

For primary PGCE tutors and trainees
**Including pupils with
SEN and/or disabilities
in primary ICT**

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1 Including pupils with SEN and/or disabilities in primary information and communication technology (ICT) lessons

Introduction

This booklet gives tutors and trainees information about subject-specific issues in the ICT curriculum for pupils with SEN and/or disabilities. It offers a straightforward introduction to planning inclusive ICT lessons. There are also suggestions for further reading and support in section 7.

Each booklet in this series contains a self-audit table (section 3). This offers a range of ideas that you can use to check against your practice and the practice you observe. The organisation of information in this table is based on the most recent research evidence and the views of expert teachers.

Recent evidence (eg Davis and Florian, 2004) suggests that much of what has traditionally been seen as pedagogy for pupils with SEN and/or disabilities consists of the approaches used in ordinary teaching, extended or emphasised for particular individuals or groups of pupils. This applies even when teaching approaches may look very different, eg when teachers are working with pupils with complex needs.

Trials of these materials in 2007/08 suggested that grouping teaching approaches into themes helps new teachers and those who work with them to consider and discuss their practice. Therefore each self-audit table is grouped under eight themes:

- maintaining an inclusive learning environment
- multi-sensory approaches, including information and communication technology (ICT)
- working with additional adults
- managing peer relationships
- adult-pupil communication
- formative assessment/assessment for learning
- motivation, and
- memory/consolidation.

There are many overlaps between these themes, but the model offers a useful starting point to help you develop teaching approaches that include pupils with SEN and/or disabilities.

ICT

"The increasing use of technology in all aspects of society makes confident, creative and productive use of ICT an essential skill for life. ICT capability encompasses not only the mastery of technical skills and techniques, but also the understanding to apply these skills purposefully, safely and responsibly in learning, everyday life and employment. ICT capability is fundamental to participation and engagement in modern society.

"ICT can be used to find, develop, analyse and present information, as well as to model situations and solve problems. ICT enables rapid access to ideas and experiences from a wide range of people, communities and cultures, and allows pupils to collaborate and exchange information on a wide scale. ICT acts as a powerful force for change in society and citizens should have an understanding of the social, ethical, legal and economic implications of its use, including how to use ICT safely and responsibly. Increased capability in the use of ICT supports initiative and independent learning, as pupils are able to make informed judgements about when and where to use ICT to enhance their learning and the quality of their work."

National Curriculum, QCA, 2009

The ICT curriculum advocates developing ICT capability, which is much more than acquiring basic skills and techniques. ICT capability focuses on pupils' ability to identify, understand and apply appropriate knowledge, skills and understanding in the use of technologies. Pupils are expected to use a range of technologies appropriately and develop understanding that can be transferred to other areas of learning or life, eg developing successful digital presentations or making appropriate use of the internet.

A range of technologies is available to support pupils with SEN and/or disabilities:¹

- **The use of technology to train or rehearse:** early technology to support pupils with SEN was often based on a drill and practice approach and there is still plenty of this software around, often intended to help pupils gain literacy and numeracy skills. Although technology like this has its place, it should only be used when needed. Too often this technology has taken centre stage. Before considering using these systems, refer to the Becta guidance on individual learning systems (ILS) (McFarlane, 1999).
- **The use of technology to assist learning:** this technology removes barriers to communication and interaction and includes switches, text readers and speech and communicator devices, such as the well-known technology used by Stephen Hawking. Using keyboard shortcuts instead of a mouse, or using a foot-controlled mouse, a head-controlled mouse or a wireless mouse, enables all pupils to be involved in creating databases or graphic plans. Screen filters may help with glare.
- **The use of technology to enable learning:** this technology plays an active role in the learning process, perhaps by asking questions, intervening in an activity or presenting interactive scenarios or simulations. It transforms learning rather than simply modifying the learning context. An interesting example is KarZouche: Social Communication,² which allows pupils with an autistic spectrum disorder (ASD) to 'walk their way' through scenarios involving social communication in everyday situations. The package contains tools that adults can use to create appropriate scenarios.

Because the range of hardware and software is wide and continually expanding, teachers should always seek to collaborate with other colleagues on removing barriers to learning and participation for particular pupils or groups of pupils. Pupils will also be able to advise on the technologies that suit them best. They may not need anything 'special'. Much of the better known, generic software, such as Microsoft Office, contains accessibility facilities for disabled pupils.

1 Based on the taxonomy suggested by Chris Abbott, 2007.

2 Where this booklet refers to a specific product, no recommendation or endorsement of that product is intended, nor should be inferred.

