SKILLS FRAMEWORK

Lywodraeth Cynulliad Cymru
Welsh Assembly Government

SKILLS FRAMEWORK

Department for Education, Lifelong Learning and Skills

Consultation document
January 2007

Title of document

Skills Framework

Audience

Headteachers, teachers and governing bodies of maintained schools in Wales; local education authorities; teacher unions and school representative bodies; teacher education and training institutions; church diocesan authorities; national bodies and agencies in Wales with an interest in education.

Overview

This document sets out the Welsh Assembly Government's proposals for a non-statutory skills framework.

Action required

Responses to this consultation document must be received by 30 March 2007. Responses can be sent to the address shown below, using the freepost envelope provided, or submitted electronically to mark.lewis4@wales.gsi.gov.uk

Further information

Enquiries about this consultation should be directed to Mark Lewis on 029 2037 5485.

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/consultations

Address for return of comments

Mark Lewis
FREEPOST SWC 1775
Cardiff
CF10 1GZ

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Background

Why has the *Skills Framework* been developed?

The Education Act of 2002 stipulates that one requirement for a balanced and broadly based curriculum is that it 'prepares…pupils for the opportunities, responsibilities and experiences of later life.'

There is strong consensus that the current subject Orders cannot alone adequately fulfil this requirement since many place an emphasis on detailed subject knowledge rather than skills development. Whilst it is important to retain a common entitlement, there is also a need to offer different pathways through learning in order to suit the aptitudes and interests of learners and to meet the aspirations of parents, employers and others.

The summary report of the *Future Skills Wales 2003 Generic Skills Survey* states:

'Of the employers reporting skills gaps, lack of IT skills is the most common problem, followed by communication skills…showing initiative, problem solving and the ability to learn.'
(*Future Skills Wales 2003 Generic Skills Survey Summary Report* – see www.futureskillswales.com)

In the document, *Excellent Schools*, Estyn had already recognised this situation and stated that:

'Schools will need to devote attention to developing attitudes to learning – affecting the disposition of learners and developing their learning skills – as well as delivering formal instruction.'
(*Excellent Schools*, Estyn, 2002).

These comments were reflected by ACCAC in its advice on the review of the school curriculum and assessment arrangements (2004) and led to a recommendation that:

'the National Curriculum Orders [should be] revised to develop a learner-centred, skills-focused curriculum that is relevant to the 21st century and inclusive of all learners. The aim should be for the revised curriculum to be first taught in September 2008'.

ACCAC concluded that a revised curriculum should have a clear focus on the needs of learners and the process of learning, accompanied by fuller attention to the development and application of skills. The goal should be to develop a curriculum with appropriate learning activities that:

- focuses on and meets learners' needs
- is inclusive and provides equality of opportunity
- equips learners with transferable skills
- is relevant, challenging, interesting and enjoyable for all learners
- transforms learning to produce resourceful, resilient and reflective lifelong learners, and
- is achievable and adequately resourced.

How is the framework organised?

The *Skills Framework* has been developed with the aim of providing guidance about continuity and progression in thinking, communication, information and communication technology (ICT) and number for learners from 3–19 and beyond. These are the skills that will enable learners of any age to become successful, whether in school, the workplace, at home or elsewhere, and they need to be firmly embedded into the experience of learners across all their learning. Their development underpins the requirements of employers and others, and will help to address current concerns about skills shortages in Wales and other parts of the United Kingdom, Europe and the wider world.

The framework is organised into four sections – the development of thinking, communication, ICT and number across the curriculum. It aims to use language in common with statements relating to other areas of education – for example, the wording of the Foundation Phase learning outcomes and that of Key Skills qualifications – so that each complements and reinforces the other. It is hoped that teachers will use the four individual sections together to underpin their planning and provide cohesive learning experiences for all learners.

A Glossary relating to the sections on thinking and number can be found on pages 11 and 20 respectively.

How is progression described?

During its early development, the framework showed six stages of progression, notionally linked to broad expectations at the beginning of the Foundation Phase, the end of that phase, the end of Key Stages 2, 3 and 4 and post-16. The two final stages relate to Key Skills qualifications, Levels 1, 2 and 3. Although it is recognised that learning and skills development does not always happen in a neat linear way, the framework is still presented in a six-column continuum for the sake of clarity. However, skills development is cyclical or spiral rather than sequential, and is linked to the complexity of the activities involved. This means that some of the skills at the 'end' of the continuum might be demonstrated at a simple level by quite young learners – for example, the ability to evaluate what has been achieved – and such skills will be refined and extended as the learners' experiences and challenges widen and become more complex. Equally, some of the skills described at the beginning of the continuum can quite appropriately be demonstrated by young adults.

