

UNIT 1 - NUMBER

Content

- Integers, powers and roots
- Ratio and proportion
- Mental calculations
- Written calculations
- Fractions, decimals and percentages
- Checking solutions
- Prime Factors
- LCF and HCM

Resources & ICT

- Textbook
- Worksheets
- Calculators
- Online resources from the BM website
- www.myimaths.com
- www.wolframalpha.com
- Interlocking plastic cubes
- iPads: Buzzmaths

Types of assessment

- Exercises from textbooks and worksheets
- Relevant questions from KS3 SAT papers
- Formative assessment of homework and test results
- Structured questioning during lessons
- Judgments based on class participation and effort

Students to Know

- The difference between ratio and proportion
- Decimal and fraction equivalents
- The meaning of HCF and LCM
- The connection between squares and roots

Students to Understand

- The difference between written and mental calculations
- Basic addition and subtraction of fractions
- Simple powers
- Inverting operations as a check

Students to be able to Do

- Calculate ratio and proportion
- Calculate prime factors
- Quick and accurate mental maths techniques

Cross curricular links

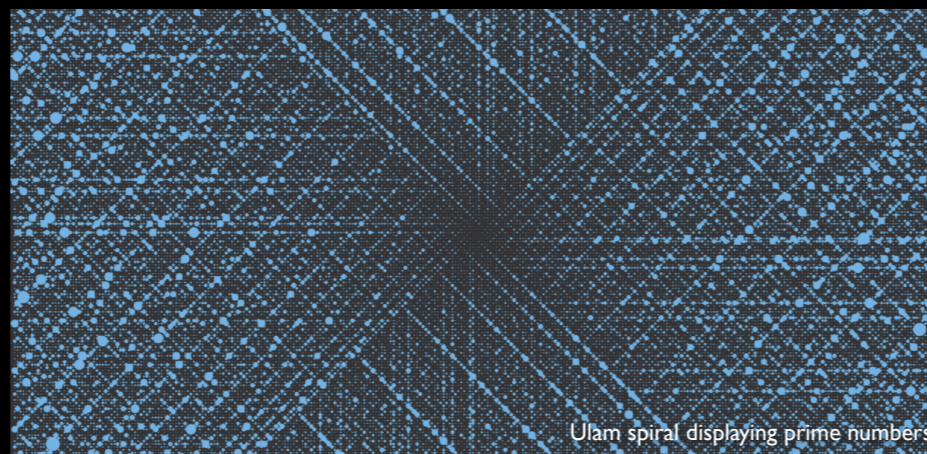
- Science and Geography; using numbers to describe quantities
- Using money, developing problem solving skills
- History; Leonardo Da Vinci's exploration of body proportions
- Sport; timing activities, analysing performance

Differentiation incl. EAL

- Extension: mixed number fractions, decimal equivalents and improper fractions, adding, subtracting, dividing and multiplying basic fractions, using square roots to find primes
- Support: visual aids, use of iPads to visualise factor breakdown

Learning styles activities

- Exploration of ratio and proportion around the school environment, building structures, cake mixes
- Fractions, percentages, discounts: shopping trips to Lausanne



Ulam spiral displaying prime numbers

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Global citizenship, internationalism, local environment

- The international search for formulae to describe prime's (e.g. The Language Of Primes)
- The use of decimals internationally, differences, cultures without decimals



UNIT 2 - ALGEBRA

Content

- Sequences
- Functions and mapping
- Graphs
- Equations
- Formulae and like terms
- Indices
- Roots
- Expressions
- Real-life scenarios

Resources & ICT

- Textbook
- Worksheets
- Calculators
- Online resources from the BM website
- www.myimaths.com
- www.wolframalpha.com
- Interlocking plastic cubes
- iPads: Buzzmaths

Types of assessment

- Exercises from textbooks and worksheets
- Relevant questions from KS3 SAT papers
- Formative assessment of homework and test results
- Structured questioning during lessons
- Judgments based on class participation and effort

Students to Know

- How to simplify expressions
- Which formulae to use in appropriate situations
- Practical applications of basic techniques
- How to determine the equation of a straight line

Students to Understand

- How to approach problems using a variety of techniques
- How algebra can be used to generalise a simple problem

Students to be able to Do

- Solve algebraic problems
- Understand algebraic vocabulary
- Solve linear equations
- Use algebra techniques to solve numeric problems
- Grouping like-terms
- Solve roots
- Use indices in simple problem solving

