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Curriculum planning guidance

Guidance

Guidance document no: 091/2013
Date of issue: January 2013

Curriculum planning guidance

Audience

Primary, secondary and special schools in Wales; Welsh local authorities and regional education consortia; unions; various organisations that have an interest in literacy and numeracy; and members of the public.

Overview

This guidance will help school senior managers to plan to embed literacy and numeracy throughout the curriculum as required by the National Literacy and Numeracy Framework (LNF).

Action required

None – for information only.

Further information

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Additional copies

This document is only available on the Welsh Government's website at www.wales.gov.uk/educationandskills

Related documents

National Literacy Programme (Welsh Government, 2012); *National Numeracy Programme* (Welsh Government, 2012); *The Skills Framework at key stage 2: An evaluation of the impact of the non-statutory Skills framework for 3 to 19-year-olds in Wales at key stage 2* (Estyn, 2011); *The Skills Framework at key stage 3: An evaluation of the non-statutory Skills framework for 3 to 19-year-olds at key stage 3* (Estyn, 2012); *Routes for Learning routemap* (Welsh Assembly Government, 2006); *Assessment of 5- to 14-year-old children's mathematical progress in schools in Wales* (Welsh Government, 2012); *Language, Literacy and Communication Skills* (Welsh Assembly Government, 2008); *Guidance on the teaching of writing skills* (Welsh Assembly Government, 2010); *Developing higher-order literacy skills across the curriculum* (Welsh Assembly Government, 2010).

This document is also available in Welsh.

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Contents

What is the purpose of this document?

This document is part of a suite of materials to support the implementation of the National Literacy and Numeracy Framework (LNF), which will become statutory in September 2013 for all learners aged 5–14.

The LNF has been introduced to raise standards in learners' literacy and numeracy skills by helping all teachers[1] to:

- develop curriculum content throughout the Foundation Phase Areas of Learning and across all subjects in Key Stages 2 and 3 to ensure that all learners have opportunities to develop and refine literacy and numeracy skills
- integrate literacy and numeracy into their teaching
- inform discussions with parents/carers, learners, and other teachers about learner performance
- help learners with their own self-assessment activities and planning for learning
- monitor, assess and report on individual learner performance
- identify learners who may benefit from intervention or who are working beyond age-related expectations.

The LNF should be used as:

- a tool for curriculum planning in order to progress literacy and numeracy skills development across the curriculum
- an assessment tool to track literacy and numeracy skills progression.

It will replace the Developing communication and number components of the non-statutory *Skills framework for 3 to 19-year-olds in Wales* (Welsh Assembly Government, 2008) while the Developing thinking and ICT components currently remain in place to guide schools on these important skills.

This document should be used as a starting point as to the way schools will address the new requirements set out in the LNF. It aims to clarify expectations and to provide advice on ways to proceed

[1] The term 'teachers' is used throughout to encompass practitioners from all phases and stages including teaching and learning assistants (TLAs).

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in order to embed the LNF in all teaching and learning. Literacy and numeracy skills must become the primary focus for planning in all subject contexts and therefore clear and coherent curriculum planning becomes an essential component to success.

Schools should, in future, start their planning from a position that differs from most past practice. With the arrival of the LNF, planning must include literacy and numeracy skills development from the start and not as an add-on. The LNF and its skills should therefore be the starting point and the whole curriculum and individual lessons should be planned with the development of those skills in mind.

This document is part of a suite of training and support materials which also include:

- **supplementary curriculum planning guidance** – for learners with additional learning needs (ALN); available January 2013
- **training pack** –to support schools in training teachers to implement the LNF; available January 2013
- **assessment materials** – to support schools and teachers with Assessment for Learning against the LNF; available September 2013
- **classroom tasks** – a pool of tried and tested resources that can be used across the curriculum to develop literacy and numeracy skills; available September 2013.

What is the LNF?

A curriculum planning tool

The LNF is first and foremost a curriculum planning tool that supports all teachers in embedding literacy and numeracy across the curriculum and developing the literacy and numeracy skills of their learners.

All schools will need to place the LNF at the heart of their curriculum planning. This document sets out the principles and whole-school practices to support such an approach including the steps that schools will need to take over time to meet these expectations.

As a curriculum planning tool, the LNF builds on the good practice in many schools, aiming to help bring about coherent approaches to developing and applying literacy and numeracy skills across the curriculum. In all schools, it is critical that such planning is truly throughout the Foundation Phase Areas of Learning and across the curriculum rather than just focused on English, Welsh and mathematics lessons.

Structure of the LNF

The LNF focuses on the learners' **acquisition** of, and ability to **apply**, the skills and concepts they have learned to complete tasks appropriate for their stage of development. Expectations are given for each school year from Reception to Year 9 in each of the elements and aspects. The LNF is designed to be inclusive of all learners, including those with additional learning needs (ALN). The Routes to literacy and Routes to numeracy components of the LNF describe progression into Foundation Phase for learners with ALN. Extension expectations are also given for those learners with higher-order literacy and/or numeracy skills, such as more able and talented (MAT) learners.

The two components of the LNF are divided into the following **strands**.

Within **literacy** the strands are:

- oracy across the curriculum
- reading across the curriculum
- writing across the curriculum.

Within **numeracy** the strands are:

- developing numerical reasoning
- using number skills
- using measuring skills
- using data skills.

Both the literacy and numeracy strands are further divided into **elements**. The literacy elements are further sub-divided into **aspects** for ease of use.

Although each of the components of the LNF is divided into strands, it is essential that the LNF is seen as being intertwined and linked.

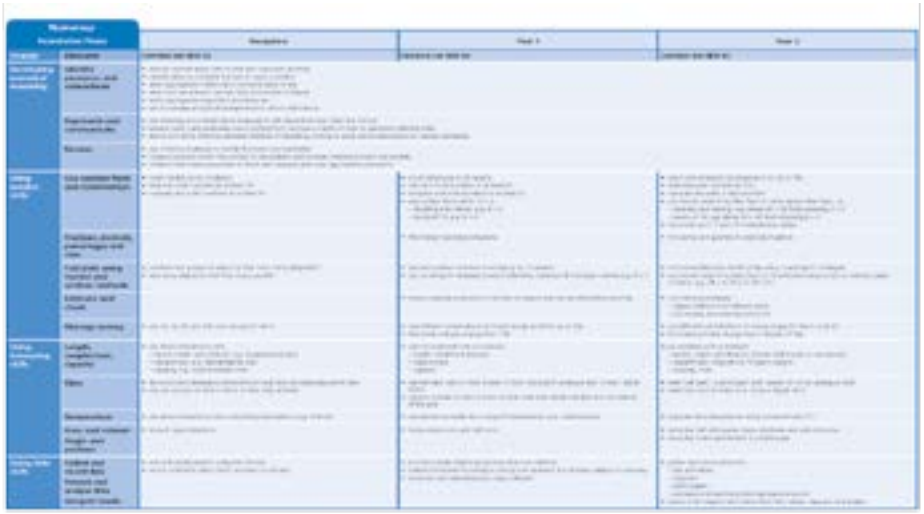
Literacy in the LNF presents oracy, reading and writing as three distinct modes of language, each with their own range of skills. However, each is dependent to a significant extent on the others. The teaching of these language skills should always be **integrated** so that each supports the others.

Numeracy in the LNF is described as consisting of four strands. However, Developing numerical reasoning underpins the three procedural strands of Using number skills, Using measuring skills, Using data skills. It is vital that numeracy is not viewed as four discrete strands, which are developed in isolation from each other. Development in numerical reasoning is the key to learner independence, confidence and ability in using numerical processing.

Literacy and numeracy skills themselves are linked and intertwined. It is crucial that the development of literacy – oracy, reading and writing across the curriculum – is linked to numeracy development and that the strands, elements and aspects of the LNF are interrelated as a whole. Oracy and writing should be viewed as the mechanism by which the understanding of numeracy skills is demonstrated. Reading skills are required to extract relevant information and data from tables, charts, graphs and text in order that numerical processing can occur to aid decision making. It is therefore important that learners become familiar with the subject-specific vocabulary of numeracy, with the techniques of extracting information from visual evidence and with the skills needed for effective communication of their ideas and findings.

Progression through the LNF

Progression is identified from early precursor skills, which are described in detail in the *Routes for Learning routemap* (Welsh Assembly Government, 2006), and into the Routes to literacy and the Routes to numeracy, then into the Foundation Phase. The columns in the LNF show how learners' skills are refined and augmented as they progress towards the expected standards for Reception. Some skill elements will not emerge until a later stage. In such cases, the relevant cells in the LNF are empty to show this.