Roles and responsibilities

Recent legislation and guidance make clear that **all** the teaching staff in a school are responsible for the provision for pupils with SEN and/or disabilities. All staff should be involved in developing school policies and fully aware of the school's procedures for identifying, assessing and making provision for pupils with SEN and/or disabilities. Staff should help pupils with SEN to overcome any barriers to participating and learning, and make any reasonable adjustments needed to include disabled pupils in all aspects of school life.

The Disability Discrimination Act (DDA) has substantial implications for everyone involved in planning and teaching the curriculum. Schools have specific duties under the DDA to:

- make reasonable adjustments to their policies and practice to prevent discrimination against disabled pupils
- increase access for disabled pupils, including access to the curriculum, through accessibility planning, and
- promote disability equality and have a disability equality scheme showing how they will do so.

These duties are important and significant. They require schools to:

- take a proactive, systematic and comprehensive approach to promoting disability equality and eliminating discrimination, and
- build disability equality considerations in from the start at every level of activity, including developing and delivering the curriculum and classroom practice.

Schools must address their various DDA duties together in a way that brings greater benefits to disabled pupils, staff, parents and other users of the school. Using the self-audit table in this booklet to develop an inclusive approach to your teaching will help you carry out these duties in your subject.

Modifying the curriculum and the National Strategies to match pupils' needs

Teachers have a statutory duty to modify the programmes of study (or National Strategy materials).

"Schools have a responsibility to provide a broad and balanced curriculum for all pupils."

National Curriculum, QCA, 2008

This is more than just giving pupils 'access to the curriculum'. The curriculum is not immovable, like some building, to which pupils with SEN and/or disabilities have to gain access. It is there to be changed, where necessary, to include all pupils.

The statutory 'inclusion statement' in the National Curriculum sets out a framework for modifying the curriculum to include all pupils. Teachers have to:

- set suitable learning challenges
- respond to pupils' diverse learning needs, and
- overcome potential barriers to learning and assessment for particular individuals and groups of pupils.

These principles allow you to:

- choose objectives for pupils with SEN and/or disabilities that are different from those of the rest of the group, or
- modify the curriculum to remove barriers so all pupils meet the same objectives.

Planning for pupils with SEN and/or disabilities should be part of the planning that you do for all pupils, rather than a separate activity. It doesn't need to be complicated or time-consuming. You can simply jot down brief notes in your lesson plans on the learning objectives and approaches you will use to remove barriers for pupils with SEN and/or disabilities. Any personal targets the pupil has can inform this planning. At times it may be appropriate to plan smaller steps to achieve the learning goal or provide additional resources. It is often possible to use the support available to do this, either from the SENCO or teaching assistant/mentor.

You should also think about the questions you will ask different groups and individuals and the ways you will check that pupils understand. Some pupils with SEN and/or disabilities will show they understand in different ways from their peers, so you should look at a range of opportunities for pupils to demonstrate what they know and can do.

2 Removing barriers to the primary ICT curriculum for pupils with SEN and/or disabilities

Teaching and learning

To make ICT lessons inclusive, teachers need to anticipate what barriers to taking part and learning particular activities, lessons or a series of lessons may pose for pupils with particular SEN and/or disabilities. So in your planning you need to consider ways of minimising or reducing those barriers so that all pupils can fully take part and learn.

In some activities, pupils with SEN and/or disabilities will be able to take part in the same way as their peers. In others, some modifications or adjustments will need to be made to include everyone.

For some activities, you may need to provide a 'parallel' activity for pupils with SEN and/or disabilities, so that they can work towards the same lesson objectives as their peers, but in a different way – eg using specialist software or equipment to communicate through signs or symbols.

Occasionally, pupils with SEN and/or disabilities will have to work on different activities, or towards different objectives, from their peers.

There are some examples in the checklist in section 3.

Assessment

When assessing pupils, you need to plan carefully to give pupils with SEN and/or disabilities every opportunity to demonstrate what they know and are able to do, using alternative means where necessary.

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, and**
 - **the attainment of pupils who require adapted equipment, such as particular switches or voice-activated software, should be assessed using these specialist items."**
- QCA, 2008

3 Self-audit for inclusive ICT lessons: planning teaching, learning and support

You can use the following checklist to audit your practice and plan for more inclusive lessons.

The left-hand column of the table suggests approaches that are appropriate for pupils with SEN and/or disabilities in all subjects. The right-hand column suggests extensions and emphases that may be helpful in removing barriers for pupils with SEN and/or disabilities in ICT.

