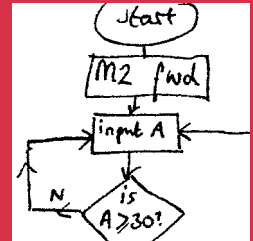


# Information and communication technology



The National Curriculum for England [www.nc.uk.net](http://www.nc.uk.net)



# About ICT in the National Curriculum

## The structure of the National Curriculum

The programmes of study<sup>1</sup> 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'<sup>2</sup>. 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.

<sup>1</sup> 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.

<sup>2</sup> As defined by the Education Act 1996, section 353a.

# The programmes of study for information and communication technology



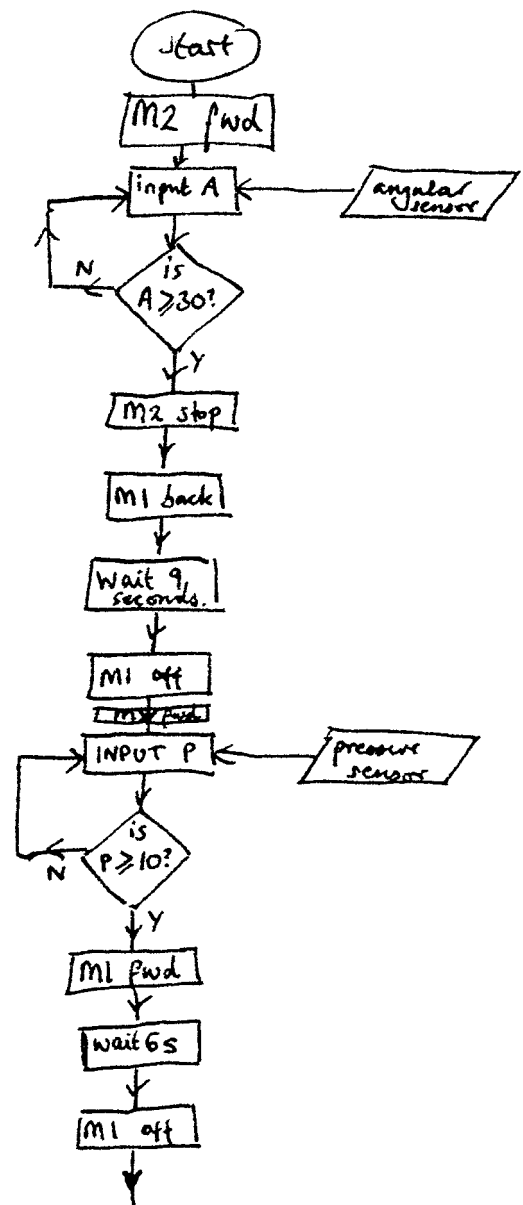
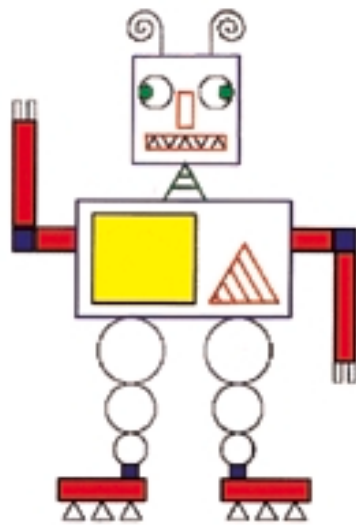
**The importance of information and communication technology**

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 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.

# 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’<sup>1</sup>. Except in the case of citizenship<sup>2</sup>, 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	<b>1–3</b>	at age 7	<b>2</b>
Key stage 2	<b>2–5</b>	at age 11	<b>4</b>
Key stage 3	<b>3–7</b>	at age 14	<b>5/6<sup>3</sup></b>

## 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.

<sup>1</sup> As defined by the Education Act 1996, section 353a.

<sup>2</sup> 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.

<sup>3</sup> 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.