

# Mathematics

## Number

### Integers, powers and roots

- Recognise negative numbers as positions on a number line, and order, add and subtract positive and negative integers in context.
- Recognise multiples, factors, common factors, primes (all less than 100), making use of simple tests of divisibility; find the lowest common multiple in simple cases; use the 'sieve' for generating primes developed by Eratosthenes.
- Recognise squares of whole numbers to at least  $20 \times 20$  and the corresponding square roots; use the notation  $\sqrt{\quad}$  and  $\sqrt{\quad}^2$ .

### Place value, ordering and rounding

- Interpret decimal notation and place value; multiply and divide whole numbers and decimals by 10, 100 or 1000.
- Order decimals including measurements, changing these to the same units.
- Round whole numbers to the nearest 10, 100 or 1000 and decimals, including measurements, to the nearest whole number or one decimal place.

### Fractions, decimals, percentages, ratio and proportion

- Recognise the equivalence of simple fractions, decimals and percentages.
- Simplify fractions by cancelling common factors and identify equivalent fractions; change an improper fraction to a mixed number, and vice versa; convert terminating decimals to fractions, e.g.  $0.23 = \frac{23}{100}$ .
- Compare two fractions by using diagrams, or by using a calculator to convert the fractions to decimals, e.g.  $\frac{3}{5}$  and  $\frac{13}{20}$ .
- Add and subtract two simple fractions, e.g.  $\frac{1}{8} + \frac{9}{8}$ ,  $\frac{11}{12} - \frac{5}{6}$ ; find fractions of quantities (whole number answers); multiply a fraction by an integer.
- Understand percentage as the number of parts in every 100; use fractions and percentages to describe parts of shapes, quantities and measures.
- Calculate simple percentages of quantities (whole number answers) and express a smaller quantity as a fraction or percentage of a larger one.
- Use percentages to represent and compare different quantities.
- Use ratio notation, simplify ratios and divide a quantity into two parts in a given ratio.
- Recognise the relationship between ratio and proportion.
- Use direct proportion in context; solve simple problems involving ratio and direct proportion.

## Calculation

### Mental strategies

- Consolidate the rapid recall of number facts, including positive integer complements to 100, multiplication facts to  $10 \times 10$  and associated division facts.
- Use known facts and place value to multiply and divide two-digit numbers by a single-digit number, e.g.  $45 \times 6$ ,  $96 \div 6$ .
- Know and apply tests of divisibility by 2, 3, 5, 6, 8, 9, 10 and 100.
- Use known facts and place value to multiply simple decimals by one-digit numbers, e.g.  $0.8 \times 6$ .
  - Calculate simple fractions and percentages of quantities, e.g. one quarter of 64, 20% of 50 kg.

- Use the laws of arithmetic and inverse operations to simplify calculations with whole numbers and decimals.
- Use the order of operations, including brackets, to work out simple calculations.

### *Addition and subtraction*

- Add and subtract integers and decimals, including numbers with different numbers of decimal places.

### *Multiplication and division*

- Multiply and divide decimals with one and/or two places by single-digit numbers, e.g.  $13.7 \times 8$ ,  $4.35 \div 5$ .
- Know that in any division where the dividend is not a multiple of the divisor there will be a remainder, e.g.  $157 \div 25 = 6$  remainder 7.
- The remainder can be expressed as a fraction of the divisor, e.g.  $157 \div 25 = 6 \frac{7}{25}$ .
- Know when to round up or down after division when the context requires a whole-number answer.

## **Algebra**

### **Expressions, equations and formulae**

- Use letters to represent unknown numbers or variables; know the meanings of the words term, expression and equation.
- Know that algebraic operations follow the same order as arithmetic operations.
- Construct simple algebraic expressions by using letters to represent numbers.
- Simplify linear expressions, e.g. collect like terms; multiply a constant over a bracket.
- Derive and use simple formulae, e.g. to change hours to minutes.
- Substitute positive integers into simple linear expressions/formulae.
- Construct and solve simple linear equations with integer coefficients (unknown on one side only), e.g.  $2x = 8$ ,  $3x + 5 = 14$ ,  $9 - 2x = 7$ .