In most cases, the actions recommended are good practice for all pupils, regardless of their particular SEN and/or disability.

In other cases, the actions taken will depend on the barriers to taking part and learning identified in relation to the lesson being taught and pupils' particular SEN and/or disabilities. For example, the challenges of including pupils with a visual impairment in ICT may be quite different from those for including pupils with other SEN and/or disabilities.

Some children with identified needs – such as behaviour difficulties – may benefit from changes in activities or working with selected others or rest breaks. In these cases it is helpful to discuss and plan with a support assistant who knows the child well. The SENCO, subject associations and/or organisations supporting people with particular SEN/disabilities may be able to offer more specialist advice.

These examples are not comprehensive or exhaustive. They are intended to stimulate thinking rather than offer detailed advice on how to teach the subject to pupils with different types of special educational needs and/or disabilities. You will wish to add your own general or subject-specific ideas to the self-audit table.

Maintaining an inclusive learning environment

Maintaining an inclusive learning environment	ICT	Observed	Tried out
<p>Sound and light issues For example:</p> <ul style="list-style-type: none"> • background noise and reverberation are reduced • sound field system is used, if appropriate • glare is reduced • there is enough light for written work • teacher's face can be seen – avoid standing in front of light sources, eg windows • pupils use hearing and low vision aids, where necessary, and • video presentations have subtitles for deaf or hearing-impaired pupils and those with communication difficulties, where required. 	<p>Sound and light issues There is effective and quiet ventilation in the computer room.</p> <p>Computer monitors are positioned to reduce glare.</p> <p>Interactive whiteboards are non-reflective to reduce glare.</p>		
<p>Seating Pupils' seating and the main board position are planned for the shape of the room.</p> <p>Pupils can see and hear clearly, as necessary:</p> <ul style="list-style-type: none"> • the teacher • each other, and • the board/TV/screens. <p>Seating allows for peer or adult support.</p> <p>There is room for pupils with mobility difficulties to obtain their own resources, equipment and materials.</p> <p>Furniture is suitable. Consider the choice of chairs and desks, eg adjustable height tables, raised boards.</p>	<p>Seating Check classrooms are not cluttered with ICT equipment.</p> <p>Make sure pupils with motor impairments have appropriate assistive technology and software to support them and enough space to use it.</p> <p>There should be adequate space at computer desks for pupils to work off-screen, collaboratively and on paper.</p> <p>Seating should allow all pupils in the class to communicate, respond and interact with each other and the teacher in discussions.</p> <p>Avoid the need for copying lots of information. For example, notes on interactive whiteboards can be printed off for all pupils.</p>		

Maintaining an inclusive learning environment	ICT	Observed	Tried out
<p>Resources Storage systems are predictable. Resources are:</p> <ul style="list-style-type: none"> • accessible, eg within reach, and • labelled clearly to encourage independent use, eg using images, colour coding, large print, symbols, Braille, as appropriate. 	<p>Resources Consider using a wireless keyboard and mouse to facilitate teacher-pupil interaction with minimal disruption.</p> <p>Is there one dedicated computer for assistive technology/specialist software, or can pupils with SEN and/or disabilities move between the resources?</p> <p>Provide assistive resources, such as templates or diagrams, to support pupils' input.</p>		
<p>Displays Displays are:</p> <ul style="list-style-type: none"> • accessible, within reach, visual, tactile • informative, and • engaging. <p>Be aware of potentially distracting elements of wall displays.</p>	<p>Displays</p>		
<p>Low-arousal areas A low-arousal area is planned for pupils who may need it and is available for use by all pupils. The area only needs to have immediately relevant materials/resources to minimise distraction.</p>	<p>Low-arousal areas Pupils on the autistic spectrum may become deeply involved in working in isolation on a computer. They will benefit from clear preparation and support when returning to a group.</p>		

Maintaining an inclusive learning environment	ICT	Observed	Tried out
<p>Health and safety Health and safety issues have been considered, eg trailing leads secured, steps and table edges marked.</p> <p>There is room for pupils with mobility difficulties to leave the site of an accident.</p> <p>Remember that pupils with an autistic spectrum disorder (ASD) may have low awareness of danger.</p>	<p>Health and safety Check the room in terms of health and safety, eg in relation to wires and cables. Make sure anti-repetitive strain injury (RSI) measures and practices are in place.</p> <p>Make sure all pupils have appropriate breaks in tasks such as data entry.</p> <p>Pupils are protected from, and taught how to deal with, abusive behaviour such as cyber-bullying – helping to maintain their psychological well-being.</p> <p>ICT offers a wide range of possibilities for responses, many of them visual. Ensure that the audio channel is also offered. A sound recording linked to a simple presentation can be highly effective.</p>		
<p>Unfamiliar learning environments Pupils are prepared adequately for visits.</p>	<p>Unfamiliar learning environments</p>		

