



The National Curriculum

Handbook for secondary teachers in England www.nc.uk.net

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The National Curriculum

Handbook for secondary teachers in England
Key stages 3 and 4

Foreword

The National Curriculum sets out a clear, full and statutory entitlement to learning for all pupils up to the age of 16. It determines the content of what will be taught and sets attainment targets for learning. It also determines how performance will be assessed and reported. An effective National Curriculum gives teachers, pupils, parents, employers and the wider community a clear and shared understanding of the skills and knowledge that young people will gain at school.

The National Curriculum is regularly reviewed to ensure that it continues to meet the changing needs of pupils and society. This revised National Curriculum principally reflects changes made to the key stage 4 curriculum from 2004. These changes enable schools to offer pupils greater choice, while ensuring they acquire the core of general learning and experience essential to later learning and employment. At key stage 4, young people should see how their studies will lead to further education and employment and be helped to develop competence in skills such as analysis, problem solving, reasoning and communication.

The key stage 4 curriculum should:

- challenge all students whatever their ability
- use curriculum flexibility to motivate students and encourage achievement
- encourage institutions to work together to deliver programmes suitable for each student.

The following are compulsory at key stage 4: English, mathematics, science, ICT, physical education, citizenship, religious education, sex education, careers education and work-related learning. The arts, design and technology, the humanities and modern foreign languages are entitlement areas at key stage 4. This means schools must make available courses in each of these areas to all students who wish to study them.

Work-related learning is a new statutory requirement at key stage 4. This handbook includes a non-statutory framework for work-related learning, which sets out the minimum experience schools should provide.

Careers education is now statutory from year 7. This handbook includes non-statutory guidelines for careers education at key stages 3 and 4.

Schools must provide religious education for all pupils, although parents can choose to withdraw their children. This handbook includes guidelines from the non-statutory national framework for religious education at key stages 3 and 4. These will support the work of local education authorities and the Standing Advisory Councils on Religious Education, who have the legal responsibility for producing an agreed religious education syllabus.

The principles of the National Curriculum remain the same at key stages 3 and 4. However, to reflect the greater flexibility available at key stage 4, this handbook presents the subject requirements of the two key stages separately.

The information in this handbook is also available on *National curriculum online* (www.nc.uk.net). This website has, for each subject:

- the programmes of study and non-statutory guidelines
- attainment targets and notes
- links to online resources.

National curriculum online also has information about the changes to the key stage 4 curriculum.

In addition, the website *National curriculum in action* (www.ncaction.org.uk) shows standards of pupils' work at different key stages and how the programmes of study translate into real activities. The schemes of work website (www.standards.dfes.gov.uk/schemes3) shows practical ways to teach the programmes of study.

About this handbook

This handbook:

- sets out the legal requirements of the National Curriculum in England for pupils aged 11 to 16
- provides information to help teachers implement the National Curriculum in their schools.

It has been written for secondary teachers. Parents, governors and all those with an interest in education will also find it useful.

The National Curriculum for pupils aged five to 11 is set out in the handbook for primary teachers. There are also separate booklets for the 12 National Curriculum subjects.

All these publications and related materials can be found on the National Curriculum website at www.nc.uk.net.

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The school curriculum and the National Curriculum



Values, aims and purposes

The school curriculum comprises all learning and other experiences that each school plans for its pupils. The National Curriculum is an important element of the school curriculum.

Values and purposes underpinning the school curriculum

Education influences and reflects the values of society, and the kind of society we want to be. It is important, therefore, to recognise a broad set of common values and purposes that underpin the school curriculum and the work of schools.¹

Foremost is a belief in education, at home and at school, as a route to the spiritual, moral, social, cultural, physical and mental development, and thus the well-being, of the individual. Education is also a route to equality of opportunity for all, a healthy and just democracy, a productive economy, and sustainable development. Education should reflect the enduring values that contribute to these ends. These include valuing ourselves, our families and other relationships, the wider groups to which we belong, the diversity in our society and the environment in which we live. Education should also reaffirm our commitment to the virtues of truth, justice, honesty, trust and a sense of duty.

At the same time, education must enable us to respond positively to the opportunities and challenges of the rapidly changing world in which we live and work. In particular, we need to be prepared to engage as individuals, parents, workers and citizens with economic, social and cultural change, including the continued globalisation of the economy and society, with new work and leisure patterns and with the rapid expansion of communication technologies.

Aims for the school curriculum

If schools are to respond effectively to these values and purposes, they need to work in collaboration with families and the local community, including church and voluntary groups, local agencies and business, in seeking to achieve two broad aims through the curriculum. These aims provide an essential context within which schools develop their own curriculum.

Aim 1: The school curriculum should aim to provide opportunities for all pupils to learn and to achieve.

The school curriculum should develop enjoyment of, and commitment to, learning as a means of encouraging and stimulating the best possible progress and the highest attainment for all pupils. It should build on pupils' strengths, interests and experiences and develop their confidence in their capacity to learn and work

¹ In planning their curriculum, schools may wish to take account of the statement of values finalised after widespread consultation by the National Forum for Values in Education and the Community (May 1997). These are reproduced on pages 219–221 of this handbook.

independently and collaboratively. It should equip them with the essential learning skills of literacy, numeracy, and information and communication technology, and promote an enquiring mind and capacity to think rationally.

The school curriculum should contribute to the development of pupils' sense of identity through knowledge and understanding of the spiritual, moral, social and cultural heritages of Britain's diverse society and of the local, national, European, Commonwealth and global dimensions of their lives. It should encourage pupils to appreciate human aspirations and achievements in aesthetic, scientific, technological and social fields, and prompt a personal response to a range of experiences and ideas.

By providing rich and varied contexts for pupils to acquire, develop and apply a broad range of knowledge, understanding and skills, the curriculum should enable pupils to think creatively and critically, to solve problems and to make a difference for the better. It should give them the opportunity to become creative, innovative, enterprising and capable of leadership to equip them for their future lives as workers and citizens. It should also develop their physical skills and encourage them to recognise the importance of pursuing a healthy lifestyle and keeping themselves and others safe.

Aim 2: The school curriculum should aim to promote pupils' spiritual, moral, social and cultural development and prepare all pupils for the opportunities, responsibilities and experiences of life.

The school curriculum should promote pupils' spiritual, moral, social and cultural development and, in particular, develop principles for distinguishing between right and wrong. It should develop their knowledge, understanding and appreciation of their own and different beliefs and cultures, and how these influence individuals and societies. The school curriculum should pass on enduring values, develop pupils' integrity and autonomy and help them to be responsible and caring citizens capable of contributing to the development of a just society. It should promote equal opportunities and enable pupils to challenge discrimination and stereotyping. It should develop their awareness and understanding of, and respect for, the environments in which they live, and secure their commitment to sustainable development at a personal, local, national and global level. It should also equip pupils as consumers to make informed judgements and independent decisions and to understand their responsibilities and rights.

The school curriculum should promote pupils' self-esteem and emotional well-being and help them to form and maintain worthwhile and satisfying relationships, based on respect for themselves and for others, at home, school, work and in the community. It should develop their ability to relate to others and work for the common good.

It should enable pupils to respond positively to opportunities, challenges and responsibilities, to manage risk and to cope with change and adversity. It should prepare pupils for the next steps in their education, training and employment and equip them to make informed choices at school and throughout their lives, enabling them to appreciate the relevance of their achievements to life and society outside school, including leisure, community engagement and employment.



The interdependence of the two aims

These two aims reinforce each other. The personal development of pupils, spiritually, morally, socially and culturally, plays a significant part in their ability to learn and to achieve. Development in both areas is essential to raising standards of attainment for all pupils.

The national framework and the purposes of the National Curriculum

The two broad aims for the school curriculum are reflected in section 78 of the Education Act 2002, which requires that all maintained schools provide a balanced and broadly based curriculum that:

- promotes the spiritual, moral, cultural, mental and physical development of pupils at the school and of society
- prepares pupils at the school for the opportunities, responsibilities and experiences of adult life.

The Act requires the Secretary of State, local authorities and the governing body and headteacher to take steps to achieve these requirements. The Secretary of State meets his responsibilities in this area by providing a national framework which incorporates the National Curriculum, religious education and other statutory requirements. This framework is designed to enable all schools to respond effectively to national and local priorities, to meet the individual learning needs of all pupils and to develop a distinctive character and ethos rooted in their local communities.

The four main purposes of the National Curriculum

To establish an entitlement

The National Curriculum secures for all pupils, irrespective of social background, culture, race, gender, differences in ability and disabilities, an entitlement to a number of areas of learning and to develop knowledge, understanding, skills and attitudes necessary for their self-fulfilment and development as active and responsible citizens.

To establish standards

The National Curriculum makes expectations for learning and attainment explicit to pupils, parents, teachers, governors, employers and the public, and establishes national standards for the performance of all pupils in the subjects it includes. These standards can be used to set targets for improvement, measure progress towards those targets, and monitor and compare performance between individuals, groups and schools.

To promote continuity and coherence

The National Curriculum contributes to a coherent national framework that promotes curriculum continuity and is sufficiently flexible to ensure progression in pupils' learning. It facilitates the transition of pupils between schools and phases of education and provides a foundation for lifelong learning.



To promote public understanding

The National Curriculum increases public understanding of, and confidence in, the work of schools and in the learning and achievements resulting from compulsory education. It provides a common basis for discussion of educational issues among lay and professional groups, including pupils, parents, teachers, governors and employers.

Developing the school curriculum

While these four purposes do not change over time, the curriculum itself cannot remain static. It must be responsive to changes in society and the economy, and changes in the nature of schooling itself. Teachers, individually and collectively, have to reappraise their teaching in response to the changing needs of their pupils and the impact of economic, social and cultural change. Education only flourishes if it successfully adapts to the demands and needs of the time.



About key stages 3 and 4

Where and when the National Curriculum applies

The National Curriculum applies to pupils of compulsory school age in community and foundation schools, including community special schools and foundation special schools, and voluntary aided and voluntary controlled schools. It is organised on the basis of four key stages¹, as shown here.

The Education Act 2002 extended the National Curriculum to include the foundation stage. This made the six areas of learning in the foundation stage the statutory curriculum for children aged 3–5.

	Key stage 1	Key stage 2	Key stage 3	Key stage 4	
Age	5–7	7–11	11–14	14–16	
Year groups	1–2	3–6	7–9	10–11	
English	■	■	■	■	National Curriculum core subjects
Mathematics	■	■	■	■	
Science	■	■	■	■	
Design and technology	■	■	■		National Curriculum non-core foundation subjects
Information and communication technology	■	■	■	■	
History	■	■	■		
Geography	■	■	■		
Modern foreign languages			■		
Art and design	■	■	■		
Music	■	■	■		
Physical education	■	■	■	■	
Citizenship			■	■	
Religious education	■	■	■	■	
Careers education			■	■	
Sex education			■	■	
Work-related learning				■	
Personal, social and health education	□	□	□	□	

■ Statutory
 □ Non-statutory

At key stage 4, the arts, design and technology, the humanities and modern foreign languages are statutory entitlement areas. Specific requirements are described on pages 200–203.

Schools have some discretion over when to start teaching the key stage programmes of study, as the law requires that programmes of study should be taught during the key stage, not that they be introduced at a particular time.

¹ The four key stages are defined precisely in section 82 of the Education Act 2002.

Using level descriptions

Assessing attainment at the end of key stage 3

In deciding on a pupil's level of attainment at the end of key stage 3, teachers should judge which description best fits the pupil's performance. When doing so, each description should be considered alongside descriptions for adjacent levels.

Arrangements for statutory assessment at the end of key stage 3 are set out in detail in QCA's annual booklets about assessment and reporting arrangements.

The level descriptions are not designed to assess individual pieces of work. They list aspects of attainment, based on the programmes of study, which teachers need to assess to build up a picture of a pupil's performance over time in a range of contexts.

Planning

Teachers' planning for schemes of work should start from the programmes of study and the needs and abilities of their pupils. Level descriptions can help to determine the degree of challenge and progression for work across each year of a key stage.

Reporting

Teachers are required to report annually to parents on pupils' progress. Although not designed to be used at the end of each year across the key stage, the level descriptions can be used as a basis to describe pupils' progress.

Target setting

To support target setting for pupils who achieve significantly below age-related expectations, performance criteria have been developed in English and mathematics leading to level 1 and within levels 1 and 2. In addition, performance criteria have been developed for pupils' personal and social development. These criteria were published in *Supporting the target setting process* (DfES/QCA 1998).

Links with qualifications

Scales used in approved national qualifications build on pupils' prior learning as set out in the programmes of study at key stage 3 and the level descriptions. Qualifications used by pupils of compulsory school age, whether in school, college or workplace, must be approved under section 96 of the Education Act 2000. Approved qualifications are listed in a DfES circular sent annually to schools and colleges. Pupils may be offered courses leading to the following qualifications:

- GCSE
- GCSE (short course)
- GCSE (double award)
- GNVQ (or GNVQ units) at foundation and intermediate level⁶
- NVQ (or NVQ units) at levels 1 and 2 (approved titles only)
- key skills unit in information technology
- entry level qualifications
- GCE AS level/A level
- other approved qualifications.

⁶ These will be a phased withdrawal of GNVQs from 2005–7.

Other requirements

Religious education

Religious education is a component of the basic curriculum, to be taught alongside the National Curriculum in all maintained schools. It must be taught to all registered pupils, except to those withdrawn by their parents, including those in school-based sixth forms. In all maintained schools, other than voluntary aided schools with a religious character, it must be taught according to a locally agreed syllabus. Each agreed syllabus should reflect the fact that the religious traditions in Great Britain are in the main Christian, while taking account of the teachings and practices of the other principal religions represented in Great Britain. The non-statutory national framework does not affect existing statutory rights and responsibilities for religious education.

Religious education makes a distinctive contribution to the school curriculum by developing pupils' knowledge and understanding of religious beliefs, teaching practices, ways of life and forms of expression. It enables pupils to consider and respond to a range of important questions related to their own spiritual development, their identity and belonging and their values and commitments.

The non-statutory national framework for religious education (published by QCA 2004) builds on previous guidance from QCA on religious education.

The framework:

- sets out non-statutory guidelines for religious education in England
- provides information to help those with responsibility for the provision and quality of religious education throughout the whole of the maintained system of education
- is set out in a similar format to the National Curriculum subjects
- seeks to establish national expectations in religious education, to improve the quality of teaching and learning in the subject and to clarify the nature and purpose of religious education in the curriculum.

The framework has been written mainly for:

- local education authorities (LEAs)
- Agreed Syllabus Conferences (ASCs)
- Standing Advisory Councils on Religious Education (SACREs).

The framework is also intended to:

- be of use to the relevant authorities with responsibility for schools with a religious character
- inform religious and secular communities about the scope of religious education.

The framework will also be of interest to:

- teachers, parents and pupils
- school governors, managers and leaders
- further education providers
- providers of teacher education and training
- inspectors and advisers
- resources developers
- others interested in religious education.

The framework is intended to benefit all pupils by helping to improve the quality of religious education across the country.

For the framework for key stage 3, see page 128. For key stage 4, see page 206.

The legal basis for religious education in most schools remains the locally agreed syllabus and, for schools with a religious character, its equivalent. The non-statutory national framework for religious education reproduced here is given for information purposes only.



Careers education

All schools must provide a programme of careers education for pupils during years 7–11, and an appropriate range of careers information. They must also allow officers from the Connexions Service access to pupils at key decision-making points during their education. Schools are encouraged to provide careers education for those in the sixth form.

Careers education contributes to the school curriculum by helping pupils manage progression in their learning and work as they move through school and beyond. Careers education helps pupils to choose and prepare for opportunities, responsibilities and experiences in education, training and employment that will contribute to their own fulfilment and to the well-being of others, including the wider society and economy.

Careers education contributes to pupils' personal effectiveness through its emphasis on transferable skills such as decision-making, handling information critically, self-awareness, action planning and review, negotiating and self-presentation. Pupils can use these skills to manage their self-development and career exploration as well as their career plans, decisions and routes.

DfES has published guidance for schools and colleges, *Careers education and guidance in England: a national framework 11–19* (DfES/0163/2003). The key stage 3 guidelines from the DfES guidance are reproduced on pages 130–132 of this booklet. The key stage 4 guidelines are on pages 208–211.

The careers education guidance builds on previous guidance, in particular:

- QCA's guidance on learning outcomes, *Learning outcomes from careers education and guidance* (QCA/99/359)
- the aims for careers education and guidance set out in *Looking forward* (School Curriculum and Assessment Authority 1995) and *Developing skills for career management* (QCA/01/751)
- local guidelines and frameworks developed by careers services and local education authorities in partnership with schools, colleges and others
- the decision-learning, opportunity awareness, transition and self-awareness model (DOTS).

Sex education

In secondary schools, headteachers and governors are required to provide a full programme of sex and relationship education to all pupils enrolled at the school. This, with the rest of PSHE, should ensure that the needs and concerns of their pupils are met appropriately. Parents have a right to withdraw their children from all or part of sex education, except that which forms part of the National Curriculum. The statutory aspects of sex education are located within the National Curriculum programmes of study for science.

The most appropriate context for sex and relationship provision is a wider programme of PSHE.

Schools must have regard to the DfES guidance for sex and relationship education (DfEE 0116/2000; www.dfes.gov.uk/sreguidance). This includes guidance on reviewing school policies as well as curriculum content and delivery. This guidance was circulated to schools in July 2000.



Work-related learning

There is a statutory requirement that schools include work-related learning within the curriculum for all students at key stage 4.

Work-related learning is defined as: planned activity that uses the context of work to develop knowledge, skills and understanding useful in work, including learning **through** the experience of work, learning **about** work and working practices, and learning the skills **for** work.

Therefore the statutory requirement is for schools to make provision for all students at key stage 4 to:

- learn **through** work, by providing opportunities for students to learn from direct experiences of work (for example, through work experience or part-time jobs, enterprise activities in schools and learning through vocational contexts in subjects)
- learn **about** work, by providing opportunities for students to develop knowledge and understanding of work and enterprise (for example, through vocational courses and careers education)
- learn **for** work by developing skills for enterprise and employability (for example through problem-solving activities, work simulations, and mock interviews).

This three-strand approach highlights that it is not skills and knowledge that are unique to work-related learning, but the context in which they are developed. Direct experience of the world of work (through a variety of activities) should be at the heart of work-related provision.

QCA has published guidance on implementing the statutory requirement for work-related learning in *Work-related learning for all at key stage 4* (QCA/03/1168).

While it is the responsibility of each school to determine the nature of provision and the opportunities to acquire work-related learning that each student will be given, it is a statutory requirement to have regard to this guidance. Ofsted will draw on the guidance to inspect provision of work-related learning.

QCA has also developed a non-statutory framework that sets out the suggested minimum experience for all young people. The framework is based on a long tradition in work-related learning and on existing practice in schools where work-related learning is a key feature of provision. It reflects current developments in 14–19 education and school–business links.

The framework comprises nine learning opportunities that together would deliver the statutory requirement. It also gives suggested minimum provision for each learning opportunity and outlines what students should be able to do as a result of their experience.

The possible learning outcomes are indicative rather than prescriptive. Schools should decide which learning opportunities and outcomes are most appropriate for their students.

For the work-related learning framework, see pages 212–215.



Learning across the National Curriculum⁷

Promoting spiritual, moral, social and cultural development across the National Curriculum

All National Curriculum subjects provide opportunities to promote pupils' spiritual, moral, social and cultural development. Explicit opportunities to promote pupils' development in these areas are provided in religious education, citizenship and the non-statutory framework for personal, social and health education⁸ (PSHE) at key stages 3 and 4. A significant contribution is also made by school ethos, effective relationships throughout the school, collective worship, and other curriculum activities.

- Pupils' *spiritual development* involves the growth of their sense of self, their unique potential, their understanding of their strengths and weaknesses, and their will to achieve. As their curiosity about themselves and their place in the world increases, they try to answer for themselves some of life's fundamental questions. They develop the knowledge, skills, understanding, qualities and attitudes they need to foster their own inner lives and non-material well-being.
- Pupils' *moral development* involves pupils acquiring an understanding of the difference between right and wrong and of moral conflict, a concern for others and the will to do what is right. They are able and willing to reflect on the consequences of their actions and learn how to forgive themselves and others. They develop the knowledge, skills, understanding, qualities and attitudes they need in order to make responsible moral decisions and to act on them.
- Pupils' *social development* involves pupils acquiring an understanding of the responsibilities and rights of being members of families and communities (local, national and global), and an ability to relate to others and to work with others for the common good. They display a sense of belonging and an increasing willingness to participate. They develop the knowledge, skills, understanding, qualities and attitudes they need to make an active contribution to the democratic process in each of their communities.
- Pupils' *cultural development* involves pupils acquiring an understanding of cultural traditions and an ability to appreciate and respond to a variety of aesthetic experiences. They acquire a respect for their own culture and that of others, an interest in others' ways of doing things and curiosity about differences. They develop the knowledge, skills, understanding, qualities and attitudes they need to understand, appreciate and contribute to culture.

Promoting personal, social and health education

Guidelines are provided in this handbook to help schools establish coherence and consistency, and to promote curriculum continuity and progression in pupils' learning in PSHE. These complement the statutory requirements for citizenship, introduced in 2002.

Promoting skills across the National Curriculum

At all key stages, pupils learn, practise, combine, develop and refine a wide range of skills in their work across the National Curriculum. Some of these skills

⁷ Additional information on opportunities to promote learning across the National Curriculum is included in the subject booklets.

⁸ Guidelines for the non-statutory framework are included on pages 134–136 (KS3) and 216–218 (KS4) of this handbook.

are subject specific (painting in art and design), some are common to several subjects (enquiry skills in science, history and geography).

Some skills are universal, for example the skills of communication, improving own learning and performance, and creative thinking. These skills are also embedded in the subjects of the National Curriculum and are essential to effective learning.

Opportunities for teaching and learning all these skills across the key stages can be identified when planning. Pupils can be encouraged to reflect on what and on how they learn, and how these skills can be applied to different subjects, different problems and real-life situations.

Key skills

Six skill areas are described as key skills because they help learners to improve their learning and performance in education, work and life. These key skills are embedded in the National Curriculum.

Communication

The key skill of communication includes skills in speaking, listening, reading and writing. Skills in speaking and listening include the ability to speak effectively for different audiences; to listen, understand and respond appropriately to others; and to participate effectively in group discussion. Skills in reading and writing include the ability to read fluently a range of literary and non-fiction texts and to reflect critically on what is read; and the ability to write fluently for a range of purposes and audiences, including critical analysis of their own and others' writing. Opportunities for developing this key skill are provided through English in particular and through pupils' use of language across the curriculum.

Application of number

The key skill of application of number includes developing a range of mental calculation skills and the ability to apply them within a variety of contexts. Skills include developing the understanding and use of mathematical language related to numbers and calculations in order to process data, solve increasingly complex problems and explain the reasoning used. Pupils need to be able to apply calculation skills and the understanding of number to problems in other National Curriculum subjects and to real-life situations. Opportunities for developing this key skill are provided explicitly in mathematics.

Information technology

The key skill of information technology includes the ability to use a range of information sources and ICT tools to find, analyse, interpret, evaluate and present information for a range of purposes. Skills include the ability to make critical and informed judgements about when and how to use ICT for maximum benefit in accessing information, in solving problems or for expressive work. The ability to use ICT information sources includes enquiry and decision-making skills, as well as information-processing and creative thinking skills and the ability to review, modify and evaluate work with ICT. Opportunities for developing this key skill are provided explicitly through the subject of ICT and through pupils' use of ICT across the curriculum.



Working with others

The key skill of working with others includes the ability to contribute to small-group and whole-class discussion, and to work with others to meet a challenge. If pupils are to work with others they must develop social skills and a growing awareness and understanding of others' needs. All subjects provide opportunities for pupils to cooperate and work effectively with others in formal and informal settings, to appreciate the experience of others and consider different perspectives, and to benefit from what others think, say and do.

Improving own learning and performance

The key skill of improving own learning and performance involves pupils reflecting on and critically evaluating their work and what they have learnt, and identifying ways to improve their learning and performance. They need to be able to identify the purposes of learning, to reflect on the processes of learning, to assess progress in learning, to identify obstacles or problems in learning and to plan ways to improve learning. All subjects provide opportunities for pupils to review their work and discuss ways to improve their learning.

Problem solving

The key skill of problem solving involves pupils developing the skills and strategies that will help them to solve the problems they face in learning and in life. Problem solving includes the skills of identifying and understanding a problem, planning ways to solve a problem, monitoring progress in tackling a problem and reviewing solutions to problems. All subjects provide pupils with opportunities to respond to the challenge of problems and to plan, test, modify and review the progress needed to achieve particular outcomes.

Thinking skills

By using thinking skills pupils can focus on 'knowing how' as well as 'knowing what' – learning how to learn. The following thinking skills complement the key skills and are embedded in the National Curriculum.

Information-processing skills

These enable pupils to locate and collect relevant information, to sort, classify, sequence, compare and contrast, and to analyse part/whole relationships.

Reasoning skills

These enable pupils to give reasons for opinions and actions, to draw inferences and make deductions, to use precise language to explain what they think, and to make judgements and decisions informed by reasons or evidence.

Enquiry skills

These enable pupils to ask relevant questions, to pose and define problems, to plan what to do and how to research, to predict outcomes and anticipate consequences, and to test conclusions and improve ideas.

Creative thinking skills

These enable pupils to generate and extend ideas, to suggest hypotheses, to apply imagination, and to look for alternative innovative outcomes.



Evaluation skills

These enable pupils to evaluate information, to judge the value of what they read, hear and do, to develop criteria for judging the value of their own and others' work or ideas, and to have confidence in their judgements.

Promoting other aspects of the school curriculum**Financial capability**

Financial capability is about making competent decisions in relation to managing money and planning finances for the future. It helps pupils to make independent and informed decisions about budgeting, spending, saving and investing, using credit, avoiding debt, and obtaining value for money. It helps pupils to understand their own and others' needs and to consider the effects of their decisions on individuals, groups, families, and communities and at a national level. Pupils should be able to understand the financial implications of their choices and to leave school prepared to be confident and knowledgeable consumers, aware of their responsibilities and rights.

There are opportunities for pupils to develop financial capability within the school curriculum, in particular in their work in mathematics, PSHE and citizenship, as well as through involvement in other school activities such as work with business and the community.

Enterprise and entrepreneurial skills

Changing patterns of work mean that many young people will consider self-employment at some point in their working lives. Pupils should therefore develop skills and attitudes that will prepare them for this as a career option. Many aspects of the curriculum at all key stages provide opportunities for developing enterprise and entrepreneurial skills.

Enterprise can be associated with a set of attributes, skills and attitudes that enable people to create and thrive on change. Enterprise education enables pupils to develop confidence, self-reliance and willingness to embrace change. Through participation in mini-enterprises pupils can practise risk management, learning from mistakes and being innovative.

Entrepreneurialism is the creation of wealth through the development of new and small businesses. Opportunities can be provided for pupils to learn about and explore the role of individuals in sustaining and developing the economy and society and to develop the entrepreneurial characteristics of tenacity, independence, innovation, imagination, risk-taking, creativity, intuition and leadership.

Education for sustainable development

Education for sustainable development enables pupils to develop the knowledge, skills, understanding and values to participate in decisions about the way we do things individually and collectively, both locally and globally, that will improve the quality of life now without damaging the planet for the future. There are opportunities for pupils to develop their understanding of sustainable development within the school curriculum, in particular in their work in geography, science, D&T and citizenship.



The National Curriculum programmes of study



A common structure and design for all subjects

The programmes of study

The National Curriculum programmes of study have been given a common structure and a common design.

In each subject, at each key stage, the main column **1** contains the programme of study, which sets out two sorts of requirements:

- **Knowledge, skills and understanding** **2** – what has to be taught in the subject during the key stage
- **Breadth of study** **3** – the contexts, activities, areas of study and range of experiences through which the **Knowledge, skills and understanding** should be taught.

Schools are not required by law to teach the content in *grey type*. This includes the examples in the main column **4** [printed inside square brackets], all text in the margins **5** and information and examples in the inclusion statement. In the programmes of study *italic type* is used to emphasise options, where schools and teachers can choose between requirements.

The programmes of study for English, mathematics and science

The programmes of study for English and science contain sections that correspond directly to the attainment targets for each subject. In mathematics this one-to-one correspondence does not hold for all key stages – see the mathematics programme of study for more information. In English, the three sections of the programme of study each contain **Breadth of study** requirements. In mathematics and science there is a single, separate set of **Breadth of study** requirements for each key stage.

The programmes of study in the non-core foundation subjects

In these subjects (except for citizenship) the programme of study simply contains two sets of requirements – **Knowledge, skills and understanding** and **Breadth of study**. The programmes of study for citizenship contain no **Breadth of study** requirements.

Information in the margins

At the start of each key stage, the margin begins with a summary **6** of the main things that pupils will learn during the key stage. The margins also contain four other types of non-statutory information:

- notes giving key information that should be taken into account when teaching the subject
- notes giving definitions of words and phrases in the programmes of study
- suggested opportunities for pupils to use information and communication technology (ICT) as they learn the subject
- some key links with other subjects indicating connections between teaching requirements, and suggesting how a requirement in one subject can build on the requirements in another in the same key stage.



The referencing system

References work as follows:

A reference in reads and means ...
Physical education key stage 2	11a, 11b → links to other subjects These requirements build on Gg/2c.	Physical education key stage 2, requirements 11a and 11b build on geography (key stage 2), paragraph 2, requirement c.
Art and design key stage 1	4a → links to other subjects This requirement builds on Ma3/2a, 2c, 2d.	Art and design key stage 1, requirement 4a builds on mathematics (key stage 1), Ma3 Shape, space and measures, paragraph 2, requirements a, c and d.
Citizenship key stage 3	1a → links to other subjects This requirement builds on Hi/10, 13.	Citizenship key stage 3, requirement 1a builds on history (key stage 3) paragraphs 10 and 13.

The attainment targets

The attainment targets **7** are at the end of this handbook. They can be read alongside the programmes of study by folding out the booklet.



General teaching requirements



Inclusion: providing effective learning opportunities for all pupils

Schools have a responsibility to provide a broad and balanced curriculum for all pupils. The National Curriculum is the starting point for planning a school curriculum that meets the specific needs of individuals and groups of pupils. This statutory inclusion statement on providing effective learning opportunities for all pupils outlines how teachers can modify, as necessary, the National Curriculum programmes of study to provide all pupils with relevant and appropriately challenging work at each key stage¹. It sets out three principles that are essential to developing a more inclusive curriculum:

- A Setting suitable learning challenges
- B Responding to pupils' diverse learning needs
- C Overcoming potential barriers to learning and assessment for individuals and groups of pupils.

Applying these principles should keep to a minimum the need for aspects of the National Curriculum to be disapplied for a pupil.

Schools are able to provide other curricular opportunities outside the National Curriculum to meet the needs of individuals or groups of pupils such as speech and language therapy and mobility training.

Three principles for inclusion

In planning and teaching the National Curriculum, teachers are required to have due regard to the following principles.

A Setting suitable learning challenges

- 1 Teachers should aim to give every pupil the opportunity to experience success in learning and to achieve as high a standard as possible. The National Curriculum programmes of study set out what most pupils should be taught at each key stage – but teachers should teach the knowledge, skills and understanding in ways that suit their pupils' abilities. This may mean choosing knowledge, skills and understanding from earlier or later key stages so that individual pupils can make progress and show what they can achieve. Where it is appropriate for pupils to make extensive use of content from an earlier key stage, there may not be time to teach all aspects of the age-related programmes of study. A similarly flexible approach will be needed to take account of any gaps in pupils' learning resulting from missed or interrupted schooling [for example, that may be experienced by travellers, refugees, those in care or those

¹ Additional information about inclusion is included in the subject booklets.



with long-term medical conditions, including pupils with neurological problems, such as head injuries, and those with degenerative conditions].

- 2 For pupils whose attainments fall significantly below the expected levels at a particular key stage, a much greater degree of differentiation will be necessary. In these circumstances, teachers may need to use the content of the programmes of study as a resource or to provide a context, in planning learning appropriate to the age and requirements of their pupils.²
- 3 For pupils whose attainments significantly exceed the expected level of attainment within one or more subjects during a particular key stage, teachers will need to plan suitably challenging work. As well as drawing on materials from later key stages or higher levels of study, teachers may plan further differentiation by extending the breadth and depth of study within individual subjects or by planning work which draws on the content of different subjects.³

B Responding to pupils' diverse learning needs

- 1 When planning, teachers should set high expectations and provide opportunities for all pupils to achieve, including boys and girls, pupils with special educational needs, pupils with disabilities, pupils from all social and cultural backgrounds, pupils of different ethnic groups including travellers, refugees and asylum seekers, and those from diverse linguistic backgrounds. Teachers need to be aware that pupils bring to school different experiences, interests and strengths which will influence the way in which they learn. Teachers should plan their approaches to teaching and learning so that all pupils can take part in lessons fully and effectively.
- 2 To ensure that they meet the full range of pupils' needs, teachers should be aware of the requirements of the equal opportunities legislation that covers gender, race and disability.⁴
- 3 Teachers should take specific action to respond to pupils' diverse needs by:
 - a creating effective learning environments
 - b securing their motivation and concentration
 - c providing equality of opportunity through teaching approaches
 - d using appropriate assessment approaches
 - e setting targets for learning.

Examples for B/3a – creating effective learning environments

Teachers create effective learning environments in which:

- the contribution of all pupils is valued
- all pupils can feel secure and are able to contribute appropriately
- stereotypical views are challenged and pupils learn to appreciate and view positively differences in others, whether arising from race, gender, ability or disability

² Teachers may find QCA's guidance on planning work for pupils with learning difficulties a helpful companion to the programmes of study.

³ Teachers may find QCA's guidance on meeting the requirements of gifted and talented pupils a helpful companion to the programmes of study.

⁴ The Sex Discrimination Act 1975, the Race Relations Act 1976, the Disability Discrimination Act 1995.



- pupils learn to take responsibility for their actions and behaviours both in school and in the wider community
- all forms of bullying and harassment, including racial harassment, are challenged
- pupils are enabled to participate safely in clothing appropriate to their religious beliefs, particularly in subjects such as science, design and technology and physical education.

Examples for B/3b – securing motivation and concentration

Teachers secure pupils’ motivation and concentration by:

- using teaching approaches appropriate to different learning styles
- using, where appropriate, a range of organisational approaches, such as setting, grouping or individual work, to ensure that learning needs are properly addressed
- varying subject content and presentation so that this matches their learning needs
- planning work which builds on their interests and cultural experiences
- planning appropriately challenging work for those whose ability and understanding are in advance of their language skills
- using materials which reflect social and cultural diversity and provide positive images of race, gender and disability
- planning and monitoring the pace of work so that they all have a chance to learn effectively and achieve success
- taking action to maintain interest and continuity of learning for pupils who may be absent for extended periods of time.

Examples for B/3c – providing equality of opportunity

Teaching approaches that provide equality of opportunity include:

- ensuring that boys and girls are able to participate in the same curriculum, particularly in science, design and technology and physical education
- taking account of the interests and concerns of boys and girls by using a range of activities and contexts for work and allowing a variety of interpretations and outcomes, particularly in English, science, design and technology, ICT, art and design, music and physical education
- avoiding gender stereotyping when organising pupils into groups, assigning them to activities or arranging access to equipment, particularly in science, design and technology, ICT, music and physical education
- taking account of pupils’ specific religious or cultural beliefs relating to the representation of ideas or experiences or to the use of particular types of equipment, particularly in science, design and technology, ICT and art and design
- enabling the fullest possible participation of pupils with disabilities or particular medical needs in all subjects, offering positive role models and making provision, where necessary, to facilitate access to activities with appropriate support, aids or adaptations. (See **Overcoming potential barriers to learning and assessment for individuals and groups of pupils.**)



Examples for B/3d – using appropriate assessment approaches

Teachers use appropriate assessment approaches that:

- allow for different learning styles and ensure that pupils are given the chance and encouragement to demonstrate their competence and attainment through appropriate means
- are familiar to the pupils and for which they have been adequately prepared
- use materials which are free from discrimination and stereotyping in any form
- provide clear and unambiguous feedback to pupils to aid further learning.

Examples for B/3e – setting targets for learning

Teachers set targets for learning that:

- build on pupils' knowledge, experiences, interests and strengths to improve areas of weakness and demonstrate progression over time
- are attainable and yet challenging and help pupils to develop their self-esteem and confidence in their ability to learn.

C Overcoming potential barriers to learning and assessment for individuals and groups of pupils

A minority of pupils will have particular learning and assessment requirements which go beyond the provisions described in sections A and B and, if not addressed, could create barriers to learning. These requirements are likely to arise as a consequence of a pupil having a special educational need or disability or may be linked to a pupil's progress in learning English as an additional language.

- 1 Teachers must take account of these requirements and make provision, where necessary, to support individuals or groups of pupils to enable them to participate effectively in the curriculum and assessment activities. During end of key stage assessments, teachers should bear in mind that special arrangements are available to support individual pupils.

Pupils with special educational needs

- 2 Curriculum planning and assessment for pupils with special educational needs must take account of the type and extent of the difficulty experienced by the pupil. Teachers will encounter a wide range of pupils with special educational needs, some of whom will also have disabilities (see paragraphs C/4 and C/5). In many cases, the action necessary to respond to an individual's requirements for curriculum access will be met through greater differentiation of tasks and materials, consistent with school-based intervention as set out in the SEN Code of Practice. A smaller number of pupils may need access to specialist equipment and approaches or to alternative or adapted activities, consistent with school-based intervention augmented by advice and support from external specialists as described in the SEN Code of Practice, or, in exceptional circumstances, with a statement of special educational need.



Teachers should, where appropriate, work closely with representatives of other agencies who may be supporting the pupil.

- 3 Teachers should take specific action to provide access to learning for pupils with special educational needs by:
 - a providing for pupils who need help with communication, language and literacy
 - b planning, where necessary, to develop pupils' understanding through the use of all available senses and experiences
 - c planning for pupils' full participation in learning and in physical and practical activities
 - d helping pupils to manage their behaviour, to take part in learning effectively and safely, and, at key stage 4, to prepare for work
 - e helping individuals to manage their emotions, particularly trauma or stress, and to take part in learning.

Examples for C/3a – helping with communication, language and literacy

Teachers provide for pupils who need help with communication, language and literacy through:

- using texts that pupils can read and understand
- using visual and written materials in different formats, including large print, symbol text and Braille
- using ICT, other technological aids and taped materials
- using alternative and augmentative communication, including signs and symbols
- using translators, communicators and amanuenses.

Examples for C/3b – developing understanding

Teachers develop pupils' understanding through the use of all available senses and experiences, by:

- using materials and resources that pupils can access through sight, touch, sound, taste or smell
- using word descriptions and other stimuli to make up for a lack of first-hand experiences
- using ICT, visual and other materials to increase pupils' knowledge of the wider world
- encouraging pupils to take part in everyday activities such as play, drama, class visits and exploring the environment.

Examples for C/3c – planning for full participation

Teachers plan for pupils' full participation in learning and in physical and practical activities through:

- using specialist aids and equipment
- providing support from adults or peers when needed
- adapting tasks or environments
- providing alternative activities, where necessary.



Examples for C/3d – managing behaviour

Teachers help pupils to manage their behaviour, take part in learning effectively and safely, and, at key stage 4, prepare for work by:

- setting realistic demands and stating them explicitly
- using positive behaviour management, including a clear structure of rewards and sanctions
- giving pupils every chance and encouragement to develop the skills they need to work well with a partner or a group
- teaching pupils to value and respect the contribution of others
- encouraging and teaching independent working skills
- teaching essential safety rules.

Examples for C/3e – managing emotions

Teachers help individuals manage their emotions and take part in learning through:

- identifying aspects of learning in which the pupil will engage and plan short-term, easily achievable goals in selected activities
- providing positive feedback to reinforce and encourage learning and build self-esteem
- selecting tasks and materials sensitively to avoid unnecessary stress for the pupil
- creating a supportive learning environment in which the pupil feels safe and is able to engage with learning
- allowing time for the pupil to engage with learning and gradually increasing the range of activities and demands.

Pupils with disabilities

- 4 Not all pupils with disabilities will necessarily have special educational needs. Many pupils with disabilities learn alongside their peers with little need for additional resources beyond the aids which they use as part of their daily life, such as a wheelchair, a hearing aid or equipment to aid vision. Teachers must take action, however, in their planning to ensure that these pupils are enabled to participate as fully and effectively as possible within the National Curriculum and the statutory assessment arrangements. Potential areas of difficulty should be identified and addressed at the outset of work, without recourse to the formal provisions for disapplication.
- 5 Teachers should take specific action to enable the effective participation of pupils with disabilities by:
 - a planning appropriate amounts of time to allow for the satisfactory completion of tasks
 - b planning opportunities, where necessary, for the development of skills in practical aspects of the curriculum
 - c identifying aspects of programmes of study and attainment targets that may present specific difficulties for individuals.