### **Sequences, functions and graphs**

- Generate terms of an integer sequence and find a term given its position in the sequence; find simple term-to-term rules.
- Generate sequences from spatial patterns and describe the general term in simple cases.
- Represent simple functions using words, symbols and mappings.
- Generate coordinate pairs that satisfy a linear equation, where  $y$  is given explicitly in terms of  $x$ ; plot the corresponding graphs;
- recognise straight-line graphs parallel to the  $x$ - or  $y$ -axis.

## **Geometry**

### **Shapes and geometric reasoning**

- Identify, describe, visualise and draw 2D shapes in different orientations.
- Use the notation and labelling conventions for points, lines, angles and shapes.
- Name and identify side, angle and symmetry properties of special quadrilaterals and triangles, and regular polygons with 5, 6 and 8 sides.
- Estimate the size of acute, obtuse and reflex angles to the nearest  $10^\circ$ .
- Start to recognise the angular connections between parallel lines, perpendicular lines and transversals.
- Calculate the sum of angles at a point, on a straight line and in a triangle, and prove that vertically opposite angles are equal; derive and use the property that the angle sum of a quadrilateral is  $360^\circ$ .

- Solve simple geometrical problems by using side and angle properties to identify equal lengths or calculate unknown angles, and explain reasoning.
- Recognise and describe common solids and some of their properties, e.g. the number of faces, edges and vertices.
- Recognise line and rotation symmetry in 2D shapes and patterns; draw lines of symmetry and complete patterns with two lines of symmetry; identify the order of rotation symmetry.
- Use a ruler, set square and protractor to:
  - o measure and draw straight lines to the nearest millimetre
  - o measure and draw acute, obtuse and reflex angles to the nearest degree
  - o draw parallel and perpendicular lines
  - o construct a triangle given two sides and the included angle (SAS) or two angles and the included side (ASA)
  - o construct squares and rectangles
  - o construct regular polygons, given a side and the internal angle.
- Read and plot coordinates of points determined by geometric information in all four quadrants.
- Transform 2D points and shapes by:
  - o reflection in a given line
  - o rotation about a given point
  - o translation.
- Know that shapes remain congruent after these transformations.

## Measure

### Length, mass and capacity

- Choose suitable units of measurement to estimate, measure, calculate and solve problems in everyday contexts.
- Know abbreviations for and relationships between metric units; convert between:
  - o kilometres (km), metres (m), centimetres (cm), millimetres (mm)
  - o tonnes (t), kilograms (kg) and grams (g)
  - o litres (l) and millilitres (ml).
- Read the scales on a range of analogue and digital measuring instruments.

### Time and rates of change

- Draw and interpret graphs in real life contexts involving more than one stage, e.g. travel graphs.
- Know the relationships between units of time; understand and use the 12-hour and 24-hour clock systems; interpret timetables; calculate time intervals.

### Area, perimeter and volume

- Know the abbreviations for and relationships between square metres (m<sup>2</sup>), square centimetres (cm<sup>2</sup>), square millimetres (mm<sup>2</sup>).
- Derive and use formulae for the area and perimeter of a rectangle; calculate the perimeter and area of compound shapes made from rectangles.
- Derive and use the formula for the volume of a cuboid; calculate volumes of cuboids.
- Calculate the surface area of cubes and cuboids from their nets.

## Handling data

### Planning and collecting data

- Decide which data would be relevant to an enquiry and collect and organise the data.
- Design and use a data collection sheet or questionnaire for a simple survey.
- Construct and use frequency tables to gather discrete data, grouped where appropriate in equal class intervals.

### Processing and presenting data

- Find the mode (or modal class for grouped data), median and range.
- Calculate the mean, including from a simple frequency table.

- Draw and interpret:
  - o bar-line graphs and bar charts
  - o frequency diagrams for grouped discrete data o simple pie charts o pictograms.

### **Interpreting and discussing results**

- Draw conclusions based on the shape of graphs and simple statistics.
- Compare two simple distributions using the range and the mode, median or mean.