The framework assumes that the skills identified in each stage of progression have been demonstrated – at least at a simple level – by learners before they move to the next stage. Progression is cumulative as well as being linked to increasing challenge in the resources used, the concepts explored, and the contexts in which the skills are developed.

Broadly, progression moves from the concrete to the more abstract, from simple to complex, from personal to the bigger picture, from the familiar to the unfamiliar. Learners progress from needing support to more independent working. They move from listening and interacting with others in a general way to a situation where they choose to work with others as a deliberate strategy for reaching understanding. In these ways they become both independent and interdependent learners.

In some columns, arrows have been used in order to avoid the use of spurious descriptions of progression in adjacent column(s). These indicate that the skills described previously continue to apply to learners at subsequent stages and that more challenging tasks would enable further progression.

For some learners, particularly those with additional needs, the notional relationship with age will not be relevant. For learners with more complex needs, a focus on the skills in the framework will provide opportunities to meet individual priorities across the curriculum.

What is the framework's relationship to the whole school curriculum?

This framework is not intended to be a curriculum framework. It underpins all the subjects of the national curriculum, the personal and social education (PSE) and the religious education (RE) frameworks, and aims to ensure a coherent approach to learning and to progression. The following icons  in these curriculum documents indicate opportunities for the development of the skills described and identified in the framework. Its greatest value will therefore be to support whole school planning.

Throughout the revision of the subject Orders, the PSE and the RE frameworks, care has been taken to ensure consistency with the *Skills Framework*. The *Skills Framework* applies to all children and young people from their earliest contact with the education system through to the time they leave school or college as young adults. There is no expectation, however, that all subjects will cover all the skills defined. A selective approach is needed.

In order to achieve consistency in terminology and compliance with existing qualifications, one of the starting points used in designing the framework were the Level 1, Level 2 and Level 3 Key Skills qualifications. The communication, number and ICT frameworks are broadly similar in title to current Key Skills, and the requirements of the final two columns of each are consistent with the wording of the Key Skills qualifications. We have also taken account of ongoing discussions about Functional Skills.

While the framework does not explicitly cover the three wider Key Skills of working with others, improving own learning and performance and problem-solving, these are integrated throughout. Improving own learning and performance and problem-solving, while seeded across the whole framework, are most fully covered by the section on the development of thinking. References in the framework such as:

- 'Plan the process/method to be used'.
- 'Regularly check progress, make ongoing revisions to process/method where necessary.'
- 'Decide whether the process/method was successful; describe any amendments made; suggest how the process/method could be improved.'

clearly demonstrate these aspects.

In the Develop stage of the section on thinking, the focus is on the development of creative and critical thinking. It is mainly here that references to creativity can be found in the strand with the sub-heading, Creating and developing ideas. For example:

- 'Develop and begin to combine a variety of imaginative ideas, possibilities and alternatives, including those of others.'

In addition, there are further opportunities for the development of creativity in other sections of the framework, particularly communication.

- 'Choose words to create effects. Choose an appropriate form, sequence and layout to suit audience and purpose.'
- 'Communicate ideas and emotions through work in art, craft, design, dance, drama, media and music.'
- 'Use given ICT resources to help create, present and share…ideas.'

Working with others is also a key element in thinking and communication, where the value of collaborative working in learning is especially recognised, as seen in the following references:

- 'Listen to the contributions of others, considering their points of view…'
- 'Make significant contributions to discussions…'
- 'Consider others' views to inform opinions and decisions…'

Even when working with others is not explicit in the framework, there is an assumption that learners will work in different ways – sometimes independently but often, especially during the planning and developing stages of their thinking, in pairs and groups of various size and composition. This collaborative approach is crucial in helping learners to test and refine their ideas, to form new concepts and deepen their understanding. Interacting with others in this way is sometimes referred to as social construction.

The advantage is that, in engaging in group discussion and interaction, learners will extend their own understanding and increasingly be able to take responsibility for their own learning.