Skills development, as described by the LNF, should be viewed as a continuum and not as a series of discrete skills to be learned and demonstrated each year from the age of 5 to 14. Progression is cumulative and each element/aspect assumes that the elements/aspects in previous years' expectations have been achieved and consolidated. It is not enough for a learner to have demonstrated achievement on a single occasion and for this to be recorded on a tick list. The skill needs to have been introduced, understood and used as a matter of course over time and in a range of examples, so that it becomes part of the learner's regular *repertoire* of applied skills.

Progression through the stages is demonstrated by an ability to develop and demonstrate increasing competence in literacy and numeracy skills. The expectations are essentially concerned with developing and recognising a learner's ability to select and apply literacy and numeracy skills in ways that are appropriate to each context. The expectations are designed to recognise learners'

progression in terms of both underpinning techniques and of the skills of application. Each age-related expectation builds on the previous year's expectation to ensure year-on-year progression for each element.

Learners with ALN may be working below age-related expectations for most, or all, of their school career. For example, below Reception, statements reflect incremental progression but are not related to age. These are within the Routes to literacy and the Routes to numeracy components. Learners of higher abilities may well be working above the age-related expectations. Careful planning for appropriate support, stretch and challenge to ensure that progression is maintained is particularly crucial in these cases and needs to be managed through progressive task development matched to learners' needs. Extension expectations are given for more able and talented learners who may be working above Year 9 expectations.

An assessment tool

The LNF is primarily a curriculum planning tool. However, it is also an assessment tool that informs teacher assessment. There will be no national data collection in relation to assessments made against the LNF.

Formal assessment against the LNF will become a statutory requirement from September 2014. This means that schools will have a full academic year to focus on embedding the LNF into their curriculum planning and their teaching and learning before being required to assess learners' progress against it.

Schools should still use the LNF to support Assessment for Learning (AfL) as part of good teaching practice. This will inform reports to parents/carers on their child's progress in literacy and numeracy, which will still be required on an annual basis from September 2013. The reports to parents/carers should include information based on the numeracy and reading tests and a narrative report on literacy and numeracy based on the LNF.

Assessment against the LNF should be formative, used by schools and individual teachers to support learner progress, classroom and curriculum planning. Teachers should use ongoing, formative, classroom assessment to monitor progress, discuss next steps needed for improvement with learners and set tasks that will give learners opportunities to make progress in their literacy and numeracy skills.

The LNF sets out clear progressive expectations for skills development for each year group up to Year 9. Comparison of individual learners' achievements against these expectations allows teachers to identify areas of strength and the development required. These should be used formatively with learners and communicated to parents/carers for annual reporting, in a narrative format, at the end of each academic year.

The LNF is not intended to be used as a 'best-fit' model of annual expectations. It should be used flexibly in order to generate the report of the progress of individual learners in terms of each learner's strengths and areas for development.

Teachers will not be expected, nor would it be appropriate, to use the LNF to arrive at a single statement about whether a learner is working at, above or below the expected level for their age. Similarly, assessment against the LNF will not yield 'levels' of literacy and numeracy as used in the national curriculum subject Orders. The purpose of the LNF is to support learners' development and application of literacy and numeracy skills in all aspects of learning and to identify strengths and areas for development as 'next steps' for improvement.

Schools and teachers will use the outcomes of their assessments to:

- inform short-, medium- and long-term planning for progression of skills across subjects and year groups and key stages
- report on the overall progress and standards across the school in relation to the LNF, as part of the annual governors' report.

It is critical in all schools that planning for assessment is integral to, and continuous with, curriculum planning. Assessment should be truly across the curriculum rather than just through English, Welsh and mathematics. Schools will need to ensure that whole-school systems are in place to support the consistent and rigorous assessment of literacy and numeracy skills across the curriculum.

In assessing progress against the LNF, learners may demonstrate competency in skills which does not coincide with their particular year group. The LNF describes a continuum of development and learners may progress further, faster or slower in some aspects than in others, with achievements spanning several columns. For an individual learner, this could evidence the need for specific

interventions, e.g. catch-up programmes, specific one-to-one support for ALN, stretch and challenge for more able and talented learners. In assessing progress in literacy and numeracy development for individual learners and identifying next steps to improvement, it is crucial to link to the learner's actual capabilities and not generalise for their year group expectations. Next steps to improvement should be **specific** to the progress of individual learners.

Next steps in progression

'Next steps' can be considered as a series of small improvements which a learner can make in order to 'close the gap' towards successive expectations in skills development described by the LNF. In planning effective learning opportunities, it is vital that next steps are considered not in terms of what learners can/can't do reliably and consistently but in terms of what they need to do next in order to make progress. Thus 'next steps' describe improvements learners need to put into action in order to make progress. These are most effective in supporting progression when they provide clear direction for learners, specifically identify where and how improvements can be made, and are generated in collaboration with the learners themselves. This means that for the LNF with its yearly expectations, some next steps to improvement will be within or between statements of expectation rather than a jump from one statement to the corresponding one in the following year group.

In order for a learner to make progress, consolidation and application of that skill in a variety of contexts (increasing in complexity, demand, familiarity of context and autonomy) needs to be carefully planned for. This describes differentiation in action for the LNF. The LNF aims for learners to be continually moving upwards. Increasing the level of demand and complexity of tasks may mean that learners initially need reminding how to apply their new-found skills. When writing sentences, for example, a learner in the Foundation Phase may be able to use capital letters. However, when asked to write about their favourite book, that same learner may not use capital letters for proper names. This should be expected and occurs until learners have had sufficient opportunity and practice to consolidate and apply these skills to the higher-order task, and with greater autonomy.

Timeline of implementation and support

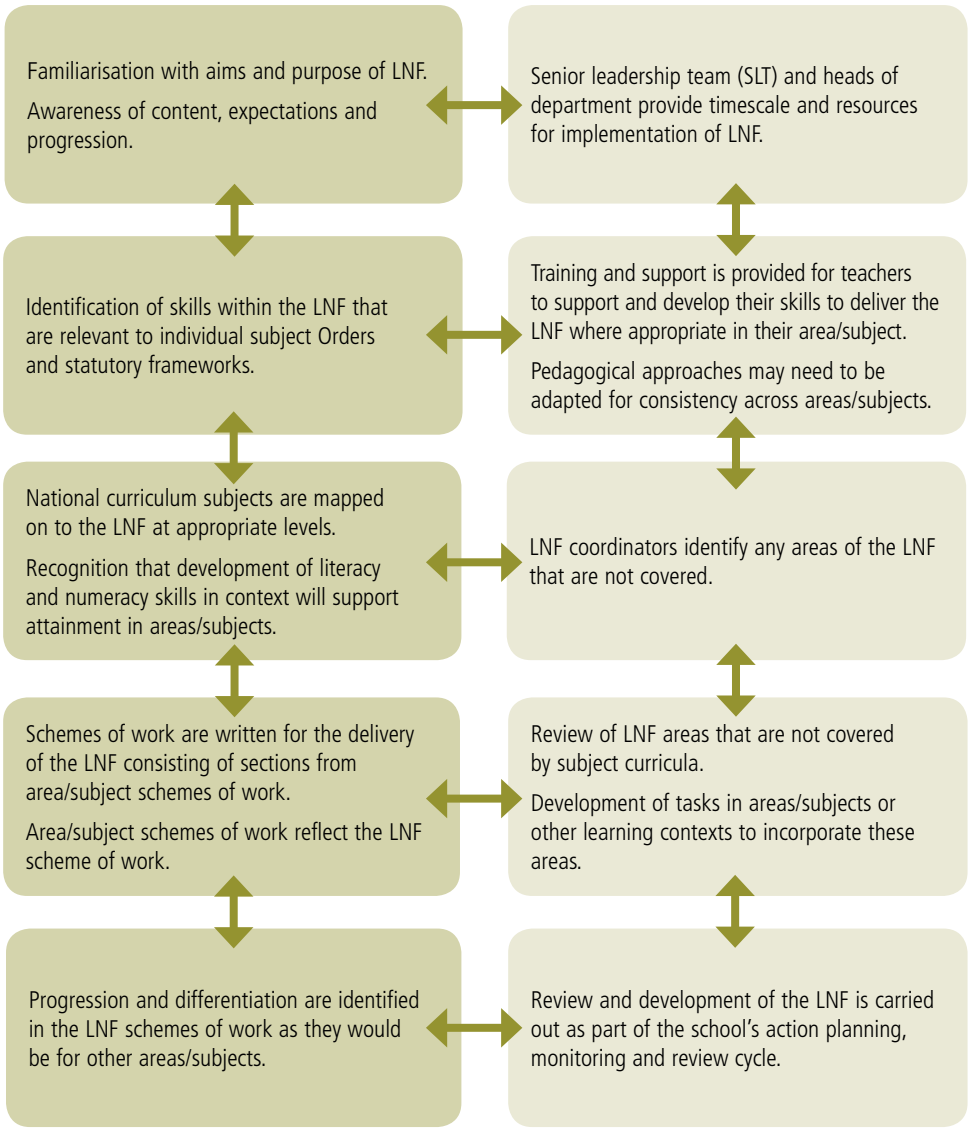
January 2013	National Literacy and Numeracy Framework (LNF) available to schools. Curriculum planning document available to schools. Training workshops available to schools.
April 2013	National support programme starts.
May 2013	Numeracy tests • Statutory procedural section of the tests. • Pilot/trial of reasoning section of the tests. Reading tests • Statutory – May 2013. • Optional diagnostic test material available.
September 2013	National Literacy and Numeracy Framework (LNF) statutory part of the curriculum. Assessment-related guidance and classroom practice materials available to schools.
May 2014	Numeracy tests • Statutory reasoning numeracy test. • Statutory procedural section of numeracy tests continue. • Statutory reading tests continue.
September 2014	Assessment against the National Literacy and Framework (LNF) introduced on a statutory basis.