### **Probability**

- Use the language of probability to describe and interpret results involving likelihood and chance.
- Understand and use the probability scale from 0 to 1.
- Find probabilities based on equally likely outcomes in simple contexts.
- Identify all the possible mutually exclusive outcomes of a single event.
- Use experimental data to estimate probabilities.
- Compare experimental and theoretical probabilities in simple contexts.

### **Problem solving**

#### **Using techniques and skills in solving mathematical problems**

- Use the laws of arithmetic and inverse operations to simplify calculations with whole numbers and decimals.
- Manipulate numbers, algebraic expressions and equations, and apply routine algorithms.
- Understand everyday systems of measurement and use them to estimate, measure and calculate.
- Recognise and use spatial relationships in two and three dimensions.
- Draw accurate mathematical diagrams, graphs and constructions.
- Check results of calculations by using inverse operations.
- Estimate, approximate and check their working.
- Solve word problems involving whole numbers, percentages, decimals, money or measures: choose operations and mental or written methods appropriate to the numbers and context, including problems with more than one step.

#### **Using understanding and strategies in solving problems**

- Identify and represent information or unknown numbers in problems, making correct use of numbers, symbols, words, diagrams, tables and graphs.
- Recognise mathematical properties, patterns and relationships, generalising in simple cases.
- Work logically and draw simple conclusions.
- Relate results or findings to the original context and check that they are reasonable.
- Record and explain methods, results and conclusions.
- Discuss and communicate findings effectively, orally and in writing.

# English

## Phonics, spelling and vocabulary

- Spell correctly most words used.
- Increase knowledge of word families, roots, derivations, morphology and regular spelling patterns.
- Use a dictionary and thesaurus effectively to further develop vocabulary.
- Learn a range of vocabulary appropriate to their needs, and use words precisely in speech and writing to clarify and extend meaning and to interest their audience.
- Learn to use the terms 'image', 'simile', 'metaphor', 'onomatopoeia', 'setting' and 'genre'.

## Grammar and punctuation

### Reading

- Comment on the use of formal and informal language and discuss the writer's motivation for making the choice.
- Show awareness of the reasons for using longer and shorter sentences.
- Begin to comment on the control of pace and meaning through choice of sentences and variety of sentence openings.

### Writing

- Use a wide range of punctuation to make meaning clear, including generally accurate use of commas in complex sentences and to present dialogue.
- Use correct grammar, including articles, word order and tenses in a range of genres and text types.
- Clarify relationships between ideas with an increasingly accurate and growing use of connectives.
- Provide clarity and emphasis in writing, using a variety of sentence lengths, structures and subjects.
- Use a range of increasingly complex sentence structures to communicate meaning and to give fluency to their writing.
- Build up detail and convey shades of meaning through sentence structure, e.g. controlling order of clauses, expanding verb phrases.

## Reading

*The following genres and text types are recommended at Stage 7:*

*Fiction and poetry: suspense and horror stories, sci-fi and fantasy novels, contemporary folk and fairy-tales, short stories (including those set in different times and places), older literature (including drama), narrative and non-narrative poems, significant poems from before 1900. Non-fiction: contemporary biography, autobiography, letters and diaries, journalistic writing/writing with bias, news websites.*

### Fiction and poetry

- Demonstrate understanding of features of narrative and non-narrative texts by explaining and developing these features in their own discussion and writing.
- Use inference and deduction to recognise implicit and inferred meanings.
- Identify and understand the main ideas, viewpoints, themes and purposes in a text. Support

comments by quotation from more than one location in the text.

- Identify and describe the effect of writers' and poets' use of literary, rhetorical and grammatical features, including imagery and figurative language.
- Comment on a writer's use of language, demonstrating an understanding of the implication of their use of vocabulary.
- Give an informed personal response to a text and provide some textual reference in support.
- Understand how readers make choices about the texts they like reading, e.g. by author or genre and know a range of ways in which to respond to texts.
- Compare poems, showing awareness of poets' use of language and its intended impact on the reader.
- Understand the different ways texts can reflect the social, cultural and historical contexts in which they were written.

