriate and relevant to their subject. Teachers will incorporate numeracy-rich tasks that reflect real-world applications, including financial modelling, statistical analysis, and digital data interpretation.

- Departments encourage pupils to think about appropriate methods, strategies and approaches to the solving of numerical problems in accordance with the agreed common methods (standardised teaching guidelines) detailed in the appendices.

EXTRA-CURRICULAR NUMERACY LEARNING EXPERIENCES FOR PUPILS

There is a range of extra-curricular Numeracy learning experiences offered to the pupils of Coleraine Grammar School. These may include:

- Junior/Intermediate Mathematical Challenge (UKMT)
- External Mathematics competitions
- Opportunities to attend lectures/workshops and seminars. E.g. Year 14 Financial Capabilities workshop
- 24 Game Club/Puzzle Club

NUMERACY SUPPORT

We aim to ensure that all pupils reach their full potential according to their individual abilities and we identify which pupils are low achieving and under achieving in order to take steps to improve their attainment.

- **Establishing a Baseline Position in Year 8**
  At the beginning of Year 8, all Year 8 pupils will complete the GL Assessment: Cognitive Ability Test (CAT4) and Progress Test in Maths (PTM), and pupils who might benefit from additional Numeracy support are identified. Intervention strategies/numeracy support are put in place for these pupils and their progress monitored and reported back to parents.

- **Professional judgement of staff**
  Subject teachers will also be able to make a professional judgement as to which pupils might benefit from additional Numeracy support. The judgements will be made based on classwork, homework and the result of subject core assessments. When a teacher identifies a pupil who they feel would benefit from extra Numeracy support, they should complete the 'Cause for Concern' document and forward this, with supporting evidence, to the Numeracy Coordinator via the Curriculum Leader, as outlined in the referral process in Appendix 2, following support in the classroom which has not resulted in significant progress.

- **Informing staff about pupils receiving Numeracy Support**
  All teachers are informed of pupils receiving Numeracy support at the start of each school year and when the groups are revised after February half-term. As much as possible, teachers are updated as pupils leave/enter the support programme, but an up-to-date list of those receiving support will always be available in the LS Withdrawal folder within the SEN & Additional Needs folder.

- **Nature of support**
  Coleraine Grammar School implements a wide range of strategies to support pupils with Numeracy needs which may include:

  - Discrete one to one or group support sessions with a dedicated Numeracy support teacher;
  - Peer mentoring with senior pupils where appropriate;
  - A range of strategies in class such as effective questioning, group work, individual task completion, extended activities, target setting, peer and self-evaluations;
  - Providing pupils and parents with a list of resources, websites, online video tutorials etc. to reinforce and practice learning that is taking place in the classroom;
  - Informing parents on Numeracy initiatives, strategies and ways in which they can help their child to improve their confidence and skills in Numeracy;
  - Where appropriate, using classroom assistants to work closely with the Numeracy Coordinator, Numeracy Support Teacher and subject teachers to assist the pupil with focused and differentiated class work, tasks and homework to improve their skills in Numeracy.

- **Numeracy Support for SEN pupils**
  The Numeracy Coordinator will work in conjunction with the SENCO to ensure:

  - Early identification and assessment of pupils' difficulties;
  - A staged approach to provision as set out in the Code of Practice;
  - Collaboration with subject teachers prior to the formulation of pupils' individual education plans (IEPs) / personal learning plans (PLPs) in order to identify initial Numeracy targets.

HIGH QUALITY LEARNING, TEACHING & ASSESSMENT

"Teachers, drawing on their professional expertise, will use a variety of teaching strategies including whole-class teaching, co-operative small group work and individual work, differentiated where appropriate."

(Count, Read: Succeed)

HIGH QUALITY LEARNING AND TEACHING IN NUMERACY

Numeracy is promoted through high quality learning and teaching which focuses on mathematical knowledge, skills and concepts, problem solving, decision-making, the development of financial capability and the exploration of mathematical ideas. All teaching staff in Coleraine Grammar School assist within their subjects to raise Numeracy standards across the school.

- Teachers work towards achieving departmental Numeracy targets;
- Teachers display key terms, methods and pupil work with regards Numeracy on classroom walls and on department noticeboards;
- Teachers engage in training on Numeracy and Using Mathematics;
- Teachers are reflective practitioners who will monitor and evaluate their own practice, adapting it to meet the Numeracy needs of all pupils;
- Teachers use common approaches and strategies to the teaching of common themes and use mathematical language accurately and consistently within departments and across the school;
- Teachers will be aware of the range of mathematical attainment that pupils bring to lessons through analysis of Pupil Profiles and where relevant IEP, and take action where appropriate;
- Teachers will set high expectations and build pupils' confidence In Numeracy;
- Teachers will encourage pupils to understand the methods that they are using and will give pupils lots of opportunity to explain to others what they are doing;
- Teachers will value pupils' different methods for calculation but point towards the best or most efficient method;
- Teachers will collaborate to ensure that pupils can apply their mathematical skills in a variety of relevant and appropriate contexts.