Examples for C/5a – planning to complete tasks

Teachers plan appropriate amounts of time to allow pupils to complete tasks satisfactorily through:

- taking account of the very slow pace at which some pupils will be able to record work, either manually or with specialist equipment, and of the physical effort required
- being aware of the high levels of concentration necessary for some pupils when following or interpreting text or graphics, particularly when using vision aids or tactile methods, and of the tiredness which may result
- allocating sufficient time, opportunity and access to equipment for pupils to gain information through experimental work and detailed observation, including the use of microscopes
- being aware of the effort required by some pupils to follow oral work, whether through use of residual hearing, lip reading or a signer, and of the tiredness or loss of concentration which may occur.

Examples for C/5b – developing skills in practical aspects

Teachers create opportunities for the development of skills in practical aspects of the curriculum through:

- providing adapted, modified or alternative activities or approaches to learning in physical education and ensuring that these have integrity and equivalence to the National Curriculum and enable pupils to make appropriate progress
- providing alternative or adapted activities in science, art and design and design and technology for pupils who are unable to manipulate tools, equipment or materials or who may be allergic to certain types of materials
- ensuring that all pupils can be included and participate safely in geography fieldwork, local studies and visits to museums, historic buildings and sites.

Examples for C/5c – overcoming specific difficulties

Teachers overcome specific difficulties for individuals presented by aspects of the programmes of study and attainment targets through:

- using approaches to enable hearing impaired pupils to learn about sound in science and music
- helping visually impaired pupils to learn about light in science, to access maps and visual resources in geography and to evaluate different products in design and technology and images in art and design
- providing opportunities for pupils to develop strength in depth where they cannot meet the particular requirements of a subject, such as the visual requirements in art and design and the singing requirements in music
- discounting these aspects in appropriate individual cases when required to make a judgement against level descriptions.



Pupils who are learning English as an additional language

- 6 Pupils for whom English is an additional language have diverse needs in terms of support necessary in English language learning. Planning should take account of such factors as the pupil's age, length of time in this country, previous educational experience and skills in other languages. Careful monitoring of each pupil's progress in the acquisition of English language skills and of subject knowledge and understanding will be necessary to confirm that no learning difficulties are present.
- 7 The ability of pupils for whom English is an additional language to take part in the National Curriculum may be ahead of their communication skills in English. Teachers should plan learning opportunities to help pupils develop their English and should aim to provide the support pupils need to take part in all subject areas.
- 8 Teachers should take specific action to help pupils who are learning English as an additional language by:
 - a developing their spoken and written English
 - b ensuring access to the curriculum and to assessment.

Examples for C/8a – developing spoken and written English

Teachers develop pupils' spoken and written English through:

- ensuring that vocabulary work covers both the technical and everyday meaning of key words, metaphors and idioms
- explaining clearly how speaking and writing in English are structured to achieve different purposes, across a range of subjects
- providing a variety of reading material [for example, pupils' own work, the media, ICT, literature, reference books] that highlight the different ways English is used, especially those that help pupils to understand society and culture
- ensuring that there are effective opportunities for talk and that talk is used to support writing in all subjects
- where appropriate, encouraging pupils to transfer their knowledge, skills and understanding of one language to another, pointing out similarities and differences between languages
- building on pupils' experiences of language at home and in the wider community, so that their developing uses of English and other languages support one another.

Examples for C/8b – ensuring access

Teachers make sure pupils have access to the curriculum and to assessment through:

- using accessible texts and materials that suit pupils' ages and levels of learning
- providing support by using ICT or video or audio materials, dictionaries and translators, readers and amanuenses
- using home or first language, where appropriate.



Use of language across the curriculum

- 1 Pupils should be taught in all subjects to express themselves correctly and appropriately and to read accurately and with understanding. Since standard English, spoken and written, is the predominant language in which knowledge and skills are taught and learned, pupils should be taught to recognise and use standard English.

Writing

- 2 In writing, pupils should be taught to use correct spelling and punctuation and follow grammatical conventions. They should also be taught to organise their writing in logical and coherent forms.

Speaking

- 3 In speaking, pupils should be taught to use language precisely and cogently.

Listening

- 4 Pupils should be taught to listen to others, and to respond and build on their ideas and views constructively.

Reading

- 5 In reading, pupils should be taught strategies to help them read with understanding, to locate and use information, to follow a process or argument and summarise, and to synthesise and adapt what they learn from their reading.
- 6 Pupils should be taught the technical and specialist vocabulary of subjects and how to use and spell these words. They should also be taught to use the patterns of language vital to understanding and expression in different subjects. These include the construction of sentences, paragraphs and texts that are often used in a subject [for example, language to express causality, chronology, logic, exploration, hypothesis, comparison, and how to ask questions and develop arguments].



Use of information and communication technology across the curriculum

- 1 Pupils should be given opportunities¹ to apply and develop their ICT capability through the use of ICT tools to support their learning in all subjects (with the exception of physical education at key stages 1 and 2).
- 2 Pupils should be given opportunities to support their work by being taught to:
 - a find things out from a variety of sources, selecting and synthesising the information to meet their needs and developing an ability to question its accuracy, bias and plausibility
 - b develop their ideas using ICT tools to amend and refine their work and enhance its quality and accuracy
 - c exchange and share information, both directly and through electronic media
 - d review, modify and evaluate their work, reflecting critically on its quality, as it progresses.

¹ At key stage 1, there are no statutory requirements to teach the use of ICT in the programmes of study for the non-core foundation subjects. Teachers should use their judgement to decide where it is appropriate to teach the use of ICT across these subjects at key stage 1. At other key stages, there are statutory requirements to use ICT in all subjects, except physical education.



Health and safety

- 1 This statement applies to science, design and technology, information and communication technology, art and design, and physical education.
- 2 When working with tools, equipment and materials, in practical activities and in different environments, including those that are unfamiliar, pupils should be taught:
 - a about hazards, risks and risk control
 - b to recognise hazards, assess consequent risks and take steps to control the risks to themselves and others
 - c to use information to assess the immediate and cumulative risks
 - d to manage their environment to ensure the health and safety of themselves and others
 - e to explain the steps they take to control risks.



Key stage 3 programmes of study



Six Views of A Waterfall

When the river threw itself off the cliff
It spun a twist of rope
So as not to lose touch with itself

'Poem' is deliberately meant to confuse and disorientate people who may be looking for traditional, archaic, 'proper' poetry. By giving it a title that does not relate to anything, Armitage sets out to challenge expectations of British poetry. The poem is written in a traditional, rhyming structure, but this ~~only~~ only ~~to~~ increases its ambiguity. Starting the poem with 'and' suggests that this is not really the beginning, and that the reader is 'listening in' on a ~~longer~~ longer monologue.

Humanlife on One



The human crouches in the shadows, patiently awaiting his victim. His sharp, darting eyes watch every movement, his ears listening and alert. A fellow predator, an enemy from another pack, catches his eye. He is also watching for the same prey. They both try to reach the best spot, while simultaneously attempting to look inconspicuous. His weapon, deadly to his prey, hidden in his pouch, is ready to be whipped out at any second. A tiny movement within the hunted's safe-haven causes the hunter to become stone-still, ready to pounce when the time is right. The entry of the victim's habitat opens. A small face peeks out, clad in sunglasses and baseball cap, the face barely visible. The pitiful disguise is unsuccessful: the hunter is not discouraged. He remains perfectly still, waiting for the right moment. The prey glances around suspiciously, but assured she is not being watched, the face becomes a full body, creeping out into the open. Only now does the predator spring into action, leaping from the shadows, whipping out his camera and, before the victim can scream, "NO PHOTOS," the deed is done, the exclusive photo taken. The A-list celebrity is indeed becoming an endangered species.

The value of English in the curriculum? What can I say?
Without English, nothing. And without good English,
nothing very well.

Anne Fine, Author

English is the language of the future, the language of the
computer. English is the most important tool you'll ever
need, no matter what career you choose. You have the right
to English. Make it your right!

Benjamin Zephaniah, Poet, Writer, Actor, TV & Radio Presenter

A good book, studied with a good English teacher, takes you
on a journey in search of answers to the crucial questions in
life you didn't even know you wanted (or needed) to ask.

Professor Lisa Jardine, Queen Mary & Westfield College, University of London

Studying English literature at school was my first, and
probably my biggest, step towards mental freedom and
independence. It was like falling in love with life.

Ian McEwan, Novelist

English

The importance of English

English is a vital way of communicating
in school, in public life and internationally.
Literature in English is rich and influential,
reflecting the experience of people from
many countries and times.
In studying English pupils develop skills
in speaking, listening, reading and writing.

It enables them to express themselves
creatively and imaginatively and to
communicate with others effectively.
Pupils learn to become enthusiastic and
critical readers of stories, poetry and drama
as well as non-fiction and media texts.
The study of English helps pupils understand
how language works by looking at its
patterns, structures and origins. Using this
knowledge pupils can choose and adapt what
they say and write in different situations.

Key stage 3 programme of study

English

In English, during key stage 3 pupils develop confidence in speaking and writing for public and formal purposes. They also develop their ability to evaluate the way language is used. They read classic and contemporary texts and explore social and moral issues.

Speaking and listening: during key stage 3 pupils learn to speak and listen confidently in a wide variety of contexts. They learn to be flexible, adapting what they say and how they say it to different situations and people. When they speak formally or to people they do not know, they are articulate and fluent in their use of spoken standard English. They learn how to evaluate the contributions they, and others, have made to discussions and drama activities. They take leading and other roles in group work.

Teaching should ensure that work in **speaking and listening, reading and writing** is integrated.

En1 Speaking and listening

Knowledge, skills and understanding

Speaking

- 1 To speak fluently and appropriately in different contexts, adapting their talk for a range of purposes and audiences, including the more formal, pupils should be taught to:
 - a structure their talk clearly, using markers so that their listeners can follow the line of thought
 - b use illustrations, evidence and anecdote to enrich and explain their ideas
 - c use gesture, tone, pace and rhetorical devices for emphasis
 - d use visual aids and images to enhance communication
 - e vary word choices, including technical vocabulary, and sentence structure for different audiences
 - f use spoken standard English fluently in different contexts
 - g evaluate the effectiveness of their speech and consider how to adapt it to a range of situations.

Listening

- 2 To listen, understand and respond critically to others, pupils should be taught to:
 - a concentrate on and recall the main features of a talk, reading, radio or television programme
 - b identify the major elements of what is being said both explicitly and implicitly
 - c distinguish features of presentation where a speaker aims to explain, persuade, amuse or argue a case
 - d distinguish tone, undertone, implications and other signs of a speaker's intentions
 - e recognise when a speaker is being ambiguous or deliberately vague, glosses over points, uses and abuses evidence and makes unsubstantiated statements
 - f ask questions and give relevant and helpful comments.

Group discussion and interaction

- 3 To participate effectively as members of different groups, pupils should be taught to:
 - a make different types of contributions to groups, adapting their speech to their listeners and the activity
 - b take different views into account and modify their own views in the light of what others say

- c sift, summarise and use the most important points
- d take different roles in the organisation, planning and sustaining of groups
- e help the group to complete its tasks by varying contributions appropriately, clarifying and synthesising others' ideas, taking them forward and building on them to reach conclusions, negotiating consensus or agreeing to differ.

Drama

- 4 To participate in a range of drama activities and to evaluate their own and others' contributions, pupils should be taught to:
 - a use a variety of dramatic techniques to explore ideas, issues, texts and meanings
 - b use different ways to convey action, character, atmosphere and tension when they are scripting and performing in plays [for example, through dialogue, movement, pace]
 - c appreciate how the structure and organisation of scenes and plays contribute to dramatic effect
 - d evaluate critically performances of dramas that they have watched or in which they have taken part.

Standard English

- 5 Pupils should be taught to use the vocabulary, structures and grammar of spoken standard English fluently and accurately in informal and formal situations.

Language variation

- 6 Pupils should be taught about how language varies, including:
 - a the importance of standard English as the language of public communication nationally and often internationally
 - b current influences on spoken and written language
 - c attitudes to language use
 - d the differences between speech and writing
 - e the vocabulary and grammar of standard English and dialectal variation
 - f the development of English, including changes over time, borrowings from other languages, origins of words, and the impact of electronic communication on written language.

Note on standard English

The paragraphs on **standard English**, **language variation**, **language structure** and **language structure and variation** in **speaking and listening**, **reading** and **writing** provide a coherent basis for language study.

Note for 5

When teaching **standard English** it is helpful to bear in mind the most common non-standard usages in England:

- subject–verb agreement (they was)
- formation of past tense (have fell, I done)
- formation of negatives (ain't)
- formation of adverbs (come quick)
- use of demonstrative pronouns (them books)
- use of pronouns (me and him went)
- use of prepositions (out the door).

Note for 10

Interaction may be face-to-face or by electronic means.

Breadth of study

- 7 During the key stage, pupils should be taught the **Knowledge, skills and understanding** through the following range of activities, contexts and purposes.

Speaking

- 8 The range of purposes should include:
- a describing, narrating, explaining, arguing, persuading, entertaining and pupils should be given opportunities to make:
 - b extended contributions to talk in different contexts and groups
 - c presentations to different audiences.

Listening

- 9 The range should include listening to and watching:
- a live talks and presentations
 - b recordings [for example, radio, television, film]
 - c discussions in which pupils respond straight away.

Group discussion and interaction

- 10 The range of purposes should include:
- a exploring, hypothesising, debating, analysing and pupils should be given opportunities to:
 - b take different roles in groups [for example, roles in organising or leading discussion, supporting others, enabling focused talk].

Drama activities

- 11 The range should include:
- a improvisation and working in role
 - b devising, scripting and performing in plays
 - c discussing and reviewing their own and others' performances.

En2 Reading

Knowledge, skills and understanding

Understanding texts

1 To develop understanding and appreciation of texts, pupils should be taught:

Reading for meaning

- a to extract meaning beyond the literal, explaining how the choice of language and style affects implied and explicit meanings
- b to analyse and discuss alternative interpretations, ambiguity and allusion
- c how ideas, values and emotions are explored and portrayed
- d to identify the perspectives offered on individuals, community and society
- e to consider how meanings are changed when texts are adapted to different media
- f to read and appreciate the scope and richness of complete novels, plays and poems

Understanding the author's craft

- g how language is used in imaginative, original and diverse ways
- h to reflect on the writer's presentation of ideas and issues, the motivation and behaviour of characters, the development of plot and the overall impact of a text
- i to distinguish between the attitudes and assumptions of characters and those of the author
- j how techniques, structure, forms and styles vary
- k to compare texts, looking at style, theme and language, and identifying connections and contrasts.

English literary heritage

2 Pupils should be taught:

- a how and why texts have been influential and significant [for example, the influence of Greek myths, the Authorised Version of the Bible, the Arthurian legends]
- b the characteristics of texts that are considered to be of high quality
- c the appeal and importance of these texts over time.

Texts from different cultures and traditions

3 Pupils should be taught:

- a to understand the values and assumptions in the texts
- b the significance of the subject matter and the language
- c the distinctive qualities of literature from different traditions
- d how familiar themes are explored in different cultural contexts [for example, how childhood is portrayed, references to oral or folk traditions]
- e to make connections and comparisons between texts from different cultures.

Reading: during key stage 3 pupils read a wide range of texts independently, both for pleasure and for study. They become enthusiastic, discriminating and responsive readers, understanding layers of meaning and appreciating what they read on a critical level.

Printed and ICT-based information texts

- 4 To develop their reading of print and ICT-based information texts, pupils should be taught to:
- select, compare and synthesise information from different texts
 - evaluate how information is presented
 - sift the relevant from the irrelevant, and distinguish between fact and opinion, bias and objectivity
 - identify the characteristic features, at word, sentence and text level, of different types of texts.

Media and moving image texts

- 5 Pupils should be taught:
- how meaning is conveyed in texts that include print, images and sometimes sounds
 - how choice of form, layout and presentation contribute to effect [for example, font, caption, illustration in printed text, sequencing, framing, soundtrack in moving image text]
 - how the nature and purpose of media products influence content and meaning [for example, selection of stories for a front page or news broadcast]
 - how audiences and readers choose and respond to media.

Language structure and variation

- 6 Pupils should be taught to draw on their knowledge of grammar and language variation to develop their understanding of texts and how language works.

Breadth of study

- 7 During the key stage, pupils should be taught the **Knowledge, skills and understanding** through the following ranges of literature and non-fiction and non-literary texts.

Literature

- 8 The range should include:
- plays, novels, short stories and poetry from the English literary heritage, including:
 - two plays by Shakespeare, one of which should be studied in key stage 3
 - drama by major playwrights
 - works of fiction by two major writers published before 1914 selected from the list on page 49
 - two works of fiction by major writers published after 1914
 - poetry by four major poets published before 1914 selected from the list on page 49
 - poetry by four major poets published after 1914

- b recent and contemporary drama, fiction and poetry written for young people and adults
- c drama, fiction and poetry by major writers from different cultures and traditions.

Non-fiction and non-literary texts

- 9 The range should include:
- a literary non-fiction
 - b print and ICT-based information and reference texts
 - c media and moving image texts [for example, newspapers, magazines, advertisements, television, films, videos].

Examples of major playwrights

William Congreve, Oliver Goldsmith, Christopher Marlowe, Sean O'Casey, Harold Pinter, J B Priestley, Peter Shaffer, G B Shaw, R B Sheridan, Oscar Wilde.

List of major writers published before 1914 (see requirement 8a iii on page 48)

Jane Austen, Charlotte Brontë, Emily Brontë, John Bunyan, Wilkie Collins, Joseph Conrad, Daniel Defoe, Charles Dickens, Arthur Conan Doyle, George Eliot, Henry Fielding, Elizabeth Gaskell, Thomas Hardy, Henry James, Mary Shelley, Robert Louis Stevenson, Jonathan Swift, Anthony Trollope, H G Wells.

Examples of fiction by major writers after 1914

E M Forster, William Golding, Graham Greene, Aldous Huxley, James Joyce, D H Lawrence, Katherine Mansfield, George Orwell, Muriel Spark, William Trevor, Evelyn Waugh.

List of major poets published before 1914 (see requirement 8a v on page 48)

Matthew Arnold, Elizabeth Barrett Browning, William Blake, Emily Brontë, Robert Browning, Robert Burns, Lord Byron, Geoffrey Chaucer, John Clare, Samuel Taylor Coleridge, John Donne, John Dryden, Thomas Gray, George Herbert, Robert Herrick, Gerard Manley Hopkins, John Keats, Andrew Marvell, John Milton, Alexander Pope, Christina Rossetti, William Shakespeare (sonnets), Percy Bysshe Shelley, Edmund Spenser, Alfred Lord Tennyson, Henry Vaughan, William Wordsworth, Sir Thomas Wyatt.

Examples of major poets after 1914

W H Auden, Gillian Clarke, Keith Douglas, T S Eliot, U A Fanthorpe, Thomas Hardy, Seamus Heaney, Ted Hughes, Elizabeth Jennings, Philip Larkin, Wilfred Owen, Sylvia Plath, Stevie Smith, Edward Thomas, R S Thomas, W B Yeats.

Examples of recent and contemporary drama, fiction and poetry

Drama: Alan Ayckbourn, Samuel Beckett, Alan Bennett, Robert Bolt, Brian Friel, Willis Hall, David Hare, Willie Russell, R C Sherriff, Arnold Wesker.

Fiction: J G Ballard, Berlie Doherty, Susan Hill, Laurie Lee, Joan Lingard, Bill Naughton, Alan Sillitoe, Mildred Taylor, Robert Westall.

Poetry: Simon Armitage, James Berry, Douglas Dunn, Liz Lochhead, Adrian Mitchell, Edwin Muir, Grace Nichols, Jo Shapcott.

Examples of drama, fiction and poetry by major writers from different cultures and traditions

Drama: Athol Fugard, Arthur Miller, Wole Soyinka, Tennessee Williams.

Fiction: Chinua Achebe, Maya Angelou, Willa Cather, Anita Desai, Nadine Gordimer, Ernest Hemingway, H H Richardson, Doris Lessing, R K Narayan, John Steinbeck, Ngugi wa Thiong'o.

Poetry: E K Brathwaite, Emily Dickinson, Robert Frost, Robert Lowell, Les Murray, Rabindranath Tagore, Derek Walcott.

Examples of non-fiction and non-literary texts

Personal record and viewpoints on society: Peter Ackroyd, James Baldwin, John Berger, James Boswell, Vera Brittain, Lord Byron, William Cobbett, Gerald Durrell, Robert Graves, Samuel Johnson, Laurie Lee, Samuel Pepys, Flora Thompson, Beatrice Webb, Dorothy Wordsworth.

Travel writing: Jan Morris, Freya Stark, Laurens Van Der Post.

Reportage: James Cameron, Winston Churchill, Alistair Cooke, Dilys Powell.

The natural world: David Attenborough, Rachel Carson, Charles Darwin, Steve Jones.

Writing: during key stage 3 pupils develop confidence in writing for a range of purposes. They develop their own distinctive styles and recognise the importance of writing with commitment and vitality. They learn to write correctly, using different formats, layouts and ways of presenting their work.

Note for 1d

The variety of narrative structures includes the use of words, sound and images.

1h → ICT opportunity

Pupils could make choices of font style and size and whether to use bold, italics or bullets in presenting their work.

Note for 2a

Planning and revising can be done simultaneously when working on screen.

En3 Writing

Knowledge, skills and understanding

Composition

- 1 Pupils should be taught to draw on their reading and knowledge of linguistic and literary forms when composing their writing. Pupils should be taught to:

Writing to imagine, explore, entertain

- a draw on their experience of good fiction, of different poetic forms and of reading, watching and performing in plays
- b use imaginative vocabulary and varied linguistic and literary techniques
- c exploit choice of language and structure to achieve particular effects and appeal to the reader
- d use a range of techniques and different ways of organising and structuring material to convey ideas, themes and characters

Writing to inform, explain, describe

- e form sentences and paragraphs that express connections between information and ideas precisely [for example, cause and effect, comparison]
- f use formal and impersonal language and concise expression
- g consider what the reader needs to know and include relevant details
- h present material clearly, using appropriate layout, illustrations and organisation

Writing to persuade, argue, advise

- i develop logical arguments and cite evidence
- j use persuasive techniques and rhetorical devices
- k anticipate reader reaction, counter opposing views and use language to gain attention and sustain interest

Writing to analyse, review, comment

- l reflect on the nature and significance of the subject matter
- m form their own view, taking into account a range of evidence and opinions
- n organise their ideas and information, distinguishing between analysis and comment
- o take account of how well the reader knows the topic.

Planning and drafting

- 2 To improve and sustain their writing, pupils should be taught to:
- a plan, draft, redraft and proofread their work on paper and on screen
 - b judge the extent to which any or all of these processes are needed in specific pieces of writing
 - c analyse critically their own and others' writing.

Punctuation

- 3 Pupils should be taught to use the full range of punctuation marks correctly to signal sentence structure, and to help the reader.

Spelling

- 4 Pupils should be taught to:
- increase their knowledge of regular patterns of spelling, word families, roots of words and derivations, including stem, prefix, suffix, inflection
 - apply their knowledge of word formation
 - spell increasingly complex polysyllabic words that do not conform to regular patterns
 - check their spelling for errors and use a dictionary when necessary
 - use different kinds of dictionary, thesaurus and spellchecker.

Handwriting and presentation

- 5 Pupils should be taught to write with fluency and, when required, speed. In presenting final polished work, pupils should be taught to:
- ensure that work is neat and clear
 - write legibly, if their work is handwritten
 - make full use of different presentational devices where appropriate.

Standard English

- 6 Pupils should be taught about the variations in written standard English and how they differ from spoken language, and to distinguish varying degrees of formality, selecting appropriately for a task.

Language structure

- 7 Pupils should be taught the principles of sentence grammar and whole-text cohesion and use this knowledge in their writing. They should be taught:
- word classes or parts of speech and their grammatical functions
 - the structure of phrases and clauses and how they can be combined to make complex sentences [for example, coordination and subordination]
 - paragraph structure and how to form different types of paragraph
 - the structure of whole texts, including cohesion, openings and conclusions in different types of writing [for example, through the use of verb tenses, reference chains]
 - the use of appropriate grammatical terminology to reflect on the meaning and clarity of individual sentences [for example, nouns, verbs, adjectives, prepositions, conjunctions, articles].

Note for 4e

Using spellcheckers involves understanding both their uses and their limitations.

5c → ICT opportunity

Pupils could use a variety of ways to present their work, including using pictures and moving images as well as print.

Note for 9

Written texts are shaped by choices of purpose, form and reader. These elements are interdependent so that, for example, forms are adapted to the writer's aim and the intended reader.

Breadth of study

- 8 During the key stage, pupils should be taught the **Knowledge, skills and understanding** through addressing the following range of purposes, readers and forms of writing.
- 9 The range of purposes for writing should include:
 - a to imagine, explore and entertain, focusing on creative, aesthetic and literary uses of language. The forms for such writing should be drawn from different kinds of stories, poems, playscripts, autobiographies, screenplays, diaries
 - b to inform, explain and describe, focusing on conveying information and ideas clearly. The forms for such writing should be drawn from memos, minutes, accounts, information leaflets, prospectuses, plans, records, summaries
 - c to persuade, argue and advise, focusing on presenting a case and influencing the reader. The forms for such writing should be drawn from brochures, advertisements, editorials, articles and letters conveying opinions, campaign literature, polemical essays
 - d to analyse, review and comment, focusing on considered and evaluative views of ideas, texts and issues. The forms for such writing should be drawn from reviews, commentaries, articles, essays, reports.
- 10 Pupils should also be taught to use writing for thinking and learning [for example, for hypothesising, paraphrasing, summarising, noting].
- 11 The range of readers for writing should include specific, known readers, a large, unknown readership and the pupils themselves.

The huge number project

How long would a traffic jam be with 1,000,000 cars in it?

First of all we measured Mr Jones's Ford Orion, it came out at 4.15 metres.

$$\begin{array}{r} 4.15 \\ \times 1,000,000 \\ \hline 4,150,000 \end{array}$$

We worked out that 1,000,000 Ford Orions would be 4,150,000 m.

We needed to change that into km. So we divided it by 1,000.

$$\begin{array}{r} 4,150,000 \\ \div 1,000 \\ \hline 4,150 \text{ km} \end{array}$$

Then we hit a problem. We realised that there would be a gap in between the cars of about 1 m.

So that would add on 1,000,000 m

$$\begin{array}{r} 5,150,000 \\ \div 1,000 \\ \hline 5,150 \text{ km} \end{array}$$

Then we used an atlas to see what countries the first car would have reached by the time the last one left London.

The importance of mathematics

Mathematics equips pupils with a uniquely powerful set of tools to understand and change the world. These tools include logical reasoning, problem-solving skills, and the ability to think in abstract ways. Mathematics is important in everyday life, many forms of employment, science and technology, medicine, the economy, the environment and development, and in public decision-making.

Different cultures have contributed to the development and application of mathematics. Today, the subject transcends cultural boundaries and its importance is universally recognised. Mathematics is a creative discipline. It can stimulate moments of pleasure and wonder when a pupil solves a problem for the first time, discovers a more elegant solution to that problem, or suddenly sees hidden connections.

Mathematics

Maths is the study of patterns abstracted from the world around us – so anything we learn in maths has literally thousands of applications, in arts, sciences, finance, health and leisure!

Professor Ruth Lawrence, University of Michigan

Mathematics is not just a collection of skills, it is a way of thinking. It lies at the core of scientific understanding, and of rational and logical argument.

Dr Colin Sparrow, Reader in Mathematics, University of Warwick

Maths is the truly global language. With it, we convey ideas to each other that words can't handle – and bypass our spoken Tower of Babel.

Professor Alison Wolf, Head of Mathematical Sciences Group, Institute of Education, University of London

If you want to take part in tomorrow's world, you'll need mathematics and statistics just as much as grammar and syntax.

Professor Robert Worcester, Chairman, Market Opinion Research International

Since the age of ten, I've been hooked on mathematical problems as intellectual challenges. However, nobody has to worry that pure mathematics won't be used. Mathematics – even some of the most abstruse mathematics that we thought would never be used – is now used every time you use your credit card, every time you use your computer.

Professor Andrew Wiles, Princeton University



The cars would have reached:

1) Greenland	5) Chad	9) Russia
2) Mauritania	6) Libya	10) Poland
3) Mali	7) Egypt	11) Norway
4) Niger	8) Turkey	

Key stage 3 programme of study

Mathematics

During key stage 3 pupils take increasing responsibility for planning and executing their work. They extend their calculating skills to fractions, percentages and decimals, and begin to understand the importance of proportional reasoning. They are beginning to use algebraic techniques and symbols with confidence. They generate and solve simple equations and study linear functions and their corresponding graphs. They begin to use deduction to manipulate algebraic expressions. Pupils progress from a simple understanding of the features of shape and space to using definitions and reasoning to understand geometrical objects. As they encounter simple algebraic and geometric proofs, they begin to understand reasoned arguments. They communicate mathematics in speech and a variety of written forms, explaining their reasoning to others. They study handling data through practical activities and are introduced to a quantitative approach to probability. Pupils work with increasing confidence and flexibility to solve unfamiliar problems. They develop positive attitudes towards mathematics and increasingly make connections between different aspects of mathematics.

Note

This programme of study covers the attainment range for this key stage. Teachers are expected to plan work drawing on all the numbered sub-sections of the programme of study. For some groups of pupils, all or part of particular lettered paragraphs may not be appropriate.

Note about sections

There is no separate section of the programme of study numbered Ma1 that corresponds to the first attainment target, **using and applying mathematics**. Teaching requirements relating to this attainment target are included within the other sections of the programme of study.

Knowledge, skills and understanding

Teaching should ensure that appropriate connections are made between the sections on **number and algebra**, **shape, space and measures**, and **handling data**.

Ma2 Number and algebra

Using and applying number and algebra

1 Pupils should be taught to:

Problem solving

- a explore connections in mathematics to develop flexible approaches to increasingly demanding problems; select appropriate strategies to use for numerical or algebraic problems
- b break down a complex calculation into simpler steps before attempting to solve it
- c use alternative approaches to overcome difficulties and evaluate the effectiveness of their strategies
- d select efficient techniques for numerical calculation and algebraic manipulation
- e make mental estimates of the answers to calculations; use checking procedures to monitor the accuracy of their results

Communicating

- f represent problems and solutions in algebraic or graphical forms; move from one form of representation to another to get different perspectives on the problem; present and interpret solutions in the context of the original problem
- g develop correct and consistent use of notation, symbols and diagrams when solving problems
- h examine critically, improve, then justify their choice of mathematical presentation; present a concise, reasoned argument

Reasoning

- i explore, identify, and use pattern and symmetry in algebraic contexts, investigating whether particular cases can be generalised further and understanding the importance of a counter-example; identify exceptional cases when solving problems; make conjectures and check them for new cases
- j show step-by-step deduction in solving a problem; explain and justify how they arrived at a conclusion
- k distinguish between a practical demonstration and a proof
- l recognise the importance of assumptions when deducing results; recognise the limitations of any assumptions that are made and the effect that varying the assumptions may have on the solution to a problem.

Numbers and the number system

2 Pupils should be taught to:

Integers

- a use their previous understanding of integers and place value to deal with arbitrarily large positive numbers and round them to a given power of 10; understand and use negative numbers, both as positions and translations on a number line; order integers; use the concepts and vocabulary of factor (divisor), multiple, common factor, highest common factor, least common multiple, prime number and prime factor decomposition

Powers and roots

- b use the terms square, positive and negative square root (knowing that the square root sign denotes the positive square root), cube, cube root; use index notation for small integer powers and index laws for multiplication and division of positive integer powers

Fractions

- c use fraction notation; understand equivalent fractions, simplifying a fraction by cancelling all common factors; order fractions by rewriting them with a common denominator

Decimals

- d use decimal notation and recognise that each terminating decimal is a fraction [for example, $0.137 = \frac{137}{1000}$]; order decimals

Percentages

- e understand that ‘percentage’ means ‘number of parts per 100’ and use this to compare proportions; interpret percentage as the operator ‘so many hundredths of’ [for example, 10% means 10 parts per 100 and 15% of Y means $\frac{15}{100} \times Y$]

Ratio and proportion

- f use ratio notation, including reduction to its simplest form and its various links to fraction notation
- g recognise where fractions or percentages are needed to compare proportions; identify problems that call for proportional reasoning, and choose the correct numbers to take as 100%, or as a whole.

1f → links to other subjects

This requirement builds on En1/1d and En3/1n.

1h → links to other subjects

This requirement builds on En1/1e, 3b and En3/1f, 1i.

Note for 3b

Pupils do not need to know the names of these laws.

Calculations

3 Pupils should be taught to:

Number operations and the relationships between them

- a add, subtract, multiply and divide integers and then any number; multiply or divide any number by powers of 10, and any positive number by a number between 0 and 1; find the prime factor decomposition of positive integers [for example, $8000 = 2^6 \times 5^3$]
- b use brackets and the hierarchy of operations; know how to use the commutative, associative and distributive laws to do mental and written calculations more efficiently
- c calculate a given fraction of a given quantity, expressing the answer as a fraction; express a given number as a fraction of another; add and subtract fractions by writing them with a common denominator; perform short division to convert a simple fraction to a decimal
- d understand and use unit fractions as multiplicative inverses [for example, by thinking of multiplication by $\frac{1}{5}$ as division by 5, or multiplication by $\frac{6}{7}$ as multiplication by 6 followed by division by 7 (or vice versa)]; multiply and divide a given fraction by an integer, by a unit fraction and by a general fraction
- e convert simple fractions of a whole to percentages of the whole and vice versa, then understand the multiplicative nature of percentages as operators [for example, 20% discount on £150 gives a total calculated as $\pounds(0.8 \times 150)$]
- f divide a quantity in a given ratio [for example, share £15 in the ratio 1:2]

Mental methods

- g recall all positive integer complements to 100 [for example, $37 + 63 = 100$]; recall all multiplication facts to 10×10 , and use them to derive quickly the corresponding division facts; recall the cubes of 2, 3, 4, 5 and 10, and the fraction-to-decimal conversion of familiar simple fractions [for example, $\frac{1}{2}, \frac{1}{4}, \frac{1}{5}, \frac{1}{10}, \frac{1}{100}, \frac{1}{3}, \frac{2}{3}, \frac{1}{8}$]
- h round to the nearest integer and to one significant figure; estimate answers to problems involving decimals
- i develop a range of strategies for mental calculation; derive unknown facts from those they know [for example, estimate $\sqrt{85}$]; add and subtract mentally numbers with up to two decimal places [for example, $13.76 - 5.21$, $20.08 + 12.4$]; multiply and divide numbers with no more than one decimal digit [for example, 14.3×4 , $56.7 \div 7$], using factorisation when possible

Written methods

- j use standard column procedures for addition and subtraction of integers and decimals
- k use standard column procedures for multiplication of integers and decimals, understanding where to position the decimal point by considering what happens if they multiply equivalent fractions [for example, $0.6 \times 0.7 = 0.42$ since $\frac{6}{10} \times \frac{7}{10} = \frac{42}{100} = 0.42$]; solve a problem involving division by a decimal by transforming it to a problem involving division by an integer
- l use efficient methods to calculate with fractions, including cancelling common factors before carrying out the calculation, recognising that, in many cases, only a fraction can express the exact answer
- m solve simple percentage problems, including increase and decrease [for example, simple interest, VAT, discounts, pay rises, annual rate of inflation, income tax, discounts]
- n solve word problems about ratio and proportion, including using informal strategies and the unitary method of solution [for example, given that m identical items cost $\pounds y$, then one item costs $\pounds \frac{y}{m}$ and n items cost $\pounds (n \times \frac{y}{m})$, the number of items that can be bought for $\pounds z$ is $z \times \frac{m}{y}$]

Calculator methods

- o use calculators effectively and efficiently: know how to enter complex calculations using brackets [for example, for negative numbers, or the division of more than one term], know how to enter a range of calculations, including those involving measures [for example, time calculations in which fractions of an hour need to be entered as fractions or decimals]
- p use the function keys for reciprocals, squares, square roots, powers, fractions (and how to enter a fraction as a decimal); use the constant key
- q understand the calculator display, interpreting it correctly [for example, in money calculations, and when the display has been rounded by the calculator], and knowing not to round during the intermediate steps of a calculation.

Solving numerical problems

- 4 Pupils should be taught to:
 - a draw on their knowledge of the operations and the relationships between them, and of simple integer powers and their corresponding roots, to solve problems involving ratio and proportion, a range of measures and compound measures, metric units, and conversion between metric and common imperial units, set in a variety of contexts

- b select appropriate operations, methods and strategies to solve number problems, including trial and improvement where a more efficient method to find the solution is not obvious
- c use a variety of checking procedures, including working the problem backwards, and considering whether a result is of the right order of magnitude
- d give solutions in the context of the problem to an appropriate degree of accuracy, recognising limitations on the accuracy of data and measurements.

Equations, formulae and identities

5 Pupils should be taught to:

Use of symbols

- a distinguish the different roles played by letter symbols in algebra, knowing that letter symbols represent definite unknown numbers in equations [for example, $x^3 + 1 = 65$], defined quantities or variables in formulae [for example, $V = IR$], general, unspecified and independent numbers in identities [for example, $3x + 2x = 5x$, or $3(a + b) = 3a + 3b$, or $(x + 1)(x - 1) = x^2 - 1$] and in functions they define new expressions or quantities by referring to known quantities [for example, $y = 2 - 7x$]
- b understand that the transformation of algebraic expressions obeys and generalises the rules of arithmetic; simplify or transform algebraic expressions by collecting like terms [for example, $x^2 + 3x + 5 - 4x + 2x^2 = 3x^2 - x + 5$], by multiplying a single term over a bracket, by taking out single term common factors [for example, $x^2 + x = x(x + 1)$], and by expanding the product of two linear expressions including squaring a linear expression [for example, $(x + 1)^2 = x^2 + 2x + 1$, $(x - 3)(x + 2) = x^2 - x - 6$]; distinguish in meaning between the words 'equation', 'formula', 'identity' and 'expression'

Index notation

- c use index notation for simple integer powers, and simple instances of index laws; substitute positive and negative numbers into expressions such as $3x^2 + 4$ and $2x^3$

Equations

- d set up simple equations [for example, find the angle a in a triangle with angles a , $a + 10$, $a + 20$]; solve simple equations [for example, $5x = 7$, $3(2x + 1) = 8$, $2(1 - x) = 6(2 + x)$, $4x^2 = 36$, $3 = \frac{1}{x^2}$], by using inverse operations or by transforming both sides in the same way

Linear equations

- e solve linear equations, with integer coefficients, in which the unknown appears on either side or on both sides of the equation; solve linear equations that require prior simplification of brackets, including those that have negative signs occurring anywhere in the equation, and those with a negative solution

Formulae

- f use formulae from mathematics and other subjects [for example, formulae for the area of a triangle, the area enclosed by a circle, density = mass/volume]; substitute numbers into a formula; derive a formula and change its subject [for example, convert temperatures between degrees Fahrenheit and degrees Celsius, find the perimeter of a rectangle given its area A and the length l of one side]

Direct proportion

- g set up and use equations to solve word and other problems involving direct proportion, and relate their algebraic solutions to graphical representations of the equations

Simultaneous linear equations

- h link a graphical representation of an equation to its algebraic solution; find an approximate solution of a pair of linear simultaneous equations by graphical methods, then find the exact solution by eliminating one variable; consider the graphs of cases that have no solution, or an infinite number of solutions

Inequalities

- i solve simple linear inequalities in one variable, and represent the solution set on a number line

Numerical methods

- j use systematic trial and improvement methods with ICT tools to find approximate solutions of equations where there is no simple analytical method [for example, $x^3 + x = 100$].

Sequences, functions and graphs

- 6 Pupils should be taught to:

Sequences

- a generate common integer sequences (including sequences of odd or even integers, squared integers, powers of 2, powers of 10, triangular numbers)
- b find the first terms of a sequence given a rule arising naturally from a context [for example, the number of ways of paying in pence using only 1p and 2p coins, or from a regularly increasing spatial pattern]; find the rule (and express it in words) for the n th term of a sequence

5f → ICT opportunity

Pupils could use a spreadsheet to construct formulae to model situations.

6g → ICT opportunity

Pupils could use a spreadsheet to generate points and plot graphs.

- c generate terms of a sequence using term-to-term and position-to-term definitions of the sequence; use linear expressions to describe the n th term of an arithmetic sequence, justifying its form by referring to the activity or context from which it was generated

Functions

- d express simple functions, at first in words and then in symbols; explore the properties of simple polynomial functions
- e use the conventions for coordinates in the plane; plot points in all four quadrants; recognise (when values are given for m and c) that equations of the form $y = mx + c$ correspond to straight-line graphs in the coordinate plane; plot graphs of functions in which y is given explicitly in terms of x [for example, $y = 2x + 3$], or implicitly [for example, $x + y = 7$]
- f construct linear functions arising from real-life problems and plot their corresponding graphs; discuss and interpret graphs arising from real situations [for example, distance–time graph for an object moving with constant speed]
- g generate points and plot graphs of simple quadratic and cubic functions [for example, $y = x^2$, $y = 3x^2 + 4$, $y = x^3$]

Gradients

- h find the gradient of lines given by equations of the form $y = mx + c$ (when values are given for m and c); investigate the gradients of parallel lines and lines perpendicular to these lines [for example, knowing that $y = 5x$ and $y = 5x - 4$ represent parallel lines, each with gradient 5 and that the graph of any line perpendicular to these lines has gradient $-\frac{1}{5}$].