Developing thinking can be defined as nurturing patterns of ideas that help learners acquire deeper understanding and enable them to explore and make sense of their world. It refers to processes of thinking that we in Wales have defined as plan, develop and reflect. These processes enable learners to plan their work, to develop and apply their ideas creatively and critically and to reflect on their learning, making links within and outside school. Although we are born with a capability to think, there is ample evidence that we can learn to think more effectively. Developing thinking pedagogy has considerable overlap with the principles of assessment for learning.

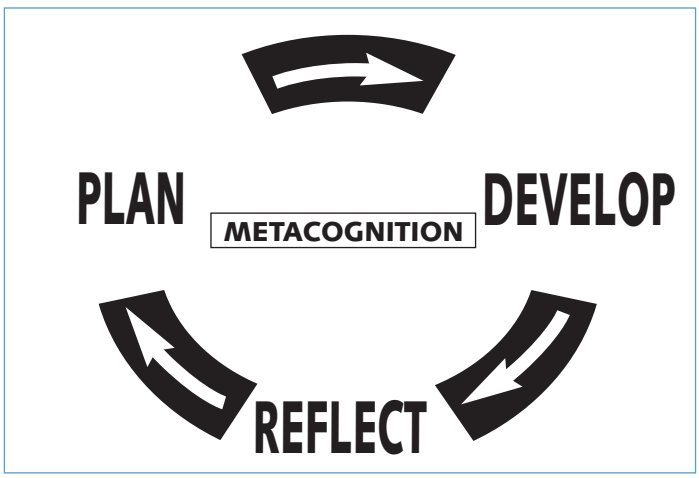
At present there are two alternative ways by which developing thinking is taught: through subject-specific methods, or through cross-curricular infusion methods. It is hoped that changes to the national curriculum Orders will enable all teachers to develop thinking in all subject areas. It should be noted that not all developing thinking strands will be appropriate in all subject areas.

It could be said that, in the past, the process of learning has been taken for granted and has at times seemed mysterious. As evidence from scientific research and classroom practice has been increasingly aligned and interwoven, a number of barriers have been overcome. The most notable have been in the fields of developing thinking and assessment for learning. Both developing thinking and assessment for learning rely on basic principles of pedagogy such as questioning technique and articulating strategies. One of the remaining barriers is a lack of a universal vocabulary for teachers to talk to their pupils about learning. The framework for progression in developing thinking and its glossary attempt to overcome this barrier.

The central and crucial process in developing thinking, from both scientific and classroom practice evidence, is labelled metacognition, thinking about thinking. In other words, learners need to reflect on learning and intentionally apply the results of reflection to further learning. Metacognition involves several areas such as:

- knowledge and understanding of thinking processes
- making sense of the task
- knowledge of strategies and methods, how and when to use them
- monitoring and evaluating learning according to the success or otherwise of the chosen strategies or methods.

Metacognition is therefore at the heart of the framework for developing thinking: without it, progression cannot be fully effective. Furthermore, the whole process of developing thinking is seen, in this model, as cyclical so that learning from reflection can be fed back into the next task. The progression has been devised to be process-led, so that it should fit in readily with current classroom practice.



Progression

Learners' progression in developing thinking is described as you read across the columns from left to right. Progression 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.

Learners progress from needing support to more independent working. They move from listening and interacting with others in a general way to a situation where they choose to work with others as a deliberate strategy for reaching understanding. In these ways they become both independent and interdependent learners.

The arrows (→) within the columns indicate that the skills described previously continue to apply to learners at subsequent stages and that more challenging tasks would enable further progression. Further information about progression across the columns is provided on page 4.

Plan	**Asking questions (to understand the problem).**	Ask why, what, how, where, when etc.	Ask questions related to context and listen before asking further questions.	Ask relevant questions and begin to link questions into sequences. Give reasons for choice of questions.	Ask questions that build on responses to earlier questions.	Ask more probing questions.	Identify the problem and set the questions to resolve it.
	Activating prior knowledge, skills and understanding.	Show awareness of personal needs and skills.	Identify and make links with prior knowledge and skills related to context.	Identify gaps and begin to build on existing knowledge, understanding and skills.	Build on existing knowledge, skills and understanding.	→	→
	Gathering information.	Choose from given options where to find information and ideas.	Suggest where to find information and ideas related to context.	Suggest how to find relevant information and ideas.	Suggest a range of options as to where and how to find relevant information and ideas.	Evaluate options.	→
	Determining the process/method and strategy.	Choose from given options what to do and how to do it.	Plan, with support, the process/method to be used.	Plan the process/method to be used.	Suggest alternative processes/methods; identify the learning/ thinking strategy to be used.	Explain why the process/method and strategy have been selected and identify possible problems.	Take account of possible problems when justifying why the strategy(ies) is to be used.
	Determining success criteria.	Identify, in response to questions, some basic success criteria for what is going to be done.	Determine some success criteria.	Determine success criteria and give some justification for choice.	Justify choice of success criteria.	→	→