Pupils will be encouraged to:

- See mental calculation as the first resort when faced with any calculation;
- Explain any calculation they have done by showing all their working out;
- Estimate an answer before a calculation is done whenever suitable;
- Consider the reasonableness of their answers after a calculation has been done (perhaps by referring to their estimate);
- Use all the relevant buttons on the scientific calculator correctly and efficiently when its use is appropriate and to be able to interpret the display sensibly;
- Use appropriate mathematical language confidently;
- Use ICT & e-learning to research and further knowledge and understanding.

ASSESSMENT

Overall Assessment of Pupil Progress

The overall assessment of a pupil's progress is measured through:

- Pupil performance in three core assessments throughout the year;
- Pupil performance in GL Assessments;
- Ongoing assessment of classwork and homework in all subject areas;
- Review of the IEPs/PLPs by SENCO and Numeracy Coordinator.

ROLES AND RESPONSIBILITIES

Governors are aware that enabling young people to become numerate is one of their core responsibilities. The Senior Leadership Team takes overall responsibility for Numeracy in Coleraine Grammar School, working closely with the Maths Curriculum Leader and the Numeracy Coordinator, however, the implementation of the Numeracy Policy is the responsibility of the whole school.

The Board of Governors will:

- Support all strategies to improve the numeracy skills of pupils and promote 'the achievement of high standards of educational attainment';
- Support the Numeracy Coordinator in improving standards in Numeracy.

The Senior Leadership Team/Head of Faculty will:

- Agree an Action Plan set for Numeracy (using the School Development Plan);
- Set and expect the highest possible standards for Numeracy;
- Provide adequate staff training for the assessment of Numeracy;
- Monitor, evaluate and review the whole school Numeracy policy, and associated policies;
- Identify key priorities in Numeracy as outlined in the School Development Plan which includes relevant professional training;
- Ensure the school meets all statutory requirements in relation to Numeracy across all Key Stages;
- Develop effective procedures to fully utilise relevant assessment data from Primary Schools (where available) to allow ease of transition between Key Stages 2 and 3;
- Ensure assessment systems are effective and disseminate data throughout the school to facilitate self-evaluation and target setting;
- Present assessment data (including Numeracy) to Governors.

The Numeracy Coordinator will:

- Provide leadership, guidance and direction for the delivery of Numeracy across the curriculum;
- Support Curriculum Leaders to plan, resource and monitor numeracy initiatives;
- Devise targets for the annual Numeracy Action Plan in line with "Count, Read: Succeed";
- Conduct baseline testing to identify pupils with numeracy difficulties;
- Work with the Special Education Needs Coordinator, Learning Support Team, Numeracy Support Teacher and classroom assistants to provide support for pupils with numeracy difficulties and organise resources to support pupils with numeracy difficulties;
- Communicate with parents of identified pupils and report on progress following each core assessment;
- Maintain a Numeracy Register of pupils who are receiving numeracy support;
- Contribute to setting Numeracy targets within IEPs/PLPs;
- Promote numeracy across the school;
- Ensure standardised methods for common topics are kept under review and made available to all relevant staff;
- Attend appropriate professional development courses;
- Provide relevant numeracy information for the Mathematics Department Action Plan/BAI and for the SENCO's report to SLT and BOG;
- Regularly revise and update the school's Numeracy Policy.

The Maths Curriculum Leader will:

- Provide leadership, guidance and direction for the delivery of Mathematics and Numeracy within the department and across the curriculum;
- Devise, implement and monitor department policies in line with the whole

school policy;

- Develop effective Numeracy strategies for those pupils who have Special Educational Needs or Additional Numeracy needs;
- Identify relevant training opportunities for department members in relation to aspects of Numeracy.

The other Curriculum Leaders will:

- Devise, implement and monitor departmental policies in line with the whole school policy;
- Ensure Numeracy is embedded in their subject area schemes of work, carry out numeracy-rich tasks and encourage members of their department to implement the use of Numeracy in their everyday teaching;
- Encourage members of their department to follow the common methods (standardised teaching guidelines) detailed in the appendices;
- In consultation with the Mathematics Department and Numeracy Coordinator, develop effective Numeracy strategies for those pupils who have Special Educational Needs or Additional Numeracy needs;
- Identify relevant training opportunities for department members in relation to aspects of Numeracy.

The SENCO will:

- Working with other relevant staff, ensure appropriate assessment arrangements for pupils on the SEN register and assess the specific Numeracy needs of pupils on the SEN register.

