Key Stages 2–3

Information and communication technology

in the National Curriculum for Wales

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Audience Teachers, headteachers and governing bodies of maintained schools in Wales; local education authorities; initial teacher training providers; teacher unions and school representative bodies; church diocesan authorities; national bodies in Wales with an interest in education.

Overview This document sets out the Welsh Assembly Government's requirements for information and communication technology in the national curriculum for Wales. It is issued pursuant to the powers contained in Section 108 of the Education Act 2002 and which are vested in the Welsh Ministers. The Welsh Ministers form part of the Welsh Assembly Government.

Action required Teachers, headteachers and governing bodies of maintained schools must ensure that the legal requirements set out in this document are implemented in line with the dates specified in the Foreword.

Further information Enquiries about this document should be directed to:

Curriculum and Assessment 3–14 Division
Department for Children, Education, Lifelong Learning and Skills
Welsh Assembly Government
Floor 10, Southgate House
Wood Street
Cardiff
CF10 1EW

Tel: 0800 083 6003
Fax: 029 2037 5496
e-mail: C&A3-14.C&A3-14@wales.gsi.gov.uk

Additional copies Can be obtained from:

Tel: 029 2037 5427
Fax: 029 2037 5494

Or by visiting the Welsh Assembly Government's website
www.wales.gov.uk

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Foreword

This document sets out the revised national curriculum for **information and communication technology** in Wales.

The structure of the national curriculum

The national curriculum applies to pupils of compulsory school age in maintained schools. It is organised on the basis of three key stages, which are broadly as follows*:

	Pupils' ages	Year groups
Key Stage 2	7–11	3–6
Key Stage 3	11–14	7–9
Key Stage 4	14–16	10–11

In Wales, the following subjects are included in the national curriculum at the key stages shown:

Key Stage 2	English, Welsh, mathematics, science, design and technology, information and communication technology, history, geography, art and design, music and physical education.
Key Stage 3	As at Key Stage 2, plus a modern foreign language.
Key Stage 4	English, Welsh, mathematics, science and physical education.

For each subject, in each of the key stages listed above, programmes of study set out what pupils should be taught and, for Key Stages 2 and 3, attainment targets set out the expected standards of pupils' performance.

At the end of Key Stages 2 and 3, standards of pupils' performance are set out in eight level descriptions of increasing difficulty, with an additional description above Level 8 to help teachers in differentiating Exceptional Performance.

At Key Stage 4, external qualifications are the main means of assessing attainment in the national curriculum. The Welsh Assembly Government publishes annually the list of qualifications that, under Section 96 of the Learning and Skills Act 2000, are approved for use with pupils of compulsory school age.

* The key stages are defined precisely in Section 103 of the Education Act 2002.

Including all learners

The revised national curriculum contains a section on including all learners which clarifies learner entitlement and schools' responsibilities.

Implementation dates

The revised programmes of study and attainment targets for **information and communication technology** become legal requirements by means of an Order made by the Welsh Assembly Government and come into effect on:

• 1 August 2008 for Years 3, 4 and 5 and Years 7 and 8
• 1 August 2009 for Year 6 and Year 9.

From these dates the existing national curriculum for **information technology** is superseded.

Welsh Assembly Government
January 2008

Including all learners

Responsibilities of schools

Under the United Nations Convention on the Rights of the Child and the Welsh Assembly Government's overarching strategy document *Rights to Action*, all children and young people must be provided with an education that develops their personality and talents to the full. The Education Act 2002 further strengthens schools' duty to safeguard and promote the welfare of all children and young people.

The equal opportunities legislation which covers age, disability, gender, race, religion and belief and sexual orientation further places a duty on schools in Wales towards present and prospective learners to eliminate discrimination and harassment, to promote positive attitudes and equal opportunities and encourage participation in all areas of school life.

Schools should develop in every learner a sense of personal and cultural identity that is receptive and respectful towards others. Schools should plan across the curriculum to develop the knowledge and understanding, skills, values and attitudes that will enable learners to participate in our multi-ethnic society in Wales. Schools should develop approaches that support the ethnic and cultural identities of all learners and reflect a range of perspectives, to engage learners and prepare them for life as global citizens.

Schools must work to reduce environmental and social barriers to inclusion and offer opportunities for all learners to achieve their full potential in preparation for further learning and life. Where appropriate, schools will need to plan and work with specialist services to ensure relevant and accessible learning experiences.

For learners with disabilities in particular, they should:

• improve access to the curriculum
• make physical improvements to increase participation in education
• provide information in appropriate formats.