Ma3 Shape, space and measures

Using and applying shape, space and measures

1 Pupils should be taught to:

Problem solving

- a select problem-solving strategies and resources, including ICT, to use in geometrical work, and monitor their effectiveness
- b select and combine known facts and problem-solving strategies to solve complex problems
- c identify what further information is needed to solve a problem; break complex problems down into a series of tasks

Communication

- d interpret, discuss and synthesise geometrical information presented in a variety of forms
- e communicate mathematically, making use of geometrical diagrams and related explanatory text
- f use precise language and exact methods to analyse geometrical configurations
- g review and justify their choices of mathematical presentation

Reasoning

- h distinguish between practical demonstration, proof, conventions, facts, definitions and derived properties
- i explain and justify inferences and deductions using mathematical reasoning
- j explore connections in geometry; pose conditional constraints of the type 'If ... then ...'; and ask questions 'What if ...?' or 'Why?'
- k show step-by-step deduction in solving a geometrical problem
- l state constraints and give starting points when making deductions
- m recognise the limitations of any assumptions that are made; understand the effects that varying the assumptions may have on the solution
- n identify exceptional cases when solving geometrical problems.

Geometrical reasoning

2 Pupils should be taught to:

Angles

- a recall and use properties of angles at a point, angles on a straight line (including right angles), perpendicular lines, and opposite angles at a vertex
- b distinguish between acute, obtuse, reflex and right angles; estimate the size of an angle in degrees

Properties of triangles and other rectilinear shapes

- c use parallel lines, alternate angles and corresponding angles; understand the properties of parallelograms and a proof that the angle sum of a triangle is 180 degrees; understand a proof that the exterior angle of a triangle is equal to the sum of the interior angles at the other two vertices

1d → links to other subjects

This requirement builds on En1/3b and En2/1a.

1e → links to other subjects

This requirement builds on En1/1d and En3/1f.

1f → links to other subjects

This requirement builds on En3/1f.

1g → links to other subjects

This requirement builds on En1/1e, 3b and En3/1i, 1n.

- d use angle properties of equilateral, isosceles and right-angled triangles; understand congruence, recognising when two triangles are congruent; explain why the angle sum of any quadrilateral is 360 degrees
- e use their knowledge of rectangles, parallelograms and triangles to deduce formulae for the area of a parallelogram, and a triangle, from the formula for the area of a rectangle
- f recall the essential properties of special types of quadrilateral, including square, rectangle, parallelogram, trapezium and rhombus; classify quadrilaterals by their geometric properties
- g calculate and use the sums of the interior and exterior angles of quadrilaterals, pentagons and hexagons; calculate and use the angles of regular polygons
- h understand, recall and use Pythagoras' theorem

Properties of circles

- i recall the definition of a circle and the meaning of related terms, including centre, radius, chord, diameter, circumference, tangent, arc, sector and segment; understand that the tangent at any point on a circle is perpendicular to the radius at that point; explain why the perpendicular from the centre to a chord bisects the chord; understand that inscribed regular polygons can be constructed by equal division of a circle

3-D shapes

- j explore the geometry of cuboids (including cubes), and shapes made from cuboids
- k use 2-D representations of 3-D shapes and analyse 3-D shapes through 2-D projections and cross-sections, including plan and elevation.

Transformations and coordinates

- 3 Pupils should be taught to:

Specifying transformations

- a understand that rotations are specified by a centre and an (anticlockwise) angle; use right angles, fractions of a turn or degrees to measure the angle of rotation; understand that reflections are specified by a mirror line, translations by a distance and direction, and enlargements by a centre and positive scale factor

Properties of transformations

- b recognise and visualise rotations, reflections and translations, including reflection symmetry of 2-D and 3-D shapes, and rotation symmetry of 2-D shapes; transform 2-D shapes by translation, rotation and reflection, recognising that these transformations preserve length and angle, so that any figure is congruent to its image under any of these transformations

- c recognise, visualise and construct enlargements of objects using positive integer scale factors greater than one, then positive scale factors less than one; understand from this that any two circles and any two squares are mathematically similar, while, in general, two rectangles are not
- d recognise that enlargements preserve angle but not length; identify the scale factor of an enlargement as the ratio of the lengths of any two corresponding line segments and apply this to triangles; understand the implications of enlargement for perimeter; use and interpret maps and scale drawings; understand the implications of enlargement for area and for volume

Coordinates

- e understand that one coordinate identifies a point on a number line, two coordinates identify a point in a plane and three coordinates identify a point in space, using the terms '1-D', '2-D' and '3-D'; use axes and coordinates to specify points in all four quadrants; locate points with given coordinates; find the coordinates of points identified by geometrical information [for example, find the coordinates of the fourth vertex of a parallelogram with vertices at (2, 1) (-7, 3) and (5, 6)]; find the coordinates of the midpoint of the line segment AB, given points A and B, then calculate the length AB.

Measures and construction

4 Pupils should be taught to:

Measures

- a interpret scales on a range of measuring instruments, including those for time and mass; know that measurements using real numbers depend on the choice of unit; recognise that measurements given to the nearest whole unit may be inaccurate by up to one half in either direction; convert measurements from one unit to another; know rough metric equivalents of pounds, feet, miles, pints and gallons; make sensible estimates of a range of measures in everyday settings
- b understand angle measure, using the associated language [for example, use bearings to specify direction]
- c understand and use compound measures, including speed and density

Construction

- d measure and draw lines to the nearest millimetre, and angles to the nearest degree; draw triangles and other 2-D shapes using a ruler and protractor, given information about their side lengths and angles; understand, from their experience of constructing them, that triangles satisfying SSS, SAS, ASA and RHS are unique, but SSA triangles are not; construct cubes, regular tetrahedra, square-based pyramids and other 3-D shapes from given information

Note for 3d

Enlargement of triangles is fundamental to work in trigonometry in the higher programme of study for key stage 4 Ma3/2g.

- e use straight edge and compasses to do standard constructions, including an equilateral triangle with a given side, the midpoint and perpendicular bisector of a line segment, the perpendicular from a point to a line, the perpendicular from a point on a line, and the bisector of an angle

Mensuration

- f find areas of rectangles, recalling the formula, understanding the connection to counting squares and how it extends this approach; recall and use the formulae for the area of a parallelogram and a triangle; find the surface area of simple shapes using the area formulae for triangles and rectangles; calculate perimeters and areas of shapes made from triangles and rectangles
- g find volumes of cuboids, recalling the formula and understanding the connection to counting cubes and how it extends this approach; calculate volumes of right prisms and of shapes made from cubes and cuboids
- h find circumferences of circles and areas enclosed by circles, recalling relevant formulae
- i convert between area measures, including cm^2 and m^2 , and volume measures, including cm^3 and m^3

Loci

- j find loci, both by reasoning and by using ICT to produce shapes and paths [for example, equilateral triangles].

Ma4 Handling data

Using and applying handling data

1 Pupils should be taught to:

Problem solving

- a carry out each of the four aspects of the handling data cycle to solve problems:
 - i specify the problem and plan: formulate questions in terms of the data needed, and consider what inferences can be drawn from the data; decide what data to collect (including sample size and data format) and what statistical analysis is needed
 - ii collect data from a variety of suitable sources, including experiments and surveys, and primary and secondary sources
 - iii process and represent the data: turn the raw data into usable information that gives insight into the problem
 - iv interpret and discuss the data: answer the initial question by drawing conclusions from the data
- b identify what further information is required to pursue a particular line of enquiry
- c select and organise the appropriate mathematics and resources to use for a task
- d review progress as they work; check and evaluate solutions

Communicating

- e interpret, discuss and synthesise information presented in a variety of forms
- f communicate mathematically, making use of diagrams and related explanatory text
- g examine critically, and justify, their choice of mathematical presentation of problems involving data

Reasoning

- h apply mathematical reasoning, explaining and justifying inferences and deductions
- i explore connections in mathematics and look for cause and effect when analysing data
- j recognise the limitations of any assumptions, and the effects that varying the assumptions could have on conclusions drawn from the data analysis.

Specifying the problem and planning

2 Pupils should be taught to:

- a see that random processes are unpredictable
- b identify questions that can be addressed by statistical methods
- c discuss how data relate to a problem; identify possible sources of bias and plan to minimise it

1e → links to other subjects

This requirement builds on En1/3b and En2/1a.

1f → ICT opportunity

Pupils could use presentation software to communicate their findings and display the data.

1f → links to other subjects

This requirement builds on En1/1d and En3/1f.

1g → links to other subjects

This requirement builds on En1/1e, 3b and En3/1i, 1n.

5c → ICT opportunity

Pupils could use databases to present their findings.

- d identify which primary data they need to collect and in what format (including grouped data, considering appropriate equal class intervals)
- e design an experiment or survey; decide what secondary data to use.

Collecting data

- 3 Pupils should be taught to:
- a design and use data-collection sheets for grouped discrete and continuous data; collect data using various methods including observation, controlled experiment, data logging, questionnaires and surveys
 - b gather data from secondary sources, including printed tables and lists from ICT-based sources
 - c design and use two-way tables for discrete and grouped data.

Processing and representing data

- 4 Pupils should be taught to:
- a draw and produce, using paper and ICT, pie charts for categorical data and diagrams for continuous data, including line graphs for time series, scatter graphs, frequency diagrams and stem-and-leaf diagrams
 - b calculate mean, range and median of small data sets with discrete then continuous data; identify the modal class for grouped data
 - c understand and use the probability scale
 - d understand and use estimates or measures of probability from theoretical models, including equally likely outcomes, or from relative frequency
 - e list all outcomes for single events, and for two successive events, in a systematic way
 - f identify different mutually exclusive outcomes and know that the sum of the probabilities of all these outcomes is 1
 - g find the median for large data sets and calculate an estimate of the mean for large data sets with grouped data
 - h draw lines of best fit by eye, understanding what these represent.

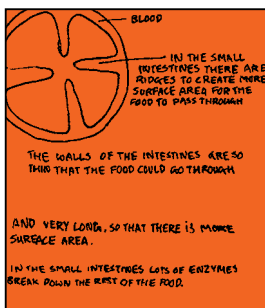
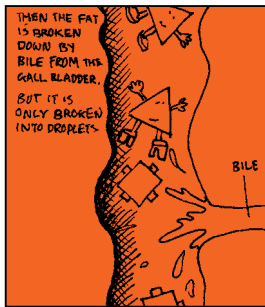
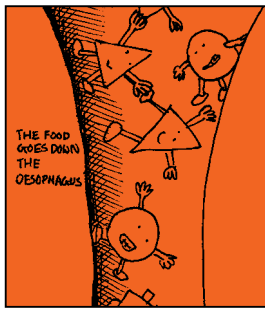
Interpreting and discussing results

- 5 Pupils should be taught to:
- a relate summarised data to the initial questions
 - b interpret a wide range of graphs and diagrams and draw conclusions
 - c look at data to find patterns and exceptions
 - d compare distributions and make inferences, using the shapes of distributions and measures of average and range
 - e evaluate and check results, answer questions, and modify their approach if necessary
 - f have a basic understanding of correlation
 - g use lines of best fit

- h use the vocabulary of probability in interpreting results involving uncertainty and prediction
- i compare experimental data and theoretical probabilities
- j understand that if they repeat an experiment, they may – and usually will – get different outcomes, and that increasing sample size generally leads to better estimates of probability and population characteristics.

Breadth of study

- 1 During the key stage, pupils should be taught the **Knowledge, skills and understanding** through:
 - a activities that ensure they become familiar with and confident using standard procedures for a range of problems, including ratio and proportion
 - b activities that enable them to understand that algebra is an extension of number
 - c solving familiar and unfamiliar problems, including multi-step problems, in a range of numerical, algebraic and graphical contexts and in open-ended and closed form
 - d activities that develop short chains of deductive reasoning and concepts of proof in algebra and geometry
 - e activities focused on geometrical definitions in which they do practical work with geometrical objects to develop their ability to visualise these objects and work with them mentally
 - f practical work in which they draw inferences from data and consider how statistics are used in real life to make informed decisions
 - g a sequence of activities that address increasingly demanding statistical problems
 - h tasks focused on using appropriate ICT [for example, spreadsheets, databases, geometry or graphic packages], using calculators correctly and efficiently, and knowing when it is not appropriate to use a particular form of technology.



Science does not tell us everything that we want to know about life, or all we need to know. But it does provide us with the most robust information about the way the universe works that has so far become available to us.

Colin Tudge, Science Writer

Science is valuable because it meshes with all our lives and allows us to channel and use our spontaneous curiosity.

Professor Susan Greenfield, Director, Royal Institution

Studying science teaches us to be good at analysis and helps us to make complex things simple. It trains minds in a way that industry prizes.

Brendan O'Neill, Chief Executive, Imperial Chemical Industries PLC

Science is an integral part of modern culture.

It stretches the imagination and creativity of young people. Its challenges are quite enormous.

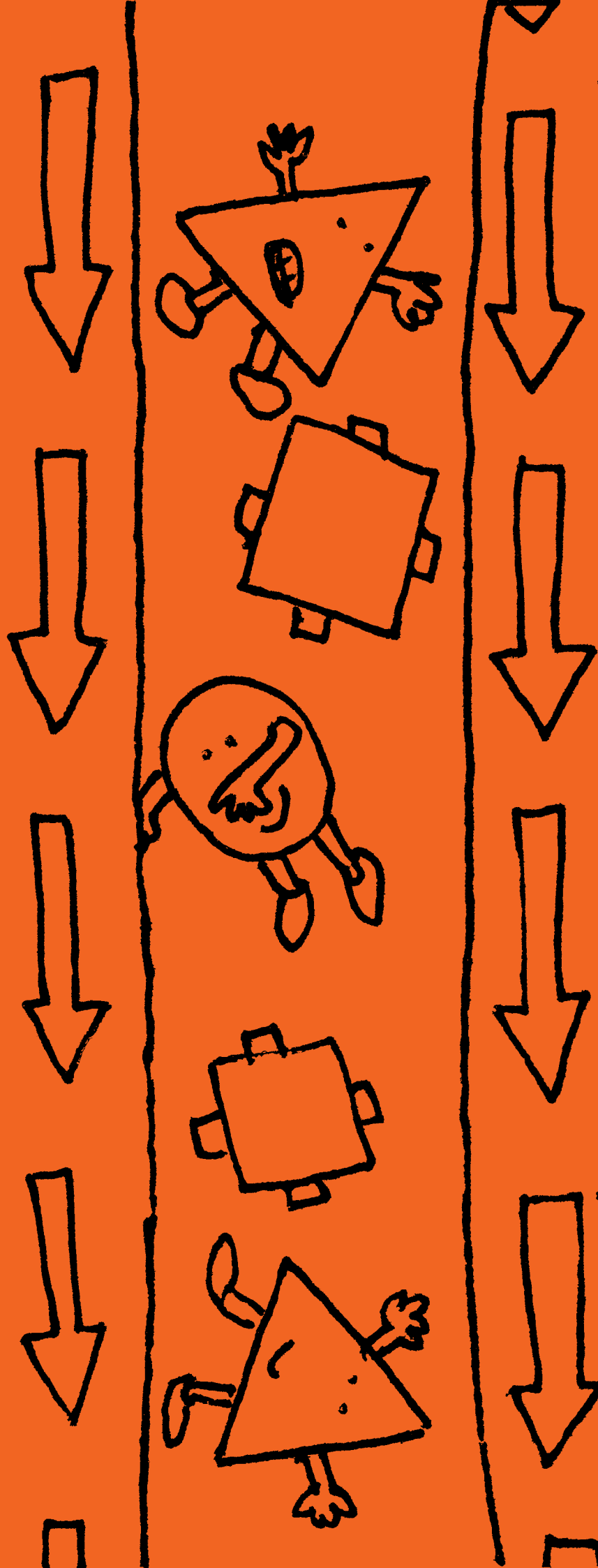
Professor Malcolm Longair, Institute of Physics Fellow in Public Understanding of Physics, Head of Cavendish Laboratory, University of Cambridge

Science

The importance of science

Science stimulates and excites pupils' curiosity about phenomena and events in the world around them. It also satisfies this curiosity with knowledge. Because science links direct practical experience with ideas, it can engage learners at many levels. Scientific method is about developing and evaluating explanations through experimental evidence and modelling. This is a spur to critical

and creative thought. Through science, pupils understand how major scientific ideas contribute to technological change – impacting on industry, business and medicine and improving quality of life. Pupils recognise the cultural significance of science and trace its worldwide development. They learn to question and discuss science-based issues that may affect their own lives, the direction of society and the future of the world.



MUSCLES ALONG THE SYSTEM PUSH THE FOOD THROUGH THE PIPES, THIS IS CALLED PERISTALSIS

BY THE TIME THE FOOD REACHES THE LARGE INTESTINE ALL THAT'S LEFT IS INSOLUABLE AND WATER

THE WATER GOES THROUGH THE WALLS OF THE LARGE INTESTINE

AND THEN...

Key stage 3 programme of study

Science

During key stage 3 pupils build on their scientific knowledge and understanding and make connections between different areas of science. They use scientific ideas and models to explain phenomena and events, and to understand a range of familiar applications of science. They think about the positive and negative effects of scientific and technological developments on the environment and in other contexts. They take account of others' views and understand why opinions may differ. They do more quantitative work, carrying out investigations on their own and with others. They evaluate their work, in particular the strength of the evidence they and others have collected. They select and use a wide range of reference sources. They communicate clearly what they did and its significance. They learn how scientists work together on present-day scientific developments and about the importance of experimental evidence in supporting scientific ideas.

Note

The general teaching requirement for health and safety applies in this subject.

2 → links to other subjects

These requirements build on En1/10a.

2b → links to other subjects

This requirement builds on En2/4a–4c.

2d → ICT opportunity

Pupils could use data-handling software with fieldwork data.

2e → links to other subjects

This requirement builds on Ma4/1a, 2c.

2g → links to other subjects

This requirement builds on Ma3/4a and Ma4/3a, 3b and ICT/2b.

2i → links to other subjects

This requirement builds on Ma4/4a, 4b, 4h.

Knowledge, skills and understanding

Teaching should ensure that scientific enquiry is taught through contexts taken from the sections on life processes and living things, materials and their properties and physical processes.

Sc1 Scientific enquiry**Ideas and evidence in science**

- 1 Pupils should be taught:
 - a about the interplay between empirical questions, evidence and scientific explanations using historical and contemporary examples [for example, Lavoisier's work on burning, the possible causes of global warming]
 - b that it is important to test explanations by using them to make predictions and by seeing if evidence matches the predictions
 - c about the ways in which scientists work today and how they worked in the past, including the roles of experimentation, evidence and creative thought in the development of scientific ideas.

Investigative skills

- 2 Pupils should be taught to:
 - Planning**
 - a use scientific knowledge and understanding to turn ideas into a form that can be investigated, and to decide on an appropriate approach
 - b decide whether to use evidence from first-hand experience or secondary sources
 - c carry out preliminary work and to make predictions, where appropriate
 - d consider key factors that need to be taken into account when collecting evidence, and how evidence may be collected in contexts [for example, fieldwork, surveys] in which the variables cannot readily be controlled
 - e decide the extent and range of data to be collected and the techniques, equipment and materials to use [for example, appropriate sample size for biological work]
 - Obtaining and presenting evidence**
 - f use a range of equipment and materials appropriately and take action to control risks to themselves and to others
 - g make observations and measurements, including the use of ICT for datalogging [for example, variables changing over time] to an appropriate degree of precision
 - h make sufficient relevant observations and measurements to reduce error and obtain reliable evidence
 - i use a wide range of methods, including diagrams, tables, charts, graphs and ICT, to represent and communicate qualitative and quantitative data

Considering evidence

- j use diagrams, tables, charts and graphs, including lines of best fit, to identify and describe patterns or relationships in data
- k use observations, measurements and other data to draw conclusions
- l decide to what extent these conclusions support a prediction or enable further predictions to be made
- m use their scientific knowledge and understanding to explain and interpret observations, measurements or other data, and conclusions

Evaluating

- n consider anomalies in observations or measurements and try to explain them
- o consider whether the evidence is sufficient to support any conclusions or interpretations made
- p suggest improvements to the methods used, where appropriate.

2j–2o → links to other subjects

These requirements build on Ma4/5a–5g, 5j.

2j → ICT opportunity

Pupils could use data-handling software to create, analyse and evaluate charts and graphs.

2a → ICT opportunity

Pupils could use databases or spreadsheets to record, analyse and evaluate information about diets.

Sc2 Life processes and living things**Cells and cell functions**

- 1 Pupils should be taught:
 - a that animal and plant cells can form tissues, and tissues can form organs
 - b the functions of chloroplasts and cell walls in plant cells and the functions of the cell membrane, cytoplasm and nucleus in both plant and animal cells
 - c ways in which some cells, including ciliated epithelial cells, sperm, ova, and root hair cells, are adapted to their functions
 - d that fertilisation in humans and flowering plants is the fusion of a male and a female cell
 - e to relate cells and cell functions to life processes in a variety of organisms.

Humans as organisms

- 2 Pupils should be taught:

Nutrition

- a about the need for a balanced diet containing carbohydrates, proteins, fats, minerals, vitamins, fibre and water, and about foods that are sources of these
- b the principles of digestion, including the role of enzymes in breaking down large molecules into smaller ones
- c that the products of digestion are absorbed into the bloodstream and transported throughout the body, and that waste material is egested
- d that food is used as a fuel during respiration to maintain the body's activity and as a raw material for growth and repair

Movement

- e the role of the skeleton and joints and the principle of antagonistic muscle pairs [for example, biceps and triceps] in movement

Reproduction

- f about the physical and emotional changes that take place during adolescence
- g about the human reproductive system, including the menstrual cycle and fertilisation
- h how the foetus develops in the uterus, including the role of the placenta

Breathing

- i the role of lung structure in gas exchange, including the effect of smoking

Respiration

- j that aerobic respiration involves a reaction in cells between oxygen and food, in which glucose is broken down into carbon dioxide and water
- k to summarise aerobic respiration in a word equation
- l that the reactants and products of respiration are transported throughout the body in the bloodstream

Health

- m that the abuse of alcohol, solvents, and other drugs affects health
- n how the growth and reproduction of bacteria and the replication of viruses can affect health, and how the body's natural defences may be enhanced by immunisation and medicines.

Green plants as organisms

3 Pupils should be taught:

Nutrition and growth

- a that plants need carbon dioxide, water and light for photosynthesis, and produce biomass and oxygen
- b to summarise photosynthesis in a word equation
- c that nitrogen and other elements, in addition to carbon, oxygen and hydrogen, are required for plant growth
- d the role of root hairs in absorbing water and minerals from the soil

Respiration

- e that plants carry out aerobic respiration.

Variation, classification and inheritance

4 Pupils should be taught:

Variation

- a about environmental and inherited causes of variation within a species

Classification

- b to classify living things into the major taxonomic groups

Inheritance

- c that selective breeding can lead to new varieties.

Living things in their environment

5 Pupils should be taught:

Adaptation and competition

- a about ways in which living things and the environment can be protected, and the importance of sustainable development
- b that habitats support a diversity of plants and animals that are interdependent
- c how some organisms are adapted to survive daily and seasonal changes in their habitats
- d how predation and competition for resources affect the size of populations [for example, bacteria, growth of vegetation]

Feeding relationships

- e about food webs composed of several food chains, and how food chains can be quantified using pyramids of numbers
- f how toxic materials can accumulate in food chains.

2n → ICT opportunity

Pupils could use simulation software to model changes in populations of bacteria in different conditions.

3a → ICT opportunity

Pupils could use sensors to record or use simulation software to model factors that affect photosynthesis.

5f → ICT opportunity

Pupils could use simulation software to explore toxic materials in food chains.

1a → ICT opportunity

Pupils could search a database for information about properties of materials.

2a → ICT opportunity

Pupils could use dataloggers to collect, analyse and evaluate changes of temperature and mass.

Sc3 Materials and their properties

Classifying materials

1 Pupils should be taught:**Solids, liquids and gases**

- a how materials can be characterised by melting point, boiling point and density
- b how the particle theory of matter can be used to explain the properties of solids, liquids and gases, including changes of state, gas pressure and diffusion

Elements, compounds and mixtures

- c that the elements are shown in the periodic table and consist of atoms, which can be represented by symbols
- d how elements vary widely in their physical properties, including appearance, state at room temperature, magnetic properties and thermal and electrical conductivity, and how these properties can be used to classify elements as metals or non-metals
- e how elements combine through chemical reactions to form compounds [for example, water, carbon dioxide, magnesium oxide, sodium chloride, most minerals] with a definite composition
- f to represent compounds by formulae and to summarise reactions by word equations
- g that mixtures [for example, air, sea water and most rocks] are composed of constituents that are not combined
- h how to separate mixtures into their constituents using distillation, chromatography and other appropriate methods.

Changing materials

2 Pupils should be taught:**Physical changes**

- a that when physical changes [for example, changes of state, formation of solutions] take place, mass is conserved
- b about the variation of solubility with temperature, the formation of saturated solutions, and the differences in solubility of solutes in different solvents
- c to relate changes of state to energy transfers

Geological changes

- d how forces generated by expansion, contraction and the freezing of water can lead to the physical weathering of rocks
- e about the formation of rocks by processes that take place over different timescales, and that the mode of formation determines their texture and the minerals they contain

- f how igneous rocks are formed by the cooling of magma, sedimentary rocks by processes including the deposition of rock fragments or organic material, or as a result of evaporation, and metamorphic rocks by the action of heat and pressure on existing rocks

Chemical reactions

- g how mass is conserved when chemical reactions take place because the same atoms are present, although combined in different ways
- h that virtually all materials, including those in living systems, are made through chemical reactions, and to recognise the importance of chemical change in everyday situations [for example, ripening fruit, setting superglue, cooking food]
- i about possible effects of burning fossil fuels on the environment [for example, production of acid rain, carbon dioxide and solid particles] and how these effects can be minimised.

Patterns of behaviour

- 3 Pupils should be taught:

Metals

- a how metals react with oxygen, water, acids and oxides of other metals, and what the products of these reactions are
- b about the displacement reactions that take place between metals and solutions of salts of other metals
- c how a reactivity series of metals can be determined by considering these reactions, and used to make predictions about other reactions

Acids and bases

- d to use indicators to classify solutions as acidic, neutral or alkaline, and to use the pH scale as a measure of the acidity of a solution
- e how metals and bases, including carbonates, react with acids, and what the products of these reactions are
- f about some everyday applications of neutralisation [for example, the treatment of indigestion, the treatment of acid soil, the manufacture of fertilizer]
- g how acids in the environment can lead to corrosion of some metals and chemical weathering of rock [for example, limestone]
- h to identify patterns in chemical reactions.

2i → ICT opportunity

Pupils could use the internet to find up-to-date information about environmental issues.

3a → ICT opportunity

Pupils could use video or CD-ROM to see reactions that are dangerous.

1a → ICT opportunity

Pupils could use simulation software to investigate and model circuits.

2a, 2f, 2g → links to other subjects

These requirements build on Ma2/5f.

Sc4 Physical processes**Electricity and magnetism****1 Pupils should be taught:****Circuits**

- a how to design and construct series and parallel circuits, and how to measure current and voltage
- b that the current in a series circuit depends on the number of cells and the number and nature of other components and that current is not ‘used up’ by components
- c that energy is transferred from batteries and other sources to other components in electrical circuits

Magnetic fields

- d about magnetic fields as regions of space where magnetic materials experience forces, and that like magnetic poles repel and unlike poles attract

Electromagnets

- e that a current in a coil produces a magnetic field pattern similar to that of a bar magnet
- f how electromagnets are constructed and used in devices [for example, relays, lifting magnets].

Forces and motion**2 Pupils should be taught:****Force and linear motion**

- a how to determine the speed of a moving object and to use the quantitative relationship between speed, distance and time
- b that the weight of an object on Earth is the result of the gravitational attraction between its mass and that of the Earth
- c that unbalanced forces change the speed or direction of movement of objects and that balanced forces produce no change in the movement of an object
- d ways in which frictional forces, including air resistance, affect motion [for example, streamlining cars, friction between tyre and road]

Force and rotation

- e that forces can cause objects to turn about a pivot
- f the principle of moments and its application to situations involving one pivot

Force and pressure

- g the quantitative relationship between force, area and pressure and its application [for example, the use of skis and snowboards, the effect of sharp blades, hydraulic brakes].

Light and sound

3 Pupils should be taught:

The behaviour of light

- a that light travels in a straight line at a finite speed in a uniform medium
- b that non-luminous objects are seen because light scattered from them enters the eye
- c how light is reflected at plane surfaces
- d how light is refracted at the boundary between two different materials
- e that white light can be dispersed to give a range of colours
- f the effect of colour filters on white light and how coloured objects appear in white light and in other colours of light

Hearing

- g that sound causes the eardrum to vibrate and that different people have different audible ranges
- h some effects of loud sounds on the ear [for example, temporary deafness]

Vibration and sound

- i that light can travel through a vacuum but sound cannot, and that light travels much faster than sound
- j the relationship between the loudness of a sound and the amplitude of the vibration causing it
- k the relationship between the pitch of a sound and the frequency of the vibration causing it.

The Earth and beyond

4 Pupils should be taught:

The solar system

- a how the movement of the Earth causes the apparent daily and annual movement of the Sun and other stars
- b the relative positions of the Earth, Sun and planets in the solar system
- c about the movements of planets around the Sun and to relate these to gravitational forces
- d that the Sun and other stars are light sources and that the planets and other bodies are seen by reflected light
- e about the use of artificial satellites and probes to observe the Earth and to explore the solar system.

Energy resources and energy transfer

5 Pupils should be taught:

Energy resources

- a about the variety of energy resources, including oil, gas, coal, biomass, food, wind, waves and batteries, and the distinction between renewable and non-renewable resources

4a, 4c, 4e → ICT opportunity

Pupils could use video or CD-ROM to study the solar system.

5a, 5c → ICT opportunity

Pupils could use the internet to find up-to-date information about energy resources.

2a → links to other subjects

This requirement builds on En1/1e and En3/9b–9d and Ma2/1g.

- b about the Sun as the ultimate source of most of the Earth's energy resources and to relate this to how coal, oil and gas are formed
- c that electricity is generated by means of a variety of energy resources

Conservation of energy

- d the distinction between temperature and heat, and that differences in temperature can lead to transfer of energy
- e ways in which energy can be usefully transferred and stored
- f how energy is transferred by the movement of particles in conduction, convection and evaporation, and that energy is transferred directly by radiation
- g that although energy is always conserved, it may be dissipated, reducing its availability as a resource.

Breadth of study

- 1 During the key stage, pupils should be taught the **Knowledge, skills and understanding** through:
 - a a range of domestic, industrial and environmental contexts
 - b considering ways in which science is applied in technological developments
 - c considering the benefits and drawbacks of scientific and technological developments, including those related to the environment, health and quality of life
 - d using a range of sources of information, including ICT-based sources
 - e using first-hand and secondary data to carry out a range of scientific investigations, including complete investigations
 - f using quantitative approaches where appropriate, including calculations based on simple relationships between physical quantities.

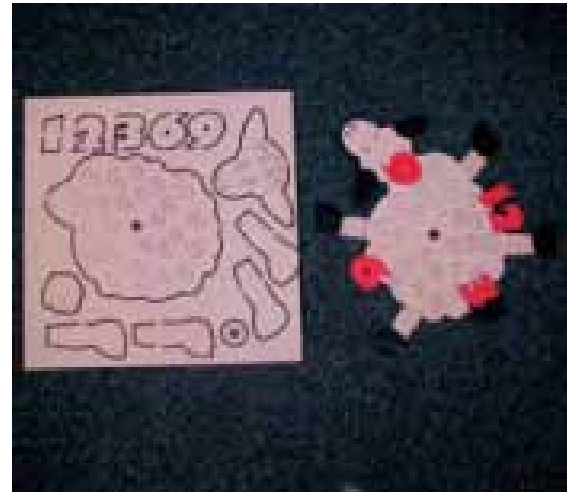
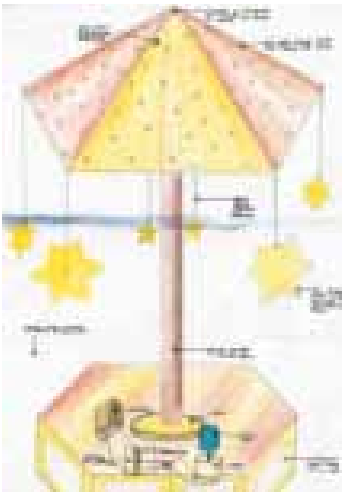
- 2 During the key stage, pupils should be taught to:

Communication

- a use scientific language, conventions and symbols, including SI units, word equations and chemical symbols, formulae and equations, where appropriate, to communicate scientific ideas and to provide scientific explanations based on evidence

Health and safety

- b recognise that there are hazards in living things, materials and physical processes, and assess risks and take action to reduce risks to themselves and others.



The design of an object defines its meaning and ultimately its utility. The nature of the connection between technology and people is determined by the designer.

Jonathan Ive, Chief Designer, Apple Computer

Design and

An understanding of the technical possibilities available, together with an interest in and sensitivity to use of language, gives you the confidence to express your design ideas.

Freda Sack, Type Designer and Typographer, The Foundry

‘Tell me and I forget – show me and I may remember – let me do it, and I learn.’ Learning through making works!

Prue Leith, Leith’s School of Food and Wine

Design and technology is about making things that people want and that work well. Creating these things is hugely exciting: it is an inventive, fun activity.

James Dyson, Chairman, Dyson Ltd



technology

The importance of design and technology

Design and technology prepares pupils to participate in tomorrow's rapidly changing technologies. They learn to think and intervene creatively to improve quality of life. The subject calls for pupils to become autonomous and creative problem solvers, as individuals and members of a team. They must look for needs, wants and opportunities and respond to them by developing a range of ideas and making products and systems. They combine practical skills with an understanding of aesthetics, social and environmental issues, function and industrial practices. As they do so, they reflect on and evaluate present and past design and technology, its uses and effects. Through design and technology, all pupils can become discriminating and informed users of products, and become innovators.



Key stage 3 programme of study

Design and technology

During key stage 3 pupils use a wide range of materials to design and make products. They work out their ideas with some precision, taking into account how products will be used, who will use them, how much they cost and their appearance. They develop their understanding of designing and making by investigating products and finding out about the work of professional designers and manufacturing industry. They use computers, including computer-aided design and manufacture (CAD/CAM) and control software, as an integral part of designing and making. They draw on knowledge and understanding from other areas of the curriculum.

The Government believes that schools should be encouraged to look for opportunities to teach both food and textiles as part of the range of contrasting materials that pupils should use as part of the key stage 3 programme of study.

Note

The general teaching requirement for health and safety applies in this subject.

1a → links to other subjects

This requirement builds on En2/4a–4c and ICT/1b.

1f → links to other subjects

This requirement builds on En3/10.

1g → ICT opportunity

Pupils could use spreadsheets to model time and costs.

1h → links to other subjects

This requirement builds on ICT/3a.

2b → links to other subjects

This requirement builds on A&D/2a.

Knowledge, skills and understanding

Teaching should ensure that **knowledge and understanding** are applied when **developing ideas, planning, producing products and evaluating them**.

Developing, planning and communicating ideas

- 1 Pupils should be taught to:
 - a identify relevant sources of information, using a range of resources including ICT
 - b respond to design briefs and produce their own design specifications for products
 - c develop criteria for their designs to guide their thinking and to form a basis for evaluation
 - d generate design proposals that match the criteria
 - e consider aesthetics and other issues that influence their planning [for example, the needs and values of intended users, function, hygiene, safety, reliability, cost]
 - f suggest outline plans for designing and making, and change them if necessary
 - g prioritise actions and reconcile decisions as a project develops, taking into account the use of time and costs when selecting materials, components, tools, equipment and production methods
 - h use graphic techniques and ICT, including computer-aided design (CAD), to explore, develop, model and communicate design proposals [for example, using CAD software or clip-art libraries, CD-ROM and internet-based resources, or scanners and digital cameras].

Working with tools, equipment, materials and components to produce quality products

- 2 Pupils should be taught:
 - a to select and use tools, equipment and processes, including computer-aided design and manufacture (CAD/CAM), to shape and form materials safely and accurately and finish them appropriately [for example, using CAM software linked to a cutter/plotter, lathe, milling machine or sewing machine]
 - b to take account of the working characteristics and properties of materials and components when deciding how and when to use them
 - c to join and combine materials and ready-made components accurately to achieve functional results
 - d to make single products and products in quantity, using a range of techniques, including CAD/CAM to ensure consistency and accuracy
 - e about the working characteristics and applications of a range of modern materials, including smart materials.

Evaluating processes and products

- 3 Pupils should be taught to:
- evaluate their design ideas as these develop, and modify their proposals to ensure that their product meets the design specification
 - test how well their products work, then evaluate them
 - identify and use criteria to judge the quality of other people's products, including the extent to which they meet a clear need, their fitness for purpose, whether resources have been used appropriately, and their impact beyond the purpose for which they were designed [for example, the global, environmental impact of products and assessment for sustainability].

Knowledge and understanding of materials and components

- 4 Pupils should be taught:
- to consider physical and chemical properties and working characteristics of a range of common and modern materials
 - that materials and components can be classified according to their properties and working characteristics
 - that materials and components can be combined, processed and finished to create more useful properties and particular aesthetic effects [for example, combining different ingredients to create products with different sensory characteristics]
 - how multiple copies can be made of the same product.

Knowledge and understanding of systems and control

- 5 Pupils should be taught:
- to recognise inputs, processes and outputs in their own and existing products
 - that complex systems can be broken down into sub-systems to make it easier to analyse them, and that each sub-system also has inputs, processes and outputs
 - the importance of feedback in control systems
 - about mechanical, electrical, electronic and pneumatic control systems, including the use of switches in electrical systems, sensors in electronic switching circuits, and how mechanical systems can be joined together to create different kinds of movement
 - how different types of systems and sub-systems can be interconnected to achieve a particular function
 - how to use electronics, microprocessors and computers to control systems, including the use of feedback
 - how to use ICT to design sub-systems and systems.

Note for 2e

Modern materials are those that are continually being developed through the invention of new or improved processes (for example, Teflon, optical fibres, neoprene, modified enzymes, antioxidants, genetically engineered foods, synthetic flavours, synthetic microfibres, Lycra blends, polartec, composite materials, cellular materials, carbon or Kevlar fibre).

Smart materials respond to differences in temperature or light and change in some way. They are called 'smart' because they sense conditions in their environment and respond to them. Some examples are:

- shape memory alloy (such as nitinol), which can be used to give mechanical movement when a set temperature is reached (such as to trigger a sprinkler system)
- liquid crystals in coated fabrics or thermochromic dyes, used to produce clothing that changes colour with light or temperature (such as colour change to warn of hypothermia possibility or excessive UV exposure)
- modified starches, such as starches that are chemically modified to set at high temperature and then become fluid again at low temperatures.

4a → links to other subjects

This requirement builds on Sc3/1a, 1d, 1g.

4b → ICT opportunity

Pupils could analyse materials and their properties using data-handling software.

6b → links to other subjects

This requirement builds on Ma2/1b–1d.

Note for 7c

'Compliant materials' is a broad term used to describe plastics and the full range of textiles, including some composites.