The Numeracy Support teacher will:

- Provide Numeracy support on a one-to-one/ small group basis for a period agreed with the Numeracy Coordinator;
- Assist the Numeracy Coordinator in providing a written report for each pupil receiving numeracy support, following each core assessment.

The Subject Teachers will:

- Be teachers of Numeracy no matter their particular subject expertise;
- Promote meaningful opportunities for pupils to develop Numeracy skills within their subject area;
- Use effective and differentiated teaching strategies which take account of the numeracy and learning needs of a range of ability groups;
- Follow the common methods (standardised teaching guidelines) detailed in the appendices.
- Implement the whole school and department Numeracy Policies;

Parents will:

- Encourage their children to use the range of strategies they have been taught and to use the suggested resources, in order to improve their child's level of Numeracy;
- Encourage their children to participate, and support their children, in Numeracy based events/competitions;
- Encourage their children to avail of any Numeracy Support offered.

Pupils will:

- Take responsibility for improving their own Numeracy needs to become more independent learners;
- Make improvements through the setting and monitoring of their own individual targets;
- Avail of Numeracy Support where offered and carry out all work/catch up on missed work in other subjects as a result of attending Numeracy Support.

MONITORING AND EVALUATING NUMERACY

The quality of Numeracy provision will be monitored and reviewed using a range of possible strategies.

Data

- Use of Core Assessment results (SIMS Data) to track progress;
- Analysis of GCSE and A-Level results.
- Use of Free School Meal (FSM) data to track Numeracy outcomes.

Observations

- Peer Observation to share good practice in Numeracy;
- PRSD.

Pupil Voice

- Engagement with pupils receiving Numeracy Support;
- Questionnaires regarding Numeracy Support.

Reflective Practitioners

- Reviewing of subject schemes of work to check for signposting of Numeracy links and tasks;
- Reviewing of Numeracy activities in lessons;
- Information gathered from Numeracy Audit;
- Book Scoops.

LINKS TO THE LOCAL COMMUNITY

'Good relationships that facilitate engagement and communication between the School and its parents and the wider community that it serves.'

(Every School a Good School, June 2009)

Coleraine Grammar School has, through its long reaching previous histories as Coleraine Academical Institution and Coleraine High School, established quality, sustainable links with the local Primary and Post Primary Schools, local businesses and community groups. It is through these close links that we highlight the importance of Numeracy to our pupils. Numeracy is promoted as an essential life skill and numerous opportunities should be offered to pupils to practice their numeracy skills in a variety of contexts, both within and outside the school environment, thus developing a collaborative learning culture which enhances the learning experience of pupils at all key stages.

Parental links include:

- Parents are advised through the school's reporting system of the progress of their child in Mathematics and in other subjects;
- Parents may discuss their child's progress with subject teachers during the annual Parent Teacher Meetings held for each Year Group;
- Parents are encouraged to take a real interest in their children's progress.

Primary School links include:

- Links exist between Coleraine Grammar School and all feeder Primary Schools to share any relevant information. This allows staff to take prior learning into consideration and continue pupils' development in Numeracy;
- Established links with primary school teachers to discuss the KS2 and KS3 Curriculum.

Post-Primary School links include:

- Collaboration with five local post primary schools including the Coleraine Area Learning Partnership (CALP);
- CALP schools work in clusters regarding Numeracy and we endeavour to engage in this as much as possible.

RELATED WHOLE-SCHOOL POLICIES

The Numeracy Policy is set within the broader school context of the curriculum and as such should be implemented in conjunction with the following school policies:

- Learning and Teaching Policy;
- SEN and Inclusion Policy.

SOURCES AND REFERENCES

- Every School a Good School – Department of Education, 2009.
- Count, Read: Succeed – Department of Education, 2011.
- TransformED NI Delivery Plan – Department of Education, 2025.