### **Non-fiction**

- Extract the main points and relevant information from a text or ICT source, using a range of strategies such as skimming and scanning.
- Make relevant notes to select, collate and summarise ideas from texts.
- Explore the range of different ways writers use layout, form and presentation in a variety of texts.
- Explore the variety and range of ways in which the content of texts can be organised, structured and combined.

## **Writing**

### **Fiction and poetry**

- Develop different ways of generating, organising and shaping ideas, using a range of planning formats or methods.
- Understand the conventions of standard English and how to use them consistently in writing.
- Write to express a personal viewpoint.
- Shape the overall organisation, sequence and presentation of a text to convey ideas clearly and effectively.
- Mirror the purpose of the writing by appropriate use of paragraphs and selection of linking words and phrases.
- Use vocabulary precisely and imaginatively to clarify and extend meaning and create specific effects.
- Vary sentence length and structure in order to provide appropriate detail and clarify relationships between setting, characters, themes, plot, etc.
- Begin to develop character and voice in fiction writing.
- Explore some of the key linguistic and literary techniques used by writers, and begin to use them for intended effect.
- Understand and use degrees of formality in a range of texts according to context, purpose and audience.

### **Non-fiction**

- Use features and conventions of a wide variety of text types in order to write to inform, explain, describe, argue, persuade and comment.
- Practise note-taking using different styles for different purposes.

## **Speaking and listening**

- Speak for a variety of purposes, such as to explain, describe, narrate, explore, analyse, imagine, discuss, argue and persuade.
- Deliberately shape talk for clarity and effect and to engage listener.

- Use a range of vocabulary appropriate to context, and use language to clarify meaning and to interest and convince their audience.
- Practise speaking fluently and clearly at an appropriate pace and volume.
- Develop the ability to listen courteously to others and be sensitive to turn taking.
- Begin to make significant contributions to group discussions, engaging with complex material, making perceptive responses and showing awareness of a speaker's aims.
- Work in solo, paired and group assignments, including role-play.
- Through role-play, show insight into texts and issues through choice of speech, gesture and movement.
- Explain features of own and others' language, showing sensitivity to the impact of varying language for different purposes and situations.



# Science

## Scientific enquiry

### Ideas and evidence

- Be able to talk about the importance of questions, evidence and explanations.
- Make predictions and review them against evidence.

### Plan investigative work

- Suggest ideas that may be tested.
- Outline plans to carry out investigations, considering the variables to control, change or observe.
- Make predictions referring to previous scientific knowledge and understanding.
- Identify appropriate evidence to collect and suitable methods of collection.
- Choose appropriate apparatus and use it correctly.

### Obtain and present evidence

- Make careful observations including measurements.
- Present results in the form of tables, bar charts and line graphs.
- Use information from secondary sources.

### Consider evidence and approach

- Make conclusions from collected data, including those presented in a graph, chart or spreadsheet.
- Recognise results and observations that do not fit into a pattern, including those presented in a graph, chart or spreadsheet.
- Consider explanations for predictions using scientific knowledge and understanding and communicate these.
- Present conclusions using different methods.

## Biology

### Plants

- Recognise the positions, and know the functions of the major organs of flowering plants, e.g. root, stem, leaf.

### Humans as organisms

- Explore the role of the skeleton and joints and the principle of antagonistic muscles.
- Recognise the positions and know the functions of the major organ systems of the human body. Secondary sources can be used.
- Research the work of scientists studying the human body.

### Cells and organisms

- Identify the seven characteristics of living things and relate these to a wide range of organisms in the local and wider environment.
- Know about the role of micro-organisms in the breakdown of organic matter, food production and disease, including the work of Louis Pasteur.
- Identify the structures present in plant and animal cells as seen with a simple light microscope and/or a computer microscope.

- Compare the structure of plant and animal cells.
- Relate the structure of some common cells to their functions. Secondary sources can be used.
- Understand that cells can be grouped together to form tissues, organs and organisms.

