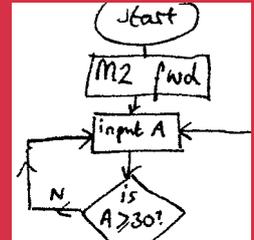


Information and communication technology



The National Curriculum for England www.nc.uk.net

Key stages 1–4



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Foreword

The National Curriculum lies at the heart of our policies to raise standards. It sets out a clear, full and statutory entitlement to learning for all pupils. 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 therefore gives teachers, pupils, parents, employers and their wider community a clear and shared understanding of the skills and knowledge that young people will gain at school. It allows schools to meet the individual learning needs of pupils and to develop a distinctive character and ethos rooted in their local communities. And it provides a framework within which all partners in education can support young people on the road to further learning.

Getting the National Curriculum right presents difficult choices and balances. It must be robust enough to define and defend the core of knowledge and cultural experience which is the entitlement of every pupil, and at the same time flexible enough to give teachers the scope to build their teaching around it in ways which will enhance its delivery to their pupils.

The focus of this National Curriculum, together with the wider school curriculum, is therefore to ensure that pupils develop from an early age the essential literacy and numeracy skills they need to learn; to provide them with a guaranteed, full and rounded entitlement to learning; to foster their creativity; and to give teachers discretion to find the best ways to inspire in their pupils a joy and commitment to learning that will last a lifetime.

An entitlement to learning must be an entitlement for all pupils. This National Curriculum includes for the first time a detailed, overarching statement on inclusion which makes clear the principles schools must follow in their teaching right across the curriculum, to ensure that all pupils have the chance to succeed, whatever their individual needs and the potential barriers to their learning may be.

Equality of opportunity is one of a broad set of common values and purposes which underpin the school curriculum and the work of schools. These also include a commitment to 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. Until now, ours was one of the few national curricula not to have a statement of rationale setting out the fundamental principles underlying the curriculum. The handbooks for primary and secondary teachers include for the first time such a statement.

This is also the first National Curriculum in England to include citizenship, from September 2002, as part of the statutory curriculum for secondary schools. Education in citizenship and democracy will provide coherence in the way in which all pupils are helped to develop a full understanding of their roles and responsibilities as citizens in a modern democracy. It will play an important role, alongside other aspects of the curriculum and school life, in helping pupils to deal with difficult moral and social questions that arise in their lives and in society. The handbooks also provide for the first time a national framework for the teaching of personal, social and health education. Both elements reflect the fact that education is also about helping pupils to develop the knowledge, skills and understanding they need to live confident, healthy, independent lives, as individuals, parents, workers and members of society.



Rt Hon David Blunkett
Secretary of State for Education
and Employment



Sir William Stubbs
Chairman, Qualifications
and Curriculum Authority

About this booklet

This booklet:

- sets out the legal requirements of the National Curriculum in England for information and communication technology (ICT)
- provides information to help teachers implement ICT in their schools.

It has been written for coordinators, subject leaders and those who teach ICT, and is one of a series of separate booklets for each National Curriculum subject.

The National Curriculum for pupils aged five to 11 is set out in the handbook for primary teachers. The National Curriculum for pupils aged 11 to 16 is set out in the handbook for secondary teachers.

All these publications, and materials that support the teaching, learning and assessment of ICT, can be found on the National Curriculum web site at www.nc.uk.net.

About ICT in the National Curriculum

The structure of the National Curriculum

The programmes of study¹ set out what pupils should be taught, and the attainment target sets out the expected standards of pupils' performance. It is for schools to choose how they organise their school curriculum to include the programmes of study for ICT.

The programmes of study

The programmes of study set out what pupils should be taught in ICT at key stages 1, 2, 3 and 4 and provide the basis for planning schemes of work. When planning, schools should also consider the general teaching requirements for inclusion, use of language, use of information and communication technology, and health and safety that apply across the programmes of study.

The **Knowledge, skills and understanding** in the programmes of study identify the four aspects of ICT in which pupils make progress:

- finding things out
- developing ideas and making things happen
- exchanging and sharing information
- reviewing, modifying and evaluating work as it progresses.