APPENDIX 1:
MATHS TERMINOLOGY

Mathematical Term	Meaning
Acute angle	An angle which measures below 90°.
Acute triangle	A triangle containing only acute angles.
Additive inverse	The opposite of a number or its negative. A number plus its additive inverse equals 0.
Adjacent angles	Angles with a common side and vertex.
Angle	Created by two rays and containing an endpoint in common.
Arc	A set of points that lie on a circle and that are positioned within a central angle.
Area	The space contained within a shape.
Average	The numerical result of dividing the sum of two or more quantities by the number of quantities.
Binomial	An expression in algebra that consists of two terms.
Bisect	To divide into two equal sections.
Cancelling	In multiplication of fractions, when one number is divided into both a numerator and a denominator.
Cartesian coordinates	Ordered number pairs that are assigned to points on a plane.
Chord	A line segment that connects two points on a circle.
Circle	A set of points that are all the same distance from a given point.
Circumference	The distance measured around a circle.
Coefficient	A number that is placed in front of a variable. For example, in 6x, 6 is the coefficient.
Common denominator	A number that can be divided evenly by all denominators in the problem.
Complementary angles	Two angles in which the sum of their measurements equals 90°.
Complex fraction	A fraction that contains a fraction or fractions in the numerator and/or denominator.
Congruent	Exactly the same. Identical in regard to size and shape.
Coordinate graph	Two perpendicular number lines, the x axis and the y axis, which make a plane upon which each point is assigned a pair of numbers.
Cube	A solid with six sides, with the sides being equal squares and the edges being equal. Also, the resulting number when a number is multiplied by itself twice.
Cube root	A number that when multiplied by itself twice gives the original number. For example, 4 is the cube root of 64.
Decimal fraction	Fraction with a denominator of 10, 100, 1,000, etc., written using a decimal point.
Degree	The measurement unit of an angle.
Denominator	The bottom symbol or number of a fraction.
Diameter	A line segment that contains the center and has its endpoints on the circle. Also, the length of this segment.

Mathematical Term	Meaning
Difference	That which results from subtraction.
Equation	A relationship between symbols and/or numbers that is balanced.
Equilateral triangle	A triangle that has three equal angles and three sides the same length.
Even number	An integer which can be divided by 2, with no remainder.
Expanded notation	To point out the place value of a digit by writing the number as the digit times its place value.
Exponent	A positive or negative number that expresses the power to which the quantity is to be raised or lowered. It is placed above and to the right of the number.
Exterior angle	In a triangle, an exterior angle is equal to the measures of the two interior angles added together.
Factor	As a noun, it is a number or symbol which divides evenly into a larger number. As a verb, it means to find two or more values whose product equals the original value.
F.O.I.L. Method	A method used for multiplying binomials in which the first terms, the outside terms, the inside terms, and then the last terms are multiplied.
Fraction	A symbol which expresses part of a whole. It contains a numerator and a denominator.
Greatest common factor	The largest factor that is common to two or more numbers.
Hypotenuse	In a right triangle it is the side opposite from the 90° angle.
Imaginary number	The square root of a negative number.
Improper fraction	A fraction in which the numerator is larger than the denominator.
Integer	A whole number. It may be positive, negative, or zero.
Interior angles	Angles formed inside the shape or inside two parallel lines.
Intersecting lines	Lines that come together at a point.
Interval	The numbers that are contained within two specific boundaries.
Irrational number	A number that is not rational (cannot be written as a fraction x/y, with x a natural number and y an integer).
Isosceles triangle	A triangle with two equal sides and two equal angles across from them.
Least common multiple	The smallest multiple that is common to two or more numbers.
Linear equation	An equation where the solution set forms a straight line when it is plotted on a coordinate graph.
Lowest common denominator	The smallest number that can be divided evenly by all denominators in the problem.
Mean	The average of a number of items in a group (total the items and divide by the number of items).
Median	The middle item in an ordered group. If the group has an even number of items, the median is the average of the two middle terms.
Mixed number	A number containing both a whole number and a fraction.
Monomial	An expression in algebra that consists of only one term.
Natural number	A counting number.

Mathematical Term	Meaning
Negative number	A number less than zero.
Nonlinear equation	An equation where the solution set does not form a straight line when it is plotted on a coordinate graph.
Number line	A visual representation of the positive and negative numbers and zero.
Numerator	The top symbol or number of a fraction.
Obtuse angle	An angle which is larger than 90° but less than 180°.
Obtuse triangle	A triangle which contains an obtuse angle.
Odd number	An integer (whole number) that is not divisible evenly by 2.
Ordered pair	Any pair of elements (x,y) where the first element is x and the second element is y. These are used to identify or plot points on coordinate graphs.
Origin	The intersection point of the two number lines of a coordinate graph. The intersection point is represented by the coordinates (0,0).
Parallel lines	Two or more lines which are always the same distance apart. They never meet.
Percentage	A common fraction with 100 as its denominator.
Perpendicular lines	Two lines which intersect at right angles.
Pi (π)	A constant that is used for determining the circumference or area of a circle. It is equal to approximately 3.14.
Polynomial	An expression in algebra that consists of two or more terms.
Positive number	A number greater than zero.
Power	A product of equal factors. $3 \times 3 \times 3 = 3^3$, read as "three to the third power" or "the third power of three." Power and exponent can be used interchangeably.
Prime number	A number that can be divided by only itself and one.
Proper fraction	A fraction in which the numerator is less than the denominator.
Proportion	Written as two equal ratios. For example, 5 is to 4 as 10 is to 8, or 5/4 = 10/8.
Pythagorean theorem	A theorem concerning right triangles. It states that the sum of the squares of a right triangle's two legs is equal to the square of the hypotenuse ($a^2 + b^2 = c^2$).
Quadrants	The four divisions on a coordinate graph.
Quadratic equation	An equation that may be expressed as $Ax^2 + Bx + C = 0$.
Radical sign	A symbol that designates a square root.
Radius	A line segment where the endpoints lie one at the center of a circle and one on the circle. The term also refers to the length of this segment.
Ratio	A comparison between two numbers or symbols. May be written x:y, x/y, or x is to y.
Rational number	An integer or fraction such as 7/7 or 9/4 or 5/1. Any number that can be written as a fraction x/y with x a natural number and y an integer.
Reciprocal	The multiplicative inverse of a number. For example, 2/3 is the reciprocal of 3/2.