### **Living things in their environment**

- Describe how organisms are adapted to their habitat, drawing on locally occurring examples. Secondary sources can be used.
- Draw and model simple food chains.
- Discuss positive and negative influence of humans on the environment, e.g. the effect on food chains, pollution and ozone depletion.
- Discuss a range of energy sources and distinguish between renewable and non-renewable resources. Secondary sources can be used.

### **Variation and classification**

- Understand what is meant by a species.
- Investigate variation within a species. Secondary sources can be used.
- Classify animals and plants into major groups, using some locally occurring examples.

## **Chemistry**

### **States of matter**

- Show in outline how the particle theory of matter can be used to explain the properties of solids, liquids and gases, including changes of state.

### **Material properties**

- Distinguish between metals and non-metals.
- Describe everyday materials and their physical properties.
- Material changes
- Use a pH scale.
- Understand neutralisation and some of its applications.
- Use indicators to distinguish acid and alkaline solutions.

### **The Earth**

- Observe and classify different types of rocks and soils.
- Research simple models of the internal structure of the Earth.
- Examine fossils and research the fossil record.
- Discuss the fossil record as a guide to estimating the age of the Earth.
- Learn about most recent estimates of the age of the Earth.

## **Physics**

### **Forces and motion**

- Describe the effects of forces on motion, including friction and air resistance.
- Describe the effect of gravity on objects. Secondary sources can be used.

### **Energy**

- Understand that energy cannot be created or destroyed and that energy is always conserved.
- Recognise different energy types and energy transfers.

### **The Earth and beyond**

- Describe how the movement of the Earth causes the apparent daily and annual movement of the sun and the stars.

- Describe the relative position and movement of the planets and the sun in the solar system.
- Discuss the impact of the ideas and discoveries of Copernicus, Galileo and more recent scientists.
- Understand that the sun and other stars are sources of light and that planets and other bodies are seen by reflected light.



# History

## Historiography

- Understand the difference between events and written accounts.
- Understand that history requires critical engagement.
- Understand the nature of bias and begin to work towards compensating for bias.

## The 19th Century

- The changes in science and technology referred to as the Industrial Revolution.
- The changes in society brought about through the Industrial Revolution.
- The growth of Unionisation and development of legal protections for workers.
- The development of key ideologies and the dominance of Imperialism.
- The Unifications of Germany and Italy.

## World War I

- Causes of World War I.
- The conditions of World War I.
- General course of World War I.
- End of World War I and the Treaty of Versailles.

## 1917 and the Interbellum

- Basic understanding of the political spectrum as applying to the early to mid-20th Century.
- Understanding of the causes and key events of the Russian Revolution.
- Understanding the causes and key features of the rise of dictators in interwar Europe.
- Awareness of the nature and effects of the Depression.

## World War II

- Understanding the basic factors that led to the rise of the Nazi Party.
- Basic understanding of the key features of Nazi rule.
- The events leading up to World War II.
- General course of World War II.
- The Ending of World War II – D-Day and the atomic attacks on Japan.

## The Cold War

- Basic understanding of the ideological split.
- Understanding the significance of Mutually Assured Destruction.
- The partition of Europe – the Berlin Airlift and the Berlin Wall.
- The creation and key functions of the UN.
- Knowledge of key events in the creation of the People's Republic of China.
- Knowledge of the significance and key events of the Korean War.
- Knowledge of the significance and key events of the Vietnam War.
- The End of the Cold War – The Velvet Revolution and the fall of the Berlin Wall.

## Recent History

*Key Aim – to develop an awareness of history as a continual process and to connect the previously studied subjects to current events.*

- Awareness of the key events of the First Gulf War.
- Awareness of the significance and key events of September 11th 2001.
- Awareness of the key features of the Afghan War.
- Awareness of the key features of the Second Gulf War.



# Geography

## Geographical Skills

- Understanding of the differences and key features of the study of Physical and Human Geography.
- Ability to interpret and understand the significance of basic demographic data.
- Awareness and basic understanding of the key features of key governmental systems.
- Awareness and basic understanding of the key features of the major world religions.
- Understanding of the primary processes leading to the formation of key landforms.
- Knowledge and ability to use terminology relating to geographic features.