These aspects of ICT are developed through working with a range of information, exploring with ICT tools, and investigating and comparing different uses of ICT as set out in **Breadth of study**.

Schools may find the DfEE/QCA exemplar schemes of work at key stages 1, 2 and 3 helpful to show how the programmes of study and attainment target can be translated into practical, manageable teaching plans.

Attainment target and level descriptions

The attainment target for ICT sets out the 'knowledge, skills and understanding that pupils of different abilities and maturities are expected to have by the end of each key stage'². The attainment target consists of eight level descriptions of increasing difficulty, plus a description for exceptional performance above level 8. Each level description describes the types and range of performance that pupils working at that level should characteristically demonstrate.

The level descriptions in ICT capability indicate progression in the four aspects of the knowledge, skills and understanding set out in the programmes of study.

¹ The Education Act 1996, section 353b, defines a programme of study as the 'matters, skills and processes' that should be taught to pupils of different abilities and maturities during the key stage.

² As defined by the Education Act 1996, section 353a.

The level descriptions provide the basis for making judgements on pupils' performance at the end of key stages 1, 2 and 3. At key stage 4, national qualifications are the main means of assessing attainment in ICT.

Range of levels within which the great majority of pupils are expected to work		Expected attainment for the majority of pupils at the end of the key stage	
Key stage 1	1–3	at age 7	2
Key stage 2	2–5	at age 11	4
Key stage 3	3–7	at age 14	5/6

Assessing attainment at the end of a key stage

In deciding on a pupil's level of attainment at the end of a key stage, 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 each key stage are set out in detail in QCA's annual booklets about assessment and reporting arrangements.



Learning across the National Curriculum

The importance of ICT to pupils' education is set out on page 14. The handbooks for primary and secondary teachers also set out in general terms how the National Curriculum can promote learning across the curriculum in a number of areas such as spiritual, moral, social and cultural development, key skills and thinking skills. The examples below indicate specific ways in which the teaching of ICT can contribute to learning across the curriculum.

Promoting pupils' spiritual, moral, social and cultural development through ICT

For example, ICT provides opportunities to promote:

- *spiritual development*, through helping pupils to discuss how the limitations of ICT make us more aware of what makes us human [for example, 'can computers create?'] and helping pupils to recognise their own, and others' creativity and imagination
- *moral development*, through considering some of the ethical issues surrounding the misuse of information [for example, the rights of access to personal information], recognising how ICT can multiply the results of our actions, and consequently appreciating the need for greater responsibility in its use
- *social development*, through considering how ICT can facilitate communication and the sharing of information and discussing how ICT affects ways of life, ways of working and communities [for example, its impact on employment, social relations and small communities]
- *cultural development*, through discussing how information arises out of a cultural context [for example, how the presentation of a site on the world wide web reflects the culture of its creators], discussing how ICT connects local, national and international communities, and through learning about other cultures through information on the internet.

Promoting key skills through ICT

For example, ICT provides opportunities for pupils to develop the key skills of:

- *communication*, through reading and selecting from a range of sources, planning, writing and refining texts in different styles and for different purposes, communicating face-to-face and by e-mail, and discussing and reflecting critically on their own and on others' work
- *application of number*, through working with quantitative data and mathematical models
- *IT*, through the programmes of study for ICT and in particular the key stage 4 programme of study, which is aligned with the key skills unit for IT
- *working with others*, through discussing and reflecting critically on their own and others' work, developing information systems as part of a group, and working with others via e-mail and the internet
- *improving own learning and performance*, through reviewing, modifying and evaluating their work as it progresses
- *problem solving*, through modelling real situations and developing solutions to problems when working with ICT.

Promoting other aspects of the curriculum

For example, ICT provides opportunities to promote:

- *thinking skills*, through helping pupils identify relevant sources of information, develop ideas and work collaboratively to solve problems
- *enterprise and entrepreneurial skills*, through encouraging pupils to design and implement solutions to real problems
- *work-related learning*, through providing pupils with access to a wide range of ICT applications and methodologies
- *education for sustainable development*, through developing pupils' understanding of the implications of ICT for working life, society and the environment.