Multi-sensory approaches, including ICT

Multi-sensory approaches, including ICT	ICT	Observed	Tried out
<p>Multi-sensory approaches Pupils' preferred learning styles are identified and built on:</p> <ul style="list-style-type: none"> • when teaching – eg visual, tactile, auditory and kinaesthetic approaches are used, such as supporting teacher talk with visual aids; using subtitled or audio-described film/video • for recording – alternatives to written recording are offered, eg drawing, scribing, word processing, mind maps, digital images, video, voice recording, and • to promote security and aid organisation – eg visual timetables are used to show plans for the day or lesson; visual prompts for routines, such as how to ask for help; shared signals are developed so that pupils can convey their understanding, uncertainty or need for help. 	<p>Multi-sensory approaches Choose resources and tasks that support alternative ways of communicating, eg presentations that use relevant digital video- or audio-editing software.</p>		

Multi-sensory approaches, including ICT	ICT	Observed	Tried out
<p>ICT ICT is used to support teaching and learning.</p> <p>Accessibility features are used to include pupils with SEN and/or disabilities, as appropriate, eg:</p> <ul style="list-style-type: none"> • keyboard shortcuts instead of a mouse • sticky keys • a foot-controlled mouse, a head-controlled mouse or a wireless mouse • screen filters to cut down glare • increased font sizes for screen extension – in any case, fonts used in printed material should not be smaller than 12 pt (24 pt for screen presentations) • clear font type (normally sans serif, such as Arial or Comic Sans) • appropriate contrast between background and text, and/or • a talking word processor to read out text. <p>Pupils with poor motor control may gain confidence and achieve success through writing/drawing on the computer.</p> <p>Predictive text can encourage pupils to use a more extensive vocabulary and attempt 'difficult' spellings. It can be enhanced by using subject-specific dictionaries.</p>	<p>ICT Consider access to, and coordination of, ICT resources to enable pupils to complete tasks successfully. For example:</p> <ul style="list-style-type: none"> • using symbol-processing software or a picture communicator for pupils with speech and language communication needs • using head switches, touch screens, or an alternative mouse or keyboard for pupils with reduced motor skills, or • adjusting the screen resolution, or using a bigger screen, for pupils with a visual impairment. 		

Working with additional adults

Working with additional adults	ICT	Observed	Tried out
<p>Consulting pupils Wherever possible, pupils are consulted about the kind and level of support they require.</p>	<p>Consulting pupils</p>		
<p>Planning support Support from additional adults is planned to scaffold pupils' learning, allowing them, increasingly, to work independently. Planning should identify:</p> <ul style="list-style-type: none"> • which individuals/groups will receive support • where in the lesson pupils will need support • the type of support pupils should receive, and • when pupils should be allowed to work independently. <p>Additional adults:</p> <ul style="list-style-type: none"> • are clear about the lesson objectives • know the sequence of the lesson • understand the lesson content • know how to break tasks into more manageable chunks • are provided with key questions to encourage formative assessment, and • where appropriate, are familiar with any ICT used to support pupils. 	<p>Planning support Make sure additional adults are trained so they are comfortable with any software and hardware being used, and understand how it can support independent learning.</p>		
<p>Evaluation Additional adults report to the teacher on pupils' progress. The effectiveness of support is monitored and reviewed.</p>	<p>Evaluation</p>		

Managing peer relationships

Managing peer relationships	ICT	Observed	Tried out
<p>Grouping pupils All forms of pupil grouping include pupils with SEN and/or disabilities.</p> <p>Manageable mixed-ability grouping or pairing is the norm, except when carefully planned for a particular purpose.</p> <p>Sequence of groupings is outlined for pupils.</p> <p>The transition from whole-class to group or independent work, and back, is clearly signalled. This is particularly helpful for pupils on the autistic spectrum.</p>	<p>Grouping pupils</p>		
<p>Managing group work and discussion Pupils move carefully from paired discussion to group discussion – the language necessary for whole-class discussion work may be a barrier for pupils who find it difficult to express themselves in public. Paired and small group discussions provide opportunities for all to take part.</p> <p>Pupils are assigned specific roles (eg chair, writer, reporter, observer) which gives all pupils something to do and keeps them focused.</p>	<p>Managing group work and discussion</p>		
<p>Developing responsibility Pupils with SEN/disabilities are:</p> <ul style="list-style-type: none"> • given opportunities to initiate and direct projects, with support as appropriate, and • involved as equal contributors in class/school governance and decision making. 	<p>Developing responsibility Use collaborative tools like blogs, wikis and podcasts to enable pupils to make a positive contribution.</p>		