Mathematical Term	Meaning
Reducing	Changing a fraction into its lowest terms. For example, 3/6 is reduced to ½.
Right angle	An angle which measures 90°.
Right triangle	A triangle which contains a 90° angle.
Scalene triangle	A triangle in which none of the sides or angles are equal.
Scientific notation	A number between 1 and 10 and multiplied by a power of 10. Used for writing very large or very small numbers.
Set	A group of objects, numbers, etc.
Simplify	To combine terms into fewer terms.
Solution, or Solution set	The entirety of answers that may satisfy the equation.
Square	The resulting number when a number is multiplied by itself. Also, a four-sided figure with equal sides and four right angles. The opposite sides are parallel.
Square root	The number which when multiplied by itself gives you the original number. For example, 6 is the square root of 36.
Straight angle	An angle which is equal to 180°.
Straight line	The shortest distance between two points. It continues indefinitely in both directions.
Supplementary angles	Two angles that when combined the sum equals 180°.
Term	A literal or numerical expression that has its own sign.
Transversal	A line which crosses two or more parallel or nonparallel lines in a plane.
Triangle	A three-sided closed figure. It contains three angles that when combined the sum equals 180°.
Trinomial	An expression in algebra which consists of three terms.
Unknown	A symbol or letter whose value is unknown.
Variable	A symbol that stands for a number.
Vertical angles	The opposite angles that are formed by the intersection of two lines. Vertical angles are equal.
Volume	The amount which can be held, as measured in cubic units. The volume of a rectangular prism = length times width times height.
Whole number	0, 1, 2, 3, 4, 5, 6, 7, 8, etc.
X-axis	The horizontal axis on a coordinate graph.
X-coordinate	The first number in an ordered pair. It refers to the distance on the x-axis.
Y-axis	The vertical axis on a coordinate graph.
Y-coordinate	The second number in an ordered pair. It refers to the distance on the y-axis.

APPENDIX 2:
NUMERACY REFERRAL PROCESS

TEACHER HAS NUMERACY CONCERNS

TEACHER IMPLEMENTS STRATEGIES IN CLASS & KEEPS EVIDENCE OF SUPPORT

IF NO IMPROVEMENT AFTER SET PERIOD OF TIME TEACHER FILLS IN CAUSE FOR CONCERN SHEET AND EMAILS TO NUMCO & SENCO (SENDS EVIDENCE OF PROBLEM AND HOW INTERVENTION STRATEGIES HAVE NOT WORKED SIGNIFICANTLY WELL)

NUMCO & SENCO LIAISE TO DECIDE BEST COURSE OF ACTION BASED ON EVIDENCE & INFORM PARENT/PUPIL, RELEVANT STAFF & PL.

APPENDIX 3:
PEER OBSERVATION
IF USING FOR SHARING GOOD PRACTICE

Subject:	Class:	Date:

Focus: Number and Algebra

Examples of this strand of Numeracy being used in the classroom.
How I will use these in my own classroom.

Focus: Shape, Space and Measures

Examples of this strand of Numeracy being used in the classroom.
How I will use these in my own classroom.

Focus: Handling Data

Examples of this strand of Numeracy being used in the classroom.
How I will use these in my own classroom.

Other:

Observer Signature:	**Date**:

Observer Colleague:	**Date**:

APPENDIX 4:
COMMON METHODS (STANDARDISED TEACHING GUIDELINES)

RATIOS

SUMMARY OF MAIN POINTS

1. Ratios relate to the sharing of a quantity in a particular proportion.

2. They are written as two numbers with a colon in between such as 2:3, 1:4, 6:11 and so forth.

3. You may be asked to give a ratio in its simplest form. This simply means cancelling the ratio down on BOTH sides – remember what you do to one side you must do to the other.

Example: Simplifying 25:35 will give you 5:7 (dividing both sides by 5)

Note: Always simplify a ratio as far as possible before beginning your calculations.