Cross curricular links

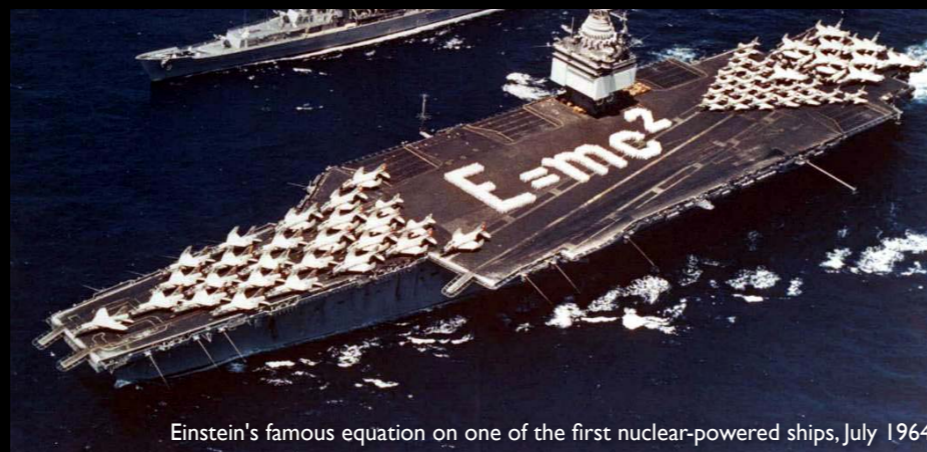
- Science; using formula, solving equations and algebraic manipulation, graphing results.
- ICT; using spreadsheets to generate straight-line graphs

Differentiation incl. EAL

- Extension tasks for gifted students: non-linear equations, e.g. quadratics
- Support: using iPads to explore roots visually, to see the application of table data into graphs, grouping simple like-terms using pictograms

Learning styles activities

- Flash cards for grouping like-terms.
- Paired work to find links between squares and roots
- Investigations: real-life scenarios, collecting data and substituting with algebraic notation



Einstein's famous equation on one of the first nuclear-powered ships, July 1964

U.S. Navy / Public domain

Global citizenship, internationalism, local environment

- Links to countries where the mathematics at hand was first developed
- Discussion of mathematics in topical stories
- Sharing of ideas from students with different mathematical backgrounds

UNIT 3 - SHAPE AND SPACE

Content

- Geometrical reasoning: lines, angles and shapes
- Metric and imperial units
- Perimeter and area
- Properties of a triangle
- Angles, bisectors and compass use
- Transformations, coordinates and symmetry
- Nets and 3D-shapes

Resources & ICT

- Textbook
- Worksheets
- Calculators
- Online resources from the BM website
- www.myimaths.com
- www.wolframalpha.com
- Interlocking plastic cubes
- ICT: using computers to create nets of 3D-shapes

Types of assessment

- Exercises from textbooks and worksheets
- Relevant questions from KS3 SAT papers
- Formative assessment of homework and test results
- Structured questioning during lessons
- Judgments based on class participation and effort

Students to Know

- Basic metric/imperial unit conversions and uses
- Details of reflections, rotations, translations and enlargements
- Line and rotational symmetry
- How to describe angles
- Compass techniques to solve loci problems
- How to use scales in practical contexts

Students to Understand

- How to approach problems using a variety of techniques
- When to use appropriate units in different situations
- When to apply area and volume formulae
- Properties of shapes including circles

Students to be able to Do

- Use a compass to construct, measure and bisect angles
- Draw, cut out and make basic 3D-shapes accurately
- Recall properties of shapes

Cross curricular links

- Science; symmetry in nature
- Art & Photography; enlargements and scale factors
- ICT; computer graphics and the application of transformations

Differentiation incl. EAL

- Extension tasks for gifted students: exploration of complex symmetrical patterns, further exploration of circle geometry and formulae
- Support: physical help and modelling with compass use and shape building

Learning styles activities

- Group investigations into the properties of shapes
- Paired work for measuring using both metric and imperial units



Models of the five platonic bodies, Weizmann Institute of Science, Israel

Uzi V. / Public domain

Global citizenship, internationalism, local environment

- Research into shapes in architecture from around the world, e.g. buildings and bridges



UNIT 4 - DATA

Content

- Probability
- Processing and representing data: pie charts and bar charts
- Correlation
- Averages
- Interpreting and discussing results
- Statistical enquiry

Resources & ICT

- Textbook
- Worksheets
- Calculators
- Online resources from the BM website
- www.myimaths.com
- www.wolframalpha.com
- Interlocking plastic cubes
- iPads: spreadsheets

Types of assessment

- Exercises from textbooks and worksheets
- Relevant questions from KS3 SAT papers
- Formative assessment of homework and test results
- Structured questioning during lessons
- Judgments based on class participation and effort

Students to Know

- Practical applications of basic techniques
- Basic averages (mode, mean and median)
- The language of statistics and probability
- The difference between theoretical and experimental probability

Students to Understand

- How to approach problems using a variety of techniques
- How to calculate probability
- Understand statistical vocabulary
- How data can be represented in a variety of diagrams

Students to be able to Do

- Use their calculators effectively
- Represent data in a variety of ways, e.g. pie charts

Cross curricular links

- Science; using statistical diagrams to interpret data from experiments
- Citizenship, Geography; using mathematics to make sense of real life statistics
- Sport; statistical analysis of performance over time

Differentiation incl. EAL

- Extension tasks for gifted students: calculating averages using long sets of data
- Support: smaller sets of data for mean, only calculating mode and median

Learning styles activities

- Class project using statistics: collecting and representing data collected on campus, e.g. sporting performances
- Simple probability exercises, tabulating results and graphing



Global citizenship, internationalism, local environment

- Local environment: data collection in Science, Citizenship and other subjects from the school campus, park or local town