## Middle East and North Africa

- Ability to locate and define the region on a world map.
- Ability to draw both a political and physical map of the region.
- Consider demographic data relating to the region.
- Understanding of key cultural and religious features of the region.
- Understanding of the general historical outline of the region.
- Understanding of key economic features of the region.
- Understanding current issues relating to the region.
- Apply Geographical Skills to case studies of Turkey, Saudi Arabia, Egypt , Iran and Israel

## Russian Federation

- Ability to locate and define Russia on a world map.
- Ability to draw both a political and physical map of the Federation.
- Consider demographic data relating to the Federation.
- Understanding of key cultural and religious features of the Federation.
- Understanding of the general historical outline of the Federation.
- Understanding of key economic features of the Federation.
- Understanding current issues relating to the Federation.

## India

- Ability to locate and define India on a world map.
- Ability to draw both a political and physical map of the country.
- Consider demographic data relating to the country.
- Understanding of key cultural and religious features of the country.
- Understanding of the general historical outline of the country.
- Understanding of key economic features of the country.
- Understanding current issues relating to the country.

## ASEAN

- Ability to locate and define the region on a world map.
- Ability to draw both a political and physical map of the region.
- Consider demographic data relating to the region.
- Understanding of key cultural and religious features of the region.
- Understanding of the general historical outline of the region.

- Understanding of key economic features of the region.
- Understanding current issues relating to the region.
- Apply Geographical Skills to case studies of Indonesia and Vietnam.

## China

- Ability to locate and define China on a world map.
- Ability to draw both a political and physical map of China.
- Consider demographic data relating to China.
- Understanding of key cultural and religious features of China.
- Understanding of the general historical outline of China.
- Understanding of key economic features of China.
- Understanding current issues relating to China.

## The Koreas

- Ability to locate and define the Koreas on a world map.
- Understanding of the differences between the two states.
- Ability to draw both a political and physical map of the Koreas.
- Consider demographic data relating to the Koreas.
- Understanding of key cultural, ideological and religious features of the Koreas.
- Understanding of the general historical outline of the Koreas.
- Understanding of key economic features of the Koreas.
- Understanding current issues relating to the Koreas.

## Japan

- Ability to locate and define Japan on a world map.
- Ability to draw both a political and physical map of Japan.
- Consider demographic data relating to Japan.
- Understanding of key cultural and religious features of Japan.
- Understanding of the general historical outline of Japan.
- Understanding of key economic features of Japan.
- Understanding current issues relating to Japan.

## Australia

- Ability to locate and define Australia on a world map.
- Ability to draw both a political and physical map of Australia.
- Consider demographic data relating to Australia.
- Understanding of key cultural and religious features of Australia.
- Understanding of the general historical outline of Australia.
- Understanding of key economic features of Australia.
- Understanding current issues relating to Australia.

# ICT

## Internet safety

- Using antivirus software.
- Using firewalls.
- Security Patching.
- Anonymity.
- Identifying grooming techniques and how to report them.

## File management

- Copying, pasting, moving files.
- Creating folders.
- Save and load files across a network.

## Control: input, process and output

- Describe inputs that can cause an event to happen.
- Use a flow diagram to graphically model a solution to a problem.
- Write a sequence of instructions and understand that sequence is important.
- Explore the effects of changing variables in a sequence of instructions.
- Test and refine a program to achieve an intended outcome.
- Discuss the use of ICT outside school and make judgements about its use.

## Multimedia presentation - My School

- Producing a multimedia presentation with text, graphics and sound.
- Using a network and equipment correctly and efficiently.
- Present the final multimedia work.

## Databases

- Designing structure, capturing and presenting data.
- Designing and setting-up a database structure.
- Understanding the variety of file types and why they are used.
- Searching a database.
- Producing an appropriate series of queries and reports.

## Graphics manipulation

- File formats and compression.
- Cloning.
- Filtering.
- Producing image files using digital imaging and image capture.
- Demonstrating the process of image editing and manipulation.

## Desktop publishing - Year 7 magazine

- Work individually to create a magazine based on theme.
- Understanding why reliability of content should be checked.
- Using a desktop publishing package.