How can we plan for delivery of the LNF?

In order to effectively integrate the LNF into current practice, curriculum planning needs to be coherent and continuous across all Areas of Learning/subjects. This is an iterative process. Teachers need to review and make changes to current provision to ensure that literacy and numeracy skills are integral to classroom practice and their progression across the curriculum is integral to learning and to raising standards in all subjects.

The diagram below shows possible stages to successful implementation.

Curriculum implementation – Key Stage 3



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In order for schools to successfully implement the LNF, a series of key questions are given in Appendix 1. These questions should lead senior managers to develop detailed and effective action plans. In addition, each stage in the diagram is exemplified here using case studies and models, which are in use in schools across Wales.

All schools should develop curriculum plans using the LNF as the starting point. Each school will be at a different stage in achieving this. The information in this section will help schools to develop a clear understanding of what they should be working towards and provide information on the stages that are needed in order to ensure that the LNF is delivered in a meaningful way which will raise levels of attainment.

Setting the context

Reviewing current provision against the LNF

A current provision review will hone teachers' thoughts as to:

- the needs of learners and how the curriculum currently meets these
- their key role in developing all learners' literacy and numeracy skills
- how the subject Orders/frameworks offer opportunities for developing literacy and numeracy skills
- how current planning and schemes of work need to be rebuilt to ensure they progress literacy and numeracy skills across subjects, for a particular year group and from one year group to the next
- how classroom practice needs to be changed to ensure opportunities for developing literacy and numeracy skills.

Most importantly it will give teachers first-hand experience of working through the LNF in order to begin to understand progression and expectations.

Schools should review their current position in terms of their teachers' prior knowledge and understanding to decide upon which activities are required in order to ensure that all teachers fully understand how they can best implement the LNF.

These activities will promote useful discussions as to how to revise schemes of work and learning plans and how pedagogical approaches need to be changed. Then, using the LNF as a starting point, teachers will be able to map literacy and numeracy across the curriculum and move on to formulating collaborative, progressive plans. The following case studies show how some schools are carrying out reviewing exercises in order to set the context and move to a position where teachers use the LNF as the starting point for curriculum planning.

Case study 1

Secondary school – reviewing the subject Orders and frameworks

Subject teams have reviewed subject Orders or frameworks and made decisions as to whether each statement has an explicit link to literacy and/or numeracy or an implicit link or no link at all. They used a simple coding system of 'sometimes', 'always' or 'never'. Intradepartmental discussions have taken place focusing on ways to rewrite schemes of work to plan for progression of the elements/aspects of the LNF.

The school's next steps are to hold interdepartmental training meetings to review how progression of the LNF's elements and aspects are integrated across a cohort. These meetings are to be chaired by the literacy and numeracy coordinators, as appropriate. Initially, the departments have been grouped with a focus on literacy and numeracy respectively with languages working with history, music, RE, art, and personal and social education (PSE) and mathematics working with science, design and technology, geography and PE. The focus will swap around within the next few weeks, to ensure all departments cover both literacy and numeracy.

Case study 2

Secondary school – mapping the LNF for a cohort

Teachers in this school are confident in the literacy and numeracy demands of their subject Orders or frameworks. They have worked in cross-curricular groups to map the LNF opportunities across each year group from Year 7 to Year 9 to better understand the experiences of that year group. Each teacher has worked within one year group. They have started to write schemes of work in terms of the elements and aspects of the LNF. Once the drafts are completed, they will then look at opportunities and progression across the whole key stage by reorganising the groups into cross-curricular, mixed year group working groups. This will ensure that they take into account adjacent years from the LNF in their planning. This is especially important when working with more able and talented learners or those with ALN.

Simple curriculum mapping and reviewing current provision against elements/aspects of the LNF as discussed in case studies 1 and 2 will only give information on where those specific skills are being used as a focus for learning. This alone will not support the development and progression of these skills. It is therefore essential that the next step is planning for **progression** of these specific skills using the LNF to provide support for expected outcomes.

Mapping progression in literacy and numeracy elements/aspects of the LNF

Knowing where the LNF skills are used across the curriculum and in schemes of work/learning plans is essential. However, for mapping to be used for successful curriculum planning, teachers need to be aware of where and how a particular element/aspect is first introduced and how it is then progressed across the curriculum and within a subject. In many cases, the skill could be initially introduced in English, Welsh, modern foreign languages or mathematics as appropriate. However, equally it could be introduced in other subjects.

Case study 3

Primary school – mapping looking at origins and development of skills

Teachers have reviewed when and where learners are introduced to a skill, and then where they consolidate its use before applying and finessing. They have reviewed all the elements/aspects of literacy and numeracy against current curriculum plans. This has led them to making decisions as to how to rewrite current learning plans to ensure that all the elements/aspects are progressed. It has also led them to review pedagogy so that a greater proportion of classroom time is focused on developing quality oracy skills through collaborative work with assessable outcomes.

In order for such a map to be useful, individual statements from the LNF have been discussed so that teachers can see how each skill is developed. An example of one of the literacy aspects is given here.

LNF: Writing across the curriculum: Organising ideas and information; Structure and organisation – looking at instructional writing

Year 3 English/Welsh – Learners are introduced to work on sequencing in narrative and other texts where sequence is important, e.g. instructions/explanations.

Year 4 design and technology – Learners review recipes and look at how they are written, including sequence, layout, language, develop success criteria for what makes a good recipe before writing their own recipe.

Year 4 history – Learners make notes on the sequence of an explanation of events. They plan to break the content into paragraphs and then write their explanation of how events happened.

Year 5 science – Learners apply knowledge of paragraphs through the year when writing in science reporting experiments and explaining what they have done. They learn about how to write introductions and conclusions.

Year 5 PE – Learners focus on accurate sequencing using appropriate language when writing orienteering instructions.

Year 5 design and technology – Learners use their knowledge of paragraphing and sequencing.

Year 6 science – Learners continue to apply this skill through increasingly detailed tasks, e.g. showing how an investigation is a fair test and how measurements used and made are meaningful including the use of SI units (numeracy link).

Year 6 design and technology – Learners continue to apply this skill through increasingly detailed and complex tasks, e.g. writing instructions for model design, which are shared with another group who build the model, writing up their explanation of their design and testing.

Year 6 geography – Learners involve numeracy skills in order to give accurate directional instructions when map reading. After going on the walk learners write up the route, including paragraphs, photos, diagrams, etc.

The school has specifically focused on a limited number of the elements/aspects of the LNF in each of several sessions in their weekly staff meetings. The individual teachers who plan to introduce a particular skill have explained to the rest of the teachers what they intend to do and the basic principles that underpin the skill. Discussion as to how this element/aspect is to be applied across the year groups has led to a common understanding of what progression looks like in each element/aspect of the LNF. It has also highlighted particular areas of plans which need to be completely rewritten in order to ensure progression.

All the schools in these three case studies recognise that the LNF's role is to support **progression** in all of the skill elements and aspects. Therefore it is not enough just to identify where the skills are being addressed. They have started to use their current position to bring about change so that they can plan for progression, using the LNF as the starting point. They are moving to a position where medium- and long-term plans will show how and when these skills will be progressed across a year group within schemes of work and learning plans and key stage/phase respectively.