Develop (creative and critical thinking)	**Creating and developing ideas.**	Show curiosity and explore everyday stimuli.	Generate imaginative ideas and possibilities.	Develop and begin to combine a variety of imaginative ideas, possibilities and alternatives, including those of others.	Develop and combine a variety of imaginative ideas, possibilities and alternatives.	→	→
	Valuing errors and unexpected outcomes.	Show surprise at unexpected outcomes.	Describe errors and unexpected outcomes.	Begin to make use of errors and unexpected outcomes.	Make use of errors and unexpected outcomes.	Value errors and unexpected outcomes and see the opportunities they present.	Build on unexpected outcomes as well as successes to re-evaluate.
	Entrepreneurial thinking.	Favour the familiar when presented with new ideas.	Begin to experiment with own and others' ideas.	Experiment confidently with own and others' ideas.	Begin to take risks with ideas, going beyond the conventional.	Take calculated risks with ideas, weighing up potential pros and cons.	→
	Thinking about cause and effect and making inferences.	See simple links between cause and effect in everyday routines; make and try out simple predictions.	Identify links between cause and effect; give reasons for inferences/ predictions.	Use some prior knowledge to explain links between cause and effect or justify inferences/ predictions.	Use prior knowledge to explain links between cause and effect and justify inferences/ predictions.	→	→
	Thinking logically and seeking patterns.	Identify obvious observed differences.	Identify and describe similarities and differences by making simple comparisons.	Identify, describe and begin to explain patterns and relationships.	Explain patterns and relationships and identify uncertainties.	Analyse patterns and explore uncertainties.	→
	Considering evidence, information and ideas.	Begin to distinguish fact from opinion.	Consider evidence, information and ideas to begin to distinguish between facts, beliefs and opinions.	Consider different interpretations and distinguish between facts, beliefs and opinions, giving reasons. Begin to recognise bias and reliability.	Identify and assess bias and reliability.	Evaluate in order to gauge bias, reliability and validity.	→
	Forming opinions and making decisions.	Begin to express own opinions and make decisions in everyday routines.	Form opinions and make decisions by weighing up some pros and cons.	Form considered opinions and make informed decisions.	Consider others' views to inform opinions and decisions.	Take different perspectives to inform opinions and decisions.	→
	Monitoring progress.	With support, follow the chosen process/method	Follow the planned process/method.	Follow the planned process/method, making some amendments where necessary.	Regularly check progress, making ongoing revisions to process/method, where necessary.	Justify any amendments.	→

Reflect	**Reviewing outcomes and success criteria.**	Begin to link outcomes to success criteria.	Link outcomes to success criteria.	Begin to evaluate outcomes against success criteria.	Evaluate outcomes and how far success criteria fully reflect successful outcomes.	Refine success criteria in the light of experience for future occasions.	→
	Reviewing the process/method.	Show or describe some of what has been done; identify, in response to questions, what worked and what didn't.	Identify what worked and what didn't; begin to suggest how the process/method could be improved.	Decide whether the process/method was successful; describe any amendments made; suggest how the process/method could be improved.	Justify amendments/ improvements.	→	→
	Evaluating own learning and thinking.	Show, in response to questions, some of what has been learned/found out.	Describe what has been learned/found out.	Describe how they have learned, and identify the ways that worked the best.	Identify the learning/thinking strategies they have used.	Justify the learning/ thinking strategies used and suggest other strategies that might have worked.	Evaluate and refine learning and thinking strategies for future occasions.
	Linking and lateral thinking.	Make links between everyday routines in different contexts.	Link the learning, with support, to other situations.	Link the learning to similar situations, within and outside school.	Link the learning to dissimilar but familiar situations, within and outside school.	Link the learning to unfamiliar or more abstract situations.	Integrate the learning and link it to more abstract situations.

Glossary – Section 1

Glossary to describe the meanings of terms used in Section 1.

Abstract – relating to theory rather than a real/actual situation/context.

Analyse – examine in detail.

Big picture – relating to a wide range of circumstances, some of which will be far away from the day-to-day life of the learner.