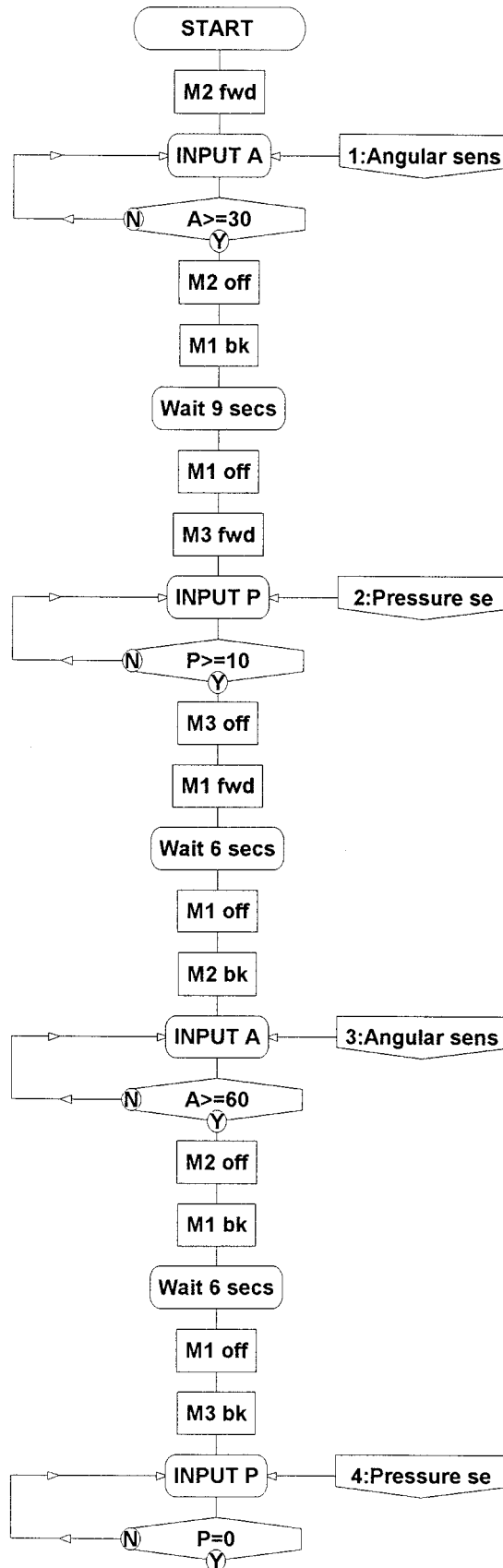
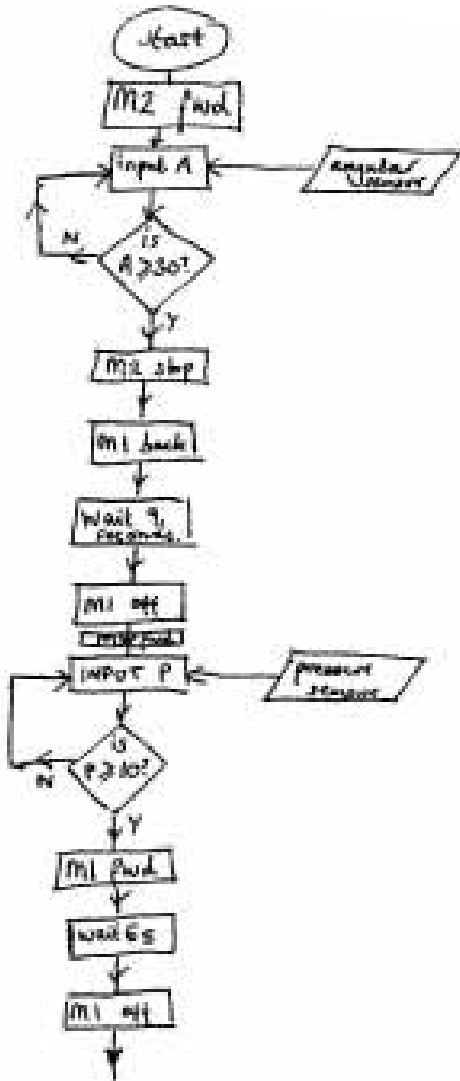
Knowledge and understanding of structures

- 6 Pupils should be taught:
- a to recognise and use structures and how to support and reinforce them
 - b simple tests and appropriate calculations to work out the effect of loads
 - c that forces of compression, tension, torsion and shear produce different effects.

Breadth of study

- 7 During the key stage, pupils should be taught the **knowledge, skills and understanding** through:
- a product analysis
 - b focused practical tasks that develop a range of techniques, skills, processes and knowledge
 - c design and make assignments in different contexts. The assignments should include control systems, and work using a range of contrasting materials, including resistant materials, *compliant materials and/or food*.

Robot Arm



arm moves right

arm stops

arm moves down

arm stops

'fingers' close

'fingers' stop

arm moves upwards

arm stops

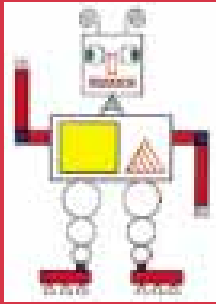
arm moves left

arm stops

arm moves down

arm stops

'fingers' open



The importance of information and communication technology

Information and communication technology (ICT) prepares pupils to participate in a rapidly changing world in which work and other activities are increasingly transformed by access to varied and developing technology. Pupils use ICT tools to find, explore, analyse, exchange and present information responsibly, creatively and with discrimination.

They learn how to employ ICT to enable rapid access to ideas and experiences from a wide range of people, communities and cultures. Increased capability in the use of ICT promotes initiative and independent learning, with pupils being able to make informed judgements about when and where to use ICT to best effect, and to consider its implications for home and work both now and in the future.

Information and communication technology

ICT has enormous potential not just for a National Curriculum. It will change the way we learn as well as the way we work.

Chris Yapp, Director, the Internet Society of England

The modern world requires new skills. Understanding ICT and, more importantly, being able to apply it to the problems we face is one of the most important. Increasingly ICT will be vital for our individual prospects and for our economy's future.

Lord Dennis Stevenson, Prime Minister's Adviser on ICT and Education

ICT expands horizons by shrinking worlds.

David Brown, Chairman, Motorola Ltd

With scientific method, we took things apart to see how they work. Now with computers we can put things back together to see how they work, by modelling complex, interrelated processes, even life itself. This is a new age of discovery, and ICT is the gateway.

Douglas Adams, Author

Key stage 3 programme of study

Information and communication technology

During key stage 3 pupils become increasingly independent users of ICT tools and information sources. They have a better understanding of how ICT can help their work in other subjects and develop their ability to judge when and how to use ICT and where it has limitations. They think about the quality and reliability of information, and access and combine increasing amounts of information. They become more focused, efficient and rigorous in their use of ICT, and carry out a range of increasingly complex tasks.

Note

The general teaching requirement for health and safety applies in this subject.

1b → links to other subjects

This requirement builds on En2/1a, 1b.

3a → links to other subjects

This requirement builds on En2/4.

Knowledge, skills and understanding

Finding things out

- 1 Pupils should be taught:
 - a to be systematic in considering the information they need and to discuss how it will be used
 - b how to obtain information well matched to purpose by selecting appropriate sources, using and refining search methods and questioning the plausibility and value of the information found
 - c how to collect, enter, analyse and evaluate quantitative and qualitative information, checking its accuracy [for example, carrying out a survey of local traffic, analysing data gathered in fieldwork].

Developing ideas and making things happen

- 2 Pupils should be taught:
 - a to develop and explore information, solve problems and derive new information for particular purposes [for example, deriving totals from raw data, reaching conclusions by exploring information]
 - b how to use ICT to measure, record, respond to and control events by planning, testing and modifying sequences of instructions [for example, using automatic weather stations, datalogging in fieldwork and experiments, using feedback to control devices]
 - c how to use ICT to test predictions and discover patterns and relationships, by exploring, evaluating and developing models and changing their rules and values
 - d to recognise where groups of instructions need repeating and to automate frequently used processes by constructing efficient procedures that are fit for purpose [for example, templates and macros, control procedures, formulae and calculations in spreadsheets].

Exchanging and sharing information

- 3 Pupils should be taught:
 - a how to interpret information and to reorganise and present it in a variety of forms that are fit for purpose [for example, information about a charitable cause presented in a leaflet for a school fundraising event]
 - b to use a range of ICT tools efficiently to draft, bring together and refine information and create good-quality presentations in a form that is sensitive to the needs of particular audiences and suits the information content
 - c how to use ICT, including email, to share and exchange information effectively [for example, web publishing, video conferencing].

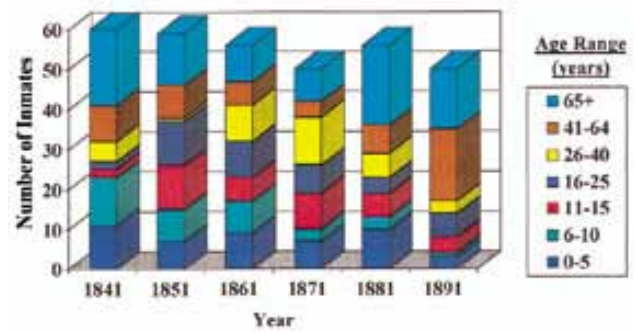
Reviewing, modifying and evaluating work as it progresses

- 4 Pupils should be taught to:
 - a reflect critically on their own and others' uses of ICT to help them develop and improve their ideas and the quality of their work
 - b share their views and experiences of ICT, considering the range of its uses and talking about its significance to individuals, communities and society
 - c discuss how they might use ICT in future work and how they would judge its effectiveness, using relevant technical terms
 - d be independent and discriminating when using ICT.

Breadth of study

- 5 During the key stage, pupils should be taught the **Knowledge, skills and understanding** through:
 - a working with a range of information to consider its characteristics, structure, organisation and purposes [for example, using database, spreadsheet and presentation software to manage membership and finances of a club and present the annual report]
 - b working with others to explore a variety of information sources and ICT tools in a variety of contexts
 - c designing information systems and evaluating and suggesting improvements to existing systems [for example, evaluating a website or researching, designing and producing a multimedia presentation for a science topic]
 - d comparing their use of ICT with its use in the wider world.

A Graph Showing the Ages of Inmates at the Workhouse From Census Data (1841-1891)



History

History is made by people. When you understand people, you can live a full life.

Charles Miller Smith, Chairman, Imperial Chemical Industries PLC

History adds colour to the curriculum. It tells you about how the princes and the people fit together – or fight. That’s life itself. If you miss out on that, you miss out on some of the most exotic, colourful characters you’ll have the chance to learn about at school.

Brian Walden, Author and Television Presenter

History is an unusual discipline. Its core is hard fact that you cannot get away from and have to learn to master. At the same time you have to be deductive, perceptive and imaginative in the use of that fact.

Dr Christine Carpenter, University of Cambridge

How do you know who you are unless you know where you’ve come from? How can you tell what’s going to happen, unless you know what’s happened before? History isn’t just about the past. It’s about why we are who we are – and about what’s next.

Tony Robinson, Actor and Television Presenter

The importance of history

History fires pupils’ curiosity about the past in Britain and the wider world. Pupils consider how the past influences the present, what past societies were like, how these societies organised their politics, and what beliefs and cultures influenced people’s actions. As they do this, pupils develop a chronological framework for their knowledge of significant events and people. They see the diversity of human experience, and understand more about themselves as individuals and members of society. What they learn can influence their decisions about personal choices, attitudes and values. In history, pupils find evidence, weigh it up and reach their own conclusions. To do this they need to be able to research, sift through evidence, and argue for their point of view – skills that are prized in adult life.

The graph shows us that in 1841 just over one third of the population of Ringwood Workhouse were children aged between 0 and 15 years of age.

This figure slowly declines to about a third in 1881 and then drops significantly to about one sixth of the total population of the workhouse.

This could just be a one off, however, as there is no data from any further censuses to show that the trend continued to be so low.

Key stage 3 programme of study

History

During key stage 3 pupils learn about significant individuals and events in the history of Britain from the Middle Ages to the twentieth century. They also learn about key aspects of European and world history. They show their understanding by making connections between events and changes in the different periods and areas studied, and by comparing the structure of societies and economic, cultural and political developments. They evaluate and use sources of information, using their historical knowledge to analyse the past and explain how it can be represented and interpreted in different ways.

Note for 3

People represent and interpret the past in many different ways, including: in pictures, plays, films, reconstructions, museum displays, and fictional and non-fiction accounts. Interpretations reflect the circumstances in which they are made, the available evidence, and the intentions of those who make them (for example, writers, archaeologists, historians, film-makers).

4a → links to other subjects

This requirement builds on En1/2 and En2/1a–1f, 4, 5 and ICT/1a–1c.

4b → ICT opportunity

Pupils could use a spreadsheet or a data file of information about an historical event to search and analyse patterns, for example, mortality rates.

5c → links to other subjects

This requirement builds on En1/1, 3 and En3/1e–1o.

Knowledge, skills and understanding

Chronological understanding

- 1 Pupils should be taught to recognise and make appropriate use of dates, vocabulary and conventions that describe historical periods and the passing of time.

Knowledge and understanding of events, people and changes in the past

- 2 Pupils should be taught:
 - a to describe and analyse the relationships between the characteristic features of the periods and societies studied including the experiences and range of ideas, beliefs and attitudes of men, women and children in the past
 - b about the social, cultural, religious and ethnic diversity of the societies studied, both in Britain and the wider world
 - c to analyse and explain the reasons for, and results of, the historical events, situations and changes in the periods studied
 - d to identify trends, both within and across different periods, and links between local, British, European and world history
 - e to consider the significance of the main events, people and changes studied.

Historical interpretation

- 3 Pupils should be taught:
 - a how and why historical events, people, situations and changes have been interpreted in different ways
 - b to evaluate interpretations.

Historical enquiry

- 4 Pupils should be taught to:
 - a identify, select and use a range of appropriate sources of information including oral accounts, documents, printed sources, the media, artefacts, pictures, photographs, music, museums, buildings and sites, and ICT-based sources as a basis for independent historical enquiries
 - b evaluate the sources used, select and record information relevant to the enquiry and reach conclusions.

Organisation and communication

- 5 Pupils should be taught to:
 - a recall, prioritise and select historical information
 - b accurately select and use chronological conventions and historical vocabulary appropriate to the periods studied to organise historical information
 - c communicate their knowledge and understanding of history, using a range of techniques, including spoken language, structured narratives, substantiated explanations and the use of ICT.

Breadth of study

- 6 During the key stage, pupils should be taught the **Knowledge, skills and understanding** through three British studies, a European study and two world studies.
- 7 In their study of local, British, European and world history, pupils should be taught about:
 - a significant events, people and changes from the recent and more distant past
 - b history from a variety of perspectives including political, religious, social, cultural, aesthetic, economic, technological and scientific
 - c aspects of the histories of England, Ireland, Scotland and Wales where appropriate
 - d the history of Britain in its European and wider world context
 - e some aspects in overview and others in depth.

Britain 1066–1500

- 8 A study of major features of Britain's medieval past: the development of the monarchy, and significant events and characteristic features of the lives of people living throughout the British Isles, including the local area if appropriate.

Britain 1500–1750

- 9 A study of crowns, parliaments and people: the major political, religious and social changes affecting people throughout the British Isles, including the local area if appropriate.

Examples for 8: Britain 1066–1500

The development of the monarchy and significant events: the Norman Conquest including the Battle of Hastings; the Domesday survey; Matilda and Stephen; Henry II and Thomas Becket; Richard I, Salah ad-Din and the Crusades; John and the Magna Carta; John in Ireland; Edward I in Wales and Edward III in Scotland; the Black Death; the Peasants' Revolt; Henry V, Henry VI, Joan of Arc and the Hundred Years' War; the Wars of the Roses.

Characteristic features of life: the structure of medieval society; the influence of communities of monks and nuns; towns, guilds and charters; the Jews, Hansards and Staplers and overseas trade; religious and secular art and architecture; the impact of the written and printed word including monastic writings; life as reflected in the work of Geoffrey Chaucer and the Paston letters.

Examples for 9: Britain 1500–1750

Political and religious changes: reformation and religious settlement; relations with other European countries in the sixteenth century; the Plantations in Ireland; religious persecution and the voyage of the Pilgrim Fathers; Charles I and the Civil Wars; Oliver Cromwell and the Commonwealth including relations with Scotland and Ireland; Charles II and the Restoration; Mary, William III and the Glorious Revolution; Queen Anne, Marlborough and Blenheim; the effects of the Acts of Union on Wales; relations between England and Scotland, the impact of the Treaty of Union and the Jacobite rebellions.

Social changes: the Elizabethan poor laws; the foundation and fortunes of the East India Company; the changing role of women; the rebuilding of London; life in restoration London; law and order; advances in medicine and surgery including the work of William Harvey; the founding of the Royal Society and the scientific discoveries of Isaac Newton, Robert Boyle and Edmund Halley; developments in the arts and architecture.

Note for Breadth of study

Not all of the aspects of the **Knowledge, skills and understanding** need be developed in each study.

Note for 7e

An overview study could consider the main issues within a period or across periods and identify and analyse links and trends.

An in-depth study could consider events, people or changes in detail, for example, analysing the reasons for an event, its consequences, different interpretations of its significance, and links with other events or changes.

Britain 1750–1900

10 A study of how expansion of trade and colonisation, industrialisation and political changes affected the United Kingdom, including the local area.

A European study before 1914

11 A study of a significant period *or* event in the pre-history or history of Europe.

A world study before 1900

12 A study of the cultures, beliefs and achievements of an African, American, Asian *or* Australasian society in the past (other than those included in the programme of study for key stage 2).

A world study after 1900

13 A study of some of the significant individuals, events and developments from across the twentieth century, including the two World Wars, the Holocaust, the Cold War, and their impact on Britain, Europe and the wider world.

Examples for 10: Britain 1750–1900

Expansion of trade and colonisation: the American Revolution; the Napoleonic Wars and the role of Nelson and Wellington; the development of Empire and colonial rule in India, South-East Asia or Africa; the Opium Wars in China.

Industrialisation: industrialisation in the local area; changes in agriculture and rural life; the development of legislation to improve working and living conditions; the role of scientists and inventors such as Edward Jenner, Humphry Davy, James Watt, Michael Faraday, Mary Somerville, Charles Darwin; the impact of industrialisation on cultural developments such as the works of William Hogarth, J M W Turner, Jane Austen, Charles Dickens, George Eliot; Gustav Holst, Henry Wood, William Gilbert and Arthur Sullivan.

Political changes: the abolition of slavery and the slave trade in the British Empire, and the work of reformers such as William Wilberforce and Olaudah Equiano; Chartism; the extension of the franchise; the development of political parties; relations between Ireland and Britain; the role of political leaders such as: Queen Victoria, Robert Peel, William Gladstone, Benjamin Disraeli; the role of reformers such as John Howard and Elizabeth Garrett.

Examples for 11: European study before 1914

Periods: the Neolithic Revolution; the Roman Empire; Europe in the time of Charlemagne; astronomy, navigation, exploration and trade in the early modern period; Spain under Philip II; the Dutch Republic in the seventeenth century; the Ottoman Empire in the sixteenth and seventeenth centuries; France at the time of the Sun King; the reign of Peter the Great.

Events: the Crusades against Islam; the Italian Renaissance; Reformation and Counter-Reformation in the sixteenth century; the Thirty Years War; the French Revolution and the Napoleonic era; the revolutions of 1848; German and Italian Unification; European imperialism in the nineteenth century.

Examples for 12: a world study before 1900

Societies in the past: Islamic civilisations (seventh to sixteenth centuries); the Qin Dynasty in China; Imperial China from the First Emperor to Kublai Khan; the Manchu invasion and the fall of the Ming dynasty; India from the Mughal Empire to the coming of the British; the civilisations of Peru; indigenous peoples of North America; black peoples of the Americas; the West African empires; Japan under the Shoguns; Tokugawa Japan; the Phoenicians; the Maoris; Muhammad and Makkah; the empires of Islam in Africa; the Sikhs and the Mahrattas; the Zulu kingdoms.

Examples for 13: a world study after 1900

Individuals: Winston Churchill; Adolf Hitler; Joseph Stalin; Benito Mussolini; Franklin Roosevelt; Mahatma Gandhi; Mao Zedong; Martin Luther King.

Events: the Western Front in the First World War; the Russian Revolution; the Depression and the New Deal in the USA; the rise of National Socialism in Germany; the emergence of Japan as a major world power; the partition of Ireland and its impact; the rise of modern China; the Vietnam War; the fall of the Berlin Wall.

Developments: the changing role and status of women; the extension of the franchise in Britain and the work of reformers such as Christabel and Emmeline Pankhurst; the Welfare State; the origins and role of the United Nations, including the UN Charter and Universal Declaration of Human Rights; the break up of the overseas empires of European countries; the origins and development of the Commonwealth and its impact; the development of the European Union; the impact on the lives of people in different parts of the world of changes in the arts, communications, science and technology, such as the work of Marie Curie, Albert Einstein, and of James Watson, Francis Crick, Rosalind Franklin and Maurice Wilkins on the structure of DNA.

Geography brings theory down to earth. And in a world where 80 per cent of information is referenced to locations, it develops spatial awareness.

Dr Rita Gardner, Director and Secretary, Royal Geographical Society
(with the Institute of British Geographers)

What is our knowledge worth if we know nothing about the world that sustains us, nothing about natural systems and climate, nothing about other countries and cultures?

Jonathon Porritt, Forum for the Future and Chairman of the UK Government
Committee on sustainable Development

What other subject tells us so much about the great issues of the age – global change, natural and human?

Professor Andrew Goudie, Chair of Oxford Inspires (a cultural development agency for Oxford) and Master of St Cross College

Geography makes us aware that we must think globally.

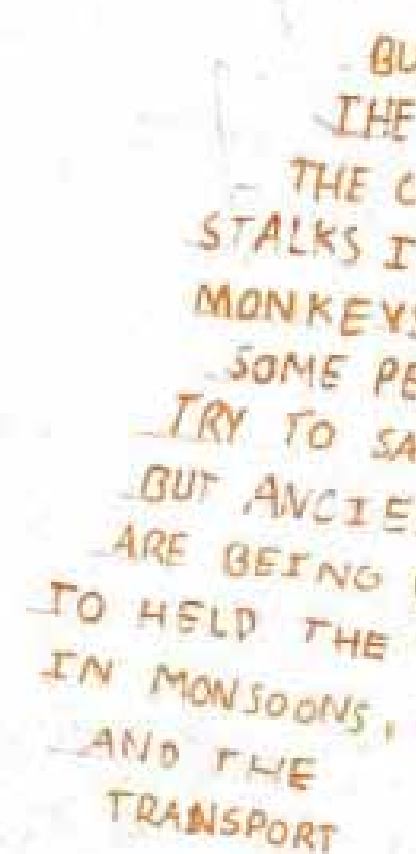
Bill Giles OBE, former Head, BBC Weather

Geography

The importance of geography

Geography provokes and answers questions about the natural and human worlds, using different scales of enquiry to view them from different perspectives. It develops knowledge of places and environments throughout the world, an understanding of maps, and a range of investigative and problem-solving skills both inside and outside the classroom. As such, it prepares pupils for adult life and employment. Geography is a focus within

the curriculum for understanding and resolving issues about the environment and sustainable development. It is also an important link between the natural and social sciences. As pupils study geography, they encounter different societies and cultures. This helps them realise how nations rely on each other. It can inspire them to think about their own place in the world, their values, and their rights and responsibilities to other people and the environment.



THE STEAMING RAIN,

THE HOT BLINDING SUN,

THE RICH GREEN TREES, THE BEAUTIFUL
DEADLY CREATURES, THE CIRCLING BIRDS IN
SKY, THE RICH COLOURED EXOTIC PLANTS, BEAUTIFUL ORCHIDS,
O-CO PLANT, EVERY PLANT HAS A USE, THE NIGHT HUNTER
ITS PREY, THE EXOTIC FISH SWIM IN THE WARM WATER,
SWING FROM TREES, SOME PEOPLE DESTROY THE RAINFOREST,
SOME PROTECT THE RAINFOREST, TRY TO SAVE THE RAINFOREST,
THE RAINFOREST, TRY TO SAVE THE RAINFOREST,
ANCIENT CIVILIZATIONS ARE DISAPPEARING, NUTRIENTS
DESTROYED BY FIRE, THE TREES GIVE OXYGEN
WORLD TO BREATHE, THE RAIN COMES DOWN
THE TREES HELD SHELTER THE PEOPLE
CREATURES. PEOPLE STEAL IRON AND
IT AWAY BY TRAIN, THE MOUNTAINS
GROW INCREASINGLY SMALLER,
THE FOREST BURNS IN PLACES,
THERE COULD BE PRECIOUS
GOLD HIDDEN, MENDEZ
WAS MURDERED FOR
TRYING TO PROTECT
THE RAINFOREST, HE
IS NOW A SYMBOL,
TRY TO SAVE THE
RAINFOREST, TRY
TO SAVE THE
RAINFOREST, TRY
TO SAVE THE
RAINFOREST

THE AMAZON

Key stage 3 programme of study

Geography

During key stage 3 pupils investigate a wide range of people, places and environments at different scales around the world. They learn about geographical patterns and processes and how political, economic, social and environmental factors affect contemporary geographical issues. They also learn about how places and environments are interdependent. They carry out geographical enquiry inside and outside the classroom. In doing this they identify geographical questions, collect and analyse written and statistical evidence, and develop their own opinions. They use a wide range of geographical skills and resources such as maps, satellite images and ICT.

1c → links to other subjects

This requirement builds on Ma4/1a, 3a, 3b.

1c → ICT opportunity

Pupils could use a digital camera to record appropriate images to support fieldwork.

1d → links to other subjects

This requirement builds on Ma4/1a, 4a, 5a–5c, 5f and ICT/1c.

1f → links to other subjects

This requirement builds on En1/1a–1e and En3/1.

Note for 2

Geographical skills are developed in the context of geographical enquiry.

Note for 2b

Fieldwork techniques are developed during fieldwork investigations outside the classroom.

2c, 2e → links to other subjects

These requirements build on Ma3/3d, 3e.

2d → links to other subjects

This requirement builds on En2/1a–1e, 4a–4c.

Knowledge, skills and understanding

Teaching should ensure that **geographical enquiry and skills** are used when developing **knowledge and understanding of places, patterns and processes, and environmental change and sustainable development**.

Geographical enquiry and skills

- 1 In undertaking geographical enquiry, pupils should be taught to:
 - a ask geographical questions [for example, ‘How and why is this landscape changing?’, ‘What is the impact of the changes?’, ‘What do I think about them?’] and to identify issues
 - b suggest appropriate sequences of investigation [for example, gathering views and factual evidence about a local issue and using them to reach a conclusion]
 - c collect, record and present evidence [for example, statistical information about countries, data about river channel characteristics]
 - d analyse and evaluate evidence and draw and justify conclusions [for example, analysing statistical data, maps and graphs, evaluating publicity leaflets that give different views about a planning issue]
 - e appreciate how people’s values and attitudes [for example, about overseas aid], including their own, affect contemporary social, environmental, economic and political issues, and to clarify and develop their own values and attitudes about such issues
 - f communicate in ways appropriate to the task and audience [for example, by using desktop publishing to produce a leaflet, drawing an annotated sketch map, producing persuasive or discursive writing about a place].
- 2 In developing geographical skills, pupils should be taught:
 - a to use an extended geographical vocabulary [for example, drainage basin, urban regeneration]
 - b to select and use appropriate fieldwork techniques [for example, land-use survey, datalogging] and instruments [for example, cameras]
 - c to use atlases and globes, and maps and plans at a range of scales, including Ordnance Survey 1:25,000 and 1:50,000 maps
 - d to select and use secondary sources of evidence, including photographs (including vertical and oblique aerial photographs), satellite images and evidence from ICT-based sources [for example, from the internet]
 - e to draw maps and plans at a range of scales, using symbols, keys and scales [for example, annotated sketch maps] and to select and use appropriate graphical techniques to present evidence on maps and diagrams [for example, pie charts, choropleth maps], including using ICT [for example, using mapping software to plot the distribution of shops and services in a town centre]

- f to communicate in different ways, including using ICT [for example, by writing a report about an environmental issue, exchanging fieldwork data using email]
- g decision-making skills, including using ICT [for example, by using a spreadsheet to help find the best location for a superstore].

Knowledge and understanding of places

- 3 Pupils should be taught:
 - a the location of places and environments studied, places and environments in the news and other significant places and environments [for example, those listed on pages 104 and 105]
 - b to describe the national, international and global contexts of places studied [for example, on the Pacific Rim, a member of the European Union]
 - c to describe and explain the physical and human features that give rise to the distinctive character of places
 - d to explain how and why changes happen in places, and the issues that arise from these changes
 - e to explain how places are interdependent [for example, through trade, aid, international tourism, acid rain], and to explore the idea of global citizenship.

Knowledge and understanding of patterns and processes

- 4 Pupils should be taught to:
 - a describe and explain patterns of physical and human features and relate these to the character of places and environments
 - b identify, describe and explain physical and human processes, and their impact on places and environments.

Knowledge and understanding of environmental change and sustainable development

- 5 Pupils should be taught to:
 - a describe and explain environmental change [for example, deforestation, soil erosion] and recognise different ways of managing it
 - b explore the idea of sustainable development and recognise its implications for people, places and environments and for their own lives.

2f → links to other subjects

This requirement builds on ICT/3b.

Note for 3a

This develops pupils' framework of locational knowledge. Places they study could include those studied in other subjects (for example, Germany or France in modern foreign languages).

Note for 3b, 3e

These develop pupils' understanding of global citizenship, which includes awareness of what it means to be a citizen in the local community and of the United Kingdom, Europe and the wider world.

5a → ICT opportunity

Pupils could use the internet to obtain Earth observation, satellite and other information about rainforest depletion and sustainable use.

Note for 6a

If the United Kingdom is one of the countries selected for study, the contexts chosen for the studies of themes should ensure an appropriate range of study.

Note for 6b–6k

The 10 geographical themes may be taught separately, in combination with other themes, or as parts of studies of places. However they are combined, the study of themes should always be set within the context of real places.

6b → ICT opportunity

Pupils could use the internet to access resources that explain and explore tectonic processes.

6c → links to other subjects

This requirement builds on Sc3/2d, 2f.

6d → ICT opportunity

Pupils could use an automatic weather station for datalogging weather information for comparison with similar data from other places.

Note for 6e

A biome is a global-scale community of plants and animals that exists in relative equilibrium with its environment.

6g → ICT opportunity

Pupils could collect information from ICT-based sources about different settlements and select and revise some of this for a report, using presentation software.

Breadth of study

6 During the key stage, pupils should be taught the **Knowledge, skills and understanding** through the study of two countries and 10 themes:

Countries

- a two countries in significantly different states of economic development, including:
 - i the regional differences that exist in each country and their causes and consequences
 - ii how and why each country may be judged to be more or less developed

Themes

- b tectonic processes and their effects on landscapes and people, including:
 - i the global distribution of tectonic activity and its relationship with the boundaries of plates
 - ii the nature, causes and effects of earthquakes *or* volcanic eruptions
 - iii human responses to the hazards associated with them
- c geomorphological processes and their effects on landscapes and people, including:
 - i the processes responsible for the development of selected landforms and the role of rock type and weathering
 - ii the causes and effects of a hazard [*for example, flooding, landslides*], and human responses to it
- d how and why weather and climate vary, including:
 - i the differences between ‘weather’ and ‘climate’
 - ii the components and links in the water cycle
 - iii how and why aspects of weather and climate vary from place to place
- e ecosystems – how physical and human processes influence vegetation, including:
 - i the characteristics and distribution of one major biome [*for example, savannah grassland, tropical rainforest, temperate forest*]
 - ii how the ecosystems of this biome are related to climate, soil and human activity
- f population distribution and change, including:
 - i the global distribution of population
 - ii the causes and effects of changes in the population of regions and countries, including migration
 - iii the interrelationship between population and resources
- g the changing characteristics of settlements, including:
 - i the reasons for the location, growth and nature of individual settlements
 - ii how and why the provision of goods and services in settlements varies
 - iii how and why changes in the functions of settlements occur and how these changes affect groups of people in different ways
 - iv patterns and changes in urban land use

- h changing distribution of economic activity and its impact, including:
 - i types and classifications of economic activity
 - ii the geographical distribution of one or more economic activities [for example, farming, tourism]
 - iii how and why the distribution has changed and is changing [for example, the impact of new technologies], and the effects of such changes
 - i development, including:
 - i ways of identifying differences in development within and between countries
 - ii effects of differences in development on the quality of life of different groups of people
 - iii factors, including the interdependence of countries, that influence development
 - j environmental issues, including:
 - i how conflicting demands on an environment arise
 - ii how and why attempts are made to plan and manage environments
 - iii effects of environmental planning and management on people, places and environments [for example, managing coastal retreat, building a reservoir]
 - k resource issues, including:
 - i the sources and supply of a resource
 - ii the effects on the environment of the use of a resource
 - iii resource planning and management [for example, reducing energy use, developing alternative energy sources].
- 7 In their study of countries and themes, pupils should:
- a study at a range of scales – local, regional, national, international and global
 - b study different parts of the world and different types of environments, including their local area, the United Kingdom, the European Union and parts of the world in different states of economic development
 - c carry out fieldwork investigations outside the classroom
 - d study issues of topical significance.

6h → ICT opportunity

Pupils could consider the increase in 'telecommuting' and its impact on the distribution of economic activities.

6j → ICT opportunity

Pupils could use a spreadsheet to collate transport management information and graph the findings.

Note for 7b

The study of places and themes in the United Kingdom and European Union contributes towards pupils' broader knowledge and understanding of the geography of the United Kingdom and of the European Union.

Exemplar maps showing this information can be found on the National Curriculum website (www.nc.uk.net) and in the schemes of work for geography.

Locational knowledge – examples of significant places and environments

British Isles	Significant places and environments
The two largest islands of the British Isles	Great Britain, Ireland
The two countries of the British Isles	The United Kingdom, the Republic of Ireland
Parts of the United Kingdom	England, Scotland, Wales, Northern Ireland
Capital cities	London, Dublin, Edinburgh, Cardiff, Belfast
The six largest cities (apart from the capital cities)	Birmingham, Glasgow, Leeds, Liverpool, Manchester, Newcastle
Four other important regional cities selected on the basis of population and regional spread	Bristol, Norwich, Nottingham, Sheffield
The six largest mountain areas in the United Kingdom	The Cambrian Mountains, the Grampian Mountains, the Lake District, the North West Highlands, the Pennines, the Southern Uplands
The three longest rivers in the United Kingdom	River Severn, River Thames, River Trent
The seas around the United Kingdom	The English Channel, the Irish Sea, the North Sea

Europe	Significant places and environments
The two countries of the British Isles	The United Kingdom, the Republic of Ireland
The six countries in Europe with the highest populations and their capital cities	France, Germany, Italy, Poland, Spain, Ukraine; Paris, Berlin, Rome, Warsaw, Madrid, Kiev
The six countries in Europe with the largest areas and their capital cities	France, Germany, Norway, Spain, Sweden, Ukraine; Paris, Berlin, Oslo, Madrid, Stockholm, Kiev
The six countries in Europe with the highest population density (excluding very small countries) and their capital cities	Belgium, Germany, Italy, Luxembourg, Netherlands, Switzerland; Brussels, Berlin, Rome, Luxembourg, Amsterdam*, Bern
Other European Union member countries not included above and their capital cities	Austria, Denmark, Finland, Greece, Portugal; Vienna, Copenhagen, Helsinki, Athens, Lisbon
The largest mountain range in Europe	The Alps
The two longest rivers in West and Central Europe	River Danube and River Rhine
The four largest seas around Europe	The Baltic Sea, the Black Sea, the Mediterranean Sea, the North Sea

* Amsterdam is the capital of the Netherlands; The Hague is the seat of government.

The world	Significant places and environments
The continents	Africa, Asia, Europe, North America, Oceania, South America, Antarctica
Two countries from each continent on the basis of population, area, gross national product (GNP), population density	Nigeria, South Africa, China, India, France, Germany, Canada, USA, Australia, New Zealand, Argentina, Brazil
Five other countries on the basis of population, area and population density	Bangladesh, Indonesia, Japan, Pakistan, Russia
Areas of family origin of the main minority ethnic groups in the United Kingdom	Bangladesh, the Caribbean, India, Pakistan, the Republic of Ireland
Cities with the highest population in each continent	Lagos, Tokyo, Paris, New York, Sydney, Sao Paulo
The nine largest world cities (apart from those identified above)	Beijing, Bombay (Mumbai), Buenos Aires, Calcutta (Kolkata), Jakarta, Los Angeles, Mexico City, Seoul, Shanghai
The three largest mountain ranges in the world (on the basis of height and geographical extent)	The Andes, the Himalayas, the Rocky Mountains
The four longest rivers in the world	River Amazon, River Mississippi, River Nile, River Yangtse
The largest desert in the world	The Sahara
The oceans	The Arctic, Atlantic, Indian and Pacific Oceans
Two canals linking seas and/or oceans	The Panama Canal, the Suez Canal
Main lines of latitude and meridian of longitude	The Poles, the Equator, the Tropics, the Antarctic and Arctic Circles, the Prime Meridian, the International Date Line



My wife and I learnt Spanish and Japanese when I played at Barcelona and Nagoya. We spent hours and hours in tuition – yet we could have learnt either language years earlier at school. Modern languages prepare you for modern life.

Gary Lineker, Footballer and Television Presenter

Learning a language makes our minds stronger and more flexible. Actually using it gives us an entirely new experience of the world.

John Cleese, Actor

Learning another language is part of making the civilised world go around, so start early.

Sir Peter Parker, Late Chair, DTI National Languages for Export Campaign

It is arrogant to assume that we can get by in English or that everyone else will speak our language. Learning a foreign language is polite, demonstrates commitment – and in today's world is absolutely necessary.

Sir Trevor McDonald, Broadcaster, ITN

Pourquoi étudier les langues?

À mon avis c'est très important d'étudier les langues et je pense que tout le monde devrait le faire.

Les langues permettent de voyager à l'étranger sans avoir de difficultés de communication. Si on sait parler la langue du pays, les vacances sont plus amusantes. On peut faire de nouvelles connaissances, rencontrer des amis et généralement c'est plus facile d'obtenir des informations. C'est essentiel pour encourager de bonnes relations internationales, surtout de nos jours quand il y a beaucoup de conflits.

Es muy importante aprender porque al colegio venimos a ser inteligentes, listos e ingeniosos, así que nosotros no somos tontos.

The importance of modern foreign languages

Through the study of a foreign language, pupils understand and appreciate different countries, cultures, people and communities – and as they do so, begin to think of themselves as citizens of the world as well as of the United Kingdom. Pupils also learn about the basic structures of language. They explore the similarities and differences between the foreign

language they are learning and English or another language, and learn how language can be manipulated and applied in different ways. Their listening, reading and memory skills improve, and their speaking and writing become more accurate. The development of these skills, together with pupils' knowledge and understanding of the structure of language, lay the foundations for future study of other languages.

Ich bin umweltfreundlich und
ich verwende umweltfreundliche
Produkte. Ich finde Umweltschutz
sehr wichtig. Das heißt ich kaufe
Spargläser. Jede Woche bringe ich
meine Glasflaschen zu H&M.
Aluminiumtüten am Supermarkt und ich
trage ein kleines Papier- und Plastik-



Modern foreign languages

Key stage 3 programme of study

Modern foreign languages

During key stage 3 pupils begin to understand, speak, read and write at least one modern foreign language. They become familiar with the sounds, written form and grammar of the language, and use this knowledge with increasing confidence and competence to express themselves in role plays, conversations and writing. They improve their understanding of the language by listening to people talking about different subjects and by reading a range of texts. They also increase their cultural awareness by communicating with people who speak the language and by using materials from countries and communities where the language is spoken.

Note about using the target language

The target language is the modern foreign language that pupils are learning. Pupils are expected to use and respond to the target language, and to use English only when necessary (for example, when discussing a grammar point or when comparing English and the target language).

Knowledge, skills and understanding

Acquiring knowledge and understanding of the target language

- 1 Pupils should be taught:
 - a the principles and interrelationship of sounds and writing in the target language
 - b the grammar of the target language and how to apply it
 - c how to express themselves using a range of vocabulary and structures.

Developing language skills

- 2 Pupils should be taught:
 - a how to listen carefully for gist and detail
 - b correct pronunciation and intonation
 - c how to ask and answer questions
 - d how to initiate and develop conversations
 - e how to vary the target language to suit context, audience and purpose
 - f how to adapt language they already know for different contexts
 - g strategies for dealing with the unpredictable [for example, unfamiliar language, unexpected responses]
 - h techniques for skimming and for scanning written texts for information, including those from ICT-based sources
 - i how to summarise and report the main points of spoken or written texts, using notes where appropriate
 - j how to redraft their writing to improve its accuracy and presentation, including the use of ICT.

Developing language-learning skills

- 3 Pupils should be taught:
 - a techniques for memorising words, phrases and short extracts
 - b how to use context and other clues to interpret meaning [for example, by identifying the grammatical function of unfamiliar words or similarities with words they know]
 - c to use their knowledge of English or another language when learning the target language
 - d how to use dictionaries and other reference materials appropriately and effectively
 - e how to develop their independence in learning and using the target language.

Developing cultural awareness

- 4 Pupils should be taught about different countries and cultures by:
- working with authentic materials in the target language, including some from ICT-based sources [for example, handwritten texts, newspapers, magazines, books, video, satellite television, texts from the internet]
 - communicating with native speakers [for example, in person, by correspondence]
 - considering their own culture and comparing it with the cultures of the countries and communities where the target language is spoken
 - considering the experiences and perspectives of people in these countries and communities.

Breadth of study

- 5 During key stage 3, pupils should be taught the **Knowledge, skills and understanding** through:
- communicating in the target language in pairs and groups, and with their teacher
 - using everyday classroom events as an opportunity for spontaneous speech
 - expressing and discussing personal feelings and opinions
 - producing and responding to different types of spoken and written language, including texts produced using ICT
 - using a range of resources, including ICT, for accessing and communicating information
 - using the target language creatively and imaginatively
 - listening, reading or viewing for personal interest and enjoyment, as well as for information
 - using the target language for real purposes [for example, by sending and receiving messages by telephone, letter, fax or email]
 - working in a variety of contexts, including everyday activities, personal and social life, the world around us, the world of work and the international world.

Note for eligible languages

- 6 Schools must offer one or more of the official languages of the European Union (Czech, Danish, Dutch, Estonian, Finnish, French, German, modern Greek, Hungarian, Italian, Latvian, Lithuanian, Maltese, Polish, Portuguese, Slovak, Slovenian, Spanish and Swedish). Schools may, in addition, offer any other modern foreign language. Non-EU languages count as a foundation subject only when offered to pupils alongside the possibility of studying an official language of the EU. A pupil may, therefore, study any modern foreign language that the school offers, but the offer must include an EU language.