Sharing good practice, support and training

Senior managers will be aware of where good practice is being shown in their schools in the development of literacy and numeracy skills. Initially, this could be in the areas of English/Welsh/MFL and

mathematics. Harnessing this expertise is essential to ensure these skills are developed across the curriculum. Cross-subject working groups would be a useful way of sharing such expertise, as would lesson observations. Further support could be from professional learning communities (PLCs), either within the school or between schools, focusing on literacy or numeracy. However, it is essential that pedagogy is also reviewed to ensure that classroom practice is central to skills development. For example, oracy skills are difficult to progress within a lesson if it is so teacher-centred that learners have little or no opportunity to discuss their ideas and plans in a collaborative manner. Therefore support needs to be both for literacy and numeracy development and for classroom practice.

Case study 4

Primary school – sharing good practice

The school's mathematics/numeracy coordinator observed lessons across the school with a focus on progression in numeracy. She developed a forward plan for twilight sessions in the specific areas of the LNF which were identified as requiring improvement. Three elements were identified. Within each training session she exemplified one of the elements with learners' work, asking teachers to identify progression and justify their reasoning. Teachers were then required to review their current planning to ensure that each element was progressed:

- across the curriculum
- across the year group
- from one year group to the next.

From carrying out this training, teachers agreed that they now better understood progression in these three elements. However, they were aware that the opportunities within their planning were focused more on procedure rather than numerical reasoning. Therefore further in-house training is planned to improve teachers' questioning processes in order to enable learners to explain their numerical reasoning.

Within action plans, senior managers should recognise where further support is needed. This could be in terms of understanding progression in literacy and numeracy skills, pedagogy and/or teachers' own skills in literacy or numeracy. Mechanisms for support could be internal or external, including working with the outstanding teachers of literacy and numeracy from the regional consortium. Whichever mechanisms of support are implemented, each process needs to be monitored and evaluated in terms of teacher development and learner outcomes in literacy and numeracy. Wherever possible all staff, including teaching and learning assistants (TLAs), should be supported and trained to ensure a cohesive approach to improving standards in literacy and numeracy.

Curriculum planning

Implementing the action plans developed through setting the context for staff and identifying their strengths and areas for development will put schools in the best position to successfully deliver the LNF. Curriculum planning, to develop long-, medium- and short-term plans, needs to ensure that teachers understand what **progression** of each element/aspect looks like and how to best progress them across the curriculum. All teachers should look at learners' work, tasks and oral interaction to really understand progression and start from the LNF in order to develop cohesive and progressive holistic plans.

Holistic, progressive curriculum planning will ensure that all learners benefit from implementation of the LNF and standards in literacy and numeracy are raised. Effective planning for progression should demonstrate the following.

Coherence and consistency

- All staff have a good knowledge of the LNF and shared understanding of what the expected outcomes would look like in a particular subject context.

Clarity of structure for skills development

- It is clear when, where and how specific skills will be introduced.
- The timing of these is appropriately linked to the LNF and allows for purposeful development and application in contexts across the curriculum.

- A cycle of introduction, consolidation, extension and evaluation for specific skills is evident using increasingly challenging and unfamiliar contexts to embed application across the curriculum.
- Tasks are designed with a specific skills focus in mind (as tasks become more complex and problem solving more challenging, a number of skills foci may be addressed).
- Tasks are carefully designed to be progressive (e.g. the nature of tasks used in Year 3 are in general less complex than those for Year 7 for the same skills focus – tasks are designed to build on previous achievements for the same skills focus).
- Tasks are differentiated to account for flexibility in learners' current positions in skills development. Broad problem-solving tasks allow learners to practise and demonstrate a number of elements/aspects within the same task. However, all tasks should allow learners to work on their 'next steps to improvement'. Therefore appropriate support (such as questions, structures, flowchart templates, etc.) should be designed and used where appropriate to support learners' next steps as well as ensuring sufficient stretch and challenge for more able and talented learners.

Planning for assessment

- Assessment against the LNF is formative, outlines strengths and areas of development and supports learners' improvement. This feeds into annual reports to parents/carers and schools' evaluation of standards.
- Formative assessment is ongoing and a part of everyday lessons. Specific wide-ranging tasks are identified as potential rich sources for formative assessment (which includes learner self-assessment, peer assessment and teacher-learner discussion). Such tasks should be drawn from different subjects across the curriculum, draw on a wide range of literacy and numeracy skills and allow a wide range of these skills to be developed.
- Learner self-assessment, peer assessment and teacher-learner formative assessment opportunities against the LNF are directly planned for.

Feedback cycle of monitoring and evaluation

- Learners' individual rates of progress are reviewed by monitoring the achievement of their 'next steps' to improvement in literacy and numeracy. Successive steps can be planned for and fed back to aid task development.
- Rate of progress of groups of learners (e.g. basic skills intervention catch-up groups, additional learning needs, more able and talented, free school meals (FSM)) can be compared and fed into school evaluations. This will allow interventions and actions to be refined.
- All plans are reviewed, their frequency planned for, and the outcomes used purposefully to improve approaches to literacy and numeracy development and standards achieved – evaluation of short-term plans should inform medium-term planning. Similarly evaluations of medium-term planning should inform long-term plans.

In planning for progression, it is essential that teachers do not simply refer to the yearly expectations in the LNF which coincide with their teaching group. As learners will be working above, below and within these expectations, it is imperative that teachers develop a good working knowledge of the skills development indicated for the years before and after their particular year group. Teachers from across different year groups, key stages and phases need to work together to share their understanding and develop meaningful tasks. Progressive skills development across the curriculum is likely to be more challenging for secondary settings than primary settings. Where possible, cluster collaboration would certainly enhance coherence and support transition. In secondary settings, cross-department collaboration is essential.

Planning for progression should permeate all forms of school planning – long-, medium- and short-term planning. Appendix 2 summarises some key issues which should be included for effective planning for using the LNF to support literacy and numeracy development.

Case study 5

Primary school – developing progressive, long-term plans

The school has ensured that all teachers and TLAs have been coached and trained in the requirements of the LNF. All are fully aware of the opportunities the LNF offers to improve learners' literacy and numeracy skills. Support mechanisms are in place to ensure teachers are regularly sharing good practice. In order to ensure progression is at the heart of their curriculum planning, they have used the LNF as a starting point to map progression across the elements and aspects.

Initially, they concentrated on long-term planning of the numeracy component of the LNF as a recent Estyn inspection had praised their literacy skills development. The LNF has been used as a framework for developing tasks to ensure progression of each element. A section from the initial draft of their plans is shown at Appendix 3. This would be further worked up to show the chronological progression in terms of topics to give long-term plans.

Discussions and training across the school have focused on numerical reasoning and the questions that need to be asked of learners in order for their reasoning to be understood by teachers and TLAs. The appropriate section of this strand is also shown in their plans to ensure the focus is not just on the procedural elements of numeracy. Within lesson plans, they aim to develop a series of focused questions to try and elicit learners' numerical reasoning.

The next step for the school is to review all their long-term plans for literacy and numeracy progression to ensure full curriculum coverage. This will be informed and consolidated as they develop their medium-term plans and write their schemes of work. The school has recognised that lesson plans need to take account of learners' current position, and give opportunities for all learners to consolidate and apply their skills in literacy and numeracy. Therefore, once schemes of work are in place, senior managers will lead on further coaching and training to enhance lesson planning by the formative assessment of learners' next steps for improvement. The school intends to monitor and evaluate the implementation of the LNF through classroom observations, learner voice questionnaires and tracking learners' progress. These evaluations will feed back into the planning process.

Case study 6

Secondary school – developing progressive, long-term plans

The school have been heavily committed to raising standards in literacy for the past three years. All teachers have been trained in progression through oracy, reading and writing and all have schemes of work which enable learners to develop effective, high-level literacy skills. In the last six months, the focus has switched to numeracy. The school has used the materials around the consultation on the LNF to action plan their approach to numeracy and enhance that for literacy.

Following familiarisation with the LNF through a training session from the literacy and numeracy coordinators, staff were asked to identify skills from the LNF that were relevant to their subject Order or framework. Senior managers developed an action plan with subject leaders and literacy and numeracy coordinators to include a timescale and the resources that would be required. Their action plan is a 'living document' to allow for the outcomes of their monitoring and evaluation processes to reshape it as time progresses.

All staff had already been trained in effective questioning through school-based PLCs. Following the training, departments were asked to focus on numerical reasoning at any point where numeracy was being used in their lessons. The PLCs were also asked to use some of their time to develop generic questions which could be used to try and get learners to articulate their numerical reasoning.