Adult-pupil communication

Adult-pupil communication	ICT	Observed	Tried out
<p>Teachers' communication Language is clear, unambiguous and accessible.</p> <p>Key words, meanings and symbols are highlighted, explained and written up, or available in some other way.</p> <p>Instructions are given clearly and reinforced visually, where necessary.</p> <p>Wording of questions is planned carefully, avoiding complex vocabulary and sentence structures.</p> <p>Questions are prepared in different styles/levels for different pupils – careful preparation ensures all pupils have opportunities to answer open-ended questions.</p> <p>Alternative communication modes are used, where necessary, to meet pupils' communication needs, eg signing, Braille.</p> <p>Text, visual aids, etc are checked for clarity and accessibility. For example, some pupils might require adapted printed materials (font, print size, background, Braille, symbols); some may require simplified or raised diagrams or described pictures.</p>	<p>Teachers' communication ICT skills are demonstrated clearly and progressively.</p>		
<p>Pupils' communication Alternative communication modes, such as sign or symbol systems, are encouraged, and pupils' contributions are valued.</p> <p>Advice is sought from the SENCO, a speech and language therapist, local authority advisory staff, and/or the pupil themselves on the best way of using such communication modes in lessons.</p> <p>Discussion of experiences and investigations is encouraged to help pupils understand them.</p>	<p>Pupils' communication Exploit the possibilities of encouraging talk in front of a computer screen between pupils who are nervous about face-to-face discussion and eye contact.</p> <p>Presentations to the group that involve ICT resources can raise prestige and improve social communication by having a role outside the classroom, eg for presentations to parents or the induction of younger pupils into a new year group.</p>		

Adult-pupil communication	ICT	Observed	Tried out
<p>Pupil-teacher interaction Where appropriate, pupils are allowed time to discuss the answers to questions in pairs, before the teacher requests verbal responses.</p> <p>Pupils with communication impairments are given:</p> <ul style="list-style-type: none"> • time to think about questions before being required to respond • time to explain, and • respect for their responses to questions and contributions to discussions. <p>Additional adults prepare pupils to contribute to feedback sessions, where necessary.</p>	<p>Pupil-teacher interaction</p>		

Formative assessment/assessment for learning

Formative assessment/ assessment for learning	ICT	Observed	Tried out
<p>Understanding the aims of the lesson Lesson objectives are made clear in pictures/symbols/writing, as appropriate.</p> <p>Objectives are challenging yet achievable. This will promote self-esteem and enable all pupils to achieve success.</p>	<p>Understanding the aims of the lesson Build up a chart (using a wallchart or other space) to show each lesson's focus and how successive lessons or topics link together to develop an area of work in ICT. This could include symbols, images or objects to make it more accessible.</p>		
<p>Focus on how pupils learn Pupils' own ways of learning and remembering things are emphasised.</p> <p>Pupils are encouraged to talk about how they achieved something. Dialogue is the key to successful assessment for learning. Teachers communicate in ways pupils are comfortable with.</p>	<p>Focus on how pupils learn</p>		
<p>Pupils know where they are in relation to learning aims End-of-lesson discussions focus on one or more of the ideas explored and the progress that pupils have made towards them during the lesson.</p> <p>Pupils are encouraged to look back to previous work/photos/records to see how much progress they have made.</p> <p>Half-termly or termly self-assessment sheets are used for pupils to assess their progress – a range of recording methods is accepted.</p>	<p>Pupils know where they are in relation to learning aims Revisiting a mind map of the same area of learning, say after three weeks of studying an ICT topic, can be a good way of assessing – through the added 'branches' of the map – how pupils' understanding of concepts is developing. This approach can be particularly valuable for pupils for whom oral and written communication present a barrier, as pictures and symbols can be included.</p>		

