

Thinking Skills and Personal Capabilities for Key Stage 3



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Acknowledgements

The Partnership Management Board would like to thank the many people who contributed to the development and production of the contents of this pack.

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Council for the Curriculum, Examinations and Assessment (CCEA)

Council for Catholic Maintained Schools (CCMS)

The Education and Library Boards

Regional Training Unit (RTU)

Classroom 2000 (C2K)

The Partnership Management Board would also like to thank all the schools who so generously allowed us to take photographs. Their participation celebrates pupils enjoying learning. Their involvement makes the materials real.

Introduction

At the heart of the Revised Curriculum lies an explicit emphasis on the development of pupils' skills and capabilities for lifelong learning and for operating effectively in society. By engaging pupils in active learning contexts across all areas of the curriculum, your teachers can develop pupils' personal and interpersonal skills, capabilities and dispositions, and their ability to think both creatively and critically.

Aims of this Guidance

This guidance aims to help your school:

- understand the Thinking Skills and Personal Capabilities (TS&PC) framework;
- identify the practical strategies needed to develop aspects of the framework; and
- plan effectively for the development and progression of Thinking Skills and Personal Capabilities through the curriculum.



The Thinking Skills and Personal Capabilities Framework

Developing skills and capabilities is important for several reasons. They:

- draw attention to the processes of learning and not just the products;
- are more likely to engage pupils in active rather than passive learning;
- enable pupils to go beyond the mere recall of information and to develop deeper understanding of topics;
- create positive dispositions and habits for learning; and
- they provide a new range of criteria against which pupils can evaluate their progress in learning.

Essentially, they enable pupils to learn how to learn.

What Thinking Skills and Personal Capabilities Should We Develop?

A distinctive feature of the current framework is that it integrates a range of different types of thinking skills and learning dispositions with collaborative learning (working with others) and independent learning (self-management and taking responsibility).

Most of our thinking is developed informally as we engage in both everyday and school activities. *Developing* thinking skills means designing learning so that pupils will think more *skillfully* than they would otherwise do – to engage them in better quality thinking. Thus, thinking skills are tools that help pupils go beyond the mere acquisition of knowledge in order to deepen their understanding and apply ideas, generate new possibilities and make decisions as well as to plan, monitor and evaluate their progress.

Personal and interpersonal skills and capabilities underpin success in all aspects of life. *Developing* personal capabilities means creating opportunities for pupils to experiment with ideas, take initiative, learn from mistakes, work collaboratively and become more self-directed in their learning. It is important, therefore, that pupils' self-esteem and self-confidence are explicitly

fostered along with their ability to manage their own emotions, to interact effectively with others and eventually to regulate and enhance their own learning. In this way, Thinking Skills and Personal Capabilities links closely with *Personal Development and Mutual Understanding* at Key Stages 1 and 2 and *Learning for Life and Work* at Key Stage 3.

The framework builds on existing research and practice in the development of skills and capabilities in the UK and elsewhere (see Bibliography).

What Kinds of Thinking Skills and Personal Capabilities Are in the Framework?

Five strands are included in the framework. These are Managing Information; Thinking, Problem-Solving and Decision-Making; Being Creative; Working with Others; and Self-Management.

Managing Information

Asking, Accessing, Selecting, Recording, Integrating, Communicating

The purpose of this strand is to develop your pupils' abilities in an information-intensive environment. Pupils should discover how to:

- ask focused questions;
- plan and set goals and break a task into sub-tasks;
- use their own and others' ideas to locate sources of information;
- select, classify, compare and evaluate information;
- select the most appropriate method for a task;
- use a range of methods for collating, recording and representing information; and
- communicate with a sense of audience and purpose.

They should understand the potential and utility of accessing, selecting and integrating information from multiple sources to support their own learning and creativity. To do this they need to ask questions, clarify their purpose and what needs to be done; access a range of information sources (books, ICT, people); select and evaluate the information for a purpose; and develop methods for recording and integrating information. Your pupils will also need

to learn how to plan, set goals when carrying out their tasks, and develop a sense of audience and purpose when communicating information.

Thinking, Problem-Solving and Decision-Making **Searching for Meaning, Deepening Understanding, Coping with Challenges**

The purpose of this strand is to engage your pupils in active learning so that they can go beyond the mere recall of factual information and the routine application of procedures. You should help your pupils discover how to:

- sequence, order, classify, and make comparisons;
- make predictions, examine evidence, and distinguish fact from opinion;
- make links between cause and effect;
- justify methods, opinions and conclusions;
- generate possible solutions, try out alternative approaches, and evaluate outcomes;
- examine options and weigh up pros and cons;
- use different types of questions; and
- make connections between learning in different contexts.



By explicitly prompting them to engage with a range of different kinds of thinking appropriate to their age, you will help them deepen their understanding of curricular topics, be critical of evidence, think flexibly and solve problems, and make reasoned judgments and decisions rather than jumping to immediate conclusions. As they progress, your pupils will become more adept at managing their own learning and at seeing and making connections.

Being Creative

Imagining, Generating, Inventing, Taking Risks for Learning

The purpose of this strand is to encourage your pupils' personal responses. Curiosity, exploration, experimentation and invention are important elements of being creative and should be integrated into learning across the curriculum along with the development of knowledge and understanding. You should help your pupils discover how to:

- seek out questions to explore and problems to solve;
- experiment with ideas and questions;
- make new connections between ideas/information;
- learn from and value other people's ideas;
- make ideas real by experimenting with different designs, actions, and outcomes;
- challenge the routine method;
- value the unexpected or surprising;
- see opportunities in mistakes and failures; and
- take risks for learning.