On a training day, cross-departmental groups were set up to review how numeracy could be progressed across subjects. Each group focused on one year group from Year 7 to Year 9. Using the LNF as a skeleton they decided on how each element could be:

- introduced
- consolidated
- progressed.

They mapped progression for each element (or part of an element) across subjects for each year group.

In the afternoon, the groups were given all the progression plans that had been developed in the morning, i.e. Years 7 to 9. Teachers were asked to review progression from one year group to the next and make amendments to the plans. Appendix 4 shows these initial plans. Developing numerical reasoning from the LNF is also included to focus teachers on this underpinning strand of the numeracy component of the LNF.

The school recognises that it still has a way to go before numeracy is effectively planned for and delivered across the curriculum. From its action planning, it has highlighted areas of good practice and has paired up teachers from across departments to act as 'buddy' mentors. The timetable has been amended so that the pairs observe each other's lessons on a fortnightly basis and have sufficient time to discuss their own next steps to improvement.

Cross-departmental literacy and numeracy groups have been set up to review progress in terms of impact on classroom practice and learners' literacy and numeracy skills. All departments are currently planning new schemes of work which will give a more holistic progression in literacy and numeracy skills development.

The school is working closely with learners, parents/carers and governors to keep all informed and to assess the impact of the changes.

Roles and responsibilities

In all phases, a whole-school approach to the teaching of literacy and numeracy across the curriculum is essential so that there is a shared and coherent vision across the school. Although every teacher plays a central role in supporting the development of literacy and numeracy, whole-school coordination will be led by senior managers and literacy and numeracy coordinators. In some schools the coordination role is performed by a team made up of literacy and numeracy specialists and teachers who have demonstrated good practice in teaching literacy and numeracy across the curriculum. The roles of literacy and numeracy coordinators are crucially important if there is to be a consistent approach across the school and all teachers are to become confident about ways to improve their learners' skills. Schools' senior management should fully support

the coordinators by ensuring they have sufficient status, experience, time and resources to carry out their jobs effectively.

Senior managers should:

- identify the school's particular curriculum and assessment needs, consider the possibilities and come to decisions about the organisation of the whole curriculum and the planning of learning pathways to suit the needs of individual learners
- identify opportunities for and facilitate the sharing of good practice within the school
- monitor the range of teaching and learning activities, ensuring that approaches are fully integrated
- review and update teaching pedagogy through the provision of appropriate coaching/training, establishing inter- and/or intra-school PLCs using outstanding teachers of literacy and numeracy to act as system leaders
- work with literacy and numeracy coordinators to coordinate feedback to parents/carers
- work with literacy and numeracy coordinators to organise and disseminate whole-school training
- evaluate the impact of this coaching/training on raising standards for all learners
- monitor, evaluate and report to governors on standards of literacy and numeracy throughout the school and the impact of actions aimed at raising these standards.

Literacy and numeracy coordinators or teams should work with senior managers, subject leaders, teachers and TLAs to:

- review the LNF provision and identify opportunities to develop and apply literacy and numeracy skills
- audit existing examples of good practice in literacy and numeracy across the curriculum
- advise on how good standards of literacy and numeracy help to improve standards across the curriculum, as well as how to introduce and consolidate the teaching of literacy and numeracy skills

- coordinate the production/revision of a school policy for developing literacy and numeracy across the curriculum
- ensure consistency of approach across the school
- identify areas of literacy and numeracy that teachers are least confident of teaching within the context of a particular subject and discuss with senior managers measures needed to address the identified issues
- facilitate/broker school-based in-service training (either as a whole school or with a group of subjects/departments) on aspects of literacy and numeracy
- evaluate the whole-school impact of applying LNF and the above approaches.

Heads of department/subject coordinators working with teachers should:

- work closely with other subject areas to coordinate programmes of work, including timing of teaching specific strategies and concepts
- identify opportunities for developing literacy and numeracy skills in schemes of work/learning plans
- map progression in literacy and numeracy skills across year groups and phases/key stages
- ensure coherence and consistency in the application of literacy and numeracy skills linked to the LNF across the subject area and all teaching staff
- ensure coherence and consistency in the application of literacy and numeracy skills linked to the LNF across other subject areas and all teaching staff
- work with departments and teachers to plan progressive, differentiated and challenging tasks that will allow learners to demonstrate understanding and develop and consolidate the full range of literacy and numeracy skills
- liaise with literacy and numeracy coordinators to share formative assessments of learners and cohorts in terms of areas of strength and development
- monitor and evaluate the impact of these approaches on standards of learning for subject areas.

All teachers should:

- be familiar with the LNF and progression through it
- understand the importance of literacy and numeracy skills in relation to raising standards of work in their own subjects
- fully integrate these skills into their planning to provide exciting new learning experiences for learners
- identify opportunities to develop and apply literacy and numeracy skills within subjects and across the curriculum
- plan for a literacy/numeracy skills focus in all lessons
- plan tasks that will allow learners to demonstrate understanding and develop and consolidate the range of literacy and numeracy skills
- liaise with literacy and numeracy coordinators, heads of subject/subject coordinators and teachers of other subjects to identify contexts through which literacy and numeracy skills can best be developed
- identify areas for refinement and suggest best ways to improve further as part of their ongoing 'assessment conversations' with learners, integrating comments on literacy and numeracy skills into their day-to-day discussion and feedback
- monitor and evaluate the impact of these approaches.

Classroom delivery

Once the LNF has been mapped and planned for, teachers and schools as a whole will need to consider how to deliver its contents in the classroom. Best practice, as always, will be engaging and motivating for learners in terms of contexts and involvement in tasks. All teachers are responsible for developing learners' literacy and numeracy skills. Therefore all need to understand the integration of the skills within literacy and numeracy.

Setting challenging tasks to progress literacy and numeracy

Tasks should be set that aim to introduce, consolidate, apply and make progress in specific literacy and/or numeracy skills. Each learner will be at different points in each skill. The choice of task/learning opportunity is crucial to success.

The demand of the task in terms of literacy and numeracy skills, as well as subject content, needs to be matched carefully to the learners' individual next steps. If the task is inappropriate in terms of context and/or demand progress will be lost.

As teachers develop their understanding of progression across the LNF, they will more readily be able to formulate next steps for learners. In addition, learners will be more able to make decisions in relation to their own next steps, initially with support from teachers.

Assessment

Assessing learners' progress in their development of literacy and numeracy skills will be formative and ongoing and supplemented by their outcomes in the annual reading and numeracy tests. However, there will be an annual requirement for teachers to make a summative report of learners' progress and to identify areas for improvement.

Teachers will need to assess progress as part of everyday classroom practice, however they organise their classrooms, and will therefore need to develop appropriate strategies for the assessment of literacy and numeracy skills. These could include:

- whole-class assessment of a particular element/aspect by setting all learners the same task, such as analysis of data by writing a report
- next steps assessment, by grouping learners in similar positions across the LNF in terms of a particular element/aspect and setting each group either:
  - the same task with different levels of support
  - different tasks focused on the particular skill under development for that group
- next steps assessment looking at the application of a particular element/aspect by identifying a group of learners to assess prior to the lesson and, once the group work is underway, concentrating their attention on that group, while ensuring the rest of the class remain on task.

Many teachers already use a 'next steps' approach to assessing learners' work, usually recording these in learners' books. Similarly in many classrooms, peer and self-assessment use the same method. If this approach is to be successful, assessment of

literacy and/or numeracy skills cannot reasonably be of the whole class at the same time as this would amount to inordinate quantities of written 'next steps'. If learners' books are the main point of reference for recording achievements and next steps, then selecting when and how to do this will be a matter for the school and each individual teacher.

Making brief, temporary, field notes might be useful when observing a group of learners for assessment purposes. For oracy, learners could use audio or video equipment to record themselves, which could be viewed by the teacher following the lesson. Out-of-class tasks and brief, focused summative assessments could supplement this information.

Reporting

Reporting to parents/carers will be annual, at the end of each academic year. Although the Welsh Government will not be collecting national data, individual local authority consortia could well request data/information from schools. Currently, the consortia are formulating their plans for integrating the LNF outcomes into their current practices.

Reporting should be narrative in nature with reports concentrating on elements/aspects that learners have consolidated and those where improvement is needed.

Schools will need to review their current reporting structures, systems and actual report content in order to take account of the opportunities and requirements of the LNF. Key questions to consider when developing reports are given here.

- How do our reports currently focus on literacy and numeracy?
- How do our reports need to change to take account of the LNF and ensure they:
  - focus on strengths and areas for development?
  - are clear and understandable to learners as well as parents/carers?
  - are clear for successive teachers and (where appropriate) schools?