Formative assessment/ assessment for learning	ICT	Observed	Tried out
<p>Giving feedback</p> <p>Marking and other feedback helps pupils improve their performance. Feedback is given in an appropriate form – verbally, in writing.</p> <p>Specific, rather than general, feedback is given. Comments are positive, explicit and evaluative.</p> <p>Emphasis is on the pupils' progress and achievement. Weaknesses are presented as areas for development. Opportunities are offered for pupils to attempt a piece of work again. These approaches are particularly useful for pupils who find it difficult to receive comments about improving their work.</p> <p>Praise is given discreetly where pupils find public praise embarrassing or difficult.</p>	<p>Giving feedback</p>		
<p>Understanding assessment criteria</p> <p>The number of goals/assessment criteria is kept small.</p> <p>Teachers talk to pupils about what they are trying to achieve.</p> <p>Pupils are involved in setting their own goals. Some pupils may find it difficult to understand the need for targets. Others may need time and support in target setting.</p> <p>Self-assessment and peer assessment are encouraged. Pupils are taught to use the language of assessment, eg "better..."</p> <p>Peer marking is encouraged, where buddies can evaluate each other's work in relation to success criteria.</p>	<p>Understanding assessment criteria</p> <p>Pupils know what level they are working at – through displays, use of assessment systems, display of objectives and levels.</p>		

Formative assessment/ assessment for learning	ICT	Observed	Tried out
<p>Reviewing progress and helping pupils to improve Teachers' responses to pupils' errors recognise, value and build on the thinking that led to them.</p> <p>End-of-lesson discussion considers the ways of working the class has found fruitful or difficult. Pupils are asked, for example:</p> <ul style="list-style-type: none"> • which key words, concepts, skills or processes were difficult and why, and how this could be improved • which parts of a task slowed them down, and • what could be done to make things go more efficiently. <p>Some pupils may have anxieties about planning to improve, especially if it involves editing or redoing a task. Pupils are encouraged to see how they've improved on their previous best.</p>	<p>Reviewing progress and helping pupils to improve</p>		
<p>Gathering assessment evidence A range of sources of assessment evidence is drawn upon.</p> <p>Assessment looks at what pupils know and can do, not at labels associated with SEN and/or disabilities.</p> <p>Notes made about individual pupils' difficulties/successes in the lesson take account of their oral contributions as well as their written work.</p>	<p>Gathering assessment evidence</p>		

Motivation

Motivation	ICT	Observed	Tried out
<p>Understanding the structure of the lesson Pupils are clear about the duration and overall structure of the lesson. Visual timetables or other devices are used to indicate the structure and progress of lessons.</p>	<p>Understanding the structure of the lesson</p>		
<p>Relevant and motivating tasks Tasks motivate pupils. They:</p> <ul style="list-style-type: none"> • stimulate interest and enthusiasm • are challenging but manageable • draw on real and familiar contexts • are relevant to pupils' lives, and • build on previous learning in the subject and in other areas of the curriculum. 	<p>Relevant and motivating tasks Programs such as KarZouche: Social Communication allow pupils with an autistic spectrum disorder (and others with communication and interaction difficulties) to 'walk their way' through scenarios involving social communication in everyday situations. The package contains tools with which adults can create appropriate scenarios.</p>		
<p>Reward systems Pupils understand reward systems and are motivated to achieve the rewards available.</p>	<p>Reward systems</p>		

Memory/consolidation

Memory/consolidation	ICT	Observed	Tried out
<p>Recapping Recap learning from the previous lesson.</p> <p>Main points from the lesson are fed back by pupils, noted down and saved so pupils can refer to them.</p>	<p>Recapping</p>		
<p>Reducing reliance on memory The amount of material to be remembered is reduced. Repeat or display important information.</p> <p>The meaningfulness and familiarity of the material is increased.</p> <p>Mental processing and explanations of complex tasks are simplified.</p> <p>The use of memory aids is encouraged. These can include wallcharts and posters, useful spellings, personalised dictionaries, cubes, counters, abacus, Unifix blocks, number lines, multiplication grids, calculators, memory cards, audio recorders and computer software.</p> <p>Activities are structured so that pupils can use available resources, such as word banks.</p> <p>Strategies, including using ICT-based records, are used to reduce the need for pupils to rely on their short- or long-term memories.</p> <p>New learning fits into the framework of what the pupil already knows.</p> <p>Teaching assistants prepare pupils to contribute to feedback sessions, where appropriate.</p>	<p>Reducing reliance on memory Display pupils' work, assessment criteria for tasks, or projects and posters to encourage pupils' understanding or trigger their memory.</p> <p>Demonstrate software in short, achievable steps for pupils who, for example, may have a poor concentration span or poor motor skills.</p> <p>Reduce the possibility of frustration at not being able to use programs to achieve an objective by having 'how-to' posters on the wall.</p>		