The programmes of study for information and communication technology



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 [printed inside square brackets], all text in the margins **4** 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.

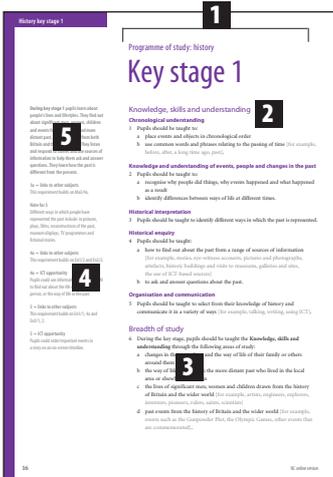
The programmes of study in the non-core foundation subjects

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 **5** 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 ...

Physical education key stage 2

Art and design key stage 1

Citizenship key stage 3

... reads ...

11a, 11b → links to other subjects
These requirements build on Gg/2c.

4a → links to other subjects
This requirement builds on
Ma3/2a, 2c, 2d.

1a → links to other subjects
This requirement builds on Hi/10, 13.

... and means ...

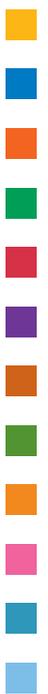
Physical education key stage 2,
requirements 11a and 11b build on
geography (key stage 2), paragraph
2, requirement c.

Art and design key stage 1,
requirement 4a builds on
mathematics (key stage 1),
Ma3 Shape, space and measures,
paragraph 2, requirements a, c and d.

Citizenship key stage 3,
requirement 1a builds on history
(key stage 3) paragraphs 10 and 13.

The attainment target

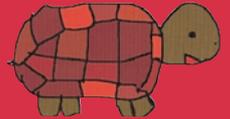
The attainment target **6** is at the end of this booklet.



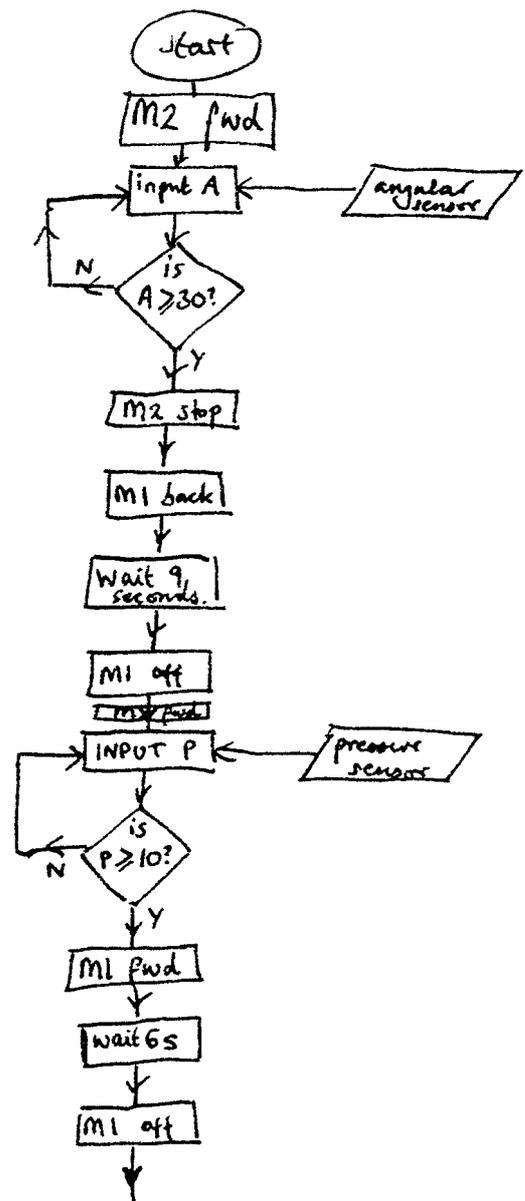
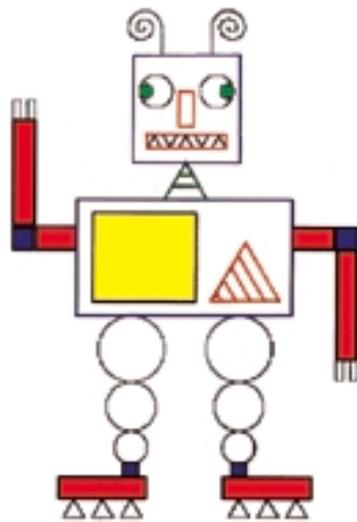
The importance of information and communication technology

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.