- How well does our current annual governors' report structure support the inclusion of a formative report on standards in literacy and numeracy?
- How should we change our reporting systems to ensure they are manageable and fulfil the requirements of the LNF?

In order to ensure that each report is personal to the learner, it is wise to steer away from comment banks, either internally produced or commercial. The fact that each teacher needs to write a specific report for each learner will enhance teachers' engagement with the LNF. However, current report formats will need to be revised to ensure that literacy and numeracy skills are viewed with the highest priority.

Appendix 1: Checklist for senior managers

Setting the context

- Do all staff know about the LNF?
- Are all staff aware of the key messages of the LNF?
  - All teachers are teachers of literacy and numeracy.
  - Literacy and numeracy skills are essential to raise standards in all subject areas.
  - Literacy and numeracy should be developed across the curriculum.
- How do we need to update our school policies on literacy and numeracy to reflect the LNF?
- How is the LNF reflected in other school policies and plans?

Reviewing current provision

- How we will work towards using the LNF as a starting point for curriculum planning?
- Have we considered the best methods for mapping our current curriculum across the LNF?
- How will we use curriculum maps to develop an approach to improving literacy and numeracy across the curriculum?

Mapping progression

- How shall we look at where each new skill is introduced and then how it is consolidated and then applied across the curriculum for each learner?
- What measures need to be put in place to ensure all teachers understand progression?

Action plan – identifying what needs to be done, how, by whom and by when. How will we monitor and evaluate progress towards our goals?

Sharing good practice, support and training

- Have we set aside appropriate time to deliver the training sessions to all staff?
- What extra training needs for staff have been identified and how can these best be provided for within or outside school?
- Have we identified good practice in relation to literacy and numeracy across all subject areas in the school?
- How can we build on this good practice?
- How common are our shared expectations of what quality looks like for literacy and numeracy development in different subjects?
- How can support be provided from within the school?
- What external support is available, such as outstanding teachers of literacy and numeracy, inter-school PLCs?
- Do we need to introduce mentoring between teachers or observing lessons to help support the introduction of the LNF? If so, how will we do this?
- How do staff need to be supported to ensure the development of specific literacy and numeracy skills within their lesson plans?
- How will each teacher be supported to develop effective, relevant and interesting tasks in schemes of work?
- How will we ensure classroom pedagogy supports successful development of literacy and numeracy skills?

Action plan – identifying what needs to be done, how, by whom and by when. How will we monitor and evaluate progress towards our goals?

Curriculum planning

- How can we break down what we need to do into short-, medium- and long-term plans?
- How is each subject area/department going to update/rewrite their schemes of work?

- Do lesson plans and schemes of work use the LNF as a starting point? How can we work towards this?
- How do we involve learners and parents/carers in this process of change so that everyone is on board?
- How can we ensure differentiation of literacy and numeracy tasks across the curriculum?
- How will we ensure that raising standards remains a focus at every stage of the planning process?
- How can we ensure on an ongoing basis that literacy and numeracy development throughout the curriculum is challenging for **every** learner?

Monitoring and evaluating

- How will the school monitor and develop the introduction of the LNF on an ongoing basis?
- How will we evaluate our progress as a school?
- How will we evaluate teachers' progress in their ability to deliver effective lessons focused on progressive literacy and numeracy skills across the curriculum?
- How will we monitor and evaluate learners' standards in literacy and numeracy?
- How will we evaluate intervention procedures?
- How will we evaluate the consistency of our approach?
- How will we communicate the changes to all learners and parents/carers in a way that is supportive and raises standards?
- How do our reporting processes enable learners and their parents/carers to be fully aware of what they need to do to improve their literacy and numeracy?

Appendix 2: Methodology for curriculum planning

Long-term planning		
Action point	**Examples**	**Key issues to be addressed**
Across phase/key stage	Subject/departmental action plans School action plans Subject/departmental overview of phase/key stage School overview of skills development through subjects for phase/key stage 'Themed' overviews for combinations of subjects	Ensure all skills in LNF are addressed across the phase/key stage (starting with **simple auditing against the LNF** to ensure no gaps in provision but moving to how skills will be progressed). Ensure **coordination and appropriate timing** for teaching strategies so that they can be used and applied purposefully across the curriculum (identification of how and when these strategies will be formally taught so they can be further developed). Clear demonstration of how skills are **progressed within the phase/key stage** by cross-curricular application. Clear demonstration of models of intervention/support for learners achieving below and above expected standards to ensure progression in literacy and numeracy. Clear identification of range of evidence used for assessment against expected outcomes in LNF. Frequency of cohort monitoring and assessment against yearly expectations. Outcomes of reviews of medium-term plans fed into yearly monitoring and evaluation of long-term plans.

Medium-term planning		
Action point	**Examples**	**Key issues to be addressed**
Across year group within phase/key stage	Subject schemes of work/termly learning plans School overview of cross-curricular termly learning plans	Ensure all skills in LNF are addressed for the year group by application across the curriculum. Clear demonstration of how a skill is **consolidated and progressed** within the year group (by considering LNF expectations for year group before and after). Evidence of progressive cross-curricular task-planning for the year (e.g. by term). Clear identification of range of evidence used for assessment against expected outcomes in LNF. Evaluation of cohort and individual strengths/areas of development. Evaluation of progress of groups of learners (e.g. Basic Skills, ALN, more able and talented, boys) to ensure interventions are appropriate and successful. Outcomes of reviews of short-term plans fed into termly monitoring and evaluation of medium-term plans.

Short-term planning		
Action point	**Examples**	**Key issues to be addressed**
Day-to-day/ weekly planning for individual learners and classes	Lesson plans Weekly planning	Clear identification of literacy/numeracy focus linked to LNF for tasks in contexts from across the curriculum. Challenging tasks used to consolidate and extend understanding in focused literacy/numeracy skill. Differentiation within tasks to provide support towards consolidation and to extend development for focused literacy/numeracy skill. Ensure assessment for learning strategies will be used to support formative feedback for learners. Variety of learner groupings used to assist effective learning through oracy and formative peer feedback and self-assessment. Monitoring and evaluation of short-term plans to inform planning for next steps against LNF expected outcomes.

Appendix 3: Primary school – developing progressive, long-term plans

Strand: Using data skills
Elements: Collect and record data, Present (and analyse) data, (Interpret results)

Focusing on **presenting** and **recording** only (text in brackets was not covered in this map).

	Year 3	Year 4	Year 5	Year 6
LNF	Learners are able to: • represent data using: – simple lists, tally charts, tables and diagrams – bar charts and bar line graphs labelled in 2s, 5s and 10s – pictograms where one symbol represents more than one unit using a key – Venn and Carroll diagrams.		Learners are able to: • represent data using: – lists, tally charts, tables, diagrams and frequency tables – bar charts, grouped data charts, line graphs and conversion graphs.	
Introduce through	Listing and tally charts of types of toys. Tables with format given for savings of classmates. Bar charts (format given) of pictograms of toys. Bar line graphs (format given) of number of learners in the school over the past 20 years. Pictograms of toys. Venn diagrams of colours showing colour mixing (given format). Carroll diagrams (given format) of classmates.		Tally charts (see Year 3/4) converted to frequency tables of heights in class. Bar charts (see Year 3/4) of local population statistics (own format). Grouped data charts (given format) of simple population statistics. Line graphs (format given) of plant growth. Conversion graphs (format given) of dollar and euro to £s.	

	Year 3	Year 4	Year 5	Year 6
Consolidate through	Listing and tally charts of types of pets, animals in zoo. Tables with format given for shoe size, weather records, Henry VIII's wives. Bar charts (format given) of rainfall, shoe size. Bar line graphs (format given) of length of jump against shoe size, recycling over the last 50 years. Pictograms of pets, animals in zoo. Venn diagrams (given format) of numbers (divisible by 2 and 3), two classmates' features. Carroll diagrams (given format) of shapes, cakes, cars.		Tally charts converted to frequency tables (given format) of exercise review of classmates, wind speed over time. Bar charts (own format) of paper clips picked up by magnets, women's jobs in Wales in 1900 compared with today. Grouped data charts (given format) of migration statistics of birds, Victorian families. Line graphs (format given) of human growth, temperature fluctuations in holiday resort compared to Wales, speed of cars. Conversion graphs (format given) of birth length and adult height, stretch of spring and mass to work out unknown mass.	
Progress through	Listing and tally charts of litter – grouping on materials, tally charts, summing and converting to a table (own format). Bar charts (own format) of causes of death in World War II. Bar line graphs (own format) of bulb brightness and number of batteries. Pictograms of eye colour (own format) converted to bar charts (format given).		Tally charts converted to tables (own format) of traffic survey, healthy eating findings. Bar charts (own format) of bulb brightness, traffic survey, healthy eating. Population statistics converted to grouped data charts (own format). Line graphs (own format) of leg length against speed over 100m.	