Concrete – relating to a real/actual situation/context.

Error/unexpected outcome – a necessary and valuable part of reaching the goal, and from which learners benefit by confronting their misunderstandings.

Evaluate – think carefully about something before making a judgment about its value, importance or quality.

'Fact' – something that could be taken as fact.

Interdependent – close cooperation between learners, e.g. within a focused small group discussion.

Justify – explain fully the evidence and reasons for reaching a particular decision or conclusion.

Learning – the skills, knowledge and understanding gained from carrying out the task. This should relate to the strategies used and the metacognitive elements as well as the subject-centred learning.

Metacognition – thinking about own thinking; tracing back how the task was tackled to understand own thinking and learning process.

Process/method – the procedure for the task – the 'what to do' and the 'how to do it'.

Strategy – a way of working to achieve something, especially one that can be applied over time/in other situations, e.g. listing positives and negatives as basis for evaluation.

Success criteria – the predicted elements of a high quality outcome.

Other important terminology for teachers

Concrete preparation – preparing the ground.

Cognitive conflict – setting the challenge.

Social construction – interacting with others to deepen understanding.

Bridging – making links within/outside subject area.

The framework for communication leads on from much of the work done over the past few years on developing literacy across the curriculum. It links elements from the proposals for language and literacy development in the Foundation Phase, levels for early literacy, the national curriculum Orders for Welsh, Welsh second language, English and modern foreign languages, and the Key Skills qualification, also called Communication, though it does not follow the format of any of these sources. The skills of communication have been separated as far as possible from the subject content of the language subject Orders. These skills apply to all subjects of the curriculum and have been organised into four elements relating to oracy, reading, writing and wider communication skills. Communication is taken to mean all forms of communication, not only that which depends on developed, unimpaired speech and hearing. The use of the word 'talk' in the first column of Oracy, therefore, refers to any kind of communication made by a speaker at an early stage of development. The Wider communication skills section includes non-verbal communication of all kinds – including gesture, mime, signing – and the expression of ideas and emotions through other mediums such as music and art.

The strands of each element are as follows:

Oracy:

Developing information and ideas.

Presenting information and ideas.

Reading:

Locating, selecting and using information using reading strategies.

Responding to what has been read.

Writing:

Organising ideas and information.

Writing accurately.

Wider communication skills:

Communicating ideas and emotions.

Communicating information.

Progression

Learners' progression in developing communication is described as you read across the columns from left to right. Progression 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.

Learners progress from needing support to more independent working. They move from listening and interacting with others in a general way to a situation where they choose to work with others as a deliberate strategy for reaching understanding. In these ways they become both independent and interdependent learners.

The arrows (→) within the columns indicate that the skills described previously continue to apply to learners at subsequent stages and that more challenging tasks would enable further progression. Further information about progression across the columns is provided on page 4.

Oracy	**Developing information and ideas.**	Listen and respond to others in familiar contexts, asking questions to obtain simple/specific information.	Show an awareness of the needs of the listener, asking questions and responding to the contributions of others.	Show an increasing awareness of the social conventions of discussion and conversation, contributing and responding appropriately.	Listen to the contributions of others, considering their points of view. Be flexible in discussions and respond aptly to what they hear.	Listen carefully, noting the strengths and weaknesses of viewpoints or lines of reasoning. Make significant contributions to discussions.	Listen perceptively, evaluating the strength of arguments and the thinking of others, identifying key messages. Make significant contributions to discussions, taking a range of roles and helping to move discussions forward.
	Presenting information and ideas.	Talk to themselves and to others and understand many more words than they can speak. Use simple vocabulary to convey meaning.	Communicate with increasing confidence to peers and others. Begin to modify their talk to the requirements of the audience, using a growing vocabulary.	Communicate clearly and confidently in a way that suits the subject, audience and purpose, using a range of vocabulary, including some key words related to subjects.	Communicate clearly and effectively in a way that suits the subject, audience and purpose. Use a wide and subject specific language.	Communicate coherently, engaging the interest of listeners. Use appropriate language forms.	→
Reading	**Locating, selecting and using information using reading strategies.**	Begin to differentiate between print and pictures.	Begin to find simple information using organisational devices and available clues to deduce meaning.	Use a range of word identification skills and different strategies to locate and reorganise ideas and information from different sources.	Use different reading strategies to locate, select and summarise information, identifying accurately the key points.	Use a range of strategies to identify key points, ideas and lines of reasoning.	Select, summarise and synthesise ideas and information.
	Responding to what has been read.	Look at texts with/without an adult, showing interest or enjoyment.	Respond to what is read, expressing opinions about major events or ideas and making connections between reading and own experiences.	Confirm their understanding by responding to texts orally and/or in writing, and taking into account the opinions of others.	Discuss and evaluate texts, using inference and deduction where necessary, and considering carefully the interpretations of others.	Discuss and show appreciation of texts, evaluating the writer's techniques.	Discuss texts, showing appreciation both of the text itself and of a range of interpretations.