Robot Arm



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, ICL Fellow for Lifelong Learning

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 1

During key stage 1 pupils explore ICT and learn to use it confidently and with purpose to achieve specific outcomes. They start to use ICT to develop their ideas and record their creative work. They become familiar with hardware and software.

Note

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

1a → links to other subjects

This requirement builds on En2/2a–2c.

2a → links to other subjects

This requirement builds on Ma2/5a.

Knowledge, skills and understanding

Finding things out

- 1 Pupils should be taught how to:
 - a gather information from a variety of sources [for example, people, books, databases, CD-ROMs, videos and TV]
 - b enter and store information in a variety of forms [for example, storing information in a prepared database, saving work]
 - c retrieve information that has been stored [for example, using a CD-ROM, loading saved work].

Developing ideas and making things happen

- 2 Pupils should be taught:
 - a to use text, tables, images and sound to develop their ideas
 - b how to select from and add to information they have retrieved for particular purposes
 - c how to plan and give instructions to make things happen [for example, programming a floor turtle, placing instructions in the right order]
 - d to try things out and explore what happens in real and imaginary situations [for example, trying out different colours on an image, using an adventure game or simulation].

Exchanging and sharing information

- 3 Pupils should be taught:
 - a how to share their ideas by presenting information in a variety of forms [for example, text, images, tables, sounds]
 - b to present their completed work effectively [for example, for public display].

Reviewing, modifying and evaluating work as it progresses

- 4 Pupils should be taught to:
 - a review what they have done to help them develop their ideas
 - b describe the effects of their actions
 - c talk about what they might change in future work.

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 investigate the different ways it can be presented [for example, information about the Sun presented as a poem, picture or sound pattern]
 - b exploring a variety of ICT tools [for example, floor turtle, word processing software, adventure game]
 - c talking about the uses of ICT inside and outside school.

Key stage 2

During key stage 2 pupils use a wider range of ICT tools and information sources to support their work in other subjects. They develop their research skills and decide what information is appropriate for their work. They begin to question the plausibility and quality of information. They learn how to amend their work and present it in a way that suits its audience.

Note

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

1a → links to other subjects

This requirement builds on En2/3.

2a → links to other subjects

This requirement builds on En3/2.

2c → links to other subjects

This requirement builds on Ma2/4d.

Knowledge, skills and understanding

Finding things out

- 1 Pupils should be taught:
 - a to talk about what information they need and how they can find and use it [for example, searching the internet or a CD-ROM, using printed material, asking people]
 - b how to prepare information for development using ICT, including selecting suitable sources, finding information, classifying it and checking it for accuracy [for example, finding information from books or newspapers, creating a class database, classifying by characteristics and purposes, checking the spelling of names is consistent]
 - c to interpret information, to check it is relevant and reasonable and to think about what might happen if there were any errors or omissions.

Developing ideas and making things happen

- 2 Pupils should be taught:
 - a how to develop and refine ideas by bringing together, organising and reorganising text, tables, images and sound as appropriate [for example, desktop publishing, multimedia presentations]
 - b how to create, test, improve and refine sequences of instructions to make things happen and to monitor events and respond to them [for example, monitoring changes in temperature, detecting light levels and turning on a light]
 - c to use simulations and explore models in order to answer ‘What if ... ?’ questions, to investigate and evaluate the effect of changing values and to identify patterns and relationships [for example, simulation software, spreadsheet models].

Exchanging and sharing information

- 3 Pupils should be taught:
 - a how to share and exchange information in a variety of forms, including e-mail [for example, displays, posters, animations, musical compositions]
 - b to be sensitive to the needs of the audience and think carefully about the content and quality when communicating information [for example, work for presentation to other pupils, writing for parents, publishing on the internet].