The creative process involves generating questions and interrogating and defining problems as well as imagining different possibilities and alternative solutions. Giving your pupils opportunities for self-expression and to value individuality will help them become more resilient in their outlook; it will allow them to learn from their mistakes and perceived failures.

Working with Others

Being Collaborative, Being Sensitive to Others' Feelings, Being Fair and Responsible

This strand enables your pupils to engage in collaborative activities and to make the most of their learning when working with others. To do this, pupils must develop the confidence and willingness to join in, have the social skills required for working in face-to-face groups, show empathy, and develop a more general social perspective. They must also appreciate some of the aspects of group dynamics and the roles that can be assumed in groups. You should help your pupils discover how to:

- listen actively and share opinions;
- develop routines of turn-taking, sharing and cooperating;
- give and respond to feedback;
- understand how actions and words affect others;
- adapt their behaviour and language to suit different people and situations;
- take personal responsibility for work with others and evaluate their own contribution to the group;
- be fair;
- respect the views and opinions of others and reach agreements using negotiation and compromise; and
- suggest ways of improving their approach to working collaboratively.

Collaborative work offers opportunities to learn negotiation skills and to develop a sense of fairness and respect that will contribute to pupils' general social and emotional development. This strand, therefore, links closely with *Personal Development*.

Self-Management

Evaluating Strengths and Weaknesses, Setting Goals and Targets, Managing and Regulating Self

The Self-Management strand helps your pupils become more self-directed, so that they can manage their learning in new situations and in the longer term. To do this, they need to become knowledgeable about themselves as pupils, be more aware of their personal strengths and weaknesses, consider how they feel about learning, and identify their interests and their limitations. To help

foster your pupils' self-management skills, you should help them discover how to:

- be aware of their personal strengths, limitations and interests;
- set personal targets and review them;
- manage their behaviour in a range of situations;
- organise and plan how to go about a task;
- focus, sustain attention and persist with tasks;
- review learning and some aspect that might be improved;
- learn ways to manage their own time;
- seek advice when necessary; and
- compare their own approach with others' and in different contexts.

When delivering this strand, pupils must work with you to set personal targets and review them, set goals for their work, and organise their time. By constantly reviewing their work and how they feel about their learning, your pupils will build personal resources that help them to become more aware of their learning and how it can be improved. This strand links closely with *Assessment for Learning* and *Personal Development and Mutual Understanding*.

How Are the Strands Related?

To make the skills and capabilities explicit and to help highlight their importance, we have grouped them into five separate strands. However, it's important to recognise that the boundaries between them are 'fuzzy', both conceptually and in practice. This is likely to be both advantageous and, at times, frustrating. On the positive side, for example, cooperating with others or working in a group or in a team is likely to support a range of other types of skills and capabilities in the classroom. For example, your pupils might be:

- working together to select, record and integrate information from a range of sources;
- coming to a group decision by generating options and weighing up pros and cons; or
- allocating one member of the group to be the time manager and so on.

Also 'setting goals for a task and breaking it down into sub-tasks' (from Managing Information) closely relates to 'persevering with a task' and 'managing time' (from Self-Management), especially if the pupils are working relatively independently.

On the other hand, it may sometimes be difficult to decide which strands are most relevant. For example, in the context of a particular classroom activity, it may be difficult to distinguish between 'generating possible solutions and trying out alternative approaches' (from Thinking, Problem-Solving and Decision-Making) and 'making ideas real by experimenting with designs, actions, and outcomes' (from Being Creative). The difference is likely to lie in the more general focus of the learning intentions and the learning activities.

It's best to consider the five strands as overlapping sets. Your teachers are likely to find learning activities and/or contexts where certain skills and capabilities are integral to the learning, where they cluster naturally, are most likely to be developed and are most readily assessed.

Planning

Your teachers will likely be at different stages in their practice with regard to developing skills and capabilities. In general, however, you will need to review current practice at the whole-school level and to identify new and/or additional opportunities for their development. The *Planning for the Revised Curriculum* booklet included in your *Curriculum Support and Implementation Box* will help you plan your implementation of Thinking Skills and Personal Capabilities. Please read this document before you begin your whole-school planning process.

When planning for TS&PC, keep the following points in mind:

- Both formative and summative assessments will need to include criteria related to the new Framework (see the *Assessment for Learning* guidance booklet in your *Curriculum Support and Implementation Box*).
- You may also need to review your methods of sharing good practice through in-house staff development, peer coaching, action research and so on. These suggestions will be linked to more general school plans for implementing the Revised Curriculum.

Infusion and Implications for Teaching

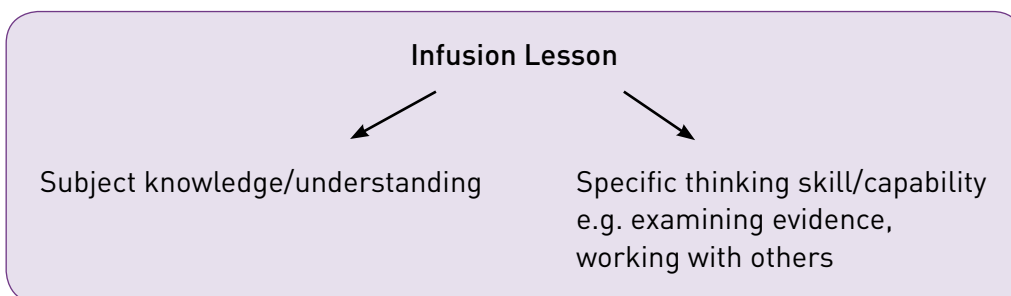
The TS&PC framework does not stand alone nor is it isolated from the traditional areas of the curriculum. Rather, the skills and capabilities highlighted in the framework need to be developed and assessed *in and through* the curriculum's *Areas of Learning*.