4. You may be asked to write a ratio in the form 1:n.

Example: Write 3:4 in the form 1:n.
As the 1 is on the left hand side of the ratio, it means changing the 3 to a 1. To do this you must divide by 3.
What you do to one side you must do to the other, so the 4 must also be divided by 3.
Therefore 3:4 is in fact 1:4/3 when written in the form 1:n.

5. You may be asked to write a ratio in the form n:1.

Example: Write 5:6 in the form n:1
As the 1 is on the right hand side of the ratio, it means changing the 6 to a 1. To do this you must divide by 6.
What you do to one side you must do to the other, so the 5 must also be divided by 6.
Therefore 5:6 is in fact 5/6:1 when written in the form n:1.

6. Equivalent ratios are ratios which would be identical to each other if they were both simplified as far as possible, for example 1:2 and 2:4. One is simply a magnification of the other – 2:4 is double 1:2.

Note the magnification must be the same on both sides for the ratios to be equivalent.

Sometimes you may be asked to solve questions based on the idea of equivalent ratios.

Example: 5:7 and 35:x are equivalent ratios. Find the value of x.

As they are equivalent, the larger of the ratios is simply a magnification of the smaller. Ask yourself what do you do to 5 to give you 35? Multiply by 7. What you do to one side you do to the other. Therefore 7 times 7 is 49.
x is 49.

7. The most popular ratio questions can be asked in one of two ways.

Type 1 is sharing out a quantity between two or more parties.

Example: A bag of 48 marbles is split in the ratio 5:1 between A and B respectively. How much do each get?

The ratio 5:1 tells us that every time A gets 5 marbles, B gets 1. Therefore every time we have 6 marbles, A gets 5 and B gets 1.

Step 1. *Add up the individual parts of the ratio* 5+1 = 6

Step 2. *Divide this figure into the total amount* 48/6 = 8

This tell us how many times we have six marbles and as such how many times A will get 5 and B will get 1.

Step 3. *Multiply this figure by each component of the ratio* as follows:

A: 5x8 = 40
B: 1x8 = 8

Type 2 is where you are given the ratio and one party's share and asked to find another party's share.

This type can be dealt with in one of two ways depending on which you find easier.

Example: A class is split in the ratio 6:7 between boys and girls respectively. There are 24 boys in the class, how many girls are there?

Method 1

You may use equivalent ratios. The ratio of 6:7 must be maintained for boys and girls. There are 24 boys which is FOUR times 6.
Therefore the girls must be FOUR times 7 which is 28.
(Note 6:7 and 24:28(girls) are equivalent)

Method 2

Step 1: *Add up the parts* as for Type 1. 6 + 7 = 13

Step 2: *Change the ratios into fractions*

Boys are 6 out of 13 - $\frac{6}{13}$

Girls are 7 out of 13 - $\frac{7}{13}$

Step 3: *Equate the fraction with the quantity given*

$\frac{6}{13} = 24$

$\frac{1}{13} = 4$ (dividing each side by 6)

Therefore,

$\frac{7}{13} = 28$ (multiplying each side by 7)

HINT

Always identify if the question is Type 1 or Type 2 and use the appropriate steps to help you with your calculations.

SOLVING EQUATIONS

Equations are solved by:

1. Simplifying both sides of the equation as far as possible (to a single algebraic term and a single number).
2. Moving all algebraic terms to one side of the equals sign and all number terms to the other side (remembering that moving a term across an equals sign changes its sign from positive to negative and vica versa).
3. Adding together like terms on each individual side.
4. Bringing across the number in front of the x and making it the divisor on the other side.

Examples

1. $8x + 4 = 6x - 10$ (solve)

$$8x - 6x = -10 - 4 \quad \text{step 2}$$
$$2x = -14 \quad \text{step 3}$$
$$X = -14/2 \quad \text{step 4}$$
$$X = -7$$

2. $5x + 4 - 2x - 8 = 2x + 3 - x + 5$ (solve)

$$3x - 4 = x + 8 \quad \text{step 1}$$
$$3x - x = 8 + 4 \quad \text{step 2}$$
$$2x = 12 \quad \text{step 3}$$
$$X = 12/2 \quad \text{step 4}$$
$$X = 6$$