Schools should seek advice regarding reasonable adjustments, alternative/adapted activities and appropriate equipment and resources, which may be used to support the full participation of all learners including those who use a means of communication other than speech.

For learners whose first language is neither English nor Welsh, schools should take specific action to help them learn both English and Welsh through the curriculum. Schools should provide learners with material that is appropriate to their ability, previous education and experience, and which extends their language development. Schools should also encourage the use of learners' home languages for learning.

Learner entitlement

Schools in Wales should ensure that all learners are engaged as full members of their school communities, accessing the wider curriculum and all school activities and working wherever possible alongside their peers. Schools should teach all programmes of study and frameworks in ways appropriate to learners' developing maturities and abilities and ensure that learners are able to use fully their preferred means of communication to access the curriculum. In order to extend their learning, learners should experience a variety of learning and teaching styles.

To enable all learners to access relevant skills, knowledge and understanding at an appropriate level, schools may use content from earlier phases or key stages within the curriculum. Schools should use material in ways suitable for the learners' age, experience, understanding and prior achievement to engage them in the learning process.

For learners working significantly below the expected levels at any key stage, schools should use the needs of the learner as a starting point and adapt the programmes of study accordingly. Sufficient flexibility exists within the curriculum to meet the needs of learners without the need for disapplication. In exceptional cases, individual learners may be disapplied, usually on a temporary basis, but group or large-scale disapplications should not be used.

Where it is not possible to cover the content of all of the programmes of study for each key stage, the statutory requirement to provide a broad, balanced curriculum can be met by selecting appropriate topics/themes from the curriculum as contexts for learning.

For more-able and talented learners working at higher levels, schools should provide greater challenge by using material in ways that extend breadth and depth of study and opportunities for independent learning. The level of demand may also be increased through the development and application of thinking, and communication, ICT and number skills across the curriculum.

Schools should choose material that will:

• provide a meaningful, relevant and motivating curriculum for their learners
• meet the specific needs of their learners and further their all-round development.

Learners of all abilities should have access to appropriate assessment and accreditation.

Skills across the curriculum

A non-statutory *Skills framework for 3 to 19-year-olds in Wales* has been developed in order to provide guidance about continuity and progression in developing thinking, communication, ICT and number for learners from 3–19.

At Key Stages 2 and 3, learners should be given opportunities to build on skills they have started to acquire and develop during the Foundation Phase. Learners should continue to acquire, develop, practise, apply and refine these skills through group and individual tasks in a variety of contexts across the curriculum. Progress can be seen in terms of the refinement of these skills and by their application to tasks that move from: concrete to abstract; simple to complex; personal to the 'big picture'; familiar to unfamiliar; and supported to independent and interdependent.

For 14–19 learners, the framework should provide the basis for making effective progress in these skills, which can be assessed through a range of qualifications, including Key Skills.

Developing thinking

Learners develop their thinking across the curriculum through the processes of **planning**, **developing** and **reflecting**.

In **ICT**, learners plan their activities identifying appropriate software and hardware. They consider the needs of the audience and they create and develop their presentations accordingly. They use ICT to explore and solve problems in a range of contexts and reflect on the strengths and weaknesses of their solutions.

Developing communication

Learners develop their communication skills across the curriculum through the skills of **oracy**, **reading**, **writing** and **wider communication**.

In **ICT**, learners communicate and present information in a variety of ways, including text, graphs, pictures and sound, to support their activities in a range of contexts. They read information from a wide range of ICT and non-ICT sources and discuss their work with their peers, teachers and others. They use ICT to interpret and analyse information and communicate their findings in ways suitable for their intended audience and purpose.

Developing ICT

Learners develop their ICT skills across the curriculum by **finding**, **developing**, **creating and presenting information and ideas** and by using a wide range of equipment and software.

Learners use **ICT** individually and collaboratively, depending on the nature and context of the task in hand.

Developing number

Learners develop their number skills across the curriculum by **using mathematical information**, **calculating**, **and interpreting and presenting findings**.

In **ICT**, learners use mathematical information and data presented numerically and graphically in data-handling software. They use number to collect and enter data for interpretation in spreadsheets and simulations and present their findings as graphs and charts, checking accuracy before processing.

Learning across the curriculum

At Key Stages 2 and 3, learners should be given opportunities to build on the experiences gained during the Foundation Phase, and to promote their knowledge and understanding of Wales, their personal and social development and well-being, and their awareness of the world of work.