Memory/consolidation	ICT	Observed	Tried out
<p>Consolidating learning Pupils' understanding is checked, eg by inviting pupils to reformulate key learning.</p> <p>Using visual or concrete ('real') materials, or activities involving movement, to reinforce or consolidate learning through a range of sensory channels.</p> <p>Reteach or revise material, where necessary, eg post-lesson tutoring.</p> <p>Opportunities are provided for pupils to repeat and reinforce previously learnt skills and processes on a regular basis, in similar and different contexts.</p> <p>Encourage pupils to develop their own strategies, eg an agreed approach to asking for help, rehearsal, note-taking, use of long-term memory, and place-keeping and organisational strategies.</p>	<p>Consolidating learning Leave enough time to consolidate pupils' learning away from the computer screen.</p>		
<p>Independent study/homework Independent study/homework is explained during the lesson, not at the end, to make sure it is understood and recorded. Teachers check all pupils are clear about homework tasks.</p> <p>Homework tasks are accessible after the lesson, eg published on a noticeboard or on the school learning platform, so pupils can return to them, if necessary, after the lesson.</p>	<p>Independent study/homework Pupils' independence can be supported by an appropriate form of e-portfolio, depending on their preferred mode of communication.</p>		

4 ICT and Every Child Matters

In 2003, the green paper 'Every Child Matters: Change for children' was published. The key outcomes for the Every Child Matters (ECM) agenda were drawn up after consultation with children, young people and families. The five outcomes that mattered most to children and young people are set out below. Each of the outcomes can be addressed through the ICT curriculum.

Outcome	General educational aspects	Through the ICT curriculum
Be healthy	<ul style="list-style-type: none"> • Work towards independent learning • Actively enquire about differing environments • Keep mentally and emotionally healthy 	<p>Effective ventilation in the computer room.</p> <p>Mental well-being is promoted by learning activities which promote challenge, allow achievement and are fun.</p> <p>Use of a range of settings (including open spaces).</p>
Stay safe	<ul style="list-style-type: none"> • Keep safe in school and on school trips • Have stability and security • Know about their place in the wider community 	<p>Regular checks on equipment, wiring and risk analysis.</p> <p>Pupils do not queue by the printer.</p> <p>Laptops or other mobile technologies can be easily transported on trolleys or other moveable storage furniture.</p> <p>Password setting rules and internet safety policy in place.</p> <p>Online safety: pupils understand the risks of displaying personal information on the internet.</p> <p>Pupils know about codes of use and penalties of misusing information management systems, including electronic registers, especially when timetabled to see health or social services, or take their medication.</p> <p>Data protection in place, eg concerning using pupils' photographs on websites or other information about individual pupils' identities.</p> <p>Pupils learn about ICT health and safety as part of the curriculum.</p>

Outcome	General educational aspects	Through the ICT curriculum
Enjoy and achieve	<ul style="list-style-type: none"> • Achieve personal and social development • Enjoy lessons • Achieve to their potential • Use alternatives to written recording, where appropriate 	<p>Personalisation offers real choice.</p> <p>Online learning tools enable pupils who are in hospital (say) to achieve as well as those in school.</p> <p>Pupils with physical disabilities are included by using devices such as head-operated mice.</p> <p>Effective links with parents through virtual learning environments (VLEs).</p>
Make a positive contribution	<ul style="list-style-type: none"> • Understand issues of difference and diversity through studying other environments and cultures • Understand about, and support, the local community • Involve themselves in extra-curricular activities 	<p>The school uses collaborative tools like blogging, wikis and podcasts to enable young people to make a positive contribution.</p> <p>Podcasting pupils are encouraged to develop business ideas, based on ICT, and encouraged to put them into practice through schemes such as Young Enterprise.</p> <p>Pupils learn to use presentation software well.</p> <p>Pupils are taught about the digital divide, both in their own country and the world as a whole.</p> <p>Pupils from schools in different countries collaborate through online forums.</p>
Achieve economic well-being	<ul style="list-style-type: none"> • Learn about ways to ensure their own economic well-being in the future • Experience visits from people who do various jobs • Visit different workplaces • Learn about different economies in different countries 	<p>Pupils are taught about:</p> <ul style="list-style-type: none"> • current and likely trends in computing and their applications, and • the social and economic effects of developments in computing. <p>Pupils are taught practical skills that are valued in the workplace.</p> <p>Opportunities for access are set at the school regardless of home circumstances, eg access through library or after-school club.</p> <p>Pupils learn about other cultures through the internet and software programs.</p>

5 Early development in the National Curriculum: the P scales for ICT

For pupils working below level 1 of the National Curriculum, performance descriptions (P scales) for ICT can be used to describe a 'best fit' for a pupil's performance.