1b, 3c → links to other subjects

These requirements build on En1/5 and En2/6 and En3/7.

2j → links to other subjects

This requirement builds on En3/2 and ICT/3b.

4b → ICT opportunity

Pupils could communicate by email with speakers of the target language, including those in more distant countries.

5d → links to other subjects

This requirement builds on ICT/3b.

5e → links to other subjects

This requirement builds on ICT/3c.

Art and design is the freedom of the individual, the freedom of expression and the freedom to fail without retort.

Simon Waterfall, Creative Director, Deepend

Art develops spiritual values and contributes a wider understanding to the experience of life, which helps to build a balanced personality.

Bridget Riley, Painter

Art and design is not just a subject to learn, but an activity that you can practise: with your hands, your eyes, your whole personality.

Quentin Blake, Children's Laureate

Awareness and interaction with design is part of the contemporary professional environment. Design issues enter our life every day.

Peter Saville, Art Director and Designer

Art and design

The importance of art and design*

Art and design stimulates creativity and imagination. It provides visual, tactile and sensory experiences and a unique way of understanding and responding to the world. Pupils use colour, form, texture, pattern and different materials and processes to communicate what they see, feel and think. Through art and design activities, they learn to make informed value judgements and aesthetic and practical decisions, becoming actively involved in shaping environments.

They explore ideas and meanings in the work of artists, craftspeople and designers. They learn about the diverse roles and functions of art, craft and design in contemporary life, and in different times and cultures. Understanding, appreciation and enjoyment of the visual arts have the power to enrich our personal and public lives.

* Art and design includes craft.





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Key stage 3 programme of study

Art and design

During key stage 3 pupils develop their creativity and imagination through more sustained activities. These help them to build on and improve their practical and critical skills and to extend their knowledge and experience of materials, processes and practices. They engage confidently with art, craft and design in the contemporary world and from different times and cultures. They become more independent in using the visual language to communicate their own ideas, feelings and meanings.

Note

The general teaching requirement for health and safety applies in this subject.

1b → links to other subjects

This requirement builds on En1/2f, 3b.

1c → ICT opportunity

Pupils could use electronic sketchbooks to record their observations and ideas.

2a → ICT opportunity

Pupils could manipulate and interpret digital images to create 2-D and 3-D work.

2b → links to other subjects

This requirement builds on D&T/2c.

3a → links to other subjects

This requirement builds on En1/3e.

3a → ICT opportunity

Pupils could recreate works of art in a contemporary context and share their work with others via email.

Knowledge, skills and understanding

Teaching should ensure that **investigating and making** includes **exploring and developing ideas** and **evaluating and developing work**. **Knowledge and understanding** should inform this process.

Exploring and developing ideas

- 1 Pupils should be taught to:
 - a record and analyse first-hand observations, to select from experience and imagination and to explore ideas for different purposes and audiences
 - b discuss and question critically, and select from a range of visual and other information [for example, exhibitions, interviews with practitioners, CD-ROMs] to help them develop ideas for independent work
 - c organise and present this information in different ways, including using a sketchbook.

Investigating and making art, craft and design

- 2 Pupils should be taught to:
 - a investigate, combine and manipulate materials and images, taking account of purpose and audience
 - b apply and extend their experience of a range of materials and processes, including drawing, refining their control of tools and techniques
 - c experiment with and select methods and approaches, synthesise observations, ideas and feelings, and design and make images and artefacts.

Evaluating and developing work

- 3 Pupils should be taught to:
 - a analyse and evaluate their own and others' work, express opinions and make reasoned judgements
 - b adapt and refine their work and plan and develop this further, in the light of their own and others' evaluations.

Knowledge and understanding

- 4 Pupils should be taught about:
 - a the visual and tactile qualities of materials and processes and how these can be manipulated and matched to ideas, purposes and audiences
 - b codes and conventions and how these are used to represent ideas, beliefs, and values in works of art, craft and design
 - c continuity and change in the purposes and audiences of artists, craftspeople and designers from Western Europe and the wider world [for example, differences in the roles and functions of art in contemporary life, medieval, Renaissance and post-Renaissance periods in Western Europe, and in different cultures such as Aboriginal, African, Islamic and Native American].

Breadth of study

- 5 During the key stage, pupils should be taught the **Knowledge, skills and understanding** through:
 - a exploring a range of starting points for practical work including themselves, their experiences and natural and made objects and environments
 - b working on their own, and collaborating with others, on projects in two and three dimensions and on different scales
 - c using a range of materials and processes, including ICT [for example, painting, collage, print making, digital media, textiles, sculpture]
 - d investigating art, craft and design in the locality, in a variety of genres, styles and traditions, and from a range of historical, social and cultural contexts [for example, in original and reproduction form, during visits to museums, galleries and sites, on the internet].



Music



Music makes a kind of liquid link between the study of languages, literature and the other arts, history, and the sciences – joining them together in the outer world of feelings and relationships and the inner world of the imagination.

Dr Robin Holloway, Composer

Music is the most universal of all the arts. Ask any person in any city in any country what their favourite music is, and they'll always have an answer. So treasure music and keep it with you always.

John Suchet, Newscaster

Music is our daily medicine which aids far better communication with others and ourselves.

Evelyn Glennie OBE, Percussionist



The importance of music

Music is a powerful, unique form of communication that can change the way pupils feel, think and act. It brings together intellect and feeling and enables personal expression, reflection and emotional development. As an integral part of culture, past and present, it helps pupils understand themselves and relate to others, forging important links between the home, school

and the wider world. The teaching of music develops pupils' ability to listen and appreciate a wide variety of music and to make judgements about musical quality. It encourages active involvement in different forms of amateur music making, both individual and communal, developing a sense of group identity and togetherness. It also increases self-discipline and creativity, aesthetic sensitivity and fulfilment.



Key stage 3 programme of study

Music

During key stage 3 pupils deepen and extend their own musical interests and skills. They perform and compose music in different styles with increasing understanding of musical devices, processes and contextual influences. They work individually and in groups of different sizes and become increasingly aware of different roles and contributions of each member of the group. They actively explore specific genres, styles and traditions from different times and cultures with increasing ability to discriminate, think critically and make connections between different areas of knowledge.

1a → links to other subjects

This requirement builds on En1/1c.

1c → links to other subjects

This requirement builds on En1/4.

Note for 4

Listening is integral to the development of all aspects of pupils' knowledge and understanding of music.

Knowledge, skills and understanding

Teaching should ensure that **listening, and applying knowledge and understanding**, are developed through the interrelated skills of **performing, composing and appraising**.

Controlling sounds through singing and playing – performing skills

- 1 Pupils should be taught how to:
 - a sing unison and part songs developing vocal techniques and musical expression
 - b perform with increasing control of instrument-specific techniques
 - c practise, rehearse and perform with awareness of different parts, the roles and contribution of the different members of the group, and the audience and venue.

Creating and developing musical ideas – composing skills

- 2 Pupils should be taught how to:
 - a improvise, exploring and developing musical ideas when performing
 - b produce, develop and extend musical ideas, selecting and combining resources within musical structures and given genres, styles and traditions.

Responding and reviewing – appraising skills

- 3 Pupils should be taught how to:
 - a analyse, evaluate and compare pieces of music
 - b communicate ideas and feelings about music using expressive language and musical vocabulary to justify their own opinions
 - c adapt their own musical ideas and refine and improve their own and others' work.

Listening, and applying knowledge and understanding

- 4 Pupils should be taught to:
 - a listen with discrimination and to internalise and recall sounds
 - b identify the expressive use of musical elements, devices, tonalities and structures
 - c identify the resources, conventions, processes and procedures, including use of ICT, staff notation and other relevant notations, used in selected musical genres, styles and traditions
 - d identify the contextual influences that affect the way music is created, performed and heard [for example, intention, use, venue, occasion, development of resources, impact of ICT, the cultural environment and the contribution of individuals].

Breadth of study

- 5 During the key stage, pupils should be taught the **Knowledge, skills and understanding** through:
- a a range of musical activities that integrate performing, composing and appraising
 - b responding to a range of musical and non-musical starting points
 - c working on their own, in groups of different sizes and as a class
 - d using ICT to create, manipulate and refine sounds
 - e a range of live and recorded music from different times and cultures including music from the British Isles, the ‘Western classical’ tradition, folk, jazz and popular genres, and by well-known composers and performers.

5b → links to other subjects

This requirement builds on En1/1a–1c and En3/1a–1d and PE/6a.

To see young people growing in physical skills, self-confidence and self-worth is a truly enriching experience. Nowhere in school is it more visible than in PE.

Duncan Goodhew, Swimmer

Exercise activates your brain and gives you energy for everything else, the energy to be enthusiastic about your work. So all your school work will gain from physical education.

Darcey Bussell, Dancer, The Royal Ballet

Physical education is about pupils learning about themselves: their capabilities, their potential and their limitations. It is the foundation of all sports participation. But it goes beyond the individual and understanding themselves – it's learning how to work with and to respect others.

Lucy Pearson, England Cricketer and Teacher

Physical education

The importance of physical education

Physical education develops pupils' physical competence and confidence, and their ability to use these to perform in a range of activities. It promotes physical skilfulness, physical development and a knowledge of the body in action. Physical education provides opportunities for pupils to be creative, competitive and to face up to different challenges as individuals and in groups and teams. It promotes positive attitudes towards active and healthy lifestyles. Pupils learn how to think in different ways to suit a wide variety of creative, competitive and challenging activities. They learn how to plan, perform and evaluate actions, ideas and performances to improve their quality and effectiveness. Through this process pupils discover their aptitudes, abilities and preferences, and make choices about how to get involved in lifelong physical activity.



Key stage 3 programme of study

Physical education

During key stage 3 pupils become more expert in their skills and techniques, and how to apply them in different activities. They start to understand what makes a performance effective and how to apply these principles to their own and others' work. They learn to take the initiative and make decisions for themselves about what to do to improve performance. They start to identify the types of activity they prefer to be involved with, and to take a variety of roles such as leader and official.

The Government believes that two hours of physical activity a week, including the National Curriculum for physical education and extra-curricular activities, should be an aspiration for all schools.

Competitive game activities are compulsory at key stage 3.

Note

The general teaching requirement for health and safety applies in this subject.

3b → links to other subjects

This requirement builds on En1/3e.

4 → links to other subjects

These requirements build on Sc2/2e, 2i, 2j, 2l.

4 → ICT opportunity

Pupils could use heart and pulse rate monitors and a variety of other measuring and recording devices to collect, analyse and interpret data.

Knowledge, skills and understanding

Teaching should ensure that, when evaluating and improving performance, connections are made between developing, selecting and applying skills, tactics and compositional ideas, and fitness and health.

Acquiring and developing skills

- 1 Pupils should be taught to:
 - a refine and adapt existing skills
 - b develop them into specific techniques that suit different activities and perform these with consistent control.

Selecting and applying skills, tactics and compositional ideas

- 2 Pupils should be taught to:
 - a use principles to plan and implement strategies, compositional and organisational ideas in individual, pair, group and team activities
 - b modify and develop their plans
 - c apply rules and conventions for different activities.

Evaluating and improving performance

- 3 Pupils should be taught to:
 - a be clear about what they want to achieve in their own work, and what they have actually achieved
 - b take the initiative to analyse their own and others' work, using this information to improve its quality.

Knowledge and understanding of fitness and health

- 4 Pupils should be taught:
 - a how to prepare for and recover from specific activities
 - b how different types of activity affect specific aspects of their fitness
 - c the benefits of regular exercise and good hygiene
 - d how to go about getting involved in activities that are good for their personal and social health and well-being.

Breadth of study

- 5 During the key stage, pupils should be taught the **Knowledge, skills and understanding** through four areas of activity. These should include:
- a games activities
- and three of the following, *at least one of which must be dance or gymnastic activities*:
- b dance activities
 - c gymnastic activities
 - d swimming activities and water safety
 - e athletic activities
 - f outdoor and adventurous activities.

Dance activities

- 6 Pupils should be taught to:
- a create and perform dances using a range of complex movement patterns and techniques
 - b use a range of dance styles and forms
 - c use compositional principles when composing their dances [for example, motif development, awareness of group relationships, spatial awareness]
 - d apply performance skills in their dances.

Games activities

- 7 Pupils should be taught to:
- a play competitive invasion, net and striking/fielding games, using techniques that suit the games
 - b use the principles of attack and defence when planning and implementing complex team strategies
 - c respond to changing situations in the games.

Gymnastic activities

- 8 Pupils should be taught to:
- a create and perform complex sequences on the floor and using apparatus
 - b use techniques and movement combinations in different gymnastic styles
 - c use compositional principles when designing their sequences [for example, changes in level, speed, direction, and relationships with apparatus and partners].

Swimming activities and water safety

- 9 Pupils should be taught to:
- a set and meet personal and group targets in swimming events, water-based activities, personal survival challenges and competitions
 - b use a range of recognised strokes, techniques and personal survival skills with technical proficiency.

6 → links to other subjects

These requirements build on Mu/2b.

7 → ICT opportunity

Pupils could use data-recording and analysis software to analyse patterns of play and individual contributions.

7, 9–11 → ICT opportunity

Pupils could use stop watches with lap recorders linked to data-collection devices to analyse and evaluate performance.

9, 10 → ICT opportunity

Pupils could use spreadsheets to record and track progress.

11b → links to other subjects

This requirement builds on Gg/2c.

Athletic activities

10 Pupils should be taught to:

- a set and meet personal and group targets in a range of athletic events, challenges and competitions
- b use a range of running, jumping and throwing techniques, singly and in combination, with precision, speed, power or stamina.

Outdoor and adventurous activities

11 Pupils should be taught to:

- a meet challenges in outdoor activities and journeys
- b use a range of orienteering and problem-solving skills and techniques in these challenges
- c identify the roles and responsibilities of individuals within a group when planning strategies
- d respond to changing conditions and situations.

There are two reasons why I initially joined the council. One, because I like to have a say in things that go on, and I wanted to see things happen. I wanted to see changes in the school and I suppose that's selfish but it's also I think that I don't want to see everyone getting a raw deal.

" Please we need help! Our village and many others are starving to death. We used to grow our own food and we did quite well, but the Government encouraged us to start growing coffee beans instead. We all thought that we would have more money with which we could buy food. We did for a while until the coffee beans gradually went down in price. Now we are suffering because ^{cheap coffee beans we have to} people in your country are producing more coffee beans, bring down the price of ours to make sure we stay in business. We are a poor country and whatever we have money, no matter how much, or food no matter how little, it's so important. You take the food and clothes and the money you have hoarded. Please think of us while you're having your dinner because you can be sure we won't be having any tonight."

I feel it is a good book to study, as it is relevant to racism in our lives today and from the story we can see that racism goes a long way back and it's really about time that it was stopped for good. I personally think that racism is the cruellest form of prejudice, as making someone feel lower than yourself for something they are born into is futile, ignorant and low.

"The book is really telling people to be wary of dictatorship and showing how a dictatorship can reduce a country's wealth so all the people are poor while they are rich. Napoleon oppresses the other animals using his team of dogs, he keeps the people under control and stops them from realising they are no better than they were before. It is part of human nature to want power or to want others to look up to us but not everybody went to the extent that Napoleon did".

Listening to ^{your} conscience can be a good idea because it's normally what you really feel or think, even if you don't like it. Some people turn to God for guidance, often to back up their own ideas or opinions.

The importance of citizenship

Citizenship gives pupils the knowledge, skills and understanding to play an effective role in society at local, national and international levels. It helps them to become informed, thoughtful and responsible citizens who are aware of their duties and rights. It promotes their spiritual, moral, social and cultural development, making them more self-confident and responsible both in and beyond the classroom. It encourages pupils to play a helpful part in the life of their schools, neighbourhoods, communities and the wider world. It also teaches them about our economy and democratic institutions and values; encourages respect for different national, religious and ethnic identities; and develops pupils' ability to reflect on issues and take part in discussions.

Citizenship is complemented by the framework for personal, social and health education at key stage 3.

Citizenship

Citizenship is more than a statutory subject. If taught well and tailored to local needs, its skills and values will enhance democratic life for us all, both rights and responsibilities, beginning in school, and radiating out.

Sir Bernard Crick, Emeritus Professor and adviser on Active Citizenship to the Home Office

We need to be aware of the racial diversity that exists in our society and value each individual.

Doreen Lawrence

It is only when you know how to be a citizen of your own country that you can learn how to be a citizen of the world.

Terry Waite, CBE

Citizenship education will enhance understanding of and participation in our democratic, legal and other civic processes.

Rt Hon Betty Boothroyd, former Speaker of the House of Commons

Create a society where people matter more than things.

Archbishop Desmond Tutu

Key stage 3 programme of study

Citizenship

During key stage 3 pupils study, reflect upon and discuss topical political, spiritual, moral, social and cultural issues, problems and events. They learn to identify the role of the legal, political, religious, social and economic institutions and systems that influence their lives and communities. They continue to be actively involved in the life of their school, neighbourhood and wider communities and learn to become more effective in public life. They learn about fairness, social justice, respect for democracy and diversity at school, local, national and global level, and through taking part responsibly in community activities.

1a → links to other subjects

This requirement builds on Hi/10, 13.

1b → links to other subjects

This requirement builds on Hi/2b and Gg/6f and A&D/5d and Mu/5e.

1c–1e → links to other subjects

These requirements build on Hi/9, 10.

1h, 1i → ICT opportunity

Pupils could explore the growing importance of the internet, email and e-commerce.

1i → links to other subjects

This requirement builds on Sc2/5a and Hi/13 and Gg/3b, 3e, 5a, 5b, 6f, 6h–6k and MFL/4c.

2a → links to other subjects

This requirement builds on En2/4a–4c.

2b → links to other subjects

This requirement builds on En1/1a–1e and En3/1i–1o.

2b → ICT opportunity

Pupils could use email to exchange views.

2c → links to other subjects

This requirement builds on En1/3.

Knowledge, skills and understanding

Teaching should ensure that **knowledge and understanding about becoming informed citizens** are acquired and applied when **developing skills of enquiry and communication**, and **participation and responsible action**.

Knowledge and understanding about becoming informed citizens

- 1 Pupils should be taught about:
 - a the legal and human rights and responsibilities underpinning society, basic aspects of the criminal justice system, and how both relate to young people
 - b the diversity of national, regional, religious and ethnic identities in the United Kingdom and the need for mutual respect and understanding
 - c central and local government, the public services they offer and how they are financed, and the opportunities to contribute
 - d the key characteristics of parliamentary and other forms of government
 - e the electoral system and the importance of voting
 - f the work of community-based, national and international voluntary groups
 - g the importance of resolving conflict fairly
 - h the significance of the media in society
 - i the world as a global community, and the political, economic, environmental and social implications of this, and the role of the European Union, the Commonwealth and the United Nations.

Developing skills of enquiry and communication

- 2 Pupils should be taught to:
 - a think about topical political, spiritual, moral, social and cultural issues, problems and events by analysing information and its sources, including ICT-based sources
 - b justify orally and in writing a personal opinion about such issues, problems or events
 - c contribute to group and exploratory class discussions, and take part in debates.

Developing skills of participation and responsible action

- 3 Pupils should be taught to:
 - a use their imagination to consider other people's experiences and be able to think about, express and explain views that are not their own
 - b negotiate, decide and take part responsibly in both school and community-based activities
 - c reflect on the process of participating.

Key stage 3 guidelines



Key stage 3 non-statutory national framework

Religious education

Throughout key stage 3, pupils extend their understanding of Christianity and at least two of the other principal religions in a local, national and global context. They deepen their understanding of important beliefs, concepts and issues of truth and authority in religion. They apply their understanding of religious and philosophical beliefs, teachings and practices to a range of ultimate questions and ethical issues, with a focus on self-awareness, relationships, rights and responsibilities. They enquire into and explain some personal, philosophical, theological and cultural reasons for similarities and differences in religious beliefs and values, both within and between religions. They interpret religious texts and other sources, recognising both the power and limitations of language and other forms of communication in expressing ideas and beliefs. They reflect on the impact of religion and belief in the world, considering both the importance of interfaith dialogue and the tensions that exist within and between religions and beliefs. They develop their evaluative skills, showing reasoned and balanced viewpoints when considering their own and others' responses to religious, philosophical and spiritual issues.

1a → Links to other subjects

This builds on Ci1b, where pupils develop their knowledge and understanding of national, regional, religious and ethnic identities in the United Kingdom and the need for mutual respect and understanding.

1c → ICT opportunity

Pupils could use the internet to investigate the websites of a range of religious groups.

1d → Links to other subjects

This builds on En3/1i and 3m, where pupils develop logical arguments and cite evidence, and form their own views, taking into account a range of evidence and options.

1d → Attitudes

Pupils have the opportunity to develop open-mindedness.

1h → Links to other subjects

This requirement builds on A&D5d where pupils investigate art, craft and design in a variety of styles and traditions and from a range of historical, social and cultural contexts.

The importance of religious education

Religious education provokes challenging questions about the ultimate meaning and purpose of life, beliefs about God, the self and the nature of reality, issues of right and wrong and what it means to be human.

It develops pupils' knowledge and understanding of Christianity, other principal religions, other religious traditions and other world views that offer answers to questions such as these. It offers opportunities for personal reflection and spiritual development. It enhances pupils' awareness and understanding of religions and beliefs, teachings, practices and forms of expression, as well as of the influence of religion on individuals, families, communities and cultures.

Religious education encourages pupils to learn from different religions, beliefs, values and traditions while exploring their own beliefs and questions of meaning. It challenges pupils to reflect on, consider, analyse, interpret and evaluate issues of truth, belief, faith and ethics and to communicate their responses.

Religious education encourages pupils to develop their sense of identity and belonging. It enables them to flourish individually within their communities and as citizens in a pluralistic society and global community. Religious education has an important role in preparing pupils for adult life, employment and lifelong learning. It enables pupils to develop respect for and sensitivity to others, in particular those whose faiths and beliefs are different from their own. It promotes discernment and enables pupils to combat prejudice.

Knowledge, skills and understanding

Learning about religion

1 Pupils should be taught to:

- a investigate and explain the differing impacts of religious beliefs and teachings on individuals, communities and societies
- b analyse and explain how religious beliefs and ideas are transmitted by people, texts and traditions
- c investigate and explain why people belong to faith communities and explain the reasons for diversity in religion
- d analyse and compare the evidence and arguments used when considering issues of truth in religion and philosophy
- e discuss and evaluate how religious beliefs and teachings inform answers to ultimate questions and ethical issues
- f apply a wide range of religious and philosophical vocabulary consistently and accurately, recognising both the power and limitations of language in expressing religious ideas and beliefs
- g interpret and evaluate a range of sources, texts and authorities, from a variety of contexts
- h interpret a variety of forms of religious and spiritual expression.

Learning from religion

2 Pupils should be taught to:

- a reflect on the relationship between beliefs, teachings and ultimate questions, communicating their own ideas and using reasoned arguments
- b evaluate the challenges and tensions of belonging to a religion and the impact of religion in the contemporary world, expressing their own ideas

The legal basis for religious education in most schools remains the locally agreed syllabus and, for schools with a religious character, its equivalent. The non-statutory national framework for religious education reproduced here is given for information purposes only.

- c express insights into the significance and value of religion and other world views on human relationships personally, locally and globally
- d reflect and evaluate their own and others' beliefs about world issues such as peace and conflict, wealth and poverty and the importance of the environment, communicating their own ideas
- e express their own beliefs and ideas, using a variety of forms of expression.

Breadth of study

- 3 During the key stage, pupils should be taught the **Knowledge, skills and understanding** through the following areas of study:

Religions and beliefs

- a Christianity
- b at least two other principal religions
- c a religious community with a significant local presence, where appropriate
- d a secular world view, where appropriate

Themes

- e beliefs and concepts: the key ideas and questions of meaning in religions and beliefs, including issues related to God, truth, the world, human life, and life after death
- f authority: different sources of authority and how they inform believers' lives
- g religion and science: issues of truth, explanation, meaning and purpose
- h expressions of spirituality: how and why human self-understanding and experiences are expressed in a variety of forms
- i ethics and relationships: questions and influences that inform ethical and moral choices, including forgiveness and issues of good and evil
- j rights and responsibilities: what religions and beliefs say about human rights and responsibilities, social justice and citizenship
- k global issues: what religions and beliefs say about health, wealth, war, animal rights and the environment
- l interfaith dialogue: a study of relationships, conflicts and collaboration within and between religions and beliefs

Experiences and opportunities

- m encountering people from different religious, cultural and philosophical groups, who can express a range of convictions on religious and ethical issues
- n visiting, where possible, places of major religious significance and using opportunities in ICT to enhance pupils' understanding of religion
- o discussing, questioning and evaluating important issues in religion and philosophy, including ultimate questions and ethical issues
- p reflecting on and carefully evaluating their own beliefs and values and those of others in response to their learning in religious education, using reasoned, balanced arguments
- q using a range of forms of expression (such as art and design, music, dance, drama, writing, ICT) to communicate their ideas and responses creatively and thoughtfully
- r exploring the connections between religious education and other subject areas such as the arts, humanities, literature, science.

2b → Attitudes

Pupils have the opportunity to develop respect for all.

2d → Links to other subjects

This builds on Gg5a–b and 6i–k, where pupils investigate issues concerning the environment and sustainability and the need to reflect on and evaluate their own and other beliefs about the issues.

2e → ICT opportunity

Pupils could use presentation software, digital video and desktop publishing to express their own beliefs and ideas.

3e–f → Links to other subjects

This builds on Hi7a–b, where pupils learn about significant events, people and changes from the recent and more distant past, and history from a variety of perspectives including political, religious, social, cultural and aesthetic.

3g → Links to other subjects

This builds on Sc1a–c, where pupils learn about empirical questions, evidence and scientific explanations using contemporary examples.

3i → Links to other subjects

This builds on PSHE3b–l, where pupils learn about the nature of friendship, the range of lifestyles and relationships, the role and importance of marriage in family relationships and the value of family life.

3n → ICT opportunity

Pupils could use CD-ROMs to experience a virtual visit and videoconference to develop their understanding of places of major religious significance.

Key stage 3 non-statutory framework

Careers education

The importance of careers education and guidance

Careers education and guidance encourages young people to prepare for their future lives. It gives them tools to make informed decisions about their education, training and occupation. It also helps them manage change and transition in a society where constantly evolving technology and working practices mean they will need to be flexible, willing to learn and to make important professional and personal choices throughout their lives.

Careers education aims to help young people become self-reliant and take responsibility for managing their own career development. It focuses on the two main strands of employability:

- the initial preparation for employment
- the skills for career management.

It helps them understand themselves and what employers are looking for.

Careers education prompts young people to identify the interests, skills and values that will shape their decisions. It teaches them about progression routes in education, available qualifications, career paths and employment trends. It provides them with tools to investigate the labour market, challenge stereotypes, broaden their horizons and take action to improve their chances. Because it highlights progression routes and opportunities, careers education and guidance increases motivation and encourages students to participate in continued learning.

A quality programme of careers education and guidance helps teachers answer the question they are frequently asked by their students: 'Why are we doing this?'

Understanding themselves and the influences on them – self-development

Learning outcomes

By the age of 14, young people should have acquired the knowledge, understanding and skills to:

- 1 undertake a realistic self-assessment of their achievements, qualities, aptitudes and abilities and present this in an appropriate format
 - reviewing achievements, skills and qualities
 - producing a personal advertisement or statement
 - drafting a personal statement for their Progress File.
- 2 use the outcomes of self-assessment to identify areas for development, build self-confidence and develop a positive self-image
 - defining current aspirations
 - generating ideas to improve self-image and self-esteem.
- 3 use goal-setting, review, reflection and action-planning to support progress and achievement and set short- and medium-term goals
 - using a portfolio approach for target setting
 - using ICT to keep a personal record
 - preparing an individual learning plan.
- 4 recognise stereotyped and misrepresented images of people, careers and work and how their own views of these issues affect their decision-making
 - collecting and analysing images of people in work
 - debating views on 'men's jobs' and 'women's jobs'.
- 5 recognise and respond to the main influences on their attitudes and values in relation to learning, work and equality of opportunity
 - negotiating ground rules for group work
 - developing a strategy for organising their time
 - identifying ways to challenge stereotyping.

Investigate opportunities in learning and work – career exploration

Learning outcomes

By the age of 14, young people should have acquired the knowledge, understanding and skills to:

- 6 recognise that work is more than paid employment and that there is considerable variation in the value individuals and society attach to different kinds of work
 - defining the term 'work'
 - investigating people's feelings about work
 - researching different people's career paths.

- 7 describe how the world of work is changing and the skills that promote employability
 - identifying jobs for life – or not
 - exploring home-working, self-employment and globalisation
 - work shadowing a parent or family member.
- 8 identify and use a variety of sources of careers information, including ICT
 - using libraries, careers software, the internet, visitors and course descriptions.
- 9 use appropriate vocabulary and organise information about work into standard and personally devised groupings
 - researching the language used in different jobs and workplaces
 - identifying job families and qualification levels.
- 10 use information handling and research skills to locate, select, analyse, integrate, present and evaluate careers information relevant to their needs
 - using the Connexions Resource Centres
 - exploring and explaining generic, vocational, technical and job-specific skills.
- 11 demonstrate knowledge and understanding of the options open to them, including opportunities provided through vocational options
 - explaining possible progression routes 14–19
 - investigating content, methods and means of assessment for courses offered at key stage 4
 - describing what is meant by higher education and the benefits it offers.

Make and adjust plans to manage change and transition – career management

Learning outcomes

By the age of 14, young people should have acquired the knowledge, understanding and skills to:

- 12 use a straightforward decision-making technique
 - looking at models of decision-making that require careful thinking – What’s important? What are the choices? What are the consequences?
- 13 identify, access and use the help and advice they need from a variety of sources, including parents or carers, teachers, Connexions PAs and other learning providers
 - identifying a list of people who can help them
 - weighing up and responding to advice and information.

Developments in learning and work make it essential that young people take a more active role in their careers learning. (It is, for example, better that young people develop the skills to investigate opportunities than that they are simply made aware of them.) Consequently, the programme emphasises individual participation. It is built on three aims. These are that young people should be able to:

- understand themselves and the influences on them – **self development**
- investigate opportunities in learning and work – **career exploration**
- make and adjust plans to manage change and transition – **career management**

- 14 manage change and transition, giving consideration to the longer term implications and the potential progression opportunities
 - reviewing case studies of former students
 - identifying the benefits and drawbacks of different opportunities
 - discussing the difference between the outcomes of chance and planned events.

- 15 make realistic and informed choices of options available post-14
 - linking learning to career ideas and goals
 - producing a timeline for choosing key stage 4 options.

- 16 organise and present personal information in an appropriate format
 - drafting a personal statement for use in an options guidance interview.

- 17 consider alternatives and make changes in response to their successes and failures
 - reviewing, explaining and forming conclusions about previous transitions and identifying lessons for the future.

Key stage 3 non-statutory guidelines

Personal, social and health education

The importance of personal, social and health education

Personal, social and health education (PSHE) at key stage 3 helps pupils to lead confident, healthy and responsible lives as individuals and members of society. Through work in lesson time and a wide range of activities across and beyond the curriculum, pupils gain practical knowledge and skills to help them live healthily and deal with the spiritual, moral, social and cultural issues they face as they approach adulthood. PSHE gives pupils opportunities to reflect on their experiences and how they are developing. It helps them to understand and manage responsibly a wider range of relationships as they mature, and to show respect for the diversity of, and differences between, people. It also develops pupils' well-being and self-esteem, encouraging belief in their ability to succeed and enabling them to take responsibility for their learning and future choice of courses and career. PSHE at key stage 3 builds on pupils' own experiences and on work at key stages 1 and 2 and complements citizenship in the curriculum, which covers public policy dilemmas related to health, law and family.

Knowledge, skills and understanding

Developing confidence and responsibility and making the most of their abilities

- 1 Pupils should be taught:
 - a to reflect on and assess their strengths in relation to personality, work and leisure
 - b to respect the differences between people as they develop their own sense of identity
 - c to recognise how others see them, and be able to give and receive constructive feedback and praise
 - d to recognise the stages of emotions associated with loss and change caused by death, divorce, separation and new family members, and how to deal positively with the strength of their feelings in different situations
 - e to relate job opportunities to their personal qualifications and skills, and understand how the choices they will make at key stage 4 should be based not only on knowledge of their personal strengths and aptitudes, but also on the changing world of work
 - f to plan realistic targets for key stage 4, seeking out information and asking for help with career plans
 - g what influences how we spend or save money and how to become competent at managing personal money.

Developing a healthy, safer lifestyle

- 2 Pupils should be taught:
 - a to recognise the physical and emotional changes that take place at puberty and how to manage these changes in a positive way
 - b how to keep healthy and what influences health, including the media
 - c that good relationships and an appropriate balance between work, leisure and exercise can promote physical and mental health
 - d basic facts and laws, including school rules, about alcohol and tobacco, illegal substances and the risks of misusing prescribed drugs
 - e in a context of the importance of relationships, about human reproduction, contraception, sexually transmitted infections, HIV and high-risk behaviours including early sexual activity
 - f to recognise and manage risk and make safer choices about healthy lifestyles, different environments and travel
 - g to recognise when pressure from others threatens their personal safety and well-being, and to develop effective ways of resisting pressures, including knowing when and where to get help
 - h basic emergency aid procedures and where to get help and support.

Developing good relationships and respecting the differences between people

- 3 Pupils should be taught:
- a about the effects of all types of stereotyping, prejudice, bullying, racism and discrimination and how to challenge them assertively
 - b how to empathise with people different from themselves
 - c about the nature of friendship and how to make and keep friends
 - d to recognise some of the cultural norms in society, including the range of lifestyles and relationships
 - e the changing nature of, and pressure on, relationships with friends and family, and when and how to seek help
 - f about the role and importance of marriage in family relationships
 - g about the role and feelings of parents and carers and the value of family life
 - h to recognise that goodwill is essential to positive and constructive relationships
 - i to negotiate within relationships, recognising that actions have consequences, and when and how to make compromises
 - j to resist pressure to do wrong, to recognise when others need help and how to support them
 - k to communicate confidently with their peers and adults.

Breadth of opportunities

- 4 During the key stage, pupils should be taught the **Knowledge, skills and understanding** through opportunities to:
- a take responsibility [for example, for carrying out tasks and meeting deadlines such as taking assembly, running the school newspaper]
 - b feel positive about themselves [for example, by taking part in a public performance]
 - c participate [for example, in developing and putting into practice school policies about anti-bullying; in an action research project designed to reduce crime and improve personal safety in their neighbourhood]
 - d make real choices and decisions [for example, about options for their future, based on their own research and career portfolios]
 - e meet and work with people [for example, people who can give them reliable information about health and safety issues, such as school nurses, community drug awareness workers]
 - f develop relationships [for example, by working together in a range of groups and social settings with their peers and others; by being responsible for a mini-enterprise scheme as part of a small group]
 - g consider social and moral dilemmas [for example, how the choices they make as consumers affect other people's economies and environments]

During key stage 3 pupils learn about themselves as growing and changing individuals and as members of their communities with more maturity, independence and power. They become more self-aware, and are capable of more sophisticated moral reasoning. They take more responsibility for themselves and become more aware of the views, needs and rights of people of all ages. They build on the experience, confidence and competence they developed in key stage 2, learning new skills to help them make decisions and play an active part in their personal and social life. They learn how to plan and manage choices for their courses and career. They continue to develop and maintain a healthy lifestyle, coping well with their changing bodies and feelings. They also learn to cope with changing relationships and understand how these can affect their health and well-being. They make the most of new opportunities to take part in the life of the school and its communities.

PSHE opportunity in science

2 → Sc2/2.

PSHE opportunity in physical education

2b, 2c → PE/4.

PSHE opportunity in design and technology

2f → D&T/2a.

PSHE opportunity in history

3d → Hi/2b.

- h find information and advice [for example, about the risks of early sexual activity, drug misuse, self-defence for keeping safe]
- i prepare for change [for example, by anticipating problems caused by changing family relationships and friendships, and by preparing for new styles of learning at key stage 4].

Key stage 4 programmes of study



English

The importance of English

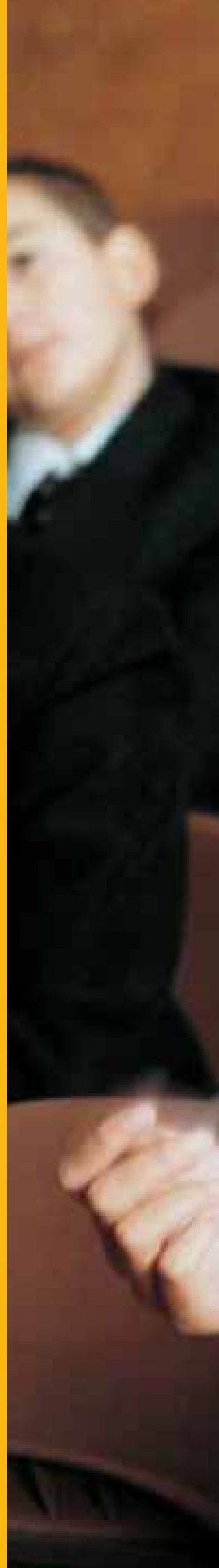
English is a vital way of communicating in school, in public life and internationally. Literature in English is rich and influential, reflecting the experience of people from many countries and times.

In studying English students develop skills in speaking, listening, reading and writing.

It enables them to express themselves creatively and imaginatively and to communicate with others effectively.

Students learn to become enthusiastic and critical readers of stories, poetry and drama as well as non-fiction and media texts.

The study of English helps students understand how language works by looking at its patterns, structures and origins. Using this knowledge students can choose and adapt what they say and write in different situations.





Key stage 4 programme of study

English

In English, during key stage 4 students learn to use language confidently, both in their academic studies and for the world beyond school. They use and analyse complex features of language. They are keen readers who can read many kinds of text and make articulate and perceptive comments about them.

Speaking and listening: during key stage 4 students learn to speak and listen confidently in a wide variety of contexts. They learn to be flexible, adapting what they say and how they say it to different situations and people. When they speak formally or to people they do not know, they are articulate and fluent in their use of spoken standard English. They learn how to evaluate the contributions they, and others, have made to discussions and drama activities. They take leading and other roles in group work.

Teaching should ensure that work in **speaking and listening, reading and writing** is integrated.

En1 Speaking and listening

Knowledge, skills and understanding

Speaking

- 1 To speak fluently and appropriately in different contexts, adapting their talk for a range of purposes and audiences, including the more formal, students should be taught to:
 - a structure their talk clearly, using markers so that their listeners can follow the line of thought
 - b use illustrations, evidence and anecdote to enrich and explain their ideas
 - c use gesture, tone, pace and rhetorical devices for emphasis
 - d use visual aids and images to enhance communication
 - e vary word choices, including technical vocabulary, and sentence structure for different audiences
 - f use spoken standard English fluently in different contexts
 - g evaluate the effectiveness of their speech and consider how to adapt it to a range of situations.

Listening

- 2 To listen, understand and respond critically to others, students should be taught to:
 - a concentrate on and recall the main features of a talk, reading, radio or television programme
 - b identify the major elements of what is being said both explicitly and implicitly
 - c distinguish features of presentation where a speaker aims to explain, persuade, amuse or argue a case
 - d distinguish tone, undertone, implications and other signs of a speaker's intentions
 - e recognise when a speaker is being ambiguous or deliberately vague, glosses over points, uses and abuses evidence and makes unsubstantiated statements
 - f ask questions and give relevant and helpful comments.

Group discussion and interaction

- 3 To participate effectively as members of different groups, students should be taught to:
 - a make different types of contributions to groups, adapting their speech to their listeners and the activity
 - b take different views into account and modify their own views in the light of what others say

- c sift, summarise and use the most important points
- d take different roles in the organisation, planning and sustaining of groups
- e help the group to complete its tasks by varying contributions appropriately, clarifying and synthesising others' ideas, taking them forward and building on them to reach conclusions, negotiating consensus or agreeing to differ.

Drama

- 4 To participate in a range of drama activities and to evaluate their own and others' contributions, students should be taught to:
 - a use a variety of dramatic techniques to explore ideas, issues, texts and meanings
 - b use different ways to convey action, character, atmosphere and tension when they are scripting and performing in plays [for example, through dialogue, movement, pace]
 - c appreciate how the structure and organisation of scenes and plays contribute to dramatic effect
 - d evaluate critically performances of dramas that they have watched or in which they have taken part.

Standard English

- 5 Students should be taught to use the vocabulary, structures and grammar of spoken standard English fluently and accurately in informal and formal situations.

Language variation

- 6 Students should be taught about how language varies, including:
 - a the importance of standard English as the language of public communication nationally and often internationally
 - b current influences on spoken and written language
 - c attitudes to language use
 - d the differences between speech and writing
 - e the vocabulary and grammar of standard English and dialectal variation
 - f the development of English, including changes over time, borrowings from other languages, origins of words, and the impact of electronic communication on written language.

Note on standard English

The paragraphs on **standard English**, **language variation**, **language structure** and **language structure and variation** in **speaking and listening**, **reading** and **writing** provide a coherent basis for language study.

