UNIT I - NUMBER

Resources & ICT

- Worksheets
- Calculators • Online resources from the BM

- www.wolframalpha.com
- Interlocking plastic cubes

- percentages
- Using a calculator
- Real-life problems

• iPads: Buzzmaths

Types of assessment

• Exercises from textbooks and

- Formative assessment of homework and test results
- Structured questioning during
- Judgments based on class

Students to Know

- The meaning of more advanced mathematical symbols
- How to interpret numeric information
- Decimal, fraction and percentage equivalences
- Basic arithmetic with fractions, e.g. division, multiplication and associated rules

Students to Understand

- · How to approach problems using a variety of techniques
- When to apply a variety of different methods
- The difference between direct and indirect proportion
- The correct operations implied in real-life worded questions

Students to be able to Do

- Use their calculators effectively
- Calculations using indices
- Written and mental methods for fraction arithmetic

Cross curricular links

- Science; ratio and proportion when making chemical mixes, use of indices when calculating great distances in Astronomy
- Geography; use of fractions,
- decimals and percentages in
- Art; ratio and proportion through perspective, model building etc.

Differentiation incl. EAL

- Extension tasks for gifted students: expectation of calculating simple fractional equivalents mentally and simple division, addition, subtraction and multiplication without written methods
- Support: simpler fractions, decimals and percentage exercises, visual aids, physically manipulating ratio and proportion, e.g. cooking

Learning styles activities

- Group or paired work investigating ratio and proportion of the body
- Art making according to set ratios and proportions
- Cooking using recipes



- Global citizenship, internationalism, local environment
- History: Leonardo Da Vinci and body proportion
- Local environment: visit to the local art museums to explore ratio and proportion



Throughout the year - 8 weeks

Content

- Integers, powers and roots
- Ratio and proportion
- Mental calculations
- Written calculations
- Fractions, decimals and



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UNIT 2 - ALGEBRA

Resources & ICT

• Online resources from the BM

• www.wolframalpha.com

• Interlocking plastic cubes

Types of assessment

• Formative assessment of

• Judgments based on class

homework and test results

Structured questioning during

• iPads: algebra app, Buzzmaths

• Exercises from textbooks and

• Worksheets

Calculators

Students to Know

- How to simplify more complex expressions
- What prime numbers are and how to calculate them
- How to solve linear equations with unknowns on both sides and negative or fractional results
- The format of a straight line equation; how to use and interpret inequalities
- Problems involving algebraic fractions

Students to Understand

- How to approach problems using a variety of techniques
- How algebra can be used to generalise a simple problem
- How to find equation of a line and how it relates to the graph
- How to draw a function from its equation
- How to calculate and use factors and multiples
- How to determine the gradient of a straight line graph

Students to be able to Do

- Solve more complex linear equations
- Use algebra techniques to a variety of problems
- Calculate squares and square roots

Cross curricular links

- Science; using formula, solving equations and algebraic manipulation
- Sport; data collection of speed and distances run to create graphs
- Physics and Chemistry; experimental data modelled with straight line equations
- History; algebra throughou history

Differentiation incl. EAL

- Extension tasks for gifted students: using quadratic equations, e.g. $y = x^2 + 2$, solving simultaneous equations
- Support: using and solving simpler equations, using graphs with only two axis, calculating simple squares and square roots

Learning styles activities

- Prime number investigations using grid paper, e.g. Ulam spirals
- Short-cuts to primes using square roots as approximations
- Data collection from sporting events



Global citizenship, internationalism, local environment

• Local environment: collecting speed data from a local race, e.g. Lausanne marathon



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Throughout the year - 8 weeks

MATHEMATICS

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Content

• Sequences

- Functions
- Graphing linear equations and intercepts
- Equations and solving simple examples
- Factors, multiples and primes
- Squares and square roots
- Formulae
- Gradients
- Expressions

UNIT 3 - SHAPE AND SPACE

Resources & ICT

- Textbook
- Worksheets
- Calculators
- Online resources from the BM website
- www.myimaths.com
- www.wolframalpha.com
- Shape sets (2D/3D)
- angles and shapesConstruction and loci

Geometrical reasoning: lines,

- Measures and mensuration; area & volume
- Transformations and coordinates
- Geometrical reasoning: loci and construction
- Basic trigonometry 1

Content

- Dasic trigonometryNets and construction
- iPads: angle app, Buzzmaths

Types of assessment

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

Students to Know

- Which formulae to use in appropriate situations
- How to convert between units of length, area and volume
- Details of reflections, rotations, translations and enlargements
- Compass techniques, e.g. bisecting angles
- How to use linear, area and volume scale factors
- What vectors represent and how to use them

Students to Understand

- When to apply area and volume formulae
- How to describe combinations of transformations
- Metric and Imperial units and conversion techniques
- Angle properties of polygons and circles
- Geometry relating to fractions of circles

Students to be able to Do

- Understand mathematical vocabulary
- Solve a variety of geometrical problems involving using basic trigonometry
- To make more complex shapes using nets

Cross curricular links

- Science; forces and the strength of structures
- Art; enlargements and scale factors
- ICT; investigating symmetry through drawing packages

Differentiation incl. EAL

- Extension tasks for gifted students: tabulating the properties of more complex shapes and calculating volumes and areas with formulae, making more complex 3D-shapes from nets, designing own shapes and making them
- Support: help when making shapes with compasses, simpler formulae, using ICT to understand concepts

Learning styles activities

- Group investigations into the properties of 3D-shapes using models
- Using ICT and photography to apply enlargement concepts
- Drawing symmetrical patterns respecting symmetry, practicing compass skills



Global citizenship, internationalism, local environment

• Indian mandala motifs, architecture from around the world, symmetry through art, e.g. Escher



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Throughout the year - 8 weeks

UNIT 4 - DATA

Resources & ICT

- Calculators
- Online resources from the BM

- Interlocking plastic cubes

Types of assessment

- Interpreting and discussing results
 - Exercises from textbooks and
 - Formative assessment of homework and test results
 - Structured questioning during
 - Judgments based on class participation and effort

Students to Know

- Statistics terminology
- The properties of the probability scale
- The difference between theoretical and experimental probability

Students to Understand

- How to approach problems using a variety of techniques
- Which diagrams are appropriate for different types of data
- How to construct a number of different statistical diagrams
- How to work with probabilities appropriately for combined events

Students to be able to Do

- Use their calculators effectively
- Understand more advanced statistical vocabulary
- Use Venn and tree diagrams to organise probability problems

Cross curricular links

- Science; using statistical diagrams to interpret data from
- Citizenship; the global impact of
- climate change

Differentiation incl. EAL

- Extension tasks for gifted students: making graphs of real data, interpreting and predicting information; making sense of large sets of data and writing reports to summarise
- Support: simpler sets of information and fewer calculations of averages

Learning styles activities

- Group work creating, collecting, graphing and analysing data
- Group and individual project work to collect and present data in a variety of ways
- Individual investigations and interpretations of real-life statistics, e.g. geography and climate



- Global citizenship, internationalism, local environment
- Statistics from around the world, e.g. climate change, population, deforestation
- Local environment: statistics project collecting data from the school



Throughout the year - 8 weeks

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Content

 Probability • Processing and representing data

• Statistical enquiry

• Calculating and using averages