Reviewing, modifying and evaluating work as it progresses

- 4 Pupils should be taught to:
 - a review what they and others have done to help them develop their ideas
 - b describe and talk about the effectiveness of their work with ICT, comparing it with other methods and considering the effect it has on others [for example, the impact made by a desktop-published newsletter or poster]
 - c talk about how they could improve future work.

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 and purposes [for example, collecting factual data from the internet and a class survey to compare the findings]
 - b working with others to explore a variety of information sources and ICT tools [for example, searching the internet for information about a different part of the world, designing textile patterns using graphics software, using ICT tools to capture and change sounds]
 - c investigating and comparing the uses of ICT inside and outside school.

Key stage 3

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 e-mail, 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 web site 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.

Key stage 4

During key stage 4 pupils 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 Pupils 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 Pupils 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 Pupils 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 Pupils 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, pupils 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 Pupils 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 Pupils should be taught to integrate the four aspects of the **Knowledge, skills and understanding** in their work with ICT.

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 stage. 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 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.¹
- 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.²

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 race, gender and disability.³
- 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

¹ Teachers may find QCA's guidance on planning work for pupils with learning difficulties a helpful companion to the programmes of study.

² Teachers may find QCA's guidance on meeting the requirements of gifted and talented pupils a helpful companion to the programmes of study.

³ 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.



Additional information for ICT

Teachers may find the following additional information helpful when implementing the statutory inclusion statement: **Providing effective learning opportunities for all pupils.** Teachers need to consider the full requirements of the inclusion statement when planning for individuals or groups of pupils. There is a specific reference to ICT in the examples for B/3c.

To overcome any potential barriers to learning in ICT, some pupils may require:

- help to compensate for difficulties in processing at speed large amounts of visual information by providing access to selected materials or more time to find things out
- support and strategies to help them interrogate and develop information presented in text and tables
- specialist software or equipment to communicate through other languages, signs or symbols and be able to exchange and share information with others through the use of computers.

In assessment:

- where a pupil is unable to use particular types of equipment, assessment of attainment should be based on understanding of the processes used in ICT as demonstrated through oral and written responses or, where possible, through the use of alternative equipment
- the attainment of pupils who require adapted equipment, such as particular switches or voice-activated software, should be assessed using these specialist items.



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.



The attainment target for ICT



About the attainment target

An attainment target sets out the ‘knowledge, skills and understanding that pupils of different abilities and maturities are expected to have by the end of each key stage’¹. Except in the case of citizenship², attainment targets consist of eight level descriptions of increasing difficulty, plus a description for exceptional performance above level 8. Each level description describes the types and range of performance that pupils working at that level should characteristically demonstrate.

The level descriptions provide the basis for making judgements about pupils’ performance at the end of key stages 1, 2 and 3. At key stage 4, national qualifications are the main means of assessing attainment in information and communication technology.

Range of levels within which the great majority of pupils are expected to work		Expected attainment for the majority of pupils at the end of the key stage	
Key stage 1	1–3	at age 7	2
Key stage 2	2–5	at age 11	4
Key stage 3	3–7	at age 14	5/6³

Assessing attainment at the end of the key stage

In deciding on a pupil’s level of attainment at the end of a key stage, 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 each key stage are set out in detail in QCA’s annual booklets about assessment and reporting arrangements.

¹ As defined by the Education Act 1996, section 353a.

² In citizenship, expected performance for the majority of pupils at the end of key stages 3 and 4 is set out in end of key stage descriptions.

³ Including modern foreign languages.

Attainment target for information and communication technology capability

Level 1

Pupils explore information from various sources, showing they know that information exists in different forms. They use ICT to work with text, images and sound to help them share their ideas. They recognise that many everyday devices respond to signals and instructions. They make choices when using such devices to produce different outcomes. They talk about their use of ICT.

Level 2

Pupils use ICT to organise and classify information and to present their findings. They enter, save and retrieve work. They use ICT to help them generate, amend and record their work and share their ideas in different forms, including text, tables, images and sound. They plan and give instructions to make things happen and describe the effects. They use ICT to explore what happens in real and imaginary situations. They talk about their experiences of ICT both inside and outside school.