Writing	**Organising ideas and information.**	Experiment with mark making using a variety of instruments on paper and/or other materials.	Write short creative and factual passages. Check work and sometimes correct errors.	Plan, organise and present ideas and information. Improve writing by redrafting.	Plan, organise and present ideas and information. Proof read and revise writing.	Write clearly and confidently, presenting ideas and information appropriately. Proof read, edit and revise work.	Write coherently, presenting ideas and information logically and effectively.
	Writing accurately.		Choose words for variety and interest, and spell simple words correctly/in a phonetically plausible way. Use simple punctuation and sentence structure.	Choose words to create effects. Choose an appropriate form, sequence and layout to suit audience and purpose. Spell most common words accurately, using a range of punctuation and sentence structures to enhance meaning.	Write effectively to suit audience and purpose, choosing appropriate vocabulary, punctuation and sentence structure. Spell accurately.	Write effectively, choosing from a repertoire of vocabulary and sentence structures, matching style to audience and purpose. Spell and punctuate correctly.	Write coherently for a full range of audiences and purposes, choosing from a wide repertoire of sentence structures and vocabulary.
Wider communication skills	**Communicating ideas and emotions.**	Begin to represent and respond to ideas and emotions through structured play activities that develop creativity.	Represent and respond to ideas and emotions through structured play activities that develop creativity.	Communicate ideas and emotions through work in art, craft, design, dance, drama, media and music.	Communicate ideas, emotions and information through more elaborate work in a range of mediums.	Communicate ideas, emotions and information confidently and consistently through more complex and elaborate work in a range of mediums.	Communicate ideas, emotions and information coherently through more complex and elaborate work in a range of mediums.
	Communicating information.	Represent and respond to information in different forms using pictures, sounds and symbols.	Represent and respond to information in different forms using pictures, sounds, symbols, diagrams and maps.	Represent and respond to information in different forms including pictures, sounds, symbols, diagrams, maps, tables and graphs.	Respond to a range of information and ideas in different forms. Integrate different forms into effective presentations.	Respond to an increasing range of information and ideas in different forms. Integrate different forms into presentations demonstrating control, proficiency and perception.	

As with those for communication and number, the framework for ICT leads on from much of the work done on developing ICT across the curriculum in the past few years. It sets out six stages of progression in ICT capability and brings together skills from the national curriculum ICT Order and the IT Key Skills requirements.

The framework has two strands:

- creating and presenting information and ideas
- finding and developing information and ideas.

The first strand maps capability in using ICT to communicate ideas, thoughts and intentions, selecting appropriate ways of giving information with the intended recipient or audience in mind. The second strand is about searching for information for specific purposes, and bringing together or processing that information in different forms to develop new information, which could be used to inform judgements and help make decisions.

The main indicators of progression in ICT capability in the two strands are:

- a developing sense of purpose and audience for the work
- increasing competence and sophistication in the use of software functions
- the gradual change from using given ICT resources to choosing and selecting resources to suit the task and purpose.

Progression

Learners' progression in developing ICT is described as you read across the columns from left to right. Progression 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.

Learners progress from needing support to more independent working. They move from listening and interacting with others in a general way to a situation where they choose to work with others as a deliberate strategy for reaching understanding. In these ways they become both independent and interdependent learners.

The arrows (→) within the columns indicate that the skills described previously continue to apply to learners at subsequent stages and that more challenging tasks would enable further progression. Further information about progression across the columns is provided on page 4.