Developing TS&PC requires an approach to teaching that extends beyond traditional didactic methods. To develop skills and capabilities, pupils need to be thoroughly engaged with their own learning, be given opportunities to practise their skills, to reflect on their achievements, and to recognise their strengths and weaknesses. Pupils cannot be considered as empty vessels to be filled; they should be viewed, instead, as active makers of meaning.

The approach used to develop and assess skills and capabilities is sometimes called infusion. From a dictionary definition, 'to infuse' means: 'to add to one thing another thing, which gives it added vigour and a new significance'.

This definition is used purposely to reinforce the point that skills cannot be developed in a vacuum but instead need a rich context. It has been shown that when thinking skills programmes are taught separately, there is a risk that pupils are less able to transfer what they have learned into other areas of the curriculum. Conversely, when thinking skills are delivered in a rich context and are infused with *Areas of Learning*, pupils acquire a deeper understanding of skills concepts and are better able to apply them in a range of contexts.

This can lead to lessons where there is the parallel development of subject knowledge and understanding and a particular mode of thinking. The thinking skill deepens understanding of the subject concept or context and this, in turn, provides an opportunity for the instruction and practice of the skill.



The Launch-Activity-Debrief lesson model in the following table illustrates how Thinking Skills and Personal Capabilities can be infused into many subject-specific activities:

Lesson Phase	Strategies for Infusion
<p>Launch</p> <p>Teachers use this stage to set up the learning as a challenge for the pupils and engage their interest.</p>	<ul style="list-style-type: none"> • Reframe tasks as a challenge to generate pupils' interest. • Share the learning intentions and expectations, making sure to include TS&PC in the learning intentions. • Connect the learning to previous learning/ activities. • Provide time for pupils to seek clarity. • Model skills/capabilities that pupils need to demonstrate.
<p>Activity</p> <p>During this stage, teachers engage pupils in an activity/ challenge where they develop a particular skill/capability in the context of the subject.</p>	<ul style="list-style-type: none"> • Have pupils plan and organise work. • Have pupils think-pair-share ideas and opinions. • Use thinking frames as part of the activity or lesson (these help pupils focus on the specific processes or steps involved in a particular thinking skill). • Use effective questions to further embed skills (<i>for example, questions to seek clarification, look for reasons, explore alternatives, invite enquiry, etc.</i>). • Have pupils work in groups on the task.
<p>Debrief</p> <p>This stage presents an opportunity to consolidate the learning (both subject and skills oriented) and promote a language for talking about what has been learned and how.</p>	<ul style="list-style-type: none"> • Conduct a well-planned plenary that includes a review of the skills and capabilities used to complete the activity. • Use a set of questions that get the pupils to think back on the skills and capabilities they demonstrated (<i>for example, 'What did you find difficult?' or 'What really made you think?'</i>). • Create a whole-class closing activity that recaps and/or also re-exercises the main skills or capabilities learned. • Connect learning to other contexts.

The skills and capabilities in the TS&PC framework can invigorate and add new dimensions to your pupils' learning. Thinking Skills and Personal Capabilities builds on and extends subject-specific skills. In addition, the single framework allows your teachers to develop TS&PC across the curriculum, making it easier for them and their pupils to make connections, see relationships and infuse the skills in all *Areas of Learning*.

Metacognition

Metacognition is a fundamental concept in the development of Thinking Skills and Personal Capabilities because it refers to the pupil's ability to plan, monitor, redirect and evaluate how they think and learn. Although there are many different definitions for the term, including:

- 'thinking about thinking';
- 'awareness of the process of learning';
- 'knowing what we know and what we don't know'; and
- 'overseeing learning'.

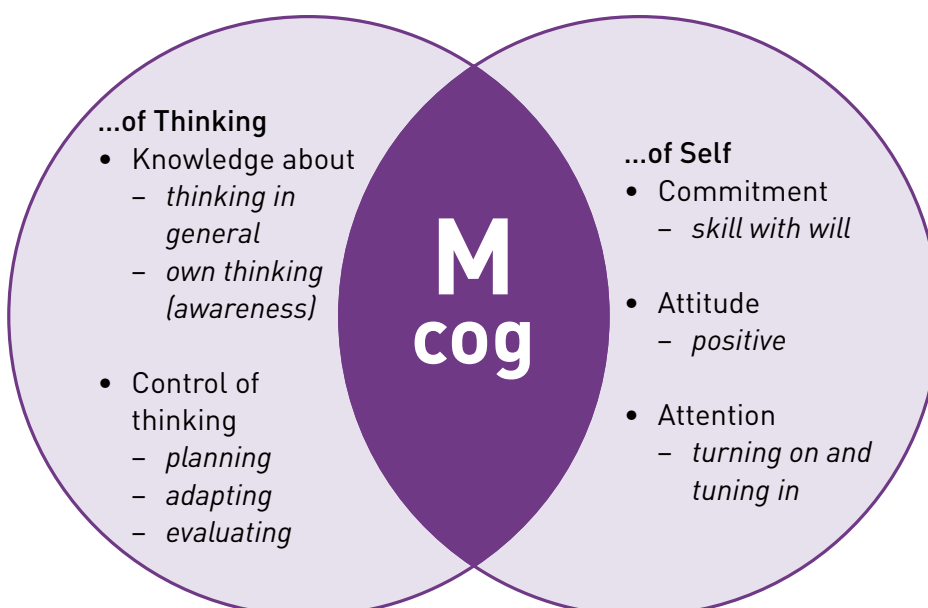
The two words that come up frequently in definitions are **knowledge and control** (see diagram below).