	Year 3	Year 4	Year 5	Year 6
	Venn diagrams of dinosaur toys (colour and type) – no format given. Venn diagrams using three categories for comparing weather in three parts of Wales (no format given). Carroll diagrams (own format) of favourite TV programmes and adverts.		Draw own conversion graphs of a foreign currency (figures rounded). Conversion graphs (own format) of weight and mass on Earth with deduction of relationship.	

Developing numerical reasoning

Identify processes and connections

Learners are able to:

- transfer mathematical skills to a variety of contexts and everyday situations
- identify the appropriate steps and information needed to complete the task or reach a solution
- select appropriate mathematics and techniques to use
- select and use suitable instruments and units of measurement
- choose an appropriate mental or written strategy and know when it is appropriate to use a calculator
- estimate and visualise size when measuring and use the correct units.

Represent and communicate

Learners are able to:

- explain results and procedures clearly using mathematical language
- refine informal methods of recording written calculations, moving to formal methods of calculation when developmentally ready
- use appropriate notation, symbols and units of measurement
- select and construct appropriate charts, diagrams and graphs with suitable scales.

Review

Learners are able to:

- select from an increasing range of checking strategies to decide if answers are reasonable
- interpret answers within the context of the problem and consider whether answers, including calculator, analogue and digital displays, are sensible
- draw conclusions from data and recognise that some conclusions may be misleading or uncertain.

Appendix 4: Secondary school – developing progressive, long-term plans

Strand: Using data skills
Elements: Collect and record data, Present (and analyse) data, (Interpret results)

Focusing on **presenting** and **recording** only (text in brackets was not covered in this map).

	Year 7	Year 8	Year 9
LNF	Learners are able to: • collect own data for a survey, *e.g. through designing a questionnaire* • construct frequency tables for sets of data, grouped where appropriate, in equal class intervals (groups given to learners) • construct a wide range of graphs and diagrams to represent the data and reflect the importance of scale (• interpret diagrams and graphs (including pie charts) • use mean, median, mode and range to compare two distributions (discrete data)).	Learners are able to: • plan how to collect data to test hypotheses • construct a wide range of graphs and diagrams to represent discrete and continuous data • construct frequency tables for sets of data in equal class intervals, selecting groups as appropriate • construct graphs to represent data including scatter diagrams to investigate correlation (• interpret diagrams and graphs to compare sets of data • use mean, median, mode and range to compare two distributions (continuous data)).	Learners are able to: • test hypotheses, making decisions about how best to record and analyse the information from large data sets • construct (and interpret) graphs and diagrams (including pie charts) to represent discrete or continuous data, with the learner choosing an appropriate scale (• select and justify statistics most appropriate to the problem considering extreme values (outliers) • examine results critically, select and justify choice of statistics recognising limitations of any assumptions and their effect on the conclusions drawn)

	Year 7	Year 8	Year 9
			• use appropriate mathematical instruments and methods to construct accurate drawings.
Introduce through	Develop a questionnaire to survey favourite pastimes/hobbies (M). Construct frequency tables of time spent on pastimes/hobbies for learners in the year (given format) (M) – convert to frequency graphs (histograms) (M). Construct line graph (own format with some support) of average temperature per month in Wales over a year (G). Construct simple bar chart (own format) of percentage recycling per year in Wales and complex bar charts (own format) of recycling compared with reusing per year in Wales (DT). Construct scaled timeline (given format) of their own life this far (H).	Develop a hypothesis to test whether boys are taller than girls (M). Plan how to collect data. Construct frequency tables of height of learners in the year (own format) (M) – convert to frequency graphs (histograms). Construct line graph of thickness of insulation against temperature change (S). Construct complex bar chart (own format) of composition of five iron ores (and make decisions as to which would be the best ore for extracting iron) (S). Construct scatter diagram (given format) to compare shoe size with height of classmates (M).	Develop and test a hypothesis to investigate population density and movement and the development of new towns (G). Construct pie chart of modes of transport to get to work – 1940 compared with today (M). Extracting data from a diagram to show how a catalytic converter works and converting this information into a pie chart. Construct line graph to compare heart rate over time with exercise (use to develop ideas of mean compared with mode and median) (S). Construct complex bar chart (own format) to compare percentage energy resources used in eight European countries (S).

	Year 7	Year 8	Year 9
	Discuss discrete and continuous variables – what they are and how to represent graphically (M). Drawing to scale a plan of the classroom (M).		Construct scatter diagram of distance travelled by a car per litre of fuel against engine size (M), average number of decayed teeth per person against sugar consumption in different countries (DT). Use mean, mode and range to compare two continuous data sets for census data for the same street in pre-Industrial Revolution and after in locality (H).
Consolidate through	Develop questionnaires to survey eating habits of the class, most useful inventions (DT), memories of World War II (H), favourite holiday destinations (M), the use of different ICT equipment by class (ICT), opinions about film genres to write a review (E/W). Construct frequency tables (given format) of eating habits (S), favourite holiday destinations (M), phenotypic features of class (S) – convert to frequency graphs.	Develop a hypothesis about how recovery time after exercise affects an athlete's performance. Plan how to collect data to test this hypothesis (PE). Construct line graphs (own format) of population of Wales over time (G), employment in Wales over time, number of cigarettes smoked and death before 60 years of age (PSE), temperature fluctuations over time in two different countries (G), cooling curves of different solutions, to	Develop and test hypotheses to consider greatest factor in earthquake destruction by looking for relationships between size of earthquake and duration, distance from epicentre, population density, etc. (G), what makes a good parachute, where the best place is to site a wind generator. Construct pie charts of air composition, energy generation in the UK (S), unemployment in Wales in 1950 compared with present day (PSE).

	Year 7	Year 8	Year 9
	Construct line graphs (own format) to consider relationships between rainfall against time and location over a week in school grounds (G), dissolving sugar and temperature/time, stretch of a spring and the mass on it (S). Construct simple bar charts (own format) to investigate the number of people of each religion in Wales (RE), average rainfall over a year in Wales (monthly) (G), land owned by principal landowners in the Domesday Book (H). Construct complex bar charts of two manors in the Domesday Book to compare the number of freemen, villagers and slaves (H), the constituents of a balanced diet with an unbalanced diet (S). Construct scaled timeline of the Medieval period (H) (own format with some support). Drawing to scale when designing a simple clock (DT).	show how the concentration of glucose in the blood stream changes over time (S). Construct complex bar chart (own format) of population statistics Wales/male and female over time (G), classmates 'pocket money' spend and save per week, girls compared with boys (PSE). Construct frequency tables (own format) to show reaction times in catching a ruler (sighted and blindfolded) (S), deaths across Europe from the plague over time (H) – convert to frequency graphs (histograms). Construct scatter diagrams (given format) to investigate the link between reaction times and final recorded times for sprints (PE), deaths by malaria in Africa and incidence of mosquitoes (PSE).	Construct line graphs to compare the length/ cross-sectional area of a wire and its electrical resistance (S), population of Wales over time, employment in Wales over time (G), deaths from unclean water in Africa over the last 20 years (S), the use of the internet over the last 20 years (ICT). Constructing line graphs to predict a relationship between wind speed and generated power output for different locations of wind turbines (G). Construct complex bar charts (own format) of deaths on Titanic percentages of lower/upper class, men, women and children (H), percentage of different food groups in a rugby player's diet on a daily basis compared with activity (PE). Construct scatter diagrams (own format) of stopping distances of cars (M), under different conditions (e.g. road conditions, mass, depth of tyre tread, etc.) (S).