ICT Skills Framework	**Creating and presenting information and ideas.**	Become aware that ICT can be used to communicate ideas.	Use given ICT resources to help create, present and share their ideas, e.g. using text/word-banks, images.	Create and present their ideas for a given purpose by combining different forms of information, e.g. text, clip art, images, sound/music, with some sense of audience.	Create and present information and ideas by combining a variety of different forms of information, e.g. text, digital images, tables, graphs, music files, with a developing sense of audience for their work.	Create and present information and ideas in consistent ways for different purposes by combining information from different sources, matching the needs of the audience.	Create and present information and ideas to meet the intended purpose and audience, selecting and using different layouts and techniques for different tasks.
				Share information with others, e.g. the use of e-mail.	Share different forms of information with others in appropriate ways, e.g. the use of e-mail with attachments; school web site.	→	
	Finding and developing information and ideas.	Become aware that information exists in a variety of forms.	Begin to find different sources of information with guidance.	Find suitable information from given sources, using simple searches, to support a range of activities.	Find relevant information from a variety of sources using key word and multiple word searches on data files and internet sources.	Find different types of information from a range of ICT sources, e.g. data files, CDs, Internet, and non-ICT sources, such as written notes, lists, diagrams, selecting relevant information.	Identify suitable sources of information, search for information using multiple search criteria, and interpret and select what is needed for different purposes.
			Begin to develop information and ideas, combining text and images.	Develop information and ideas by processing data from given sources to support their activities in a range of subjects, and begin to ask questions about bias of information sources.	Develop information and ideas for specific purposes by processing data from a variety of sources, checking accuracy and plausibility of information.	→	Develop and refine new information on which to make judgements and draw conclusions.

The framework for Developing number across the curriculum leads on from much of the work done over the last few years on developing numeracy across the curriculum, most of which was focused on Key Stage 2 and Key Stage 3. There has been much discussion over the past twenty years or so about what numeracy is, but there is general agreement that it involves more than just calculating correctly and also involves 'the ability to use number correctly and appropriately across a wide range of situations and contexts. This includes using number and graphical techniques to represent, interpret and analyse data as well as, for example, measuring, saving and spending, describing and comparing properties of shapes.' *(Aiming for Excellence in KS3: Raising standards in literacy and numeracy:* BBC Wales/Estyn/WAG/ACCAC, 2003)

The framework is intended to be as inclusive as possible. For this reason, the title for this section was chosen to be Number rather than Numeracy in order to be equally valid for the youngest and oldest learners, as well as those with additional needs. Number skills can be applied at all ages in different situations across the curriculum, as appropriate to learners' abilities, achievements and stages of development, contributing to a deeper understanding of subject contexts.

The framework links elements from the proposals for mathematical development in the Foundation Phase, early mathematical development for pupils with additional needs, the proposed revised mathematics programmes of study, and the Key Skills qualification, Application of Number, though it does not follow the format of any of these sources.

The format chosen for the Developing number framework has three main elements each with several strands, though these are not intended to be independent of each other:

Using information	**Calculating**	**Interpreting results and presenting findings**
Using numbers.	Using the number system.	Talking about and explaining work.
Measuring.	Using a variety of methods.	Comparing data.
Gathering information.		Recording and interpreting data and presenting findings.

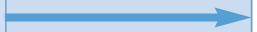
Progression

Learners' progression in developing number is described as you read across the columns from left to right. Progression 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.

Learners progress from needing support to more independent working. They move from listening and interacting with others in a general way to a situation where they choose to work with others as a deliberate strategy for reaching understanding. In these ways they become both independent and interdependent learners.

The arrows (→) within the columns indicate that the skills described previously continue to apply to learners at subsequent stages and that more challenging tasks would enable further progression. Further information about progression across the columns is provided on page 4.

Using information	**Using numbers.**	Use numbers in games and role play.	Use whole numbers in practical situations; use fractions in the context of simple shape. Recognise and use coins of different values.	Use decimals in the context of money and measures; use negative numbers in the context of temperature; use fractions of a whole and percentages in practical contexts.	Use ratio and proportion in practical contexts, including currency exchange rates, value for money and scale drawings.	Use whole numbers, decimals, fractions, percentages, negative numbers, ratio and proportion in a variety of ways in practical contexts.	→
	Measuring.	Compare two or more objects by direct comparison of physical properties.	Measure and compare length and mass; order events in time.	Choose and use units of measure and measuring instruments; read scales to an appropriate degree of accuracy.	Use more precise instruments with finer calibrations. Make reasonable estimates of a range of measures in everyday situations. Use correct units for compound measures such as volume, density or speed.	Read scales on familiar measuring equipment to given levels of accuracy.	Make accurate and reliable observations choosing equipment suitable to the task.
	Gathering information.	Count a small number of objects.	Gather data systematically by counting and by measuring. Extract data presented in lists, tables, charts, diagrams or graphs.	Gather information in a variety of ways, including from questionnaires or databases. Select data from given information presented in a variety of numerical and graphical ways.	Recognise the difference between, and the implications for, gathering discrete and continuous data. Access and select data from information presented in a variety of ways and from different sources.	Obtain the information needed in a variety of ways, including from written and graphical sources and by direct observation or measuring.	Choose how to obtain relevant information from different sources.