At Key Stage 4, learners' knowledge and understanding should be developed and applied within the contexts of their individual 14–19 pathways including the Learning Core.

Curriculum Cymreig (7–14) and Wales, Europe and the World (14–19)

Learners aged 7–14 should be given opportunities to develop and apply knowledge and understanding of the cultural, economic, environmental, historical and linguistic characteristics of Wales. Learners aged 14–19 should have opportunities for active engagement in understanding the political, social, economic and cultural aspects of Wales as part of the world as a whole. For 14–19 Learners, this is a part of their Learning Core entitlement and is a requirement at Key Stage 4.

ICT contributes to the Curriculum Cymreig by offering learners opportunities to find and analyse information about the rich characteristics of Wales and communicate their findings in a variety of ways.

Personal and social education

Learners should be given opportunities to promote their health and emotional well-being and moral and spiritual development; to become active citizens and promote sustainable development and global citizenship; and to prepare for lifelong learning. For 14–19 learners, this is a part of their Learning Core entitlement and is a requirement at Key Stage 4.

ICT contributes to learners' personal and social education by providing opportunities to work in contexts that allow learners to make decisions based on the values that underpin society, helping them become active and informed global citizens. They begin to identify and question bias in sources of information and become increasingly aware of the social, ethical and moral effects of ICT in the wider world.

Learners should gain an understanding of the importance of adopting safe and legal practices when using digital communications, along with an appreciation of the need to show respect towards others.

Careers and the world of work

Learners aged 11–19 should be given opportunities to develop their awareness of careers and the world of work and how their studies contribute to their readiness for a working life. For 14–19 learners, this is a part of their Learning Core entitlement and is a requirement at Key Stage 4.

ICT contributes to learners' awareness of careers and the world of work by providing opportunities for them to engage purposefully with the technologies that are increasingly used in the workplace, develop essential skills for employment and consider the economic effects of ICT in the wider world.

Progression in information and communication technology

Information and communication technology in the Foundation Phase

In the Foundation Phase, ICT should be holistic and integral to all Areas of Learning. Children's ICT skills, knowledge and understanding should be developed through a range of experiences that involve them finding and developing information and ideas, and creating and presenting information and ideas. Children's progression in ICT capability should be observed with an understanding of child development and the stages children move through.

Information and communication technology at Key Stage 2

At Key Stage 2, learners should be given opportunities to build on their experiences during the Foundation Phase. They should be taught to consider the sort of information they require to support their tasks and activities and how they might locate that information; to use an increasing range of ICT tools and resources to find, process and communicate relevant information from a variety of given safe and suitable sources; to develop and communicate their ideas in appropriate ways with a developing sense of purpose and audience.

Information and communication technology at Key Stage 3

At Key Stage 3, learners should be given opportunities to build on the skills, knowledge and understanding acquired at Key Stage 2. They develop a growing awareness of the relevance and plausibility of information and begin to identify and question bias in sources. They should be taught to become increasingly independent in their use of safe and suitable information sources, both ICT and non-ICT; to use a range of ICT skills and resources to find, analyse, communicate, present and share information, while becoming more aware of the need to check the accuracy of their work; to consider the advantages and limitations of using ICT in their activities across a range of subjects thus becoming increasingly aware of the social, ethical, moral and economic effects of ICT in the wider society.

Skills

Find and analyse information

Pupils should be given opportunities to:

1. discuss the purpose of their tasks, the intended audiences and the resources needed

2. find information from a variety of sources for a defined purpose

3. select suitable information and make simple judgements about sources of information

4. produce and use databases to ask and answer questions, *e.g. search, sort and graph*

5. produce and use models and/or simulations to ask and answer questions, *e.g. use a spreadsheet to calculate and graph sales in a shop*

6. investigate the effect of changing variables in models and/or simulations to ask and answer 'what if…?' type questions.

Range

Pupils should be given opportunities to:

- use ICT tools and suitable information sources safely and legally, in accordance with LEA/school guidelines

- use a range of ICT resources and equipment independently and collaboratively, *e.g. cameras, scanners, CD/DVD players, MP3 players, mobile phones, PDAs*

- use ICT sources of information and non-ICT sources of information

- use ICT to further their understanding of information they have retrieved and processed

- use ICT to explore and to solve problems in the context of work across a variety of subjects

- draw upon their experiences of using ICT to form judgements about its value in supporting their work

- store and retrieve information they have found or created

- evaluate their work and learning

- discuss new developments in ICT and the use of ICT in the wider world.