Note for 5

When teaching **standard English** it is helpful to bear in mind the most common non-standard usages in England:

- subject–verb agreement (they was)
- formation of past tense (have fell, I done)
- formation of negatives (ain't)
- formation of adverbs (come quick)
- use of demonstrative pronouns (them books)
- use of pronouns (me and him went)
- use of prepositions (out the door).

Note for 10

Interaction may be face-to-face or by electronic means.

Breadth of study

7 During the key stage, students should be taught the **Knowledge, skills and understanding** through the following range of activities, contexts and purposes.

Speaking

- 8 The range of purposes should include:
- a describing, narrating, explaining, arguing, persuading, entertaining and students should be given opportunities to make:
 - b extended contributions to talk in different contexts and groups
 - c presentations to different audiences.

Listening

- 9 The range should include listening to and watching:
- a live talks and presentations
 - b recordings [for example, radio, television, film]
 - c discussions in which students respond straight away.

Group discussion and interaction

- 10 The range of purposes should include:
- a exploring, hypothesising, debating, analysing and students should be given opportunities to:
 - b take different roles in groups [for example, roles in organising or leading discussion, supporting others, enabling focused talk].

Drama activities

- 11 The range should include:
- a improvisation and working in role
 - b devising, scripting and performing in plays
 - c discussing and reviewing their own and others' performances.

En2 Reading

Knowledge, skills and understanding

Understanding texts

1 To develop understanding and appreciation of texts, students should be taught:

Reading for meaning

- a to extract meaning beyond the literal, explaining how the choice of language and style affects implied and explicit meanings
- b to analyse and discuss alternative interpretations, ambiguity and allusion
- c how ideas, values and emotions are explored and portrayed
- d to identify the perspectives offered on individuals, community and society
- e to consider how meanings are changed when texts are adapted to different media
- f to read and appreciate the scope and richness of complete novels, plays and poems

Understanding the author's craft

- g how language is used in imaginative, original and diverse ways
- h to reflect on the writer's presentation of ideas and issues, the motivation and behaviour of characters, the development of plot and the overall impact of a text
- i to distinguish between the attitudes and assumptions of characters and those of the author
- j how techniques, structure, forms and styles vary
- k to compare texts, looking at style, theme and language, and identifying connections and contrasts.

English literary heritage

2 Students should be taught:

- a how and why texts have been influential and significant [for example, the influence of Greek myths, the Authorised Version of the Bible, the Arthurian legends]
- b the characteristics of texts that are considered to be of high quality
- c the appeal and importance of these texts over time.

Texts from different cultures and traditions

3 Students should be taught:

- a to understand the values and assumptions in the texts
- b the significance of the subject matter and the language
- c the distinctive qualities of literature from different traditions
- d how familiar themes are explored in different cultural contexts [for example, how childhood is portrayed, references to oral or folk traditions]
- e to make connections and comparisons between texts from different cultures.

Reading: during key stage 4 students read a wide range of texts independently, both for pleasure and for study. They become enthusiastic, discriminating and responsive readers, understanding layers of meaning and appreciating what they read on a critical level.

Printed and ICT-based information texts

- 4 To develop their reading of print and ICT-based information texts, students should be taught to:
- select, compare and synthesise information from different texts
 - evaluate how information is presented
 - sift the relevant from the irrelevant, and distinguish between fact and opinion, bias and objectivity
 - identify the characteristic features, at word, sentence and text level, of different types of texts.

Media and moving image texts

- 5 Students should be taught:
- how meaning is conveyed in texts that include print, images and sometimes sounds
 - how choice of form, layout and presentation contribute to effect [for example, font, caption, illustration in printed text, sequencing, framing, soundtrack in moving image text]
 - how the nature and purpose of media products influence content and meaning [for example, selection of stories for a front page or news broadcast]
 - how audiences and readers choose and respond to media.

Language structure and variation

- 6 Students should be taught to draw on their knowledge of grammar and language variation to develop their understanding of texts and how language works.

Breadth of study

- 7 During the key stage, students should be taught the **Knowledge, skills and understanding** through the following ranges of literature and non-fiction and non-literary texts.

Literature

- 8 The range should include:
- plays, novels, short stories and poetry from the English literary heritage, including:
 - two plays by Shakespeare, one of which should be studied in key stage 3
 - drama by major playwrights
 - works of fiction by two major writers published before 1914 selected from the list on page 145
 - two works of fiction by major writers published after 1914
 - poetry by four major poets published before 1914 selected from the list on page 145
 - poetry by four major poets published after 1914

- b recent and contemporary drama, fiction and poetry written for young people and adults
- c drama, fiction and poetry by major writers from different cultures and traditions.

Non-fiction and non-literary texts

- 9 The range should include:
- a literary non-fiction
 - b print and ICT-based information and reference texts
 - c media and moving image texts [for example, newspapers, magazines, advertisements, television, films, videos].

Examples of major playwrights

William Congreve, Oliver Goldsmith, Christopher Marlowe, Sean O'Casey, Harold Pinter, J B Priestley, Peter Shaffer, G B Shaw, R B Sheridan, Oscar Wilde.

List of major writers published before 1914 (see requirement 8a iii on page 144)

Jane Austen, Charlotte Brontë, Emily Brontë, John Bunyan, Wilkie Collins, Joseph Conrad, Daniel Defoe, Charles Dickens, Arthur Conan Doyle, George Eliot, Henry Fielding, Elizabeth Gaskell, Thomas Hardy, Henry James, Mary Shelley, Robert Louis Stevenson, Jonathan Swift, Anthony Trollope, H G Wells.

Examples of fiction by major writers after 1914

E M Forster, William Golding, Graham Greene, Aldous Huxley, James Joyce, D H Lawrence, Katherine Mansfield, George Orwell, Muriel Spark, William Trevor, Evelyn Waugh.

List of major poets published before 1914 (see requirement 8a v on page 144)

Matthew Arnold, Elizabeth Barrett Browning, William Blake, Emily Brontë, Robert Browning, Robert Burns, Lord Byron, Geoffrey Chaucer, John Clare, Samuel Taylor Coleridge, John Donne, John Dryden, Thomas Gray, George Herbert, Robert Herrick, Gerard Manley Hopkins, John Keats, Andrew Marvell, John Milton, Alexander Pope, Christina Rossetti, William Shakespeare (sonnets), Percy Bysshe Shelley, Edmund Spenser, Alfred Lord Tennyson, Henry Vaughan, William Wordsworth, Sir Thomas Wyatt.

Examples of major poets after 1914

W H Auden, Gillian Clarke, Keith Douglas, T S Eliot, U A Fanthorpe, Thomas Hardy, Seamus Heaney, Ted Hughes, Elizabeth Jennings, Philip Larkin, Wilfred Owen, Sylvia Plath, Stevie Smith, Edward Thomas, R S Thomas, W B Yeats.

Examples of recent and contemporary drama, fiction and poetry

Drama: Alan Ayckbourn, Samuel Beckett, Alan Bennett, Robert Bolt, Brian Friel, Willis Hall, David Hare, Willie Russell, R C Sherriff, Arnold Wesker.

Fiction: J G Ballard, Berlie Doherty, Susan Hill, Laurie Lee, Joan Lingard, Bill Naughton, Alan Sillitoe, Mildred Taylor, Robert Westall.

Poetry: Simon Armitage, James Berry, Douglas Dunn, Liz Lochhead, Adrian Mitchell, Edwin Muir, Grace Nichols, Jo Shapcott.

Examples of drama, fiction and poetry by major writers from different cultures and traditions

Drama: Athol Fugard, Arthur Miller, Wole Soyinka, Tennessee Williams.

Fiction: Chinua Achebe, Maya Angelou, Willa Cather, Anita Desai, Nadine Gordimer, Ernest Hemingway, H H Richardson, Doris Lessing, R K Narayan, John Steinbeck, Ngugi wa Thiong'o.

Poetry: E K Brathwaite, Emily Dickinson, Robert Frost, Robert Lowell, Les Murray, Rabindranath Tagore, Derek Walcott.

Examples of non-fiction and non-literary texts

Personal record and viewpoints on society: Peter Ackroyd, James Baldwin, John Berger, James Boswell, Vera Brittain, Lord Byron, William Cobbett, Gerald Durrell, Robert Graves, Samuel Johnson, Laurie Lee, Samuel Pepys, Flora Thompson, Beatrice Webb, Dorothy Wordsworth.

Travel writing: Jan Morris, Freya Stark, Laurens Van Der Post.

Reportage: James Cameron, Winston Churchill, Alistair Cooke, Dilys Powell.

The natural world: David Attenborough, Rachel Carson, Charles Darwin, Steve Jones.

Writing: during key stage 4 students develop confidence in writing for a range of purposes. They develop their own distinctive styles and recognise the importance of writing with commitment and vitality. They learn to write correctly, using different formats, layouts and ways of presenting their work.

Note for 1d

The variety of narrative structures includes the use of words, sound and images.

1h → ICT opportunity

Students could make choices of font style and size and whether to use bold, italics or bullets in presenting their work.

Note for 2a

Planning and revising can be done simultaneously when working on screen.

En3 Writing

Knowledge, skills and understanding

Composition

- 1 Students should be taught to draw on their reading and knowledge of linguistic and literary forms when composing their writing. Students should be taught to:

Writing to imagine, explore, entertain

- a draw on their experience of good fiction, of different poetic forms and of reading, watching and performing in plays
- b use imaginative vocabulary and varied linguistic and literary techniques
- c exploit choice of language and structure to achieve particular effects and appeal to the reader
- d use a range of techniques and different ways of organising and structuring material to convey ideas, themes and characters

Writing to inform, explain, describe

- e form sentences and paragraphs that express connections between information and ideas precisely [for example, cause and effect, comparison]
- f use formal and impersonal language and concise expression
- g consider what the reader needs to know and include relevant details
- h present material clearly, using appropriate layout, illustrations and organisation

Writing to persuade, argue, advise

- i develop logical arguments and cite evidence
- j use persuasive techniques and rhetorical devices
- k anticipate reader reaction, counter opposing views and use language to gain attention and sustain interest

Writing to analyse, review, comment

- l reflect on the nature and significance of the subject matter
- m form their own view, taking into account a range of evidence and opinions
- n organise their ideas and information, distinguishing between analysis and comment
- o take account of how well the reader knows the topic.

Planning and drafting

- 2 To improve and sustain their writing, students should be taught to:
- a plan, draft, redraft and proofread their work on paper and on screen
 - b judge the extent to which any or all of these processes are needed in specific pieces of writing
 - c analyse critically their own and others' writing.

Punctuation

- 3 Students should be taught to use the full range of punctuation marks correctly to signal sentence structure, and to help the reader.

Spelling

- 4 Students should be taught to:
- increase their knowledge of regular patterns of spelling, word families, roots of words and derivations, including stem, prefix, suffix, inflection
 - apply their knowledge of word formation
 - spell increasingly complex polysyllabic words that do not conform to regular patterns
 - check their spelling for errors and use a dictionary when necessary
 - use different kinds of dictionary, thesaurus and spellchecker.

Handwriting and presentation

- 5 Students should be taught to write with fluency and, when required, speed. In presenting final polished work, students should be taught to:
- ensure that work is neat and clear
 - write legibly, if their work is handwritten
 - make full use of different presentational devices where appropriate.

Standard English

- 6 Students should be taught about the variations in written standard English and how they differ from spoken language, and to distinguish varying degrees of formality, selecting appropriately for a task.

Language structure

- 7 Students should be taught the principles of sentence grammar and whole-text cohesion and use this knowledge in their writing. They should be taught:
- word classes or parts of speech and their grammatical functions
 - the structure of phrases and clauses and how they can be combined to make complex sentences [for example, coordination and subordination]
 - paragraph structure and how to form different types of paragraph
 - the structure of whole texts, including cohesion, openings and conclusions in different types of writing [for example, through the use of verb tenses, reference chains]
 - the use of appropriate grammatical terminology to reflect on the meaning and clarity of individual sentences [for example, nouns, verbs, adjectives, prepositions, conjunctions, articles].

Note for 4e

Using spellcheckers involves understanding both their uses and their limitations.

5c → ICT opportunity

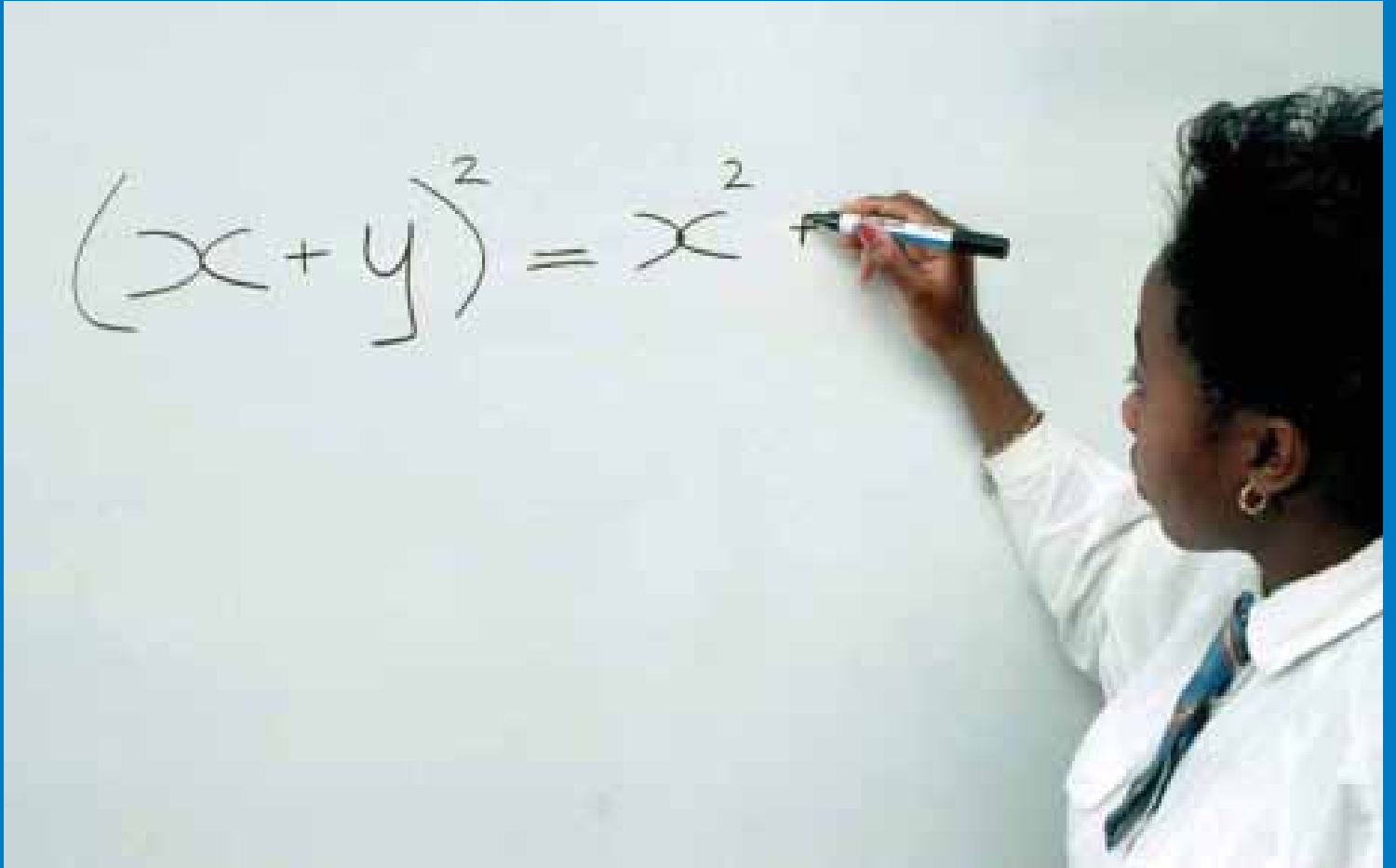
Students could use a variety of ways to present their work, including using pictures and moving images as well as print.

Note for 9

Written texts are shaped by choices of purpose, form and reader. These elements are interdependent so that, for example, forms are adapted to the writer's aim and the intended reader.

Breadth of study

- 8 During the key stage, students should be taught the **Knowledge, skills and understanding** through addressing the following range of purposes, readers and forms of writing.
- 9 The range of purposes for writing should include:
 - a to imagine, explore and entertain, focusing on creative, aesthetic and literary uses of language. The forms for such writing should be drawn from different kinds of stories, poems, playscripts, autobiographies, screenplays, diaries
 - b to inform, explain and describe, focusing on conveying information and ideas clearly. The forms for such writing should be drawn from memos, minutes, accounts, information leaflets, prospectuses, plans, records, summaries
 - c to persuade, argue and advise, focusing on presenting a case and influencing the reader. The forms for such writing should be drawn from brochures, advertisements, editorials, articles and letters conveying opinions, campaign literature, polemical essays
 - d to analyse, review and comment, focusing on considered and evaluative views of ideas, texts and issues. The forms for such writing should be drawn from reviews, commentaries, articles, essays, reports.
- 10 Students should also be taught to use writing for thinking and learning [for example, for hypothesising, paraphrasing, summarising, noting].
- 11 The range of readers for writing should include specific, known readers, a large, unknown readership and the students themselves.



The importance of mathematics

Mathematics equips students with a uniquely powerful set of tools to understand and change the world. These tools include logical reasoning, problem-solving skills, and the ability to think in abstract ways. Mathematics is important in everyday life, many forms of employment, science and technology, medicine, the economy, the environment and development, and in public decision-making.

Different cultures have contributed to the development and application of mathematics. Today, the subject transcends cultural boundaries and its importance is universally recognised. Mathematics is a creative discipline. It can stimulate moments of pleasure and wonder when a pupil solves a problem for the first time, discovers a more elegant solution to that problem, or suddenly sees hidden connections.

Mathematics



During key stage 4 (foundation) students consolidate their understanding of basic mathematics, which will help them to tackle unfamiliar problems in the workplace and everyday life and develop the knowledge and skills they need in the future. They become more fluent in making connections between different areas of mathematics and its application in the world around them. They become increasingly proficient in calculating fractions, percentages and decimals, and use proportional reasoning in simple contexts. Building on their understanding of numbers, they make generalisations using letters, manipulate simple algebraic expressions and apply basic algebraic techniques to solve problems. They extend their use of mathematical vocabulary to talk about numbers and geometrical objects. They begin to understand and follow a short proof, and use geometrical properties to find missing angles and lengths, explaining their reasoning with increasing confidence. They collect data, learn statistical techniques to analyse data and use ICT to present and interpret the results.

Note

Mathematics at key stage 4

In mathematics there are two programmes of study – foundation and higher. Students may be taught either the foundation or the higher programme of study.

The foundation programme of study is intended for those students who have not attained a secure level 5 at the end of key stage 3. Teachers are expected to plan work drawing on all the numbered sub-sections of the programme of study.

For some groups of students, all or part of particular lettered paragraphs may not be appropriate.

Note about sections

There is no separate section of the programme of study numbered Ma1 that corresponds to the first attainment target, **using and applying mathematics**. Teaching requirements relating to this attainment target are included within the other sections of the programme of study.

Key stage 4 programme of study

Mathematics foundation

Knowledge, skills and understanding

Teaching should ensure that appropriate connections are made between the sections on **number and algebra**, **shape, space and measures**, and **handling data**.

Ma2 Number and algebra

Using and applying number and algebra

1 Students should be taught to:

Problem solving

- select and use suitable problem-solving strategies and efficient techniques to solve numerical and algebraic problems
- break down a complex calculation into simpler steps before attempting to solve it
- use algebra to formulate and solve a simple problem – identifying the variable, setting up an equation, solving the equation and interpreting the solution in the context of the problem
- make mental estimates of the answers to calculations; use checking procedures, including use of inverse operations; work to stated levels of accuracy

Communicating

- interpret and discuss numerical and algebraic information presented in a variety of forms
- use notation and symbols correctly and consistently within a given problem
- use a range of strategies to create numerical, algebraic or graphical representations of a problem and its solution; move from one form of representation to another to get different perspectives on the problem
- present and interpret solutions in the context of the original problem
- review and justify their choice of mathematical presentation

Reasoning

- explore, identify, and use pattern and symmetry in algebraic contexts [for example, using simple codes that substitute numbers for letters], investigating whether particular cases can be generalised further, and understanding the importance of a counter-example; identify exceptional cases when solving problems
- show step-by-step deduction in solving a problem
- distinguish between a practical demonstration and a proof
- recognise the importance of assumptions when deducing results; recognise the limitations of any assumptions that are made and the effect that varying the assumptions may have on the solution to a problem.

Numbers and the number system

2 Students should be taught to:

Integers

- a use their previous understanding of integers and place value to deal with arbitrarily large positive numbers and round them to a given power of 10; understand and use positive numbers, both as positions and translations on a number line; order integers; use the concepts and vocabulary of factor (divisor), multiple and common factor

Powers and roots

- b use the terms square, positive square root, cube; use index notation for squares, cubes and powers of 10; express standard index form both in conventional notation and on a calculator display

Fractions

- c understand equivalent fractions, simplifying a fraction by cancelling all common factors; order fractions by rewriting them with a common denominator

Decimals

- d use decimal notation and recognise that each terminating decimal is a fraction [for example, $0.137 = \frac{137}{1000}$]; order decimals

Percentages

- e understand that ‘percentage’ means ‘number of parts per 100’ and use this to compare proportions; interpret percentage as the operator ‘so many hundredths of’ [for example, 10% means 10 parts per 100 and 15% of Y means $\frac{15}{100} \times Y$]; use percentage in real-life situations [for example, commerce and business, including rate of inflation, VAT and interest rates]

Ratio

- f use ratio notation, including reduction to its simplest form and its various links to fraction notation [for example, in maps and scale drawings, paper sizes and gears].

Calculations

3 Students should be taught to:

Number operations and the relationships between them

- a add, subtract, multiply and divide integers and then any number; multiply or divide any number by powers of 10, and any positive number by a number between 0 and 1
- b use brackets and the hierarchy of operations

1e → links to other subjects

This requirement builds on En1/3b and En2/1a.

1h, 1i → links to other subjects

These requirements build on En1/1d, 1e and En3/1f, 1i, 1n.

Note for 3i

Students do not need to know the names of the laws.

- c calculate a given fraction of a given quantity [for example, for scale drawings and construction of models, down payments, discounts], expressing the answer as a fraction; express a given number as a fraction of another; add and subtract fractions by writing them with a common denominator; perform short division to convert a simple fraction to a decimal
- d understand and use unit fractions as multiplicative inverses [for example, by thinking of multiplication by $\frac{1}{5}$ as division by 5, or multiplication by $\frac{6}{7}$ as multiplication by 6 followed by division by 7 (or vice versa)]; multiply and divide a fraction by an integer, and multiply a fraction by a unit fraction
- e convert simple fractions of a whole to percentages of the whole and vice versa [for example, analysing diets, budgets or the costs of running, maintaining and owning a car], then understand the multiplicative nature of percentages as operators [for example, 30% increase on £150 gives a total calculated as $\pounds(1.3 \times 150)$ while a 20% discount gives a total calculated as $\pounds(0.8 \times 150)$]
- f divide a quantity in a given ratio [for example, share £15 in the ratio of 1:2]

Mental methods

- g recall all positive integer complements to 100 [for example, $37 + 63 = 100$]; recall all multiplication facts to 10×10 , and use them to derive quickly the corresponding division facts; recall the cubes of 2, 3, 4, 5 and 10, and the fraction-to-decimal conversion of familiar simple fractions [for example, $\frac{1}{2}, \frac{1}{4}, \frac{1}{5}, \frac{1}{10}, \frac{1}{100}, \frac{1}{3}, \frac{2}{3}, \frac{1}{8}$]
- h round to the nearest integer and to one significant figure; estimate answers to problems involving decimals
- i develop a range of strategies for mental calculation; derive unknown facts from those they know [for example, estimate $\sqrt{85}$]; add and subtract mentally numbers with up to two decimal places [for example, $13.76 - 5.21$, $20.08 + 12.4$]; multiply and divide numbers with no more than one decimal digit, [for example, 14.3×4 , $56.7 \div 7$] using the commutative, associative, and distributive laws and factorisation where possible, or place value adjustments

Written methods

- j use standard column procedures for addition and subtraction of integers and decimals
- k use standard column procedures for multiplication of integers and decimals, understanding where to position the decimal point by considering what happens if they multiply equivalent fractions; solve a problem involving division by a decimal (up to two places of decimals) by transforming it to a problem involving division by an integer
- l use efficient methods to calculate with fractions, including cancelling common factors before carrying out the calculation, recognising that, in many cases, only a fraction can express the exact answer

- m solve simple percentage problems, including increase and decrease [for example, VAT, annual rate of inflation, income tax, discounts]
- n solve word problems about ratio and proportion, including using informal strategies and the unitary method of solution [for example, given that m identical items cost $\pounds y$, then one item costs $\pounds \frac{y}{m}$ and n items cost $\pounds(n \times \frac{y}{m})$, the number of items that can be bought for $\pounds z$ is $z \times \frac{m}{y}$]

Calculator methods

- o use calculators effectively and efficiently: know how to enter complex calculations and use function keys for reciprocals, squares and powers
- p enter a range of calculations, including those involving standard index form and measures [for example, time calculations in which fractions of an hour must be entered as fractions or as decimals]
- q understand the calculator display, interpreting it correctly [for example, in money calculations, or when the display has been rounded by the calculator], and knowing not to round during the intermediate steps of a calculation.

Solving numerical problems

- 4 Students should be taught to:
 - a draw on their knowledge of the operations and the relationships between them, and of simple integer powers and their corresponding roots, to solve problems involving ratio and proportion, a range of measures and compound measures, metric units, and conversion between metric and common imperial units, set in a variety of contexts
 - b select appropriate operations, methods and strategies to solve number problems, including trial and improvement where a more efficient method to find the solution is not obvious
 - c use a variety of checking procedures, including working the problem backwards, and considering whether a result is of the right order of magnitude
 - d give solutions in the context of the problem to an appropriate degree of accuracy, interpreting the solution shown on a calculator display, and recognising limitations on the accuracy of data and measurements.

5f → ICT opportunity

Students could use a spreadsheet to construct formulae to model situations.

Equations, formulae and identities

5 Students should be taught to:

Use of symbols

- a distinguish the different roles played by letter symbols in algebra, knowing that letter symbols represent definite unknown numbers in equations [for example, $5x + 1 = 16$], defined quantities or variables in formulae [for example, $V = IR$], general, unspecified and independent numbers in identities [for example, $3x + 2x = 5x$, $(x + 1)^2 = x^2 + 2x + 1$ for all values of x] and in functions they define new expressions or quantities by referring to known quantities [for example, $y = 2x$]
- b understand that the transformation of algebraic expressions obeys and generalises the rules of arithmetic; manipulate algebraic expressions by collecting like terms, by multiplying a single term over a bracket, and by taking out single term common factors [for example, $x + 5 - 2x - 1 = 4 - x$; $5(2x + 3) = 10x + 15$; $x^2 + 3x = x(x + 3)$]; distinguish in meaning between the words ‘equation’, ‘formula’, ‘identity’ and ‘expression’

Index notation

- c use index notation for simple integer powers, and simple instances of index laws; substitute positive and negative numbers into expressions such as $3x^2 + 4$ and $2x^3$

Inequalities

- d solve simple linear inequalities in one variable, and represent the solution set on the number line

Linear equations

- e solve linear equations, with integer coefficients, in which the unknown appears on either side or on both sides of the equation; solve linear equations that require prior simplification of brackets, including those that have negative signs occurring anywhere in the equation, and those with a negative solution

Formulae

- f use formulae from mathematics and other subjects expressed initially in words and then using letters and symbols [for example, formulae for the area of a triangle, the area enclosed by a circle, wage earned = hours worked \times rate per hour]; substitute numbers into a formula; derive a formula and change its subject [for example, convert temperatures between degrees Fahrenheit and degrees Celsius, find the perimeter of a rectangle given its area A and the length l of one side, use $V = IR$ to generate a formula for R in terms of V and I].

Sequences, functions and graphs

6 Students should be taught to:

Sequences

- a generate terms of a sequence using term-to-term and position-to-term definitions of the sequence; use linear expressions to describe the n th term of an arithmetic sequence, justifying its form by referring to the activity or context from which it was generated

Graphs of linear functions

- b use the conventions for coordinates in the plane; plot points in all four quadrants; recognise (when values are given for m and c) that equations of the form $y = mx + c$ correspond to straight-line graphs in the coordinate plane; plot graphs of functions in which y is given explicitly in terms of x [for example, $y = 2x + 3$], or implicitly [for example, $x + y = 7$]
- c construct linear functions from real-life problems and plot their corresponding graphs; discuss and interpret graphs arising from real situations; understand that the point of intersection of two different lines in the same two variables that simultaneously describe a real situation is the solution to the simultaneous equations represented by the lines; draw line of best fit through a set of linearly related points and find its equation

Gradients

- d find the gradient of lines given by equations of the form $y = mx + c$ (when values are given for m and c); investigate the gradients of parallel lines

Interpret graphical information

- e interpret information presented in a range of linear and non-linear graphs [for example, graphs describing trends, conversion graphs, distance–time graphs, graphs of height or weight against age, graphs of quantities that vary against time, such as employment].

6d → ICT opportunity

Students could use a spreadsheet to calculate points and draw graphs to explore the effects of varying m and c in the graph of $y=mx+c$.

1d → links to other subjects

This requirement builds on En1/3b and En2/1a.

1e → links to other subjects

This requirement builds on En1/1d and En3/1f.

1f → links to other subjects

This requirement builds on En1/1e and En3/1f.

1g → links to other subjects

This requirement builds on En3/1i, 1n.

Ma3 Shape, space and measures

Using and applying shape, space and measures

1 Students should be taught to:

Problem solving

- a select problem-solving strategies and resources, including ICT tools, to use in geometrical work, and monitor their effectiveness
- b select and combine known facts and problem-solving strategies to solve complex problems
- c identify what further information is needed to solve a geometrical problem; break complex problems down into a series of tasks

Communicating

- d interpret, discuss and synthesise geometrical information presented in a variety of forms
- e communicate mathematically, by presenting and organising results and explaining geometrical diagrams
- f use geometrical language appropriately
- g review and justify their choices of mathematical presentation

Reasoning

- h distinguish between practical demonstrations and proofs
- i apply mathematical reasoning, explaining and justifying inferences and deductions
- j show step-by-step deduction in solving a geometrical problem
- k state constraints and give starting points when making deductions
- l recognise the limitations of any assumptions that are made; understand the effects that varying the assumptions may have on the solution
- m identify exceptional cases when solving geometrical problems.

Geometrical reasoning

2 Students should be taught to:

Angles

- a recall and use properties of angles at a point, angles on a straight line (including right angles), perpendicular lines, and opposite angles at a vertex
- b distinguish between acute, obtuse, reflex and right angles; estimate the size of an angle in degrees

Properties of triangles and other rectilinear shapes

- c use parallel lines, alternate angles and corresponding angles; understand the properties of parallelograms and a proof that the angle sum of a triangle is 180 degrees; understand a proof that the exterior angle of a triangle is equal to the sum of the interior angles at the other two vertices
- d use angle properties of equilateral, isosceles and right-angled triangles; understand congruence; explain why the angle sum of any quadrilateral is 360 degrees

- e use their knowledge of rectangles, parallelograms and triangles to deduce formulae for the area of a parallelogram, and a triangle, from the formula for the area of a rectangle
- f recall the essential properties of special types of quadrilateral, including square, rectangle, parallelogram, trapezium and rhombus; classify quadrilaterals by their geometric properties
- g calculate and use the sums of the interior and exterior angles of quadrilaterals, pentagons and hexagons; calculate and use the angles of regular polygons
- h understand, recall and use Pythagoras' theorem

Properties of circles

- i recall the definition of a circle and the meaning of related terms, including centre, radius, chord, diameter, circumference, tangent, arc, sector and segment; understand that inscribed regular polygons can be constructed by equal division of a circle

3-D shapes

- j explore the geometry of cuboids (including cubes), and shapes made from cuboids
- k use 2-D representations of 3-D shapes and analyse 3-D shapes through 2-D projections and cross-sections, including plan and elevation.

Transformations and coordinates

- 3 Students should be taught to:

Specifying transformations

- a understand that rotations are specified by a centre and an (anticlockwise) angle; rotate a shape about the origin, or any other point; measure the angle of rotation using right angles, simple fractions of a turn or degrees; understand that reflections are specified by a mirror line, at first using a line parallel to an axis, then a mirror line such as $y = x$ or $y = -x$; understand that translations are specified by a distance and direction, and enlargements by a centre and positive scale factor

Properties of transformations

- b recognise and visualise rotations, reflections and translations, including reflection symmetry of 2-D and 3-D shapes, and rotation symmetry of 2-D shapes; transform triangles and other 2-D shapes by translation, rotation and reflection, recognising that these transformations preserve length and angle, so that any figure is congruent to its image under any of these transformations
- c recognise, visualise and construct enlargements of objects using positive scale factors greater than one, then positive scale factors less than one; understand from this that any two circles and any two squares are mathematically similar, while, in general, two rectangles are not

- d recognise that enlargements preserve angle but not length; identify the scale factor of an enlargement as the ratio of the lengths of any two corresponding line segments and apply this to triangles; understand the implications of enlargement for perimeter; use and interpret maps and scale drawings; understand the implications of enlargement for area and for volume; distinguish between formulae for perimeter, area and volume by considering dimensions; understand and use simple examples of the relationship between enlargement and areas and volumes of shapes and solids

Coordinates

- e understand that one coordinate identifies a point on a number line, two coordinates identify a point in a plane and three coordinates identify a point in space, using the terms '1-D', '2-D' and '3-D'; use axes and coordinates to specify points in all four quadrants; locate points with given coordinates; find the coordinates of points identified by geometrical information [for example, find the coordinates of the fourth vertex of a parallelogram with vertices at (2, 1) (-7, 3) and (5, 6)]; find the coordinates of the midpoint of the line segment AB, given points A and B, then calculate the length AB.

Measures and construction

- 4 Students should be taught to:

Measures

- a interpret scales on a range of measuring instruments, including those for time and mass; know that measurements using real numbers depend on the choice of unit; recognise that measurements given to the nearest whole unit may be inaccurate by up to one half in either direction; convert measurements from one unit to another; know rough metric equivalents of pounds, feet, miles, pints and gallons; make sensible estimates of a range of measures in everyday settings
- b understand angle measure using the associated language [for example, use bearings to specify direction]
- c understand and use compound measures, including speed

Construction

- d measure and draw lines to the nearest millimetre, and angles to the nearest degree; draw triangles and other 2-D shapes using a ruler and protractor, given information about their side lengths and angles; understand, from their experience of constructing them, that triangles satisfying SSS, SAS, ASA and RHS are unique, but SSA triangles are not; construct cubes, regular tetrahedra, square-based pyramids and other 3-D shapes from given information

- e use straight edge and compasses to do standard constructions, including an equilateral triangle with a given side, the midpoint and perpendicular bisector of a line segment, the perpendicular from a point to a line, the perpendicular from a point on a line, and the bisector of an angle

Mensuration

- f find areas of rectangles, recalling the formula, understanding the connection to counting squares and how it extends this approach; recall and use the formulae for the area of a parallelogram and a triangle; find the surface area of simple shapes using the area formulae for triangles and rectangles; calculate perimeters and areas of shapes made from triangles and rectangles
- g find volumes of cuboids, recalling the formula and understanding the connection to counting cubes and how it extends this approach; calculate volumes of right prisms and of shapes made from cubes and cuboids
- h find circumferences of circles and areas enclosed by circles, recalling relevant formulae
- i convert between area measures, including cm^2 and m^2 , and volume measures, including cm^3 and m^3

Loci

- j find loci, both by reasoning and by using ICT to produce shapes and paths [for example, equilateral triangles].

1e → links to other subjects

This requirement builds on En1/3b and En2/1a.

1f → links to other subjects

This requirement builds on En1/1d and En3/1f.

1g → links to other subjects

This requirement builds on En1/1e, 3b and En3/1i, 1n.

Ma4 Handling data

Using and applying handling data

1 Students should be taught to:

Problem solving

- a carry out each of the four aspects of the handling data cycle to solve problems:
 - i specify the problem and plan: formulate questions in terms of the data needed, and consider what inferences can be drawn from the data; decide what data to collect (including sample size and data format) and what statistical analysis is needed
 - ii collect data from a variety of suitable sources, including experiments and surveys, and primary and secondary sources
 - iii process and represent the data: turn the raw data into usable information that gives insight into the problem
 - iv interpret and discuss: answer the initial question by drawing conclusions from the data
- b identify what further information is needed to pursue a particular line of enquiry
- c select and organise the appropriate mathematics and resources to use for a task
- d review progress while working; check and evaluate solutions

Communicating

- e interpret, discuss and synthesise information presented in a variety of forms
- f communicate mathematically, including using ICT, making use of diagrams and related explanatory text
- g examine critically, and justify, their choices of mathematical presentation of problems involving data

Reasoning

- h apply mathematical reasoning, explaining and justifying inferences and deductions
- i explore connections in mathematics and look for cause and effect when analysing data
- j recognise the limitations of any assumptions and the effects that varying the assumptions could have on conclusions drawn from the data analysis.

Specifying the problem and planning

- 2 Students should be taught to:
 - a see that random processes are unpredictable
 - b identify questions that can be addressed by statistical methods
 - c discuss how data relate to a problem; identify possible sources of bias and plan to minimise it
 - d identify which primary data they need to collect and in what format, including grouped data, considering appropriate equal class intervals
 - e design an experiment or survey; decide what secondary data to use.

Collecting data

- 3 Students should be taught to:
 - a design and use data-collection sheets for grouped discrete and continuous data; collect data using various methods, including observation, controlled experiment, data logging, questionnaires and surveys
 - b gather data from secondary sources, including printed tables and lists from ICT-based sources
 - c design and use two-way tables for discrete and grouped data.

Processing and representing data

- 4 Students should be taught to:
 - a draw and produce, using paper and ICT, pie charts for categorical data, and diagrams for continuous data, including line graphs for time series, scatter graphs, frequency diagrams and stem-and-leaf diagrams
 - b calculate mean, range and median of small data sets with discrete then continuous data; identify the modal class for grouped data
 - c understand and use the probability scale
 - d understand and use estimates or measures of probability from theoretical models (including equally likely outcomes), or from relative frequency
 - e list all outcomes for single events, and for two successive events, in a systematic way
 - f identify different mutually exclusive outcomes and know that the sum of the probabilities of all these outcomes is 1
 - g find the median for large data sets and calculate an estimate of the mean for large data sets with grouped data
 - h draw lines of best fit by eye, understanding what these represent.

5c → ICT opportunity

Students could use databases to present their findings.

Interpreting and discussing results

- 5 Students should be taught to:
- a relate summarised data to the initial questions
 - b interpret a wide range of graphs and diagrams and draw conclusions
 - c look at data to find patterns and exceptions
 - d compare distributions and make inferences, using the shapes of distributions and measures of average and range
 - e consider and check results and modify their approach if necessary
 - f have a basic understanding of correlation as a measure of the strength of the association between two variables; identify correlation or no correlation using lines of best fit
 - g use the vocabulary of probability to interpret results involving uncertainty and prediction
 - h compare experimental data and theoretical probabilities
 - i understand that if they repeat an experiment, they may – and usually will – get different outcomes, and that increasing sample size generally leads to better estimates of probability and population characteristics
 - j discuss implications of findings in the context of the problem
 - k interpret social statistics including index numbers [for example, the General Index of Retail Prices]; **time series** [for example, population growth]; and **survey data** [for example, the National Census].

Breadth of study

- 1 During the key stage, students should be taught the **Knowledge, skills and understanding** through:
 - a extending mental and written calculation strategies and using efficient procedures confidently to calculate with integers, fractions, decimals, percentages, ratio and proportion
 - b solving a range of familiar and unfamiliar problems, including those drawn from real-life contexts and other areas of the curriculum
 - c activities that provide frequent opportunities to discuss their work, to develop reasoning and understanding and to explain their reasoning and strategies
 - d activities focused on developing short chains of deductive reasoning and correct use of the '=' sign
 - e activities in which they do practical work with geometrical objects, visualise them and work with them mentally
 - f practical work in which they draw inferences from data, consider how statistics are used in real life to make informed decisions, and recognise the difference between meaningful and misleading representations of data
 - g activities focused on the major ideas of statistics, including using appropriate populations and representative samples, using different measurement scales, using probability as a measure of uncertainty, using randomness and variability, reducing bias in sampling and measuring, and using inference to make decisions
 - h substantial use of tasks focused on using appropriate ICT [for example, spreadsheets, databases, geometry or graphic packages], using calculators correctly and efficiently, and knowing when not to use a calculator.

During key stage 4 (higher) students take increasing responsibility for planning and executing their work. They realise their calculating skills to include powers, roots and numbers expressed in standard form. They learn the importance of precision and rigour in mathematics. They use proportional reasoning with fluency and develop skills of algebraic manipulation and simplification. They extend their knowledge of functions and related graphs and solve a range of equations, including those with non-integer coefficients. They use short chains of deductive reasoning, develop their own proofs, and begin to understand the importance of proof in mathematics. Students use definitions and formal reasoning to describe and understand geometrical figures and the logical relationships between them. They learn to handle data through practical activities, using a broader range of skills and techniques, including sampling. Students develop the confidence and flexibility to solve unfamiliar problems and to use ICT appropriately. By seeing the importance of mathematics as an analytical tool for solving problems, they learn to appreciate its unique power.