	Year 7	Year 8	Year 9
	Compare discrete and continuous data to investigate the factors affecting an athlete's performance of a sport (e.g. stride length and sprinting, foot size and long jump, number of turns and range for discuss) (PE).		
Progress through	Develop questionnaires to survey exercise per week of classmates taking into account the qualitative and quantitative information/data required (PE). Construct frequency tables (own format) of the use of different ICT equipment by class (ICT). Construct line graphs (own format) of carbon dioxide emissions over time in the UK compared with the world. Select appropriate graphs to represent discrete and continuous data (M). Construct scaled timeline of the historical ages (H) (own format).	Develop hypotheses to test the preferred environmental conditions of woodlice (S), the qualities required for a toy for a sensory deprived toddler (PSE). Plan how to collect data. Discuss reliability/repeatability, in respect of internet searches (ICT), experimental results (S), data surveys (G). Construct line graphs (own formats) of population of predator and prey to determine the carrying capacity (S), rate of flow of a river from source to the sea (G), properties of five materials to determine the best one for making a prosthetic limb (DT).	Develop and test hypotheses to consider whether mobile phones are harmful to health (ICT), whether women are equal to men in terms of rights in different countries (PSE). Construct pie charts (own format) of causes of death in Crimean war after reviewing Florence Nightingale's work (H), emissions from different countries to review how each might impact on global warming (S). Construct complex bar charts (own format) to review the efficiency of Florence Nightingale's work, census data of own street re employment over 50 years (H).

	Year 7	Year 8	Year 9
	Drawing to scale when comparing areas within a local castle to their functions and the number of people using the area (H). Compare discrete and continuous data to investigate data on cars to make a decision to recommend someone to buy a hybrid car opposed to a petrol, diesel or electric car (DT).	Construct complex bar charts (own format) to interrogate pyramids of numbers (S), population statistics Wales/male and female over time (G). Construct scatter diagrams (own format) to investigate proximity to boundary between tectonic plates and number and magnitude of earthquakes (G), world death and birth rate to predict future shortfall in food and resources (PSE).	Construct line graphs of temperature changes due to global warming (to predict rise in temperature over the next 50 years), energy changes involved in a bungee jump (to predict energy 'wasted' from the system) (S), calorific requirements through life in order to develop a healthy eating plan (DT). Construct complex bar charts (own format) of the composition of various food stuffs from labels to compare brands (DT). Construct scatter diagrams of proximity to mobile phone masts and deaths by cancer (ICT).

Developing numerical reasoning

Identify processes and connections

Learners are able to:

- transfer mathematical skills across the curriculum in a variety of contexts and everyday situations
- select, trial and evaluate a variety of possible approaches and break complex problems into a series of tasks
- prioritise and organise the relevant steps needed to complete the task or reach a solution
- choose an appropriate mental or written strategy and know when it is appropriate to use a calculator
- use a scientific calculator to carry out calculations effectively and efficiently using the available range of function keys
- identify, measure or obtain required information to complete the task
- identify what further information might be required and select what information is most appropriate
- select appropriate mathematics and techniques to use
- estimate and visualise size when measuring and use the correct units.

Represent and communicate

Learners are able to:

- explain results and procedures precisely using appropriate mathematical language
- refine methods of recording calculations
- use appropriate notation, symbols and units of measurement, including compound measures
- select and construct appropriate charts, diagrams and graphs with suitable scales
- interpret graphs that describe real-life situations, including those used in the media, recognising that some graphs may be misleading.

Review

Learners are able to:

- select and apply appropriate checking strategies
- interpret answers within the context of the problem and consider whether answers, including calculator, analogue and digital displays, are sensible
- verify and justify results or solutions, including discussion on risk and chance where relevant
- interpret mathematical information; draw inferences from graphs, diagrams and data, including discussion on limitations of data
- draw conclusions from data and recognise that some conclusions may be misleading or uncertain.

Key

Mathematics (M)
Geography (G)
PSE (PSE)
Religious education (RE)
ICT (ICT)
Science (S)
History (H)
Design and technology (DT)
PE (PE)
English/Welsh (E/W)

Appendix 5: Useful links and references

Making the most of learning – Implementing the revised curriculum (Welsh Assembly Government, 2008)

Observing Children (Welsh Assembly Government, 2008)

Language, Literacy and Communication Skills (Welsh Assembly Government, 2008)

Foundation Phase Child Development Profile: Guidance (Welsh Assembly Government, 2009)

How to develop thinking and assessment for learning in the classroom (Welsh Assembly Government, 2010)

Why develop thinking and assessment for learning in the classroom? (Welsh Assembly Government, 2010)

Foundation Phase: Framework for Children's Learning for 3 to 7-year-olds in Wales (Welsh Assembly Government, 2008)

A guide to using PISA as a learning context (Welsh Government, 2012)

Routes for learning (Welsh Assembly Government, 2007)

The Skills Framework at key stage 2: An evaluation of the impact of the non-statutory Skills framework for 3 to 19 year-olds in Wales at key stage 2 (Estyn, 2011)

The Skills Framework at key stage 3: An evaluation of the non-statutory Skills framework for 3 to 19 year-olds in Wales at key stage 3 (Estyn, 2012)

Schools need to develop a skills-based curriculum to help improve pupils' literacy and numeracy skills (Estyn, 2011)

Developing skills (Curriculum for excellence) (Kier Bloomer and Chris McIlroy, 2012)
www.educationscotland.gov.uk/resources/s/skillsinpractice/developingthinkingskills.asp

PISA 2009, Assessment Framework – Key competencies in reading, mathematics and science (OECD, 2009)

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Literacy

Guidance on the teaching of writing skills: INSET opportunities for teachers of all subjects across the curriculum at Key Stages 2 and 3 (Welsh Assembly Government, 2010)

Supporting learners higher-order literacy skills (Welsh Assembly Government, 2009)

Guidance on the teaching of higher-order reading skills: INSET opportunities for teachers of all subjects across the curriculum at Key Stages 2 and 3 (Welsh Assembly Government, 2010)

Developing higher-order literacy skills across the curriculum (Welsh Assembly Government, 2010)

Literacy and the Foundation Phase: An evaluation of the implementation of the Foundation Phase for five to six-year-olds in primary schools, with special reference to literacy (Estyn, 2011)

Literacy brings results (Estyn, 2011)

Literacy in key stage 3 (Estyn, 2012)

Literacy success for boys (Estyn, 2011)

A strategy and guidance for inspecting literacy for pupils aged 3 to 18 years (Estyn, 2011)

Numeracy

Developing higher-order mathematical skills (Welsh Government, 2011)

Improving numeracy in key stage 2 and key stage 3 (Estyn, 2010)

Numeracy for 14 to 19-year-olds (Estyn, 2011)

Support for pupils improves numeracy skills (Estyn, 2010)

Excellence in mathematics – Report from the Maths Excellence Group www.scotland.gov.uk/Resource/Doc/91982/0114466.pdf

Related documents

National Literacy Programme (Welsh Government, 2012)
www.wales.gov.uk/topics/educationandskills/schoolshome/literacynumeracy/literacyprogramme/?lang=en

National Numeracy Programme (Welsh Government, 2012)
www.wales.gov.uk/topics/educationandskills/schoolshome/literacynumeracy/numeracyprogramme/?lang=en

The Skills Framework at key stage 2: An evaluation of the impact of the non-statutory Skills framework for 3 to 19-year-olds in Wales at key stage 2 (Estyn, 2011)
www.estyn.gov.uk/english/docViewer/205514.4/the-skills-framework-at-key-stage-2-july-2011/?navmap=30,119,196/?lang=en

The Skills Framework at key stage 3: An evaluation of the impact of the non-statutory Skills framework for 3 to 19-year-olds at key stage 3 (Estyn, 2012)
www.estyn.gov.uk/english/docViewer/245235.9/an-evaluation-of-the-impact-of-the-non-statutory-skills-framework-for-3-to-19-year-olds-in-wales-at-key-stage-3-may-2012/?navmap=30,163/?lang=en

Routes for Learning routemap (Welsh Assembly Government, 2006)
www.wales.gov.uk/topics/educationandskills/schoolshome/curriculuminwales/additionaleducationalneeds/routeslearning/?lang=en

Assessment of 5- to 14-year-old children's mathematical progress in schools in Wales (Welsh Government, 2012)
www.wales.gov.uk/about/aboutresearch/social/latestresearch/childrenmathematical/?lang=en

Language, Literacy and Communication Skills (Welsh Assembly Government, 2008)
www.wales.gov.uk/topics/educationandskills/earlyyearshome/foundation_phase/foundationphasepractitioners/languageliteracy/;jsessionid=y501PQ1Hvb2x541qG8gfJvJ0YQKYB3xZrC1SVTv3tXZGZwLqpLYz!-863523534/?lang=en

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Guidance on the teaching of writing skills (Welsh Assembly Government, 2010)
www.wales.gov.uk/topics/educationandskills/schoolshome/curriculuminwales/higherorder/guidanceteachingskills/?lang=en

Developing higher-order literacy skills across the curriculum (Welsh Assembly Government, 2010)
www.wales.gov.uk/topics/educationandskills/schoolshome/curriculuminwales/higherorder/literacy/?lang=en

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