Level 3

Pupils use ICT to save information and to find and use appropriate stored information, following straightforward lines of enquiry. They use ICT to generate, develop, organise and present their work. They share and exchange their ideas with others. They use sequences of instructions to control devices and achieve specific outcomes. They make appropriate choices when using ICT-based models or simulations to help them find things out and solve problems. They describe their use of ICT and its use outside school.

Level 4

Pupils understand the need for care in framing questions when collecting, finding and interrogating information. They interpret their findings, question plausibility and recognise that poor-quality information leads to unreliable results. They add to, amend and combine different forms of information from a variety of sources. They use ICT to present information in different forms and show they are aware of the intended audience and the need for quality in their presentations. They exchange information and ideas with others in a variety of ways, including using e-mail. They use ICT systems to control events in a predetermined manner and to sense physical data. They use ICT-based models and simulations to explore patterns and relationships, and make predictions about the consequences of their decisions. They compare their use of ICT with other methods and with its use outside school.

Level 5

Pupils select the information they need for different purposes, check its accuracy and organise it in a form suitable for processing. They use ICT to structure, refine and present information in different forms and styles for specific purposes and audiences. They exchange information and ideas with others in a variety of ways, including using e-mail. They create sequences of instructions to control events, and understand the need to be precise when framing and sequencing instructions. They understand how ICT devices with sensors can be used to monitor and measure external events. They explore the effects of changing the variables in an ICT-based model. They discuss their knowledge and experience of using ICT and their observations of its use outside school. They assess the use of ICT in their work and are able to reflect critically in order to make improvements in subsequent work.

Level 6

Pupils develop and refine their work to enhance its quality, using information from a range of sources. Where necessary, they use complex lines of enquiry to test hypotheses. They present their ideas in a variety of ways and show a clear sense of audience. They develop, try out and refine sequences of instructions to monitor, measure and control events, and show efficiency in framing these instructions. They use ICT-based models to make predictions and vary the rules within the models. They assess the validity of these models by comparing their behaviour with information from other sources. They discuss the impact of ICT on society.

Level 7

Pupils combine information from a variety of ICT-based and other sources for presentation to different audiences. They identify the advantages and limitations of different information-handling applications. They select and use information systems suited to their work in a variety of contexts, translating enquiries expressed in ordinary language into the form required by the system. They use ICT to measure, record and analyse physical variables and control events. They design ICT-based models and procedures with variables to meet particular needs. They consider the benefits and limitations of ICT tools and information sources and of the results they produce, and they use these results to inform future judgements about the quality of their work. They take part in informed discussions about the use of ICT and its impact on society.

Level 8

Pupils independently select appropriate information sources and ICT tools for specific tasks, taking into account ease of use and suitability. They design successful ways to collect and prepare information for processing. They design and implement systems for others to use. When developing systems that respond to events, they make appropriate use of feedback. They take part in informed discussions about the social, economic, ethical and moral issues raised by ICT.

Exceptional performance

Pupils evaluate software packages and ICT-based models, analysing the situations for which they were developed and assessing their efficiency, ease of use and appropriateness. They suggest refinements to existing systems and design, implement and document systems for others to use, predicting some of the consequences that could arise from the use of such systems. When discussing their own and others' use of ICT, they use their knowledge and experience of information systems to inform their views on the social, economic, political, legal, ethical and moral issues raised by ICT.

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Excellence
in schools

This booklet:

- sets out the legal requirements of the National Curriculum in England for information and communication technology (ICT)
- provides information to help teachers implement ICT in their schools.

It has been written for coordinators, subject leaders and those who teach ICT, and is one of a series of separate booklets for each National Curriculum subject.

The National Curriculum for pupils aged five to 11 is set out in the handbook for primary teachers. The National Curriculum for pupils aged 11 to 16 is set out in the handbook for secondary teachers.

All these publications, and materials that support the teaching, learning and assessment of ICT, can be found on the National Curriculum web site at www.nc.uk.net.