All schools must report on pupils' attainment at the end of each key stage in terms of both P scales and national curriculum levels.

P scales 1–3 address very early levels of learning and are the same in all subjects, but illustrated with subject-specific examples.

As a trainee teacher, you may not meet pupils assessed at these very early levels very often. If you have to teach these pupils during your placements, you should expect a great deal of support in differentiating teaching and learning.

From **P4**, each subject has its own progression. For example:

At **P1** "Any participation is fully prompted".

But by **P8** pupils "can load a resource and make a choice from it, (for example, a particular game on a CD, a section of a DVD, tracks on a music CD...). They communicate about their use of ICT".

The full P scales for ICT are set out in QCA's Planning, Teaching and Assessing the Curriculum for Pupils with Learning Difficulties: Information and communication technology (please see section 7).

From **P8**, pupils move to the national curriculum levels.

While a typically developing child will have achieved **P8** by the age of four, some pupils will take considerably longer.

At all times you should be aware of the need to respect the developmental maturity of the pupils you are planning for. Choose materials and tasks appropriate to the age and maturity of the pupils. This is a particular issue when using software and other published resources.

6 Bilingual learners

"Children must not be regarded as having a learning difficulty solely because the language or form of language of their home is different from the language in which they will be taught."
SEN Code of Practice (DfES, 2001)

Pupils must not be regarded as having a learning difficulty because they are learning English as an additional language (EAL).

Bilingual learners take up to two years to develop basic communication skills (street and playground survival language).

Some pupils may take a long time before they feel confident enough to actively take part in classroom activities and use the English they have learnt. A 'silent' period is typical of this learning and should not be seen as a learning difficulty.

Many learners with EAL do not acquire language in the same way as first language learners. A pupil may be fluent orally but struggle considerably with reading or writing; or a pupil may be very literate in written English, but lack confidence in the rapid flow of speech required in conversational dialogue. It is therefore important to assess language competence in all language modes and not to assume a level of competence based on performance in one mode.

'A Language in Common' (QCA, 2000) is a common assessment scale that can be used to gauge where pupils are in their acquisition of English. It gives assessment steps for pupils with EAL working below national curriculum level 1 and is useful in helping teachers reach a common understanding of the nature of each step or level of language acquisition. It also shows how the information can be used for target setting and what support may be needed to ensure progress.

Another useful resource is 'Assessing the Needs of Bilingual Pupils: Living in two languages' by Deryn Hall.

When a class or subject teacher feels that a lack of progress in a bilingual pupil's learning may be due to a learning difficulty (SEN or disability) they should consult the SENCO or inclusion manager and work with them to develop an appropriate response.

7 Sources of information and advice

Publications

Abbott, C, Detheridge, T and Detheridge, C, 2007, Symbols, Literacy and Social Justice, Widgit Software

Abbott, C, 2007, E-inclusion: Learning Difficulties and Digital Technologies, Futurelab

Davis, P and Florian, L, 2004, Teaching Strategies and Approaches for Pupils with Special Educational Needs: A Scoping Study, DfES Research Report RR516

Florian, L and Hegarty, J (eds), 2004, ICT and Special Educational Needs: A tool for inclusion, Open University Press, Maidenhead

Hall, D, 2001, Assessing the Needs of Bilingual Pupils: Living in two languages, David Fulton Publishers

McFarlane, A, 1999, ILS: A Guide to Good Practice, Becta

North, M and McKeown, S, Meeting SEN in the Curriculum: ICT, David Fulton Publishers

QCA, 2000, A Language in Common: Assessing English as an additional language

QCA, 2009, Planning, Teaching and Assessing the Curriculum for Pupils with Learning Difficulties: Information and communication technology – available online at:

www.qcda.gov.uk/libraryAssets/media/P_scales_ICT.pdf

Websites

Bobby is a web-based, free public service that analyses web pages for their accessibility to people with disabilities: **www.cast.org/bobby**

Inclusion section of the Becta schools website:

http://schools.becta.org.uk/index.php?section=tl&catcode=ss_tl_inc_02

Inclusive Technology offers advice and displays a range of resources that can be used in supporting people with special needs: **www.inclusive.co.uk**

www.immersiveeducation.com (for KarZouche) – a selection of resources to aid teaching

www.widgit.com – a selection of resources to aid teaching

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