Create and communicate information

Pupils should be given opportunities to:

1. create and communicate information in the form of text, images and sound, using a range of ICT hardware and software

2. create a range of presentations combining a variety of information and media, *e.g. a poster combining text and graphics, a multimedia presentation*

3. share and exchange information safely through electronic means, *e.g. use of e-mail, virtual learning environments.*

Health, safety and child protection

Pupils should be taught how to use ICT comfortably, safely and responsibly, and to consider the hazards and risks in their activities, *e.g. the importance of not disclosing personal details to strangers.* They should be able to follow instructions to minimise risk to themselves and others.
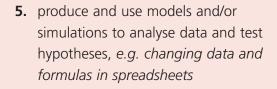
Skills

Find and analyse information

Pupils should be given opportunities to:

1. plan tasks, including consideration of purpose/audience and appropriate resources

2. find relevant information efficiently from a variety of sources for a defined purpose

3. select relevant information and make informed judgements about sources of information

4. produce and use databases to analyse data and follow particular lines of enquiry, *e.g. use simple and complex queries (searches/sorts)*

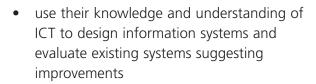5. produce and use models and/or simulations to analyse data and test hypotheses, *e.g. changing data and formulas in spreadsheets*

6. investigate more complex patterns and relationships in models and/or simulations.

Range

Pupils should be given opportunities to:

• use ICT tools and suitable information sources safely and legally, in accordance with LEA/school guidelines

• use a range of ICT resources and equipment independently and collaboratively, *e.g. cameras, scanners, CD/DVD players, MP3 players, mobile phones, PDAs*

• use a range of information, from a variety of sources, considering how its characteristics, structure and purpose influences its use with ICT

• use ICT to analyse and interpret data and produce new information on which to draw conclusions

• use their knowledge and understanding of ICT to design information systems and evaluate existing systems suggesting improvements

• use ICT to explore and to solve problems in the context of work across a variety of subjects

• draw upon their experiences of using ICT to form judgements about its value in supporting their work

• manage their workspace

• reflect on their work, evaluating outcomes and learning

• become aware of new developments in ICT and consider the social, economic, ethical and moral issues raised by the impact and use of ICT.

Create and communicate information

Pupils should be given opportunities to:

1. create and communicate information in the form of text, images and sound, using a range of ICT hardware and software

2. create and develop a range of presentations, combining a variety of information and media, for specific purposes and audiences, *e.g. use higher order functions in a presentation package*

3. share and exchange information safely through electronic means, *e.g. collaborative use of e-mail with attachments, virtual learning environments*.

Health, safety and child protection

Pupils should be taught how to use ICT comfortably, safely and responsibly, and to consider the hazards and risks in their activities. They should be able to follow instructions to minimise risk to themselves and others and understand that disclosing personal details can put themselves and others at risk.

Level descriptions

The following level descriptions describe the types and range of performance that pupils working at a particular level should characteristically demonstrate. 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. Each description should be considered in conjunction with the descriptions for adjacent levels.

By the end of Key Stage 2, the performance of the great majority of pupils should be within the range of Levels 2 to 5, and by the end of Key Stage 3 within the range 3 to 7. Level 8 is available for very able pupils and, to help teachers differentiate Exceptional Performance at Key Stage 3, a description above Level 8 is provided.

Level 1

Pupils explore, with support, different types of information held on ICT systems. They use ICT to move objects on-screen for a defined purpose and use words and pictures to communicate ideas. They use the internet/related technologies safely, with support. They are aware of ICT in their world. They recognise the different parts of a computer system.

Level 2

Pupils consider, create and communicate information and ideas in different forms using text, images, pictures and sound. They find information from a given source using it to answer simple questions. Pupils enter information into a record with some assistance. They explore the effects of making changes in models or simulations. Pupils store and retrieve work with some assistance. They are aware of the use of ICT in the outside world.

Level 3

Pupils begin to organise their tasks and use ICT to create, organise, amend and present information and ideas. They find information from a range of given sources and use ICT to search, sort and/or graph data to follow simple lines of enquiry. Pupils understand how changing one variable affects another in models or simulations. They store and retrieve work independently. Pupils send and receive information electronically, with support. They understand the use of a range of input and output devices.