Calculating	**Using the number system.**	Join in with familiar number rhymes and songs.	Choose the appropriate operations when solving addition and subtraction problems.	Recognise the number operations needed to solve problems. Order large numbers to develop an awareness of size/magnitude and chronology.	Order negative numbers and decimals.	Identify suitable calculations to get the results needed for the task.	Select appropriate methods for obtaining the results needed, including grouping data when appropriate.
	Using a variety of methods.	Begin to use the concept of 'more'. Match pairs of related objects or pictures.	Use a variety of mental strategies to add and subtract small numbers.	Use a variety of methods of mental and written computation; solve numerical and practical problems, approximating or estimating as appropriate; check that the results are reasonable by referring to the size of numbers or the context.	Check the accuracy of results by estimating, approximating or using inverse operations to decide whether or not the results are reasonable.	Work to the level of accuracy required. Check calculations using different methods to make sure that they make sense. Use formulae to calculate in practical and everyday situations.	Carry out calculations involving two or more steps. Check results to identify and correct any errors. Show clearly methods of carrying out calculations, and give the level of accuracy of the result.
Interpreting results and presenting findings	**Talking about and explaining work.**	Talk about or show an awareness of activities involving number.	Use the language of number, shape and comparatives, and the symbols for addition, subtraction, multiplication and division when talking about work.	Use the language of position (including coordinates and compass points), movement, data and measures when talking about work.	Use correct mathematical language, symbols and notation when presenting work.	Use mathematical terminology and notation correctly when describing and explaining methods and findings.	
	Comparing data.	Match objects or pictures; sort objects according to a given criterion.	Sort objects, using one or more criteria.	Describe and compare sets of discrete data, using the mode, mean, median or range as appropriate.	Compare two sets of continuous data.	Use basic ideas of correlation to determine the inter-dependence of two variables.	Compare data in a variety of situations, using percentage, range, mean and median as appropriate.
	Recording and interpreting data and presenting findings.	Record numbers, initially by making marks or drawing pictures.	Record and interpret data in simple tables, lists, pictograms, charts, graphs and diagrams.	Record and interpret data in charts, diagrams, tables, bar charts/graphs and line graphs. Label graphs and their axes appropriately. Be aware that some conclusions can be uncertain or misleading.	Select from, construct and interpret a variety of methods of presenting data, including pie charts, scatter graphs, line graphs; recognise that some interpretations can be misleading.	Record and present gathered data in fully labelled formats.	Select and use methods to identify trends.

Glossary – Section 4

Glossary to describe the meanings of terms used in Section 4.

Number operations – add, subtract, multiply, divide.

Inverse operations – addition and subtraction, e.g. 2 + 4 = 6 so 6 – 4 = 2
multiplication and division, e.g. 2 x 4 = 8 so 8 / 4 = 2.

Ratio and proportion – For example, if orange squash is made up of one part juice to four parts of water, the ratio of juice to water is written as 'one to four', written as 1 : 4. The proportion of the squash which is juice will be ⅕ (one fifth).

Discrete data – can usually be found by counting, for example, the number of people on a bus.

Continuous data – is usually found by measuring and is never exactly accurate. The accuracy of a measurement depends on the precision of the measuring instrument. Also, there will be infinitely many values between any two measured values of continuous data. For example, day-time temperature might be recorded several times a day, but the temperature will have changed continuously between any two different measured values.

Mode – the most frequently occurring value of a set of numbers.
For example, 2, 5, 5, 3, 7, 8, 3, 3, 9 has mode = 3.

Median – the middle value of a set of numbers written in order. For example, 1, 23, 34, 42, 71 has a median of 34. 1, 3, 5, 8, 9, 26 has a median of 6.5 – halfway between the two middle values.

Mean – calculated by adding up all the values and dividing by the number of values.
For example, the mean of 1, 2, 4, 5, 8 is 4 (total of 20, 5 values).

Range of a set of data – the difference between the largest value and smallest value. For example, the range of 1, 2, 4, 5, 8 is 7.