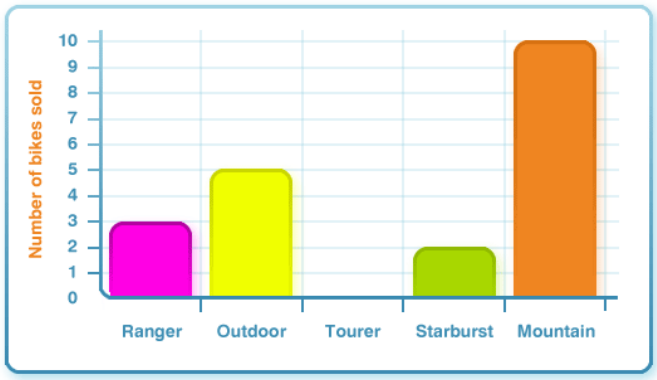
GRAPHS AND CHARTS

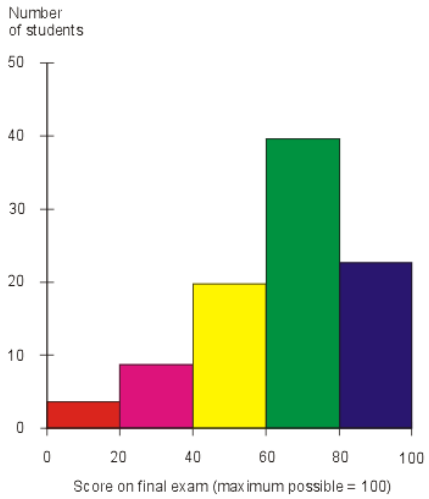
All graphs and charts should have:

1. A Title
2. A labelled x and y axis
3. A key, if necessary

A Bar Chart can be used to display data that can be counted.

Each bar represents a different category and so the bars should have a space between them, i.e. the bars should not touch each other.

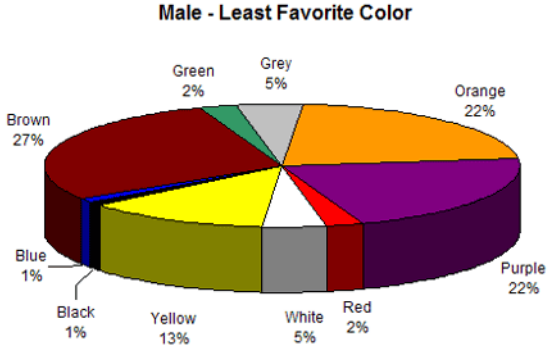


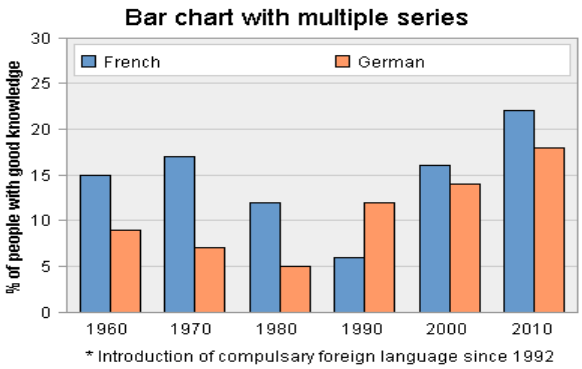


Histograms are used to display grouped data that is continuous.

It looks like a bar chart, but there are no gaps between the bars ie the bars touch each other.

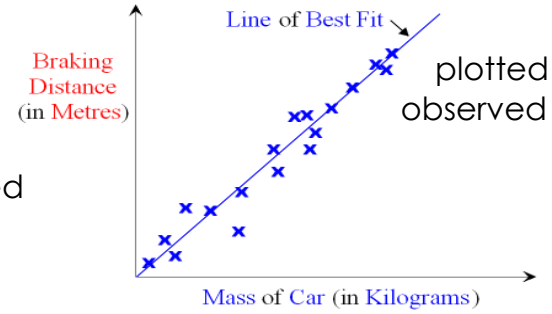
Pie Charts are normally used for categorical data, ie data broken into several categories such as in this example males least favourite colours.





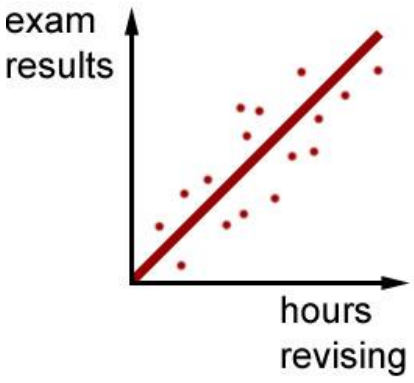
A **Dual Bar Chart** is used to compare 2 sets of data.

A **Scatter Graph** shows how 2 statistical quantities might be related. Points are plotted on a set or (x,y) axes, and any trend is observed the **line of best fit** is a straight line that passes through or is as close to as many of the plotted points as possible.