Level 4

Pupils broadly plan their tasks and combine a variety of information and media when creating and developing their ideas, with a sense of purpose and audience. They use ICT to select relevant information from a range of given sources, recognising that poor quality information and data yields unreliable results. Pupils begin to check the validity of data. They add and amend records in databases. They use ICT to explore patterns and relationships. They make simple predictions about how changing one variable affects another in models or simulations. They send and receive information electronically. Pupils discuss and begin to form opinions about some of the issues raised by the use of ICT and internet safety. They use the internet/related technologies safely in accordance with given guidelines. Pupils manage their workspace effectively. They show an awareness of the basic functions of hardware and software.

Level 5

Pupils plan their tasks for purpose and audience. They combine a variety of information and media when creating, refining and developing their own ideas and information. Their presentations are fit for purpose and meet the needs of their intended audience. They search for and select information from a range of sources, considering relevance, plausibility and accuracy. Pupils create their own databases and search or sort on more than one field to follow particular lines of enquiry. They create their own models or simulations and investigate the effect of changing data. They use ICT to send and receive files electronically. Pupils form opinions about issues raised by the use of ICT and are aware of dangers associated with misuse of the internet/related technologies. They recognise the implications of using networks.

Level 6

Pupils plan their tasks in detail for specific purposes and audiences. They use ICT to create and refine their work using information from a range of sources, recognising the need for different styles for different audiences. They use ICT to check accuracy and plausibility by comparing information from different sources, making choices to meet the needs of a specific purpose or audience. They use databases to follow complex lines of enquiry and draw conclusions. They use models or simulations of increasing complexity, vary the rules within them and test hypotheses. Pupils have opinions about issues raised by the use of ICT and know the dangers associated with misuse of the internet/related technologies.

Attainment target

Level 7

Pupils plan independently for different purposes and audiences specifying resources and sources. They refine their choice of selected information to match the needs of a specific purpose or audience. Pupils identify the advantages and limitations of different applications and select and use suitable ICT facilities. They design a database making appropriate choices within a data-handling application, using its specialised functions. They design computer models and procedures, with variables, to meet specific needs. Pupils have informed opinions of legal and other issues raised by the use of ICT in the wider world. They use the internet/related technologies safely and independently.

Level 8

Pupils plan independently for a specific purpose and refine in the light of development. They make informed judgements on selected information, evaluating its plausibility, accuracy and relevance to purpose and audience. Pupils design and implement ICT systems for others to use. They create presentations for others to meet specific requirements. They discuss in an informed way the social, economic, ethical and moral issues raised by ICT.

Exceptional Performance

Pupils evaluate software packages and complex computer models, analysing the situation for which they were developed and assess their efficiency, ease of use and appropriateness, suggesting possible refinements. Pupils design, implement and document systems for others to use, predicting some of the consequences that could arise in use. When discussing their own and others' use of ICT, they relate their understanding of the technical features of information systems to an appreciation of how those systems affect wider social, economic, ethical and moral issues.

National curriculum outcomes

The following national curriculum outcomes are non-statutory. They have been written to recognise the attainment of pupils working below Level 1. National Curriculum Outcomes 1, 2 and 3 align with the Foundation Phase Outcomes 1, 2 and 3.

Foundation Phase	National Curriculum
Foundation Phase Outcome 1	National Curriculum Outcome 1
Foundation Phase Outcome 2	National Curriculum Outcome 2
Foundation Phase Outcome 3	National Curriculum Outcome 3
Foundation Phase Outcome 4	National Curriculum Level 1
Foundation Phase Outcome 5	National Curriculum Level 2
Foundation Phase Outcome 6	National Curriculum Level 3

The national curriculum outcomes describe the types and range of performance that pupils working at a particular outcome should characteristically demonstrate. In deciding on a pupil's outcome of attainment at the end of a key stage, teachers should judge which description best fits the pupil's performance. Each description should be considered in conjunction with the descriptions for adjacent outcomes.

Outcome 1

Pupils use simple computer programmes through a range of access devices and make connections between the control device and the information on-screen. They begin to select letters and symbols to communicate about themselves and their immediate interests.

Outcome 2

Pupils can follow simple instructions. They use ICT to interact with others and respond to questions, making connections and simple predictions based on their previous ICT experience. Pupils use ICT to express their ideas and feelings (*e.g. choosing photographs for recording work or telling a story*). They begin to use a range of programmes to record and present ideas and feelings and understand that information can be saved.

Outcome 3

Pupils can sequence up to four key pictures/words/symbols to communicate their developing knowledge of ICT and its use. They begin to choose equipment and software for familiar activities and can load a resource and make choices from it (*e.g. a game from disk, a music track from CD*).

Notes