Note

Mathematics at key stage 4

In mathematics there are two programmes of study – foundation and higher. Students may be taught either the foundation or the higher programme of study.

The higher programme of study is intended for students who have attained a secure level 5 at the end of key stage 3. Teachers are expected to plan work drawing on all the numbered sub-sections of the programme of study.

For some groups of students, all or part of particular lettered paragraphs may not be appropriate.

Note about sections

There is no separate section of the programme of study numbered Ma1 that corresponds to the first attainment target, **using and applying mathematics**. Teaching requirements relating to this attainment target are included within the other sections of the programme of study.

Key stage 4 programme of study

Mathematics higher

Knowledge, skills and understanding

Teaching should ensure that appropriate connections are made between the sections on **number and algebra**, **shape, space and measures**, and **handling data**.

Ma2 Number and algebra

Using and applying number and algebra

1 Students should be taught to:

Problem solving

- a select and use appropriate and efficient techniques and strategies to solve problems of increasing complexity, involving numerical and algebraic manipulation
- b identify what further information may be required in order to pursue a particular line of enquiry and give reasons for following or rejecting particular approaches
- c break down a complex calculation into simpler steps before attempting a solution and justify their choice of methods
- d make mental estimates of the answers to calculations; present answers to sensible levels of accuracy; understand how errors are compounded in certain calculations

Communicating

- e discuss their work and explain their reasoning using an increasing range of mathematical language and notation
- f use a variety of strategies and diagrams for establishing algebraic or graphical representations of a problem and its solution; move from one form of representation to another to get different perspectives on the problem
- g present and interpret solutions in the context of the original problem
- h use notation and symbols correctly and consistently within a given problem
- i examine critically, improve, then justify their choice of mathematical presentation; present a concise, reasoned argument

Reasoning

- j explore, identify, and use pattern and symmetry in algebraic contexts, investigating whether a particular case may be generalised further and understand the importance of a counter-example; identify exceptional cases when solving problems
- k understand the difference between a practical demonstration and a proof
- l show step-by-step deduction in solving a problem; derive proofs using short chains of deductive reasoning.

- m recognise the significance of stating constraints and assumptions when deducing results; recognise the limitations of any assumptions that are made and the effect that varying the assumptions may have on the solution to a problem.

Numbers and the number system

- 2 Students should be taught to:

Integers

- a use their previous understanding of integers and place value to deal with arbitrarily large positive numbers and round them to a given power of 10; understand and use negative integers both as positions and translations on a number line; order integers; use the concepts and vocabulary of factor (divisor), multiple, common factor, highest common factor, least common multiple, prime number and prime factor decomposition

Powers and roots

- b use the terms square, positive square root, negative square root, cube and cube root; use index notation [for example, 8^2 , $8^{\frac{2}{3}}$] and index laws for multiplication and division of integer powers; use standard index form, expressed in conventional notation and on a calculator display

Fractions

- c understand equivalent fractions, simplifying a fraction by cancelling all common factors; order fractions by rewriting them with a common denominator

Decimals

- d recognise that each terminating decimal is a fraction [for example, $0.137 = \frac{137}{1000}$]; recognise that recurring decimals are exact fractions, and that some exact fractions are recurring decimals [for example, $\frac{1}{7} = 0.142857142857\dots$]; order decimals

Percentages

- e understand that ‘percentage’ means ‘number of parts per 100’, and interpret percentage as the operator ‘so many hundredths of’ [for example, 10% means 10 parts per 100 and 15% of Y means $\frac{15}{100} \times Y$]

Ratio

- f use ratio notation, including reduction to its simplest form and its various links to fraction notation.

Calculations

- 3 Students should be taught to:

Number operations and the relationships between them

- a multiply or divide any number by powers of 10, and any positive number by a number between 0 and 1; find the prime factor decomposition of positive integers; understand ‘reciprocal’ as multiplicative inverse, knowing

1e → links to other subjects

This requirement builds on En1/1d, 1e.

1f → links to other subjects

This requirement builds on En1/1d.

1g → links to other subjects

This requirement builds on En3/1f, 1n.

1i → links to other subjects

This requirement builds on En1/1e, 3b and En2/1a and En3/1f, 1i.

that any non-zero number multiplied by its reciprocal is 1 (and that zero has no reciprocal, because division by zero is not defined); multiply and divide by a negative number; use index laws to simplify and calculate the value of numerical expressions involving multiplication and division of integer, fractional and negative powers; use inverse operations, understanding that the inverse operation of raising a positive number to power n is raising the result of this operation to power $\frac{1}{n}$

- b use brackets and the hierarchy of operations
- c calculate a given fraction of a given quantity, expressing the answer as a fraction; express a given number as a fraction of another; add and subtract fractions by writing them with a common denominator; perform short division to convert a simple fraction to a decimal; distinguish between fractions with denominators that have only prime factors of 2 and 5 (which are represented by terminating decimals), and other fractions (which are represented by recurring decimals); convert a recurring decimal to a fraction [for example, $0.142857142857\dots = \frac{1}{7}$]
- d understand and use unit fractions as multiplicative inverses [for example, by thinking of multiplication by $\frac{1}{5}$ as division by 5, or multiplication by $\frac{6}{7}$ as multiplication by 6 followed by division by 7 (or vice versa)]; multiply and divide a given fraction by an integer, by a unit fraction and by a general fraction
- e convert simple fractions of a whole to percentages of the whole and vice versa; then understand the multiplicative nature of percentages as operators [for example, a 15% increase in value Y , followed by a 15% decrease is calculated as $1.15 \times 0.85 \times Y$]; calculate an original amount when given the transformed amount after a percentage change; reverse percentage problems [for example, given that a meal in a restaurant costs £36 with VAT at 17.5%, its price before VAT is calculated as $\pounds \frac{36}{1.175}$]
- f divide a quantity in a given ratio

Mental methods

- g recall integer squares from 2×2 to 15×15 and the corresponding square roots, the cubes of 2, 3, 4, 5 and 10, the fact that $n^0 = 1$ and $n^{-1} = \frac{1}{n}$ for positive integers n [for example, $10^0 = 1$; $9^{-1} = \frac{1}{9}$], the corresponding rule for negative numbers [for example, $5^{-2} = \frac{1}{5^2} = \frac{1}{25}$], $n^{\frac{1}{2}} = \sqrt{n}$ and $n^{\frac{1}{3}} = \sqrt[3]{n}$ for any positive number n [for example, $25^{\frac{1}{2}} = 5$ and $64^{\frac{1}{3}} = 4$]
- h round to a given number of significant figures; develop a range of strategies for mental calculation; derive unknown facts from those they know; convert between ordinary and standard index form representations [for example, $0.1234 = 1.234 \times 10^{-1}$], converting to standard index form to make sensible estimates for calculations involving multiplication and/or division

Written methods

- i use efficient methods to calculate with fractions, including cancelling common factors before carrying out the calculation, recognising that in many cases only a fraction can express the exact answer
- j solve percentage problems, including percentage increase and decrease [for example, simple interest, VAT, annual rate of inflation]; and reverse percentages
- k represent repeated proportional change using a multiplier raised to a power [for example, compound interest]
- l calculate an unknown quantity from quantities that vary in direct or inverse proportion
- m calculate with standard index form [for example, $2.4 \times 10^7 \times 5 \times 10^3 = 12 \times 10^{10} = 1.2 \times 10^{11}$, $(2.4 \times 10^7) \div (5 \times 10^3) = 4.8 \times 10^3$]
- n use surds and π in exact calculations, without a calculator; rationalise a denominator such as $\frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$

Calculator methods

- o use calculators effectively and efficiently, knowing how to enter complex calculations; use an extended range of function keys, including trigonometrical and statistical functions relevant across this programme of study
- p understand the calculator display, knowing when to interpret the display, when the display has been rounded by the calculator, and not to round during the intermediate steps of a calculation
- q use calculators, or written methods, to calculate the upper and lower bounds of calculations, particularly when working with measurements
- r use standard index form display and how to enter numbers in standard index form
- s use calculators for reverse percentage calculations by doing an appropriate division
- t use calculators to explore exponential growth and decay [for example, in science or geography], using a multiplier and the power key.

Solving numerical problems

- 4 Students should be taught to:
 - a draw on their knowledge of operations and inverse operations (including powers and roots), and of methods of simplification (including factorisation and the use of the commutative, associative and distributive laws of addition, multiplication and factorisation) in order to select and use suitable strategies and techniques to solve problems and word problems, including those involving ratio and proportion, repeated proportional change, fractions, percentages and reverse percentages, inverse proportion, surds, measures and conversion between measures, and compound measures defined within a particular situation

Note for 3n

Numbers that can be written as the ratio of two integers are known as rational numbers. Surds and π are examples of irrational numbers, which cannot be written as the ratio of two integers.

5g → ICT opportunity

Students could use a spreadsheet or graphic calculator to construct and use formulae.

- b check and estimate answers to problems; select and justify appropriate degrees of accuracy for answers to problems; recognise limitations on the accuracy of data and measurements.

Equations, formulae and identities

- 5 Students should be taught to:

Use of symbols

- a distinguish the different roles played by letter symbols in algebra, using the correct notational conventions for multiplying or dividing by a given number, and knowing that letter symbols represent definite unknown numbers in equations [for example, $x^2 + 1 = 82$], defined quantities or variables in formula [for example, $V = IR$], general, unspecified and independent numbers in identities [for example, $(x + 1)^2 = x^2 + 2x + 1$ for all x], and in functions they define new expressions or quantities by referring to known quantities [for example, $y = 2 - 7x$; $f(x) = x^3$; $y = \frac{1}{x}$ with $x \neq 0$]
- b understand that the transformation of algebraic entities obeys and generalises the well-defined rules of generalised arithmetic [for example, $a(b + c) = ab + ac$]; expand the product of two linear expressions [for example, $(x + 1)(x + 2) = x^2 + 3x + 2$]; manipulate algebraic expressions by collecting like terms, multiplying a single term over a bracket, taking out common factors [for example, $9x - 3 = 3(3x - 1)$], factorising quadratic expressions including the difference of two squares [for example, $x^2 - 9 = (x + 3)(x - 3)$] and cancelling common factors in rational expressions [for example, $2(x + 1)^2 / (x + 1) = 2(x + 1)$]
- c know the meaning of and use the words ‘equation’, ‘formula’, ‘identity’ and ‘expression’

Index notation

- d use index notation for simple integer powers, and simple instances of index laws [for example, $x^3 \times x^2 = x^5$; $\frac{x^3}{x^2} = x^1$; $(x^2)^3 = x^6$]; substitute positive and negative numbers into expressions such as $3x^2 + 4$ and $2x^3$

Equations

- e set up simple equations [for example, find the angle a in a triangle with angles a , $a + 10$, $a + 20$]; solve simple equations [for example, $5x = 7$; $11 - 4x = 2$; $3(2x + 1) = 8$; $2(1 - x) = 6(2 + x)$; $4x^2 = 49$; $3 = \frac{12}{x}$] by using inverse operations or by transforming both sides in the same way

Linear equations

- f solve linear equations in one unknown, with integer or fractional coefficients, in which the unknown appears on either side or on both sides of the equation; solve linear equations that require prior simplification of brackets, including those that have negative signs occurring anywhere in the equation, and those with a negative solution

Formulae

- g use formulae from mathematics and other subjects [for example, for area of a triangle or a parallelogram, area enclosed by a circle, volume of a prism, volume of a cone]; substitute numbers into a formula; change the subject of a formula, including cases where the subject occurs twice, or where a power of the subject appears [for example, find r given that $A = \pi r^2$, find x given $y = mx + c$]; generate a formula [for example, find the perimeter of a rectangle given its area A and the length l of one side]

Direct and inverse proportion

- h set up and use equations to solve word and other problems involving direct proportion or inverse proportion [for example, $y \propto x$, $y \propto x^2$, $y \propto \frac{1}{x}$, $y \propto \frac{1}{x^2}$] and relate algebraic solutions to graphical representation of the equations

Simultaneous linear equations

- i find the exact solution of two simultaneous equations in two unknowns by eliminating a variable, and interpret the equations as lines and their common solution as the point of intersection
- j solve simple linear inequalities in one variable, and represent the solution set on a number line; solve several linear inequalities in two variables and find the solution set

Quadratic equations

- k solve quadratic equations by factorisation, completing the square and using the quadratic formula

Simultaneous linear and quadratic equations

- l solve exactly, by elimination of an unknown, two simultaneous equations in two unknowns, one of which is linear in each unknown, and the other is linear in one unknown and quadratic in the other [for example, solve the simultaneous equations $y = 11x - 2$ and $y = 5x^2$], or where the second is of the form $x^2 + y^2 = r^2$

Numerical methods

- m use systematic trial and improvement to find approximate solutions of equations where there is no simple analytical method of solving them [for example, $x^3 - x = 900$].

Sequences, functions and graphs

- 6 Students should be taught to:

Sequences

- a generate common integer sequences (including sequences of odd or even integers, squared integers, powers of 2, powers of 10, triangular numbers); generate terms of a sequence using term-to-term and position-to-term definitions of the sequence; use linear expressions to describe the n th term of an arithmetic sequence, justifying its form by reference to the activity or context from which it was generated

6b–6f → ICT opportunity

Students could generate functions from plots of data, for example, from a science experiment, using simple curve fitting techniques on graphic calculators, or with graphics software.

6g → ICT opportunity

Students could use software to explore transformations of graphs.

Note for 6h

The derivation of the circle equation is an application of Pythagoras' theorem. Loci can be considered from an algebraic point of view as here or from a geometric point of view as in Ma3/3e

Graphs of linear functions

- b use conventions for coordinates in the plane; plot points in all four quadrants; recognise (when values are given for m and c) that equations of the form $y = mx + c$ correspond to straight-line graphs in the coordinate plane; plot graphs of functions in which y is given explicitly in terms of x (as in $y = 2x + 3$), or implicitly (as in $x + y = 7$)
- c find the gradient of lines given by equations of the form $y = mx + c$ (when values are given for m and c); understand that the form $y = mx + c$ represents a straight line and that m is the gradient of the line, and c is the value of the y -intercept; explore the gradients of parallel lines and lines perpendicular to these lines [for example, know that the lines represented by the equations $y = -5x$ and $y = 3 - 5x$ are parallel, each having gradient (-5) and that the line with equation $y = \frac{x}{5}$ is perpendicular to these lines and has gradient $\frac{1}{5}$]

Interpreting graphical information

- d construct linear functions and plot the corresponding graphs arising from real-life problems; discuss and interpret graphs modelling real situations [for example, distance–time graph for a particle moving with constant speed, the depth of water in a container as it empties, the velocity–time graph for a particle moving with constant acceleration]

Quadratic functions

- e generate points and plot graphs of simple quadratic functions [for example, $y = x^2$; $y = 3x^2 + 4$], then more general quadratic functions [for example, $y = x^2 - 2x + 1$]; find approximate solutions of a quadratic equation from the graph of the corresponding quadratic function; find the intersection points of the graphs of a linear and quadratic function, knowing that these are the approximate solutions of the corresponding simultaneous equations representing the linear and quadratic functions

Other functions

- f plot graphs of: simple cubic functions [for example, $y = x^3$], the reciprocal function $y = \frac{1}{x}$ with $x \neq 0$, the exponential function $y = k^x$ for integer values of x and simple positive values of k [for example, $y = 2^x$; $y = (\frac{1}{2})^x$], the circular functions $y = \sin x$ and $y = \cos x$, using a spreadsheet or graph plotter as well as pencil and paper; recognise the characteristic shapes of all these functions

Transformation of functions

- g apply to the graph of $y = f(x)$ the transformations $y = f(x) + a$, $y = f(ax)$, $y = f(x + a)$, $y = af(x)$ for linear, quadratic, sine and cosine functions $f(x)$

Loci

- h construct the graphs of simple loci, including the circle $x^2 + y^2 = r^2$ for a circle of radius r centred at the origin of coordinates; find graphically the intersection points of a given straight line with this circle and know that this corresponds to solving the two simultaneous equations representing the line and the circle.

Ma3 Shape, space and measures

Using and applying shape, space and measures

1 Students should be taught to:

Problem solving

- a select the problem-solving strategies to use in geometrical work, and consider and explain the extent to which the selections they made were appropriate
- b select and combine known facts and problem-solving strategies to solve more complex geometrical problems
- c develop and follow alternative lines of enquiry, justifying their decisions to follow or reject particular approaches

Communicating

- d communicate mathematically, with emphasis on a critical examination of the presentation and organisation of results, and on effective use of symbols and geometrical diagrams
- e use precise formal language and exact methods for analysing geometrical configurations

Reasoning

- f apply mathematical reasoning, progressing from brief mathematical explanations towards full justifications in more complex contexts
- g explore connections in geometry; pose conditional constraints of the type 'If ... then ...'; and ask questions 'What if ...?' or 'Why?'
- h show step-by-step deduction in solving a geometrical problem
- i state constraints and give starting points when making deductions
- j understand the necessary and sufficient conditions under which generalisations, inferences and solutions to geometrical problems remain valid.

Geometrical reasoning

2 Students should be taught to:

Properties of triangles and other rectilinear shapes

- a distinguish between lines and line segments; use parallel lines, alternate angles and corresponding angles; understand the consequent properties of parallelograms and a proof that the angle sum of a triangle is 180 degrees; understand a proof that the exterior angle of a triangle is equal to the sum of the interior angles at the other two vertices
- b use angle properties of equilateral, isosceles and right-angled triangles; explain why the angle sum of a quadrilateral is 360 degrees
- c recall the definitions of special types of quadrilateral, including square, rectangle, parallelogram, trapezium and rhombus; classify quadrilaterals by their geometric properties

1d, 1e → links to other subjects

These requirements build on En1/1d, 1e and En3/1f, 1i, 1n.

- d calculate and use the sums of the interior and exterior angles of quadrilaterals, pentagons, hexagons; calculate and use the angles of regular polygons
- e understand and use SSS, SAS, ASA and RHS conditions to prove the congruence of triangles using formal arguments, and to verify standard ruler and compass constructions
- f understand, recall and use Pythagoras' theorem in 2-D, then 3-D problems; investigate the geometry of cuboids including cubes, and shapes made from cuboids, including the use of Pythagoras' theorem to calculate lengths in three dimensions
- g understand similarity of triangles and of other plane figures, and use this to make geometric inferences; understand, recall and use trigonometrical relationships in right-angled triangles, and use these to solve problems, including those involving bearings, then use these relationships in 3-D contexts, including finding the angles between a line and a plane (but not the angle between two planes or between two skew lines); calculate the area of a triangle using $\frac{1}{2}ab \sin C$; draw, sketch and describe the graphs of trigonometric functions for angles of any size, including transformations involving scalings in either or both the x and y directions; use the sine and cosine rules to solve 2-D and 3-D problems

Properties of circles

- h recall the definition of a circle and the meaning of related terms, including centre, radius, chord, diameter, circumference, tangent, arc, sector and segment; understand that the tangent at any point on a circle is perpendicular to the radius at that point; understand and use the fact that tangents from an external point are equal in length; explain why the perpendicular from the centre to a chord bisects the chord; understand that inscribed regular polygons can be constructed by equal division of a circle; prove and use the facts that the angle subtended by an arc at the centre of a circle is twice the angle subtended at any point on the circumference, the angle subtended at the circumference by a semicircle is a right angle, that angles in the same segment are equal, and that opposite angles of a cyclic quadrilateral sum to 180 degrees; prove and use the alternate segment theorem

3-D shapes

- i use 2-D representations of 3-D shapes and analyse 3-D shapes through 2-D projections and cross-sections, including plan and elevation; solve problems involving surface areas and volumes of prisms, pyramids, cylinders, cones and spheres; solve problems involving more complex shapes and solids, including segments of circles and frustums of cones.

Transformations and coordinates

3 Students should be taught to:

Specifying transformations

- a understand that rotations are specified by a centre and an (anticlockwise) angle; use any point as the centre of rotation; measure the angle of rotation, using right angles, fractions of a turn or degrees; understand that reflections are specified by a (mirror) line; understand that translations are specified by giving a distance and direction (or a vector), and enlargements by a centre and a positive scale factor

Properties of transformations

- b recognise and visualise rotations, reflections and translations including reflection symmetry of 2-D and 3-D shapes, and rotation symmetry of 2-D shapes; transform triangles and other 2-D shapes by translation, rotation and reflection and combinations of these transformations; use congruence to show that translations, rotations and reflections preserve length and angle, so that any figure is congruent to its image under any of these transformations; distinguish properties that are preserved under particular transformations
- c recognise, visualise and construct enlargements of objects; understand from this that any two circles and any two squares are mathematically similar, while, in general, two rectangles are not, then use positive fractional and negative scale factors
- d recognise that enlargements preserve angle but not length; identify the scale factor of an enlargement as the ratio of the lengths of any two corresponding line segments; understand the implications of enlargement for perimeter; use and interpret maps and scale drawings; understand the difference between formulae for perimeter, area and volume by considering dimensions; understand and use the effect of enlargement on areas and volumes of shapes and solids

Coordinates

- e understand that one coordinate identifies a point on a number line, that two coordinates identify a point in a plane and three coordinates identify a point in space, using the terms '1-D', '2-D' and '3-D'; use axes and coordinates to specify points in all four quadrants; locate points with given coordinates; find the coordinates of points identified by geometrical information; find the coordinates of the midpoint of the line segment AB, given the points A and B, then calculate the length AB

3b–3f → ICT opportunity

Students could use software to explore transformations and their effects on properties of shapes.

Vectors

- f understand and use vector notation; calculate, and represent graphically the sum of two vectors, the difference of two vectors and a scalar multiple of a vector; calculate the resultant of two vectors; understand and use the commutative and associative properties of vector addition; solve simple geometrical problems in 2-D using vector methods.

Measures and construction

- 4 Students should be taught to:

Measures

- a use angle measure [for example, use bearings to specify direction]; know that measurements using real numbers depend on the choice of unit; recognise that measurements given to the nearest whole unit may be inaccurate by up to one half in either direction; convert measurements from one unit to another; understand and use compound measures, including speed and density

Construction

- b draw approximate constructions of triangles and other 2-D shapes, using a ruler and protractor, given information about side lengths and angles; construct specified cubes, regular tetrahedra, square-based pyramids and other 3-D shapes
- c use straight edge and compasses to do standard constructions including an equilateral triangle with a given side, the midpoint and perpendicular bisector of a line segment, the perpendicular from a point to a line, the perpendicular from a point on a line, and the bisector of an angle

Mensuration

- d find the surface area of simple shapes by using the formulae for the areas of triangles and rectangles; find volumes of cuboids, recalling the formula and understanding the connection to counting cubes and how it extends this approach; calculate volumes of right prisms and of shapes made from cubes and cuboids; convert between volume measures including cm^3 and m^3 ; find circumferences of circles and areas enclosed by circles, recalling relevant formulae; calculate the lengths of arcs and the areas of sectors of circles

Loci

- e find loci, both by reasoning and by using ICT to produce shapes and paths [for example, a region bounded by a circle and an intersecting line].

Ma4 Handling data

Using and applying handling data

1 Students should be taught to:

Problem solving

- a carry out each of the four aspects of the handling data cycle to solve problems:
 - i specify the problem and plan: formulate questions in terms of the data needed, and consider what inferences can be drawn from the data; decide what data to collect (including sample size and data format) and what statistical analysis is needed)
 - ii collect data from a variety of suitable sources, including experiments and surveys, and primary and secondary sources
 - iii process and represent the data: turn the raw data into usable information that gives insight into the problem
 - iv interpret and discuss the data: answer the initial question by drawing conclusions from the data
- b select the problem-solving strategies to use in statistical work, and monitor their effectiveness (these strategies should address the scale and manageability of the tasks, and should consider whether the mathematics and approach used are delivering the most appropriate solutions)

Communicating

- c communicate mathematically, with emphasis on the use of an increasing range of diagrams and related explanatory text, on the selection of their mathematical presentation, explaining its purpose and approach, and on the use of symbols to convey statistical meaning

Reasoning

- d apply mathematical reasoning, explaining and justifying inferences and deductions, justifying arguments and solutions
- e identify exceptional or unexpected cases when solving statistical problems
- f explore connections in mathematics and look for relationships between variables when analysing data
- g recognise the limitations of any assumptions and the effects that varying the assumptions could have on the conclusions drawn from data analysis.

Specifying the problem and planning

2 Students should be taught to:

- a see that random processes are unpredictable
- b identify key questions that can be addressed by statistical methods
- c discuss how data relate to a problem; identify possible sources of bias and plan to minimise it

1c → links to other subjects

This requirement builds on En1/1d, 1e and En3/1f, 1i, 1n.

1c → ICT opportunity

Students could use databases or spreadsheets to present their findings and display their data.

- d identify which primary data they need to collect and in what format, including grouped data, considering appropriate equal class intervals; select and justify a sampling scheme and a method to investigate a population, including random and stratified sampling
- e design an experiment or survey; decide what primary and secondary data to use.

Collecting data

- 3 Students should be taught to:
 - a collect data using various methods, including observation, controlled experiment, data logging, questionnaires and surveys
 - b gather data from secondary sources, including printed tables and lists from ICT-based sources
 - c design and use two-way tables for discrete and grouped data
 - d deal with practical problems such as non-response or missing data.

Processing and representing data

- 4 Students should be taught to:
 - a draw and produce, using paper and ICT, pie charts for categorical data, and diagrams for continuous data, including line graphs (time series), scatter graphs, frequency diagrams, stem-and-leaf diagrams, cumulative frequency tables and diagrams, box plots and histograms for grouped continuous data
 - b understand and use estimates or measures of probability from theoretical models, or from relative frequency
 - c list all outcomes for single events, and for two successive events, in a systematic way
 - d identify different mutually exclusive outcomes and know that the sum of the probabilities of all these outcomes is 1
 - e find the median, quartiles and interquartile range for large data sets and calculate the mean for large data sets with grouped data
 - f calculate an appropriate moving average
 - g know when to add or multiply two probabilities: if A and B are mutually exclusive, then the probability of A or B occurring is $P(A) + P(B)$, whereas if A and B are independent events, the probability of A and B occurring is $P(A) \times P(B)$
 - h use tree diagrams to represent outcomes of compound events, recognising when events are independent
 - i draw lines of best fit by eye, understanding what these represent
 - j use relevant statistical functions on a calculator or spreadsheet.

Interpreting and discussing results

- 5 Students should be taught to:
- a relate summarised data to the initial questions
 - b interpret a wide range of graphs and diagrams and draw conclusions; identify seasonality and trends in time series
 - c look at data to find patterns and exceptions
 - d compare distributions and make inferences, using shapes of distributions and measures of average and spread, including median and quartiles; understand frequency density
 - e consider and check results, and modify their approaches if necessary
 - f appreciate that correlation is a measure of the strength of the association between two variables; distinguish between positive, negative and zero correlation using lines of best fit; appreciate that zero correlation does not necessarily imply ‘no relationship’ but merely ‘no linear relationship’
 - g use the vocabulary of probability to interpret results involving uncertainty and prediction [for example, ‘there is some evidence from this sample that ...’]
 - h compare experimental data and theoretical probabilities
 - i understand that if they repeat an experiment, they may – and usually will – get different outcomes, and that increasing sample size generally leads to better estimates of probability and population parameters.

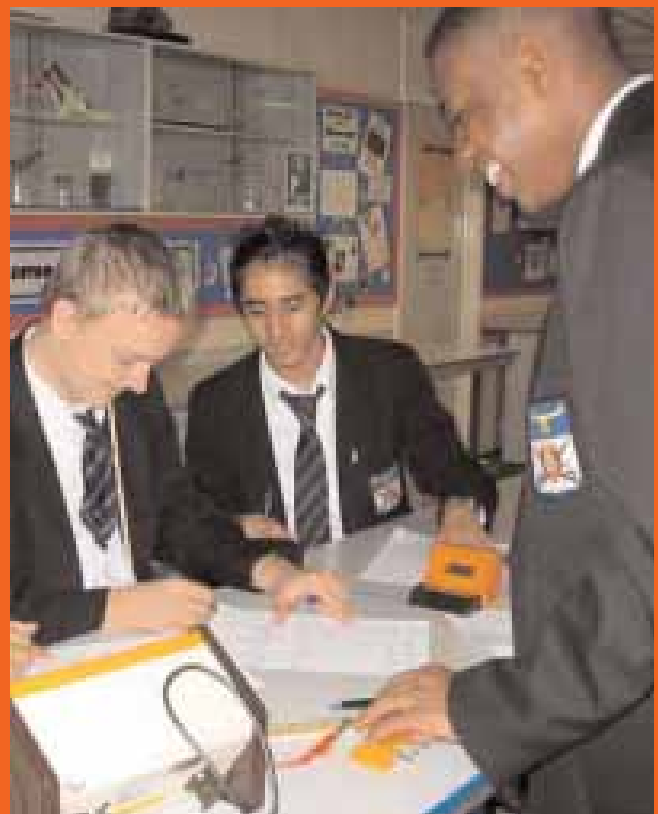
5c → ICT opportunity

Students could use databases to present their findings.

Breadth of study

- 1 During the key stage, students should be taught the **Knowledge, skills and understanding** through:
 - a activities that ensure they become familiar with and confident using standard procedures for the range of calculations appropriate to this level of study
 - b solving familiar and unfamiliar problems in a range of numerical, algebraic and graphical contexts and in open-ended and closed form
 - c using standard notations for decimals, fractions, percentages, ratio and indices
 - d activities that show how algebra, as an extension of number using symbols, gives precise form to mathematical relationships and calculations
 - e activities in which they progress from using definitions and short chains of reasoning to understanding and formulating proofs in algebra and geometry
 - f a sequence of practical activities that address increasingly demanding statistical problems in which they draw inferences from data and consider the uses of statistics in society
 - g choosing appropriate ICT tools and using these to solve numerical and graphical problems, to represent and manipulate geometrical configurations and to present and analyse data.

Science



The importance of science

Science stimulates and excites students' curiosity about phenomena and events in the world around them. It also satisfies this curiosity with knowledge. Because science links direct practical experience with ideas, it can engage learners at many levels. Scientific method is about developing and evaluating explanations through experimental evidence and modelling. This is a spur to critical

and creative thought. Through science, students understand how major scientific ideas contribute to technological change – impacting on industry, business and medicine and improving quality of life. Students recognise the cultural significance of science and trace its worldwide development. They learn to question and discuss science-based issues that may affect their own lives, the direction of society and the future of the world.



This key stage 4 programme of study for science is effective from September 2006.

The expectation is that at key stage 4, the majority of students are expected to continue studying a substantial programme of science, taking courses that are equivalent in scale to the current double science.

For key stage 4 science teaching until September 2006, see the existing programme of study *Science: the National Curriculum for England (QCA/99/461)* or *National curriculum online (www.nc.uk.net)*.

During key stage 4, pupils learn about the way science and scientists work within society. They consider the relationships between data, evidence, theories and explanations, and develop their practical, problem-solving and enquiry skills, working individually and in groups. They evaluate enquiry methods and conclusions both qualitatively and quantitatively, and communicate their ideas with clarity and precision.

All students develop their ability to relate their understanding of science to their own and others' decisions about lifestyles, and to scientific and technological developments in society.

Most students also develop their understanding and skills in ways that provide the basis for further studies in science and related areas.

Note

The general teaching requirement for health and safety applies in this subject.

2 → links to other subjects

These requirements build on En1/10, Ma4/3a, 3b, ICT/1a, 1b.

2b → ICT opportunity

Pupils could use data-handling software to analyse data from fieldwork and use datalogging equipment to collect data.

Key stage 4 programme of study

Science

Knowledge, skills and understanding

Teachers should ensure that the Knowledge, skills and understanding of how science works are integrated into the teaching of the Breadth of study.

How science works

Data, evidence, theories and explanations

- 1 Students should be taught:
 - a how scientific data can be collected and analysed
 - b how interpretation of data, using creative thought, provides evidence to test ideas and develop theories
 - c how explanations of many phenomena can be developed using scientific theories, models and ideas
 - d that there are some questions that science cannot currently answer, and some that science cannot address.

Practical and enquiry skills

- 2 Students should be taught to:
 - a plan to test a scientific idea, answer a scientific question, or solve a scientific problem
 - b collect data from primary or secondary sources, including using ICT sources and tools
 - c work accurately and safely, individually and with others, when collecting first-hand data
 - d evaluate methods of collection of data and consider their validity and reliability as evidence.

Communication skills

- 3 Students should be taught to:
 - a recall, analyse, interpret, apply and question scientific information or ideas
 - b use both qualitative and quantitative approaches
 - c present information, develop an argument and draw a conclusion, using scientific, technical and mathematical language, conventions and symbols and ICT tools.

Applications and implications of science

- 4 Students should be taught:
 - a about the use of contemporary scientific and technological developments and their benefits, drawbacks and risks
 - b to consider how and why decisions about science and technology are made, including those that raise ethical issues, and about the social, economic and environmental effects of such decisions
 - c how uncertainties in scientific knowledge and scientific ideas change over time and about the role of the scientific community in validating these changes.

Breadth of study

During the key stage, students should be taught the **Knowledge, skills and understanding** of how science works through the study of organisms and health, chemical and material behaviour, energy, electricity and radiations, and the environment, Earth and universe.

Organisms and health

- 5 In their study of science, the following should be covered:
- organisms are interdependent and adapted to their environments
 - variation within species can lead to evolutionary changes and similarities and differences between species can be measured and classified
 - the ways in which organisms function are related to the genes in their cells
 - chemical and electrical signals enable body systems to respond to internal and external changes, in order to maintain the body in an optimal state
 - human health is affected by a range of environmental and inherited factors, by the use and misuse of drugs and by medical treatments.

Chemical and material behaviour

- 6 In their study of science, the following should be covered:
- chemical change takes place by the rearrangement of atoms in substances
 - there are patterns in the chemical reactions between substances
 - new materials are made from natural resources by chemical reactions
 - the properties of a material determine its uses.

Energy, electricity and radiations

- 7 In their study of science, the following should be covered:
- energy transfers can be measured and their efficiency calculated, which is important in considering the economic costs and environmental effects of energy use
 - electrical power is readily transferred and controlled, and can be used in a range of different situations
 - radiations, including ionising radiations, can transfer energy
 - radiations in the form of waves can be used for communication.

Environment, Earth and universe

- 8 In their study of science, the following should be covered:
- the effects of human activity on the environment can be assessed using living and non-living indicators
 - the surface and the atmosphere of the Earth have changed since the Earth's origin and are changing at present
 - the solar system is part of the universe, which has changed since its origin and continues to show long-term changes.

3 → links to other subjects

This requirement builds on En1/1 and En3/1i.

3b → links to other subjects

This requirement builds on Ma3/4a and Ma4/4.

3c → links to other subjects

This requirement builds on En3/9, 10, Ma2/1e–1i, Ma4/5, ICT/3a, 3b.

5a → ICT opportunity

Students could use simulations/spreadsheets to model the effects of competition and predation.

5e → ICT opportunity

Students could use the internet to find out about current developments and issues.

6a → ICT opportunity

Students could use simulations/spreadsheets to explore models of atomic and molecular arrangements.

6c → ICT opportunity

Students could use the internet to find out about products and processes.

6d → ICT opportunity

Students could use a database of material properties to explore uses.

7a → links to other subjects

This requirement builds on Ma2/4b, 5a.

7a,7b → ICT opportunity

Students could use simulations/spreadsheets to model the supply of electrical power and energy loss in a house.

8a → ICT opportunity

Students could use simulations/spreadsheets to explore environmental effects.

8c → ICT opportunity

Students could use a CD-ROM to explore the origin of the solar system.



Information and communication technology



The importance of information and communication technology

Information and communication technology (ICT) prepares students to participate in a rapidly changing world in which work and other activities are increasingly transformed by access to varied and developing technology. Students use ICT tools to find, explore, analyse, exchange and present information responsibly, creatively and with

discrimination. They learn how to employ ICT to enable rapid access to ideas and experiences from a wide range of people, communities and cultures. Increased capability in the use of ICT promotes initiative and independent learning, with students being able to make informed judgements about when and where to use ICT to best effect, and to consider its implications for home and work both now and in the future.

Key stage 4 programme of study

Information and communication technology

During key stage 4 students become more responsible for choosing and using ICT tools and information sources. They use a wide range of ICT applications confidently and effectively, and are able to work independently much of the time. They choose and design ICT systems to suit particular needs and may design and implement systems for other people to use. They work with others to carry out and evaluate their work.

Notes

The general teaching requirement for health and safety applies in this subject. This programme of study aligns with the key skills unit for IT.

Knowledge, skills and understanding

Finding things out

- 1 Students should be taught:
 - a how to analyse the requirements of tasks, taking into account the information they need and the ways they will use it
 - b to be discriminating in their use of information sources and ICT tools.

Developing ideas and making things happen

- 2 Students should be taught to:
 - a use ICT to enhance their learning and the quality of their work
 - b use ICT effectively to explore, develop and interpret information and solve problems in a variety of subjects and contexts
 - c apply, as appropriate, the concepts and techniques of using ICT to measure, record, respond to, control and automate events
 - d apply, as appropriate, the concepts and techniques of ICT-based modelling, considering their advantages and limitations against other methods.

Exchanging and sharing information

- 3 Students should be taught to:
 - a use information sources and ICT tools effectively to share, exchange and present information in a variety of subjects and contexts
 - b consider how the information found and developed using ICT should be interpreted and presented in forms that are sensitive to the needs of particular audiences, fit for purpose and suit the information content.

Reviewing, modifying and evaluating work as it progresses

- 4 Students should be taught to:
 - a evaluate the effectiveness of their own and others' uses of information sources and ICT tools, using the results to improve the quality of their work and to inform future judgements
 - b reflect critically on the impact of ICT on their own and others' lives, considering the social, economic, political, legal, ethical and moral issues [for example, changes to working practices, the economic impact of e-commerce, the implications of personal information gathered, held and exchanged using ICT]
 - c use their initiative to find out about and exploit the potential of more advanced or new ICT tools and information sources [for example, new sites on the internet, new or upgraded application software].

Breadth of study

- 5 During the key stage, students should be taught the **Knowledge, skills and understanding** through:
 - a tackling demanding problems in a wide variety of contexts, including work in other subjects
 - b using a range of information sources and ICT tools to improve efficiency and extend capability
 - c working with others to explore, develop and pass on information
 - d designing information systems and evaluating and suggesting improvements to existing systems, with use by others in mind [for example, designing an integrated system for running a school production or a small company]
 - e comparing their use of ICT with its use in the wider world.
- 6 Students should be taught to be independent, responsible, effective and reflective in their selection, development and use of information sources and ICT tools to support their work, including application in other areas of their study and in other contexts [for example, work experience, community activity].
- 7 Students should be taught to integrate the four aspects of the **Knowledge, skills and understanding** in their work with ICT.

Physical education

The importance of physical education

Physical education develops students' physical competence and confidence, and their ability to use these to perform in a range of activities. It promotes physical skilfulness, physical development and a knowledge of the body in action. Physical education provides opportunities for students to be creative, competitive and to face up to different challenges as individuals and in groups and teams. It promotes

positive attitudes towards active and healthy lifestyles. Students learn how to think in different ways to suit a wide variety of creative, competitive and challenging activities. They learn how to plan, perform and evaluate actions, ideas and performances to improve their quality and effectiveness. Through this process students discover their aptitudes, abilities and preferences, and make choices about how to get involved in lifelong physical activity.





Key stage 4 programme of study

Physical education

During key stage 4 students tackle complex and demanding activities applying their knowledge of skills, techniques and effective performance. They decide whether to get involved in physical activity that is mainly focused on competing or performing, promoting health and well-being, or developing personal fitness. They also decide on roles that suit them best including performer, coach, choreographer, leader and official. The view they have of their skilfulness and physical competence gives them the confidence to get involved in exercise and activity out of school and in later life.

Physical education

The Government believes that two hours of physical activity a week, including the National Curriculum for physical education and extra-curricular activities, should be an aspiration for all schools.

At key stage 4, students can choose other activities instead of competitive team and individual games, however, the Government expects schools to continue to provide these for students who wish to take up this option.

Note

The general teaching requirement for health and safety applies in this subject.

3 → links to other subjects

These requirements build on En1/3a–3e.

4 → links to other subjects

These requirements build on Sc2/2e, 2f (double).

Knowledge, skills and understanding

Teaching should ensure that, when evaluating and improving performance, connections are made between developing, selecting and applying skills, tactics and compositional ideas, and fitness and health.

Acquiring and developing skills

- 1 Students should be taught to:
 - a develop and apply advanced skills and techniques
 - b apply them in increasingly demanding situations.

Selecting and applying skills, tactics and compositional ideas

- 2 Students should be taught to:
 - a use advanced strategic and/or choreographic and organisational concepts and principles
 - b apply these concepts and principles in increasingly demanding situations
 - c apply rules and conventions for different activities.

Evaluating and improving performance

- 3 Students should be taught to:
 - a make informed choices about what role they want to take in each activity
 - b judge how good a performance is and decide how to improve it
 - c prioritise and carry out these decisions to improve their own and others' performances
 - d develop leadership skills.