With these themes in mind, in Thinking Skills and Personal Capabilities, metacognition is defined as follows:

'the ability of the learner to plan, monitor, redirect and evaluate how they think and learn.'

This broad definition of metacognition aligns with the TS&PC framework, where thinking skills are seen as inextricably connected to dispositions, emotions and behaviours (i.e., personal and inter-personal skills).

Knowledge and Control



Knowledge and control

Metacognition includes the knowledge and control of both one's *thinking* and of one's *self*. Pupils with metacognitive skills have:

- *knowledge about thinking in general* – they recognise the different mental strategies required for different tasks (e.g., memorising, understanding, reasoning, problem-solving, etc.); and
- *knowledge about their own thinking* – they have an awareness of what mental strategies they find easy/difficult.

They also show *control of thinking*. They are able to choose strategies to cope with different tasks, for example by posing questions to themselves like those below when planning, adapting, and evaluating:

When Planning	When Adapting	When Evaluating
<ul style="list-style-type: none"> • How am I going to do it? • Is it similar to anything I've done before? • Is it one of those? 	<ul style="list-style-type: none"> • Do I understand it so far? • Do I need to ask a question? • Am I on the right track? • Am I still on task? • Is there a better way? 	<ul style="list-style-type: none"> • How did I do it? • What method/strategy worked? • What did I learn? • Did my plan work out? • Can I learn from my mistakes? • Can I do better next time?

Pupils with metacognitive skills also demonstrate *knowledge and control of themselves*. Knowledge and control of one's self includes recognising dispositions such as commitment, attitude, and attention, which are just as important as the specific thinking strategies needed to manage learning.

Pupils who commit themselves to tasks assert metacognitive control. They align 'skill with will'. Their conscious control of attention also helps them understand that the level of attention required for a task varies with the task and that they can adjust the focus of their attention accordingly. This sense of personal control helps these pupils perform tasks efficiently.

Positive attitudes also play an important role in metacognitive self-control. Successful pupils attribute their success to their own efforts.

Metacognition in the classroom

In order for your pupils to develop and strengthen their metacognitive abilities, your teachers must prompt and support its development in the classroom. To start, they must talk more often with the pupils about 'thinking' and develop a shared vocabulary about thinking. They can foster this through modelling, thinking aloud, encouraging pupils to explain their approach to a task, displaying key words in thinking diagrams, allowing pupils to problem-solve in pairs, planning effective plenaries, etc.

Another key strategy for supporting metacognitive development is giving pupils the opportunity to plan and self-regulate their learning. Your teachers can do this by:

- creating open-ended and multi-step tasks, which allow pupils to assume increasing responsibility for planning and regulating their learning; and
- involving the pupils in peer and self-assessment. Explicit guidance on peer and self-assessment is available in the *Assessment for Learning* guidance booklet in your school's *Curriculum Support and Implementation Box*.

Learning logs are another valuable classroom tool. A learning log is a journal or a diary of how pupils go about their learning. It can help your pupils record their successes, and it also encourages them to reflect upon their thinking and comment on how they have dealt with difficulties. It prompts self-assessment and can help them make connections between their learning in different contexts.

Finally, your teachers can stimulate metacognitive development during a task or lesson cycle by:

- helping pupils clarify and understand the particular demands of the task;
- helping them recognise the particular thinking skills and learning strategies required;
- reviewing these different strategies with the pupils when the task is completed;
- getting the pupils to evaluate their thinking and learning strategies and to suggest improvements; and
- prompting the pupils to think about other contexts where these skills and strategies are likely to be successful.

Seven Classroom Strategies

From the research literature (see bibliography), we have identified a number of key classroom strategies that your teachers can use to cultivate and strengthen their pupils' skills and capabilities and to ensure that they use these in new situations. These seven classroom strategies represent a shift towards a more pupil-centred and skills-integrated curriculum. To realise their full benefits, your teachers should implement these strategies using an infusion methodology. This will ensure that the skills and capabilities are embedded within the curriculum's *Areas of Learning* and are taught as an integral part of curricular topics.

These suggested strategies will help your teachers expand their current classroom practice in a direction that supports a more explicit emphasis on thinking and active learning. It's important that the skills and capabilities are made explicit to the pupils in the learning intentions and that the pupils, as well as their teachers, recognise their importance. This reliance on learning intentions for teaching creates a strong link between TS&PC and *Assessment for Learning*.

A word of caution: It's important to remember that not all learning will be investigative or enquiry based. Your teachers will still need to convey information, give facts and figures, explain concepts and present formulas. Nevertheless, every area of learning can provide opportunities to develop units of work that use a particular type of thinking or explicitly develop an aspect of personal capabilities.

Many of these strategies overlap with each other and also support the principles of *Assessment for Learning*. Any one of these could represent a manageable starting point for developing classroom/department/whole-school practice. Each of the strategies, summarised below, is explained in more detail in the briefing sheets that appear in Appendix 1:

Seven Classroom Strategies

- **Setting Open-Ended Challenges** (see briefing sheet 1)
Using **open-ended activities and challenges** are very important. Open-endedness enables pupils to respond creatively, construct their own meaning, and offer reasoned decisions and solutions.
- **Making Thinking Important** (see briefing sheet 2)
It is important that **thinking is valued and made important**. Pupils need to be given **time to think**. Too often teachers pose questions and expect pupils to come up with immediate answers. If we want higher quality learning, then pupils need time for more considered responses.