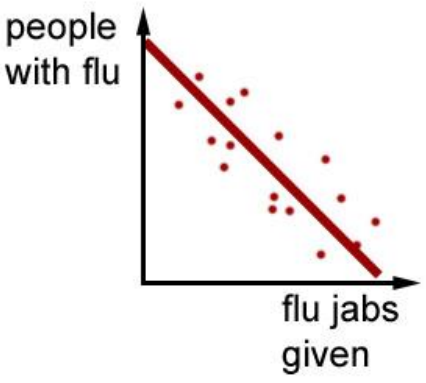


Positive Correlation:
as one quantity increases so the other increases.
Similarly as one quantity decreases the other quantity decreases as well.

Negative Correlation:
Similarly as one quantity increases the other one decreases.

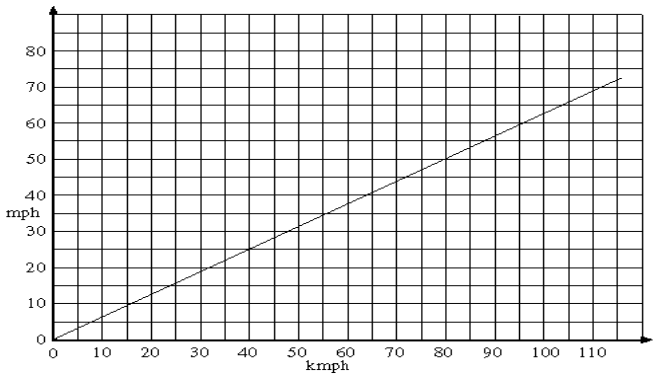


POSITIVE CORRELATION
- people who do more revision get higher exam results.
- revising increases success.



NEGATIVE CORRELATION
- when more jabs are given the number of people with flu falls.
- flu jabs prevent flu.

Conversion Graph – if you want to convert mph into kph, for example, you can use a conversion graph. The graph will often be a straight line passing through the origin.



Mean	**the ordinary average of a set of numbers. Add all the numbers up, and divide by how many there where.**
Median	the middle value, once the values have been arranged in order of size.
Mode or modal	the value which occurs most often.
Range	the difference between the highest and lowest data in the set.

Finding a Percentage of an Amount

To calculate for example 34 % of £2400….

First divide £2400 by 100 (to find 1%) and then multiply by 34.

= 34 % of £2400
= 2400÷100 x 34
= £816

Common Conversions: Fractions – Decimals - Percentages

Fraction	Decimal	Percentage (%)
½	0.5	50
1/4	0.25	25
1/5	0.2	20
1/10	0.1	10
1/3	0.3333…	33 **1/3**
1/8	0.125	12 **1/2**
3/4	0.75	75
3/10	0.3	0.3

SUBSTITUTION

We replace the letter with the value that it has been given.

Examples:

If m=5, find the value of:

(i) 3m

3m =3 x m
= 3 x (5)
= 15

(ii) 2m + 4

=2 x m + 4
= 2 x (5) + 4
=10 + 4
=14

Remember: Put the value substituted into brackets

(iii) $4m^2$

$= 4 \times m^2$
$=4 \times (5)^2$
=4 x 25
=100

(iv) $9m - m^2 + 6$

$=9 \times m - m^2 + 6$
$= 9 \times (5) - (5)^2 + 6$
= 45 - 25 + 6
=26

Common Formula used across the curriculum:

Examples:

(i) If v=u+at, t=3,u=2 and a=4, find the value of v?

v = u + a x t
v = (2) + (4) x (3)
v = 2 +12
v=14

Incorrect v = 6 x 3
v = 18

Remember: Multiply & divide before you add or subtract (BODMAS)

(ii) If v=u+at, v=12, u=4 and a=2, find the value of t?

v = u + at
v = u + a x t
(12) = (4) + (2) x t
12 - 4 = 2 x t
8 = 2 x t
8/2 =t
4 = t or t =4

If the unknown is not the subject of the formula you need to rearrange to solve.
(Inverse -plus 4 moves to other side and becomes minus 4, multiply by 2 moves and divides by 2)

(iii) A ball is dropped from the leaning tower of Pisa, at a height of 50m from the ground. The ball is dropped from rest and falls freely under gravity. How long will it be before the ball hits the ground? Acceleration due to gravity is 9.8 m/s^2

We know: s = 50, a = 9.8, u = 0 and we want to find t.

$s = ut + \frac{1}{2} at^2$

$s = u \times t + \frac{1}{2} \times a \times t^2$ **0 x t = 0 (this will disappear)**

$(50) = (0) \times t + \frac{1}{2} \times (9.8) \times t^2$ **½ x 9.8 =4.9**

$50 = 4.9 \times t^2$ **Rearrange: move 4.9 and divide**

$50/4.9 = t^2$ **Inverse of squaring is square rooting**

$t = \sqrt{(50/4.9)}$ Calc. $t = 3.19$ (2d.p)

Renewed: December 2025 **Review Date: December 2028**