Knowledge and understanding of fitness and health

- 4 Students should be taught:
 - a how preparation, training and fitness relate to and affect performance
 - b how to design and carry out activity and training programmes that have specific purposes
 - c the importance of exercise and activity to personal, social and mental health and well-being
 - d how to monitor and develop their own training, exercise and activity programmes in and out of school.

Breadth of study

- 5 During the key stage, students should be taught the **Knowledge, skills and understanding** through *two of the six activity areas*.

Dance activities

- 6 Students should be taught to:
- choreograph and perform complex dances using advanced techniques and skills with accuracy and expression
 - reflect different social and cultural contexts in their dances and communicate artistic intention
 - use presentational skills in their dances.

Games activities

- 7 Students should be taught to:
- play competitive games
 - use advanced techniques and skills specific to the games played with consistency and control
 - respond effectively to changing situations within their games.

Gymnastic activities

- 8 Students should be taught to:
- compose and perform sequences, both on the floor and using apparatus, in specific gymnastic styles, applying set criteria
 - use advanced techniques and skills with precision and accuracy
 - use advanced compositional concepts and principles when composing their sequences.

Swimming activities and water safety

- 9 Students should be taught to:
- meet challenges in specific swimming events and water-based activities
 - use advanced techniques and skills with control, power or stamina and technical proficiency.

Athletic activities

- 10 Students should be taught to:
- take part in specific athletic events
 - use advanced techniques and skills with precision, speed, power or stamina and technical proficiency.

Outdoor and adventurous activities

- 11 Students should be taught to:
- meet challenges in large-scale outdoor activities and journeys
 - use a range of complex outdoor activity skills and techniques [for example, canoeing, sailing, rock climbing, hillwalking]
 - solve problems and overcome challenges in unfamiliar environments
 - respond to changing conditions and environments.

6 → ICT opportunity

Students could use multimedia devices to create sounds and music and provide lighting and other effects to enhance their dance.

6, 8, 10 → ICT opportunity

Students could use databases of movement ideas and techniques to analyse and evaluate performance.

6, 8–10 → ICT opportunity

Students could use digital cameras to help them to analyse actions and techniques.

7 → ICT opportunity

Students could use videos of games analysis to develop understanding of patterns of play and individual contributions.

9–11 → ICT opportunity

Students could use a variety of electronic and digital recording, measuring and timing devices to measure the effectiveness of performance.

9, 10 → ICT opportunity

Students could use spreadsheets to collect, analyse and interpret data.

The importance of citizenship

Citizenship gives students the knowledge, skills and understanding to play an effective role in society at local, national and international levels. It helps them to become informed, thoughtful and responsible citizens who are aware of their duties and rights. It promotes their spiritual, moral, social and cultural development, making them more self-confident and responsible both in and beyond the classroom. It encourages students to play a

helpful part in the life of their schools, neighbourhoods, communities and the wider world. It also teaches them about our economy and democratic institutions and values; encourages respect for different national, religious and ethnic identities; and develops students' ability to reflect on issues and take part in discussions.

Citizenship is complemented by the framework for personal, social and health education at key stage 4.

Citizenship





Key stage 4 programme of study

Citizenship

During key stage 4 students continue to study, think about and discuss topical political, spiritual, moral, social and cultural issues, problems and events. They study the legal, political, religious, social, constitutional and economic systems that influence their lives and communities, looking more closely at how they work and their effects. They continue to be actively involved in the life of their school, neighbourhood and wider communities, taking greater responsibility. They develop a range of skills to help them do this, with a growing emphasis on critical awareness and evaluation. They develop knowledge, skills and understanding in these areas through, for example, learning more about fairness, social justice, respect for democracy and diversity at school, local, national and global level, and through taking part in community activities.

1i → links to other subjects

This requirement builds on MFL/5i.

Note for 1j

Local Agenda 21 gives local authorities responsibility to improve sustainable development.

1j → links to other subjects

This requirement builds on Sc2/4b, 4c (single) and Sc2/5b, 5c (double).

2a → links to other subjects

This requirement builds on En2/4a–4c and Ma4/5k (foundation and higher).

2b → links to other subjects

This requirement builds on En1/1a–1e and En3/1i–1o.

2c → links to other subjects

This requirement builds on En1/3.

Knowledge, skills and understanding

Teaching should ensure that **knowledge and understanding about becoming informed citizens** are acquired and applied when **developing skills of enquiry and communication**, and **participation and responsible action**.

Knowledge and understanding about becoming informed citizens

- 1 Students should be taught about:
 - a the legal and human rights and responsibilities underpinning society and how they relate to citizens, including the role and operation of the criminal and civil justice systems
 - b the origins and implications of the diverse national, regional, religious and ethnic identities in the United Kingdom and the need for mutual respect and understanding
 - c the work of parliament, the government and the courts in making and shaping the law
 - d the importance of playing an active part in democratic and electoral processes
 - e how the economy functions, including the role of business and financial services
 - f the opportunities for individuals and voluntary groups to bring about social change locally, nationally, in Europe and internationally
 - g the importance of a free press, and the media's role in society, including the internet, in providing information and affecting opinion
 - h the rights and responsibilities of consumers, employers and employees
 - i the United Kingdom's relations in Europe, including the European Union, and relations with the Commonwealth and the United Nations
 - j the wider issues and challenges of global interdependence and responsibility, including sustainable development and Local Agenda 21.

Developing skills of enquiry and communication

- 2 Students should be taught to:
 - a research a topical political, spiritual, moral, social or cultural issue, problem or event by analysing information from different sources, including ICT-based sources, showing an awareness of the use and abuse of statistics
 - b express, justify and defend orally and in writing a personal opinion about such issues, problems or events
 - c contribute to group and exploratory class discussions, and take part in formal debates.

Developing skills of participation and responsible action

- 3 Students should be taught to:
 - a use their imagination to consider other people's experiences and be able to think about, express, explain and critically evaluate views that are not their own
 - b negotiate, decide and take part responsibly in school and community-based activities
 - c reflect on the process of participating.

Key stage 4 guidelines



The entitlement areas

To ensure a broad and balanced curriculum at key stage 4, greater flexibility within the curriculum combined with entitlements provides genuine choices for students. The creation of the entitlement areas makes the notion of a balanced curriculum explicit. To fulfil this requirement, LEAs, governors and headteachers must have regard to QCA's guidance relating to the entitlement areas.

The following are defined as entitlement areas: the arts, design and technology, the humanities and modern foreign languages.

The statutory requirements of the entitlement areas are:

- schools must provide access to a minimum of one course in each of the four entitlement areas
- a course is a planned learning programme with learning objectives; size and duration are not fixed; different courses will offer different learning experiences
- a course that meets the entitlement requirements must give students the opportunity to obtain an approved qualification. This requirement emphasises the significance and substance of the entitlement areas at key stage 4
- 'approved qualifications' are external qualifications that have been approved by the Secretary of State. External qualifications are defined in Section 96 of the Learning and Skills Act 2000. Approved qualifications are available at a range of levels and are listed on the DfES website at www.dfes.gov.uk/section96
- schools must provide the opportunity for students to take a course in all four areas should they wish to do so
- schools will go beyond the minimum requirement and offer, as now, a range of courses. It is expected that most schools will offer at least two courses in each entitlement area. All schools should aspire to offer as wide a choice as possible, either by themselves or in collaboration with others.

QCA has published guidance on the statutory requirements at key stage 4, *Changes to the key stage 4 curriculum: guidance for implementation from September 2004* (QCA/03/1167). Additional guidance on the entitlement areas is available at www.qca.org.uk/14-19.

The arts entitlement area

The arts entitlement area:

- involves students in making, sharing and responding to works of art as a dynamic part of culture past and present. This includes all art forms, for example paintings, sculpture, theatre, films and musicals
- is met by the existing arts curriculum disciplines of art and design, music, dance, drama and media arts. It does not include literature, as opportunities already exist for this area within English.

Schools can fulfil the entitlement by providing access to courses that:

- focus on separate disciplines within the areas of media arts, performing arts and visual arts
- focus on the development of critical appreciation and understanding across a range of arts disciplines.

Schools are encouraged to offer courses in as many of these areas as they consider appropriate to the needs of their students.

The design and technology entitlement area

The design and technology entitlement area involves students in:

- developing and applying knowledge and understanding of materials, components, systems and control and how they can be combined and processed for design, industrial and manufacturing purposes
- developing, planning and communicating ideas that take into account technical, social, aesthetic and environmental concerns and respond to needs, function, and industrial practices
- working with tools, equipment and computers (CAD and CAM) to produce quality products through product analysis, focused practical tasks and design and make activities, including activities related to industrial practices
- evaluating processes and products in a discriminating and informed way.

Schools can fulfil the entitlement by providing access to courses in the following areas:

- product design (including textiles technology, resistant materials technology and graphic products) or manufacturing
- food technology or hospitality and catering/home economics
- systems and control, electronic products, electronics and communication technology, industrial technology or engineering.

From 2004 there is no longer a statutory programme of study for design and technology at key stage 4. The text of the previous programme of study becomes non-statutory guidelines for the teaching of design and technology at key stage 4.

For the key stage 4 design and technology guidelines, see pages 204–205.

The humanities entitlement area

The humanities entitlement area:

- involves students in exploring the spatial, political, social, economic, environmental and temporal dimensions of human existence and in addressing issues of concern to humanity in the past, present and future
- is met by the existing national curriculum subjects of history and geography. It does not include English literature, religious education and citizenship, which have separate statutory requirements.

Schools can make this possible by providing access to courses that focus on:

- the separate subjects of geography and history
- issues and themes that result in combining aspects of geography and history, for example in humanities courses
- issues and themes that result in combining substantial aspects of geography and/or history with other disciplines and curriculum areas, for example literature, the arts, science, modern foreign languages and ICT
- issues and themes that combine aspects of geography and/or history with relevant vocational areas, for example the heritage industry, work in art galleries, urban rural planning, leisure/tourism and journalism.

It is envisaged that schools will provide access to a wide range of courses, so that, as at present, students may continue to study both geography and history at key stage 4.

The modern foreign languages entitlement area

The modern foreign languages entitlement area involves students in:

- speaking and writing in a modern foreign language
- understanding and responding to speech and written materials in that language
- learning about the culture of countries or communities where the language is spoken.

To meet the entitlement requirements, schools must provide access to at least one course in an official language of the European Union (EU) that leads to a qualification approved under Section 96.

The importance of other languages including community languages is recognised. Schools are encouraged to offer courses in other languages in addition to EU languages, whether or not these have been offered at key stage 3.

The official languages of the EU are Czech, Danish, Dutch, Estonian, Finnish, French, German, modern Greek, Hungarian, Italian, Latvian, Lithuanian, Maltese, Polish, Portuguese, Slovak, Slovenian, Spanish and Swedish. There are currently no qualifications approved under Section 96 for Czech, Estonian, Finnish, Hungarian, Latvian, Lithuanian, Maltese, Slovak or Slovenian.

From 2004, there is no longer a statutory programme of study for modern foreign languages at key stage 4. The text of the programme of study for key stage 3 becomes non-statutory guidelines for the teaching of modern foreign languages at key stage 4; see pages 106–109.

Key stage 4 non-statutory guidelines

Design and technology

During key stage 4 students take part in design and make projects that are linked to their own interests, industrial practice and the community. Projects may involve an enterprise activity, where students identify an opportunity, design to meet a need, manufacture products and evaluate the whole design and make process. Students use ICT to help with their work, including computer-aided design and manufacture (CAD/CAM) software, control programs and ICT-based sources for research. They consider how technology affects society and their own lives, and learn that new technologies have both advantages and disadvantages.

Note

The general teaching requirement for health and safety applies in this subject.

1d → ICT opportunity

Students could use spreadsheets to model schedules.

Knowledge, skills and understanding

Teaching should ensure that **knowledge and understanding** are applied when **developing ideas, planning, producing products and evaluating them**.

Developing, planning and communicating ideas

- 1 Students should be taught to:
 - a develop and use design briefs, detailed specifications and criteria
 - b consider issues that affect their planning [for example, the needs and values of a range of users; moral, economic, social, cultural and environmental considerations; product maintenance; safety; the degree of accuracy needed in production]
 - c design for manufacturing in quantity
 - d produce and use detailed working schedules, setting realistic deadlines and identifying critical points
 - e match materials and components with tools, equipment and processes, taking account of critical dimensions and tolerances when deciding how to manufacture the product
 - f be flexible and adaptable in responding to changing circumstances and new opportunities
 - g use graphic techniques and ICT, including computer-aided design (CAD), to generate, develop, model and communicate design proposals [for example, using CAD software to generate accurate drawings and part drawings to help with manufacturing].

Working with tools, equipment, materials and components to produce quality products

- 2 Students should be taught to:
 - a select and use tools, equipment and processes effectively and safely to make products that match a specification
 - b use a range of industrial applications when working with familiar materials and processes
 - c manufacture single products and products in quantity, applying quality assurance techniques
 - d use computer-aided manufacture (CAM) in single item production and in batch or volume production [for example, using vinyl cutters, embroiderers, knitting machines, engravers, milling machines, lathes]
 - e simulate production and assembly lines, including the use of ICT.

Evaluating processes and products

- 3 Students should be taught to:
- check design proposals against design criteria, and review and modify them if necessary as they develop their product
 - devise and apply tests to check the quality of their work at critical points during development
 - ensure that their products are of a suitable quality for intended users [for example, how well products meet a range of considerations such as moral, cultural and environmental] and suggest modifications that would improve their performance if necessary
 - recognise the difference between quality of design and quality of manufacture, and use essential criteria to judge the quality of other people's products.

4b → ICT opportunity

Students could research industrial applications on the internet.

Knowledge and understanding of materials and components

- 4 Students should be taught:
- how materials are cut, shaped and formed to specified tolerances
 - how materials can be combined and processed to create more useful properties, and how these changed materials are used in industry
 - how materials are prepared for manufacture and how pre-manufactured standard components are used
 - about a variety of finishing processes, and why they are important for aesthetic and functional reasons
 - that to achieve the optimum use of materials and components, they need to take into account the relationships between material, form and intended manufacturing processes.

Knowledge and understanding of systems and control

- 5 Students should be taught:
- the concepts of input, process and output, and the importance of feedback in controlling systems, including:
 - how control systems and sub-systems can be designed, used and connected to achieve different purposes
 - how feedback is incorporated into systems
 - how to analyse the performance of systems.

Breadth of study

- 6 During the key stage, students should be taught the **Knowledge, skills and understanding** through:
- product analysis
 - focused practical tasks that develop a range of techniques, skills, processes and knowledge
 - design and make assignments, which include activities related to industrial practices and the application of systems and control.

Ages 14–19 non-statutory framework

Religious education

Throughout this phase, students analyse and interpret a wide range of religious, philosophical and ethical concepts in increasing depth. They investigate issues of diversity within and between religions and the ways in which religion and spirituality are expressed in philosophy, ethics, science and the arts. They expand and balance their evaluations of the impact of religions on individuals, communities and societies, locally, nationally and globally. They understand the importance of dialogue between and among different religions and beliefs. They gain a greater understanding of how religion and belief contribute to community cohesion, recognising the various perceptions people have regarding the roles of religion in the world.

1a → Links to other subjects

This builds on Sc4a–c, where students learn about scientific controversies and ethical issues.

1a → Links to other subjects

This builds on Ci1b, where students learn about the origins and implications of the diverse national, regional, religious and ethnic identities in the United Kingdom and the need for mutual respect and understanding.

1b → ICT opportunity

Students could use a wide range of presentation software to present their findings.

1e → Links to other subjects

This builds on En2/2a–c, where students learn about how and why texts have been influential and significant, and the appeal and importance of these texts over time.

The importance of religious education

Religious education provokes challenging questions about the ultimate meaning and purpose of life, beliefs about God, the self and the nature of reality, issues of right and wrong and what it means to be human.

It develops students' knowledge and understanding of Christianity, other principal religions, other religious traditions and other world views that offer answers to questions such as these. It offers opportunities for personal reflection and spiritual development. It enhances students' awareness and understanding of religions and beliefs, teachings, practices and forms of expression, as well as of the influence of religion on individuals, families, communities and cultures.

Religious education encourages students to learn from different religions, beliefs, values and traditions while exploring their own beliefs and questions of meaning. It challenges students to reflect on, consider, analyse, interpret and evaluate issues of truth, belief, faith and ethics and to communicate their responses.

Religious education encourages students to develop their sense of identity and belonging. It enables them to flourish individually within their communities and as citizens in a pluralistic society and global community. Religious education has an important role in preparing students for adult life, employment and lifelong learning. It enables students to develop respect for and sensitivity to others, in particular those whose faiths and beliefs are different from their own. It promotes discernment and enables students to combat prejudice.

Knowledge, skills and understanding

Learning about religion

- 1 Students should be taught to:
 - a investigate, study and interpret significant religious, philosophical and ethical issues, including the study of religious and spiritual experience, in light of their own sense of identity, experience and commitments
 - b think rigorously and present coherent, widely informed and detailed arguments about beliefs, ethics, values and issues, drawing well-substantiated conclusions
 - c develop their understanding of the principal methods by which religions and spirituality are studied
 - d draw upon, interpret and evaluate the rich and varied forms of creative expression in religious life
 - e use specialist vocabulary to evaluate critically both the power and limitations of religious language.

Learning from religion

- 2 Students should be taught to:
 - a reflect on, express and justify their own opinions in light of their learning about religion and their study of religious, philosophical, moral and spiritual questions
 - b develop their own values and attitudes in order to recognise their rights and responsibilities in light of their learning about religion
 - c relate their learning in religious education to the wider world, gaining a sense of personal autonomy in preparation for adult life

The legal basis for religious education in most schools remains the locally agreed syllabus and, for schools with a religious character, its equivalent. The non-statutory national framework for religious education reproduced here is given for information purposes only.

- d develop skills that are useful in a wide range of careers and in adult life generally, especially skills of critical enquiry, creative problem-solving, and communication in a variety of media.

What should schools do?

Schools should provide religious education to every student in accordance with legal requirements.

Religious education is a statutory subject for all registered students, including students in the school sixth form, except those withdrawn by their parents. It must be made available in sixth-form colleges to students who wish to take it. Although it is not a requirement in colleges of further education, similar arrangements should apply.

Religious education must be taught according to the locally agreed syllabus or faith community guidelines, which often specify accredited courses as the programme of study in religious education at key stage 4 and post-16.

While there is no legal requirement that students must sit public examinations, students deserve the opportunity to have their learning in the statutory curriculum subject of religious education accredited. Accreditation can be through courses leading to qualifications with the title 'Religious studies' and/or other approved courses that require the study of religion and ethics. Agreed Syllabus Conferences (ASCs) are recommended to include a requirement that religious education should be taught at the following ages through accredited qualifications so that, from the earliest opportunity, schools provide:

- for all students aged 14–16, at least one course in religious education or religious studies leading to a qualification approved under Section 96⁶
- for all students aged 16–19, at least one course in religious education or religious studies leading to a qualification approved under Section 96 that represents progression from 14–16.

How can schools fulfil their requirement to provide religious education to all registered students?

Schools should plan for continuity of provision of religious education that is progressive and rigorous from key stage 3 for all students. Schools can make this possible by providing access to discrete courses or units leading to qualifications that meet legal requirements regarding the study of Christianity, and/or other principal religions, and/or other beliefs, world views or philosophies, within the context of a pluralistic society.

All courses should provide opportunities within and beyond school for learning that involves first-hand experiences and activities involving people, places and events (for example the local area, places of worship and community activities, public meetings, and places of employment, education, training or recreation). Students will have different experiences of religious education according to the courses chosen.

⁶ Section 96 of the Learning and Skills Act 2000. This requires maintained schools to provide only qualifications approved by the Secretary of State.

The legal basis for religious education in most schools remains the locally agreed syllabus and, for schools with a religious character, its equivalent. The non-statutory national framework for religious education reproduced here is given for information purposes only.

1d → Attitudes

Students have the opportunity to develop appreciation and wonder.

2b → Links to other subjects

This builds on PSHE3a–c, where students are taught about the power of prejudice, and to challenge racism and discrimination assertively.

2c → Attitudes

Students have the opportunity to develop self-awareness.

2d → Links to other subjects

This builds on ICT1a, 2b and 3a–b.

Key stage 4 non-statutory guidelines

Careers education

The importance of careers education and guidance

Careers education and guidance encourages young people to prepare for their future lives. It gives them tools to make informed decisions about their education, training and occupation. It also helps them manage change and transition in a society where constantly evolving technology and working practices mean they will need to be flexible, willing to learn and to make important professional and personal choices throughout their lives.

Careers education aims to help young people become self-reliant and take responsibility for managing their own career development. It focuses on the two main strands of employability:

- the initial preparation for employment
- the skills for career management.

It helps them understand themselves and what employers are looking for.

Careers education prompts young people to identify the interests, skills and values that will shape their decisions. It teaches them about progression routes in education, available qualifications, career paths and employment trends. It provides them with tools to investigate the labour market, challenge stereotypes, broaden their horizons and take action to improve their chances. Because it highlights progression routes and opportunities, careers education and guidance increases motivation and encourages students to participate in continued learning.

A quality programme of careers education and guidance helps teachers answer the question they are frequently asked by their students: 'Why are we doing this?'

Understanding themselves and the influences on them – self development

Learning outcomes

By the age of 16, young people should have acquired the knowledge, understanding and skills to:

- 1 use self-assessments and career-related questionnaires to help identify and set short- and medium-term goals, and career and learning targets
 - matching interests and abilities
 - listing common skills groupings and completing a skills checklist to identify personal skill levels.
- 2 review and reflect on how their experiences have added to their knowledge, understanding and skills and use this information when developing career plans
 - recording and commenting on how work experience has helped to develop their employability
 - writing a reflective account of their work experience.
- 3 use review, reflection and action planning to make progress and support career development
 - using marks/test grades to check progress on targets and career plans
 - reviewing and updating their learning plan.
- 4 explain why it is important to develop personal values to combat stereotyping, tackle discrimination in learning and work and suggest ways of doing this
 - completing an in-tray exercise on harassment
 - examining an organisation's equal opportunities policy.
- 5 use guided self-exploration to recognise and respond appropriately to the main influences on their attitudes, values and behaviour in relation to learning and work
 - identifying and reviewing their responses to influences and pressures such as the media, peers, friends and relatives.

Investigate opportunities in learning and work – career exploration

Learning outcomes

By the age of 16, young people should have acquired the knowledge, understanding and skills to:

- 6 explain the term ‘career’ and its relevance to their own lives
 - discussing perceptions of the term ‘career’ in relation to different age groups and contexts.
- 7 describe employment trends and associated learning opportunities at different levels
 - using work experience to find out how jobs have changed over a five-year period
 - completing labour market quizzes.
- 8 identify, select and use a wide range of careers information and distinguish between objectivity and bias
 - making independent use of the careers library, Connexions Resource Centres and other information sources to follow up a guidance session
 - comparing promotional materials and impartial careers information.
- 9 understand the qualifications available post-16, and the similarities and differences between sixth form, further education (FE) and work-based training
 - researching post-16 options through use of booklets and open evenings.
- 10 use work-related learning and direct experience of work to improve their chances
 - setting personal objectives for work experience
 - reviewing the effect of work experience on their career plans.
- 11 understand the progression routes open to them and compare critically these options and explain and justify the range of opportunities they are considering
 - interviewing a sixth form student, an FE student and a modern apprentice
 - producing a career chart showing what they want to do and why.

Developments in learning and work make it essential that young people take a more active role in their career learning. (It is, for example, better that young people develop the skills to investigate opportunities than that they are simply made aware of them.) Consequently, the programme emphasises individual participation. It is built on three aims. These are that young people should be able to:

- understand themselves and the influences on them – **self development**
- investigate opportunities in learning and work – **career exploration**
- make and adjust plans to manage change and transition – **career management**

Make and adjust plans to manage change and transition – career management

Learning outcomes

By the age of 16, young people should have acquired the knowledge, understanding and skills to:

- 12 select and use decision-making techniques that are fit for the purpose, including preparing and using action plans that incorporate contingencies
 - identifying questions they need to answer to help them make decisions
 - setting targets and drafting an action plan for their top two progression goals/choices.

- 13 compare different options and select suitable ones using their own criteria and the outcomes of information, advice and guidance
 - discussing flexible career routes and listing factors to take into account when choosing options.

- 14 take finance and other factors into account when making decisions about the future
 - calculating budgets
 - investigating funding sources to support learning.

- 15 understand and follow application procedures, recognising the need for and producing speculative and targeted CVs, personal statements and application letters for a range of different scenarios
 - producing an applications calendar and action plan
 - investigating application procedures in learning and work and practising different responses
 - compiling a CV and producing a word-processed personal statement/ application letter.

- 16 understand the purpose of interviews and select and present personal information to make targeted applications
- producing an interview checklist
 - practising responses to potentially difficult questions
 - using an analysis of vacancy, recruitment and selection information to identify relevant information and prepare an application.
- 17 understand what employers look for in relation to behaviour at work, appreciate their rights and responsibilities in learning and work, and know where to get help
- completing a true/false quiz about rights and responsibilities at work
 - investigating health and safety at work
 - researching the role of student support and human resource staff.

Key stage 4 non-statutory framework

Work-related learning

The importance of work-related learning

Work-related learning is an essential part of fully preparing for an adult life in which all young people will contribute to the country's economic well-being. The statutory requirement ensures clarity, coherence and quality of provision. All young people should receive work-related learning that is individually appropriate as part of a broad and balanced curriculum.

Young people care increasingly about the role of education in occupational success. They want to see how education will relate to their future lives. They want assurance that what they are learning is developing their employability. Work-related learning provides the connection between learning and earning – a strong motivator for many – and enterprise education develops innovation, creativity, drive and flair.

Learning about work and enterprise is only one aspect of work-related learning. Some basic economic understanding is essential for all citizens. All young people need to understand how the economy functions, and the role of business and financial services.

Many of the skills that are valuable for both higher education and future employment can be developed through work-related activities. Work experience and enterprise programmes, with their focus on social and personal skills, offer opportunities to stretch the most able students.

One of the barriers to participation in higher education is the low self-esteem and limited aspirations of many intelligent 14- to 16-year-olds. Improved knowledge of the labour market and employers' needs will raise the aspirations of some and help others make more informed decisions about suitable learning programmes post-16.

1 Elements of provision for all students

- Students recognise, develop and apply their skills for enterprise and employability.

Suggested minimum

- Students have the opportunity to develop and apply their skills in at least two work-related activities. Students have at least one opportunity to discuss the skills developed across the whole of their work-related programme.

Through this provision students can:

- describe and demonstrate the main qualities and skills needed to enter and thrive in the working world
- evaluate the usefulness of a range of employability skills
- assess, undertake and manage risk, and make decisions in conditions of uncertainty
- collect relevant evidence and use it for making decisions
- show leadership, management, drive and self-reliance when working on tasks and in teams
- demonstrate innovative approaches to solving problems.

2 Elements of provision for all students

- Students use their experience of work, including work experience and part-time jobs, to extend their understanding of work.

Suggested minimum

- Students have the equivalent of at least half a day for debriefing and follow-up of work experience and/or part-time work.

Through this provision students can:

- give an account (in any medium) of their work placement or part-time job, identifying what they have learnt about work
- apply some of the learning gained from work experience to their key stage 4 courses and their career planning
- analyse what motivates people for work
- demonstrate an understanding of the main changes happening in the world of work.

3 Elements of provision for all students

- Students learn about the way business enterprises operate, working roles and conditions, and rights and responsibilities in the workplace.

Suggested minimum

- Students have at least two curriculum activities that develop their understanding of business and work.

Through this provision students can:

- outline the main types of business enterprises and the key roles within each
- give examples of employers' and employees' rights and responsibilities at work, particularly in relation to equality of opportunity, respect for diversity and health and safety
- demonstrate a basic knowledge and understanding of a range of economic concepts
- describe some ways that working conditions changed during the last century and give some reasons for the changes.

4 Elements of provision for all students

- Students develop awareness of the extent and diversity of local and national employment opportunities.

Suggested minimum

- Students undertake at least two tasks that investigate labour market information.

Through this provision students can:

- explain the chief characteristics of employment, self-employment, unemployment and voluntary work
- recognise the concept of the labour market (local, national, European and global)
- describe the main trends in employment in their local area and relate these to their career plans.

5 Elements of provision for all students

- Students relate their own abilities, attributes and achievements to career intentions and make informed choices based on an understanding of the alternatives.

Suggested minimum

- Students undertake activities to develop their skills for career management, including a guidance interview focusing on career progression.

Through this provision students can:

- collect and use relevant information about opportunities available to them beyond key stage 4
- reflect on and record achievements, abilities, interests and skills and use them to make realistic choices for progression after key stage 4
- access and use an interview with a careers guidance specialist to progress plans
- complete application procedures for work placements, part-time jobs and post-16 opportunities, including preparing a CV and adapting it for different applications
- present themselves well at an interview.

6 Elements of provision for all students

- Students undertake tasks and activities set in work contexts.

Suggested minimum

- Students use work as a context for learning within the curriculum on at least two occasions, and record evidence of their learning.

Through this provision students can:

- explain the relevance of a curriculum subject to the world of work
- demonstrate understanding or work-related language and vocabulary
- analyse how examples of learning within the curriculum can be applied to work contexts.

7 Elements of provision for all students

- Students learn from contact with personnel from different employment sectors.

Suggested minimum

- Students have direct contact with a minimum of two people from different employment sectors with differing roles and working conditions.

Through this provision students can:

- describe working practices in different employment sectors
- understand the career motivations and pathways taken by people in different employment sectors
- understand the importance to employers of attitudes, qualifications and skills.

8 Elements of provision for all students

- Students have experience (direct or indirect) of working practices and environments.

Suggested minimum

- Students use work practices or environments as contexts for learning in the curriculum on at least two occasions and record evidence of their learning.

Through this provision students can:

- describe (from experience gained through work placements, visits, simulations, videos and so on) the working practices of one type of business compared with another
- describe (from experience gained) the work environment in one type of business compared with another
- describe the main hazards associated with particular types of workplace.

9 Elements of provision for all students

- Students engage with ideas, challenges and applications from the business world.

Suggested minimum

- Students undertake at least one business challenge, problem-solving or enterprise activity.

Through this provision students can:

- know and understand key enterprise concepts
- demonstrate the main enterprise skills, attitudes and qualities.

Key stage 4 non-statutory guidelines

Personal, social and health education

The importance of personal, social and health education

Personal, social and health education (PSHE) at key stage 4 helps students to lead confident, healthy and responsible lives as individuals and members of society. Through work in lesson time and a wide range of activities across and beyond the curriculum, students gain practical knowledge and skills to help them live healthily and deal with the spiritual, moral, social and cultural issues they face as they approach adulthood. PSHE gives students opportunities to reflect on their experiences and how they are developing. It helps them to understand and manage responsibly a wider range of relationships as they mature, and to show respect for the diversity of, and differences between, people. It also develops students' well-being and self-esteem, encouraging belief in their ability to succeed and enabling them to take responsibility for their learning and future choice of courses and career. PSHE at key stages 3 and 4 builds on pupils' own experiences and on work at previous key stages and complements citizenship in the curriculum, which covers public policy dilemmas related to health, law and family.

Knowledge, skills and understanding

Developing confidence and responsibility and making the most of their abilities

- 1 Students should be taught:
 - a to be aware of and assess their personal qualities, skills, achievements and potential, so that they can set personal goals
 - b to have a sense of their own identity and present themselves confidently in a range of situations
 - c to be aware of how others see them, manage praise and criticism, and success and failure in a positive way and learn from the experience
 - d to recognise influences, pressures and sources of help and respond to them appropriately
 - e to use a range of financial tools and services, including budgeting and saving, in managing personal money
 - f about the options open to them post-16, including employment and continuing education and training, and about their financial implications
 - g to use the careers service to help them choose their next steps, negotiate and plan their post-16 choices with parents and others, develop career management skills, and prepare and put into practice personal action plans.

Developing a healthy, safer lifestyle

- 2 Students should be taught:
 - a to think about the alternatives and long- and short-term consequences when making decisions about personal health
 - b to use assertiveness skills to resist unhelpful pressure
 - c the causes, symptoms and treatments for stress and depression, and to identify strategies for prevention and management
 - d about the link between eating patterns and self-image, including eating disorders
 - e about the health risks of alcohol, tobacco and other drug use, early sexual activity and pregnancy, different food choices and sunbathing, and about safer choices they can make
 - f in the context of the importance of relationships, how different forms of contraception work, and where to get advice, in order to inform future choices
 - g to seek professional advice confidently and find information about health
 - h to recognise and follow health and safety requirements and develop the skills to cope with emergency situations that require basic aid procedures, including resuscitation techniques.

Developing good relationships and respecting the differences between people

- 3 Students should be taught:
- a about the diversity of different ethnic groups and the power of prejudice
 - b to be aware of exploitation in relationships
 - c to challenge offending behaviour, prejudice, bullying, racism and discrimination assertively and take the initiative in giving and receiving support
 - d to work cooperatively with a range of people who are different from themselves
 - e to be able to talk about relationships and feelings
 - f to deal with changing relationships in a positive way, showing goodwill to others and using strategies to resolve disagreements peacefully
 - g about the nature and importance of marriage for family life and bringing up children
 - h about the role and responsibilities of a parent, and the qualities of good parenting and its value to family life
 - i about the impact of separation, divorce and bereavement on families and how to adapt to changing circumstances
 - j to know about the statutory and voluntary organisations that support relationships in crisis
 - k to develop working relationships with a range of adults, including people they meet during work experience, personal guidance and community activities.

Breadth of opportunities

- 4 During the key stage, students should be taught the **knowledge, skills and understanding** through opportunities to:
- a take responsibility [for example, by representing the school to visitors and at outside events]
 - b feel positive about themselves [for example, by gaining recognition for the role they play in school life, such as organising activities for younger students or working in a resource centre]
 - c participate [for example, in an initiative to improve their local community; in challenging activities involving physical performance, public performance or organised events outside the school]
 - d make real choices and decisions [for example, about their priorities, plans and use of time; about their choices post-16, with regular review and support]
 - e meet and work with people [for example, through activities such as work experience and industry days; through having an employer as a mentor]
 - f develop relationships [for example, by discussing relationships in single and mixed sex groups]

During key stage 4 students use the knowledge, skills and understanding that they have gained in earlier key stages and their own experience to take new and more adult roles in school and the wider community. They develop the self-awareness and confidence needed for adult life, further learning and work. They have opportunities to show that they can take responsibility for their own learning and career choices by setting personal targets and planning to meet them. They develop their ability to weigh up alternative courses of action for health and well-being. They gain greater knowledge and understanding of spiritual, moral, social and cultural issues through increased moral reasoning, clarifying their opinions and attitudes in discussions with their peers and informed adults and considering the consequences of their decisions. They learn to understand and value relationships with a wide range of people and gain the knowledge and skills to seek advice about these and other personal issues. They learn to respect the views, needs and rights of people of all ages.

PSHE opportunity in science

2 → Sc2/2 (single and double).

PSHE opportunity in physical education

2c → PE/4.

Note for 2h

See health and safety in the general teaching requirements.

- g consider social and moral dilemmas [for example, young parenthood, genetic engineering, attitudes to the law]
- h find information and provide advice [for example, by providing peer support services to other students]
- i prepare for change [for example, in relation to progression to further education and training].

Statement of values by the National Forum for Values in Education and the Community

An extract from the preamble to the statement

- The remit of the Forum was to decide whether there are any values that are commonly agreed upon across society, not whether there are any values that should be agreed upon across society. The only authority claimed for these values is the authority of consensus.
- These values are not exhaustive. They do not, for example, include religious beliefs, principles or teachings, though these are often the source of commonly held values. The statement neither implies nor entails that these are the only values that should be taught in schools. There is no suggestion that schools should confine themselves to these values.
- Agreement on the values outlined below is compatible with disagreement on their source. Many believe that God is the ultimate source of value, and that we are accountable to God for our actions; others that values have their source only in human nature, and that we are accountable only to our consciences. The statement of values is consistent with these and other views on the source of value.
- Agreement on these values is compatible with different interpretations and applications of them. It is for schools to decide, reflecting the range of views in the wider community, how these values should be interpreted and applied. For example, the principle ‘we support the institution of marriage’ may legitimately be interpreted as giving rise to positive promotion of marriage as an ideal, of the responsibilities of parenthood, and of the duty of children to respect their parents.
- The ordering of the values does not imply any priority or necessary preference. The ordering reflects the belief of many that values in the context of the self must precede the development of the other values.
- These values are so fundamental that they may appear unexceptional. Their demanding nature is demonstrated both by our collective failure consistently to live up to them, and the moral challenge which acting on them in practice entails.

Schools and teachers can have confidence that there is general agreement in society upon these values. They can therefore expect the support and encouragement of society if they base their teaching and the school ethos on these values.

The statement of values

The self

We value ourselves as unique human beings capable of spiritual, moral, intellectual and physical growth and development.

On the basis of these values, we should:

- develop an understanding of our own characters, strengths and weaknesses
- develop self-respect and self-discipline
- clarify the meaning and purpose in our lives and decide, on the basis of this, how we believe that our lives should be lived
- make responsible use of our talents, rights and opportunities
- strive, throughout life, for knowledge, wisdom and understanding
- take responsibility, within our capabilities, for our own lives.

Relationships

We value others for themselves, not only for what they have or what they can do for us. We value relationships as fundamental to the development and fulfilment of ourselves and others, and to the good of the community.

On the basis of these values, we should:

- respect others, including children
- care for others and exercise goodwill in our dealings with them
- show others they are valued
- earn loyalty, trust and confidence
- work cooperatively with others
- respect the privacy and property of others
- resolve disputes peacefully.

Society

We value truth, freedom, justice, human rights, the rule of law and collective effort for the common good. In particular, we value families as sources of love and support for all their members, and as the basis of a society in which people care for others.

On the basis of these values, we should:

- understand and carry out our responsibilities as citizens
- refuse to support values or actions that may be harmful to individuals or communities
- support families in raising children and caring for dependants
- support the institution of marriage
- recognise that the love and commitment required for a secure and happy childhood can also be found in families of different kinds

- help people to know about the law and legal processes
- respect the rule of law and encourage others to do so
- respect religious and cultural diversity
- promote opportunities for all
- support those who cannot, by themselves, sustain a dignified life-style
- promote participation in the democratic process by all sectors of the community
- contribute to, as well as benefit fairly from, economic and cultural resources
- make truth, integrity, honesty and goodwill priorities in public and private life.

The environment

We value the environment, both natural and shaped by humanity, as the basis of life and a source of wonder and inspiration.

On the basis of these values, we should:

- accept our responsibility to maintain a sustainable environment for future generations
- understand the place of human beings within nature
- understand our responsibilities for other species
- ensure that development can be justified
- preserve balance and diversity in nature wherever possible
- preserve areas of beauty and interest for future generations
- repair, wherever possible, habitats damaged by human development and other means.

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About the work used in this document

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Schools Adam's Grammar School, All Saints School, Almondbury Junior School, Bishops Castle Community College, Bolton Brow Junior and Infant School, Boxford C of E Voluntary Controlled Primary School, Bugbrooke School, Cantell School, Charnwood Primary School, Cheselbourne County First School, Chester Catholic High School, Clytha Primary School, Dales Infant School, Deanery C of E High School, Driffield C of E Infants' School, The Duchess's High School, Dursley Primary School, The English International School (Brussels), Fourfields County Primary School, Furze Infants School, Gosforth High School, Grahame Park Junior School, Green Park Combined School, Gusford Community Primary School, Hartshill School, Headington School, Holyport Manor School, Jersey College for Girls Preparatory School, King Edward VI School, King James's School, Kingsway Junior School, Knutsford High School, Langley Park School for Girls, Leiston Primary School, Liskeard School, Maltby Manor Infant School, Mullion Comprehensive School, North Marston C of E First School, Norton Hill School, Our Lady of Compassion Primary School, Penglais School, Priory Secondary School, Redknock School, Richard Whittington Primary School, Ringwood School, Sarah Bonnell School, Sedgemoor Manor Infants School, Selly Park Technology College for Girls, Southwark Infant School, St Albans High School for Girls, St Denys C of E Infant School, St Helen's C of E (Aided) Primary School, St John's Infants School, St Joseph's RC Infant School, St Laurence School, St Mary Magdalene School, St Matthew's C of E Aided Primary School, St Michael's C of E School, St Saviour's and St Olave's School, St Thomas The Martyr C of E Primary School, Sawtry Community College, Swanhurst School, Tideway School, Torfield School, Trinity C of E Primary School, Upper Poppelton School, Walton High School, Westgate School.

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This handbook:

- sets out the legal requirements of the National Curriculum in England for pupils aged 11 to 16
- provides information to help teachers implement the National Curriculum in their schools.

It has been written for secondary teachers. Parents, governors and all those with an interest in education will also find it useful.

The National Curriculum for pupils aged five to 11 is set out in the handbook for primary teachers. There are also separate booklets for the 12 National Curriculum subjects.

All these publications and related materials can be found on the National Curriculum website at www.nc.uk.net.

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