- **Effective Questioning** (see briefing sheet 3)
 Although questioning strategies that check knowledge and understanding are important, developing skills and capabilities requires teachers to use questioning strategies that go a step further. Instead, they should use strategies that ask for further elaboration and, for example, that invite explanation and justification and/or prompt further questions and enquiry. Also, encouraging *pupil* questioning and extending their questions is as important as extending teachers' questions.
- **Making Thinking Explicit** (see briefing sheet 4)
 It is important for teachers to be more explicit with pupils about what they mean by TS&PC. This can help pupils recognise what these are and their relevance as well as give teachers an opportunity to teach thinking more directly. Pupils need to develop a **language for talking about their thinking and being reflective about their learning**. The term 'metacognition' or 'thinking about thinking' is often used in this context (see page 11).

Using thinking questions, thinking frames or thinking diagrams can also help to bring thinking into the open and make the steps involved in a particular type of thinking more explicit.

Thinking frames and thinking diagrams enhance thinking by;

- placing the focus on the thinking process;
- giving teachers a tool to teach directly for thinking;
- giving pupils a scaffold or guide to help them focus on one step at a time;
- slowing down thinking;
- making thinking visible; and
- providing an external record of the thinking process for pupils and teachers to evaluate and reflect.

Thinking frames are a temporary support. With practice, pupils will be able to work without them on similar and more complex tasks.

- **Enabling Collaborative Learning** (see briefing sheet 5)
Giving pupils' meaningful and challenging opportunities to work and collaborate with others is important. The dialogue that results not only allows pupils to develop social and teamwork skills, but talking about what and how they are learning also improves their understanding and their capacity for reasoning and argument.
- **Promoting independent learning** (see briefing sheet 6)
To enable pupils to be more self-directed, they need opportunities to plan, manage and monitor their progress. To do this successfully depends on several of the other classroom strategies – being more explicit about skills and capabilities, developing a language, setting goals, and reflecting on learning as well as a general focus on higher quality learning.
- **Making Connections** (see briefing sheet 7)
In order to help pupils transfer their learning, teachers need to make **deliberate and explicit connections** between the meanings and applications of skills and capabilities across contexts, both within and outside the curriculum.

'Research shows that very often pupils do not carry over the facts, principles and skills they acquire in one context into other contexts. Knowledge tends to get glued to the narrow circumstances of initial acquisition. If we want pupils to transfer their learning, we need to teach explicitly for transfer, helping pupils to make the connections they otherwise might not make and helping them to cultivate mental habits of making links and connections.'

David Perkins, "Teaching for Understanding", Journal of the American Federation of Teachers (1993)

Progression of TS&PC in Pupils

The progression of a pupil's thinking skills and personal capabilities is not as straightforward or linear as is the case with subject knowledge and understanding. It can seem, at times, to be rather messy in nature.

For example, sometimes we are able to demonstrate our skills and capabilities well because:

- the task is relatively undemanding; or
- the topic is familiar; or
- we have been given a good working model by a more competent person.

At other times, if we are confronted with a new type of problem, or find ourselves working with new people or must deal with a particularly emotive topic, we may find that our previously successful problem-solving methods do not work so well and that our previous mastery seems to fall apart.

With this in mind, it's important for your teachers to recognise that pupils will not master a particular pattern of thinking or a capability once and for all. They can only make sustained progress through practice and by applying the skills repeatedly in a range of contexts and at increasing levels of challenge and demand. The nature of the feedback your teachers provide (as well as feedback from self and peer review) will help your pupils see and understand what to do next to improve. This is why progression in skills and capabilities is often referred to as cyclical progression (broadening and deepening).

Progression is also influenced by the knowledge base a task requires as well as the level of complexity in the task. These both affect how well we can demonstrate our skills and capabilities. For example, sometimes the difference between novice and more expert pupils is not their basic capacity for reasoning but rather the amount of prior knowledge they have accumulated about the topic. On other occasions, the difference might be due to the capacity of expert pupils to draw on a wider range of information sources or to deal with more open-ended tasks, and so on.

Sometimes the difference is due to qualitative differences in the patterns of thinking expected of pupils at different ages. For example, younger pupils benefit from concrete representations. They may not be able to deal with multiple dimensions or multi-step tasks that are beyond the capacity of their

working memories. However, there are wide individual differences between pupils of similar ages, and if your teachers follow too closely a stage-like theory of pupils' development, they are likely to under-challenge younger pupils. In addition, there is increasing evidence that younger pupils are capable of more abstract reasoning than previously believed, provided that tasks are appropriately situated and contextualised. Taking all this into account, it is important for your teachers to consider the demand or level of challenge in a task – for whatever reason – when considering a pupil's progression in learning.

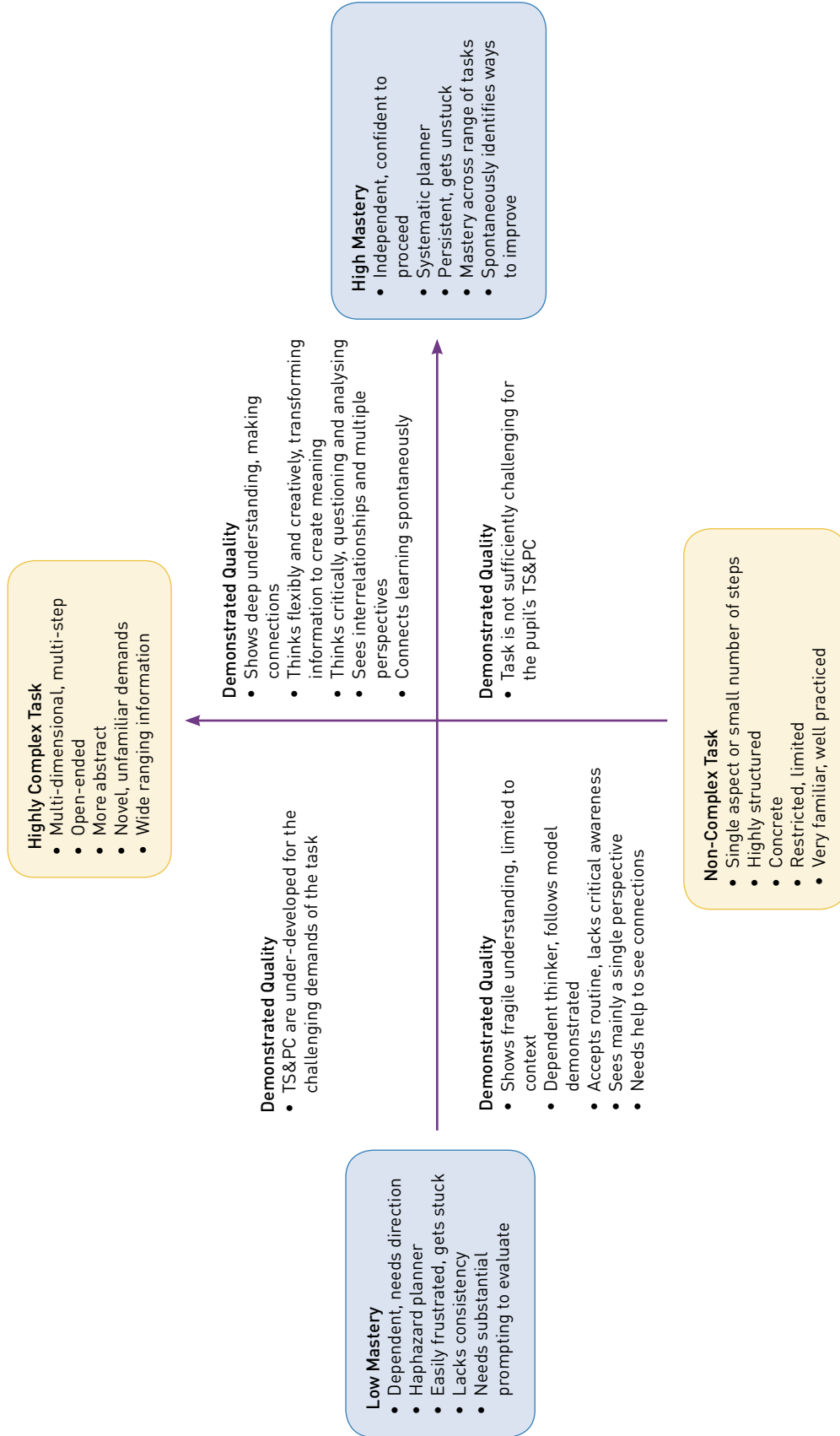
And finally, pupils are likely to differ in the degree of consistency and independence they demonstrate when using skills and capabilities at any point in time. When we have achieved a degree of mastery, we are able to show off our competence with ease and without much prompting from others. In other words, we are capable of being independent and of acting autonomously. At earlier stages, our performance is more uneven and we sometimes need support and guidance from others to move us on. The same will be true of your pupils.

Two Dimensions of Development and Progression

Although there are many irregularities in the progression of Thinking Skills and Personal Capabilities, the diagram on the following page illustrates some of the regularities in development and progression. It shows the ways in which the quality of a pupil's skill or capability is influenced by:

- the complexity of the task to be completed; and
- the pupil's level of mastery in the skill or capability.

Two Dimensions of TS&PC Development



In the diagram, the horizontal line represents the pupil's level of mastery at any point in time, particularly his or her ability to regulate and take responsibility for his or her own learning, whether working in groups or alone. This includes his or her ability to plan, persevere with tasks, be consistent across a range of tasks, work independently and evaluate his or her own work.

The vertical line shows the ways in which the demands and complexity of a task can influence how well a pupil can exercise his or her skills and capabilities. As indicated earlier, tasks can be more or less challenging for pupils for many reasons - degree of prior knowledge required, number of steps, degree of open-endedness, level of abstraction, previous practice and so on. If your pupils' skills and capabilities are to progress, then your teachers must increase the level of challenge in tasks along whatever dimensions are appropriate. This will allow your pupils sufficient scope to broaden and deepen their thinking and to act competently in different contexts.

The four quadrants show the qualities of thinking that pupils of different levels of competence might demonstrate. The top right-hand quadrant clearly shows the kind of thinking demonstrated by pupils who are successfully responding to highly challenging tasks and can so do consistently and with a degree of independence. These pupils show deep understanding of the topics. They can also think flexibly, be critical, see interrelationships, make connections, etc. The bottom left hand quadrant shows the kind of thinking demonstrated by pupils with less developed skills and capabilities. These pupils often demonstrate understanding that is fragile and related to the specifics. They are not capable of going beyond the routine and require substantial prompting.

In the upper left-hand quadrant, the tasks are more challenging while the pupil's skills and capabilities are not sufficiently developed to enable them to respond to the challenge (outside the zone of proximal development, according to Vygotsky). In these situations, pupils are left behind and can lose interest. In contrast, learning in the lower right-hand quadrant may not be sufficiently challenging for pupils. Tasks may be too routine and well within the pupil's skills and capabilities. In these situations, pupils often become bored and disruptive.

Although there are age differences in the general characteristics of children's thinking, it is important to remember that the progression along the diagonal is *not* related to age alone. Pupils in early years classrooms can demonstrate high-quality thinking that is appropriate to their age and engage in challenging tasks, which they can perform confidently and independently. Likewise, undergraduate pupils can show a thinking profile typical of the lower left-hand quadrant. Progression occurs through a cyclical process – one where tasks/ contexts become more challenging and pupils' Thinking Skills and Personal Capabilities improve to meet the challenges of the situation.



Progress Maps

To help your teachers specifically link the progression illustrated in the diagram to the five strands of TS&PC, we've developed 'From-To Progress Maps'. These appear in Appendix 2.

In each map, the top box (in pink) expresses the idea of progression in both the complexity of tasks as well in the pupil's consistency and independence. The blue box identifies the strands. The green boxes indicate a rough approximation of the likely pathway pupils will follow as their competence increases and they move from the Foundation Stage to Key Stage 3. These pathways take into account the non-linear and cyclical nature of this kind of learning. Full details of how to develop the strands are available in Appendix 3.

The diagram overleaf offers an overview of the structure of the progress maps and highlights how skills and capabilities can progress from Foundation to Key Stage 3.

Links with Assessment for Learning

Thinking Skills and Personal Capabilities is closely linked to *Assessment for Learning* (AfL). Both emphasise the nature of learning as being active, meaning-making and collaborative and both endeavour to improve the quality of pupils' learning.

The TS&PC framework provides a rich source of learning intentions for lesson planning and success criteria for evaluating learning outcomes. It can also provide a shared language to help pupils be more explicit about different aspects of learning and to recognise their meaning in different contexts. This can help pupils engage more readily with self and peer-evaluation, which is often the more difficult of AfL practices.

For example, teachers can turn the statements in the From-To Progress Maps into more pupil-friendly language that forms the basis for self and peer-evaluation:

- 'I can select and sort the most important pieces of information.' (Managing Information)
- 'I can spot similarities and differences.' (Thinking, Problem-Solving, and Decision-Making)
- 'I can check to see if my evidence is reliable. (Thinking, Problem-Solving, and Decision-Making)
- 'I can listen and talk to others in my group to help do the task.' (Working with Others)

There is also substantial overlap between the key classroom strategies for enhancing skills and capabilities (presented in Appendix 1) and the classroom strategies used in an AfL approach. For example, both approaches emphasise active learning, effective questioning, thinking (wait) time, developing a shared language, collaboration and reflection. Together they form a powerful pedagogy where the whole may well be greater than the sum of the parts.

Additional Resources

This guidance is part of a range of resources, outlined below, to support the development and infusion of Thinking Skills and Personal Capabilities.

Name of Resource	Purpose
<i>'Planning for Implementation: The Revised Northern Ireland Curriculum'</i> DVD (with briefing sheets and Critical Questions)	Whole-staff awareness raising and discussion
TS&PC CPD units (available on the CPD disc in your <i>Curriculum Support and Implementation Box</i>)	CPD activities for facilitators, senior management, school curriculum teams and teachers
<i>Active Learning and Teaching Methods</i> booklet (available on the CPD disc in your <i>Curriculum Support and Implementation Box</i>)	For classroom teachers and pupils
TS&PC Toolbox Modules available from www.nicurriculum.org.uk	Supplementary CPD units for teachers and clusters wishing to target specific areas of interest

Bibliography

Bianchi, L. <http://www.personalcapabilities.co.uk/>, accessed 1 August 2006.

Claxton, G. (2002). *Building Learning Power*. Bristol: TLO Limited.

Costa, A. L. (2001). *Developing Minds: A resource book for teaching thinking (3rd ed)*. Alexandria, VA: Association for Supervision and Curriculum Development.

Dawes, L. Mercer, N. & Wegerif, R. (2000). *Thinking Together: A programme of activities for developing speaking, listening and thinking skills for pupil aged 8-11*. Birmingham: *Imaginative Minds*.

DfES (2005). *Leading in Learning: Developing thinking skills at Key Stage 3*. London: Department for Education and Skills (Key Stage 3 Strategy).

Higgins, S., Baumfield, V., Lin, M., Moseley, D., Butterworth, M., Downey, G., Gregson, M., Oberski, I., Rockett, M., & Thacker, D. (2004). *Thinking Skills Approaches to Effective Teaching and Learning: What is the evidence for impact on pupils?* In Research Evidence in Education Library. London: EPPI-Centre, Social Science Research Unit, Institute of Education.

Higgins, S., Hall, E., Baumfield, V. & Moseley, D. (2005). *A Meta-analysis of the Impact of the Implementation of Thinking Skills Approaches on Pupils*. In: Research Evidence in Education Library. London: EPPI-Centre, Social Science Research Unit, Institute of Education.

James, M. & Pollard, A. (2006). *Improving Teaching and Learning in Schools: A commentary by the Teaching and Learning Research Programme*. London: ESRC TLRP, downloadable from www.tlrp.org

Leat, D. (1998). *Thinking Through Geography*. Cambridge: Chris Kington Publishing.

Leat, D. & Higgins, S. (2002). *The Role of Powerful Pedagogical Strategies in Curriculum Development*. 'The Curriculum Journal', 13(1), 71-85.

Marzano, R.J., Brandt, R.S., Hughes, C.S., Jones, B.F., Presseisen, B.Z., Rankin, S.C., & Suhor, C. (1988). *Dimensions of Thinking: A framework for curriculum and instruction*. Alexandria, VA: Association for Supervision and Curriculum Development.

McGuinness, C. (1999). *From Thinking Skills to Thinking Classrooms: A review and evaluation of approaches for developing pupils' thinking*. Norwich: HMSO. (DFEE Research Report No. 115)

McGuinness, C. (2000). *ACTS: A methodology for teaching thinking across the curriculum*. 'Teaching Thinking', 2, 1-12.

McGuinness, C. (2005). *Teaching Thinking: Theory and practice*. 'British Journal of Educational Psychology Monograph Series II', 3, Pedagogy – Learning for Teaching, 107-126.

McGuinness, C. (2006). www.sustainablethinkingclassrooms.qub.ac.uk, accessed 1 August 2006.

McGuinness, C. et al. (2006). *Building Thinking Skills in Thinking Classrooms: ACTS in Northern Ireland*. ESRC Teaching and Learning Research Programme, Research Briefing No. 18, September, 2006. Downloadable from www.tlrp.org

Moseley, D., Baumfield, V., Elliot, J., Gregson, M., Higgins, S., Miller, J. & Newton, D.P. (2005) *Frameworks for Thinking: A handbook for teaching and learning*. Cambridge: Cambridge University Press.

Shayer, M. & Adey, P. (Eds.). (2002). *Learning Intelligence: Cognitive acceleration across the curriculum from 5 to 15 years*. Buckingham: Open University Press.

Swartz, R. & Parks, S. (1994). *Infusing the Teaching of Critical and Creative Thinking into Content Instruction: A lesson design handbook for the elementary grades*. California: Critical Thinking Press & Software.

Swartz, R. J. (2001). Infusing critical and creative thinking into content instruction. In A.L. Costa, (Ed.), *Developing Minds: A resource for teaching thinking (pp. 266-274) (3rd edition)*. Alexandria, VA: Association for Supervision and Curriculum Development.

Tishman, S., Perkins, D.N., & Jay, E. (1995). *The Thinking Classroom: Learning and teaching a culture of thinking*. Boston, MA: Allyn & Bacon.

Wallace, B. (2001). *Teaching Thinking Skills Across the Early Years: A practical approach for pupil aged 4 to 7*. London: David Fulton Publishers.

Wegerif, R. (2002). *Literature Review in Thinking Skills, Technology and Learning*. Nesta FutureLab Series. Downloaded from www.nestafuturelab.org/research/reviews/ts01.htm on 25/06/2005.

Appendix 1: Classroom Strategy Briefing Sheets

Briefing Sheet 1: Setting Open-Ended Challenges

Open-ended challenges do not have a single absolutely correct answer or a single way of arriving at a correct answer. They involve the pupil in searching for and constructing meaning rather than trying to memorise a correct answer or have meaning constructed for them.

Open-ended challenges promote the development of Thinking Skills and Personal Capabilities by encouraging pupils to respond creatively, offer reasoned decisions, solutions and possibilities, develop more autonomy and value individual differences.

Getting Started

Moving on

<ul style="list-style-type: none"> • Use strategies to get your pupils to make their own notes. • Use tools and strategies to check understanding (e.g. sequencing, sorting and classifying, comparing and contrasting, linking cause and effect, etc.). • Set up challenges to go beyond comprehension, for example: <ul style="list-style-type: none"> – ask more ‘why? ‘how? ‘what if?’ questions; – ‘present an argument against option A...’; or – ‘explain what you think might happen if.....’ • Let pupils, individually and in groups, work through difficulties, prompting and scaffolding only as appropriate. 	<ul style="list-style-type: none"> • Use powerful pedagogical strategies (e.g. <i>Odd One Out, Most Likely To, Mysteries, and Living Graphs</i>). • Use problem-solving and decision-making scenarios (e.g. <i>historical decisions, environmental problems, inventing and designing, etc.</i>). • Use an enquiry approach: <ul style="list-style-type: none"> – Create a need to know. – Gather and organise information. – Make sense of this information. – Evaluate evidence. – Draw conclusions. – Express a personal response. – Reflect on learning.
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Briefing Sheet 2: Making Thinking Important

If we want pupils to see thinking as important we need to provide time and space for it to happen in the classroom. The classroom culture should promote thinking and creativity rather than discourage them.

Getting Started

Moving on

Getting Started	Moving on
<p>Introducing thinking</p> <ul style="list-style-type: none"> • Make thinking a focus of learning (<i>e.g. signpost opportunities for thinking questions and tasks, include Thinking Skills and Personal Capabilities in learning intentions, etc.</i>). • Think aloud – be a model of thoughtfulness to your class. <i>Ask pupils to describe, analyse and evaluate your thinking.</i> • Teach thinking routines for different situations (<i>e.g. Use questions for analysing visual stimuli such as ‘What is going on here?’, ‘What is it that makes you think that?’, etc.</i>). • Ensure your classroom supports thinking through its: <ul style="list-style-type: none"> – Displays – <i>key learning words, questioning prompts, ‘quality boards’ (annotating best practice), ‘stuck boards’ (strategies for getting unstuck), etc;</i> – Layout – <i>supports active learning and group work; and</i> – Climate – <i>values all ideas and opinions, prompts and scaffolds learning, uses ‘wrong’ answers to further learning, encourages risk-taking for learning, etc.</i> 	<p>Assessing thinking</p> <ul style="list-style-type: none"> • Make thinking a focus of assessment (<i>e.g. build thinking skills into assessment tasks</i>). • Use teacher observation, develop rubrics, get pupils to use learning logs, thinking diaries, etc. • Explicitly assess written and oral work for the quality of the thinking (<i>e.g. get pupils to use the steps in the thinking diagram to develop a written argument</i>). • Get pupils to use/create their own thinking frames/diagrams in new situations. • Involve pupils in peer and self-assessment of TS&PC in your subject context. • Use decision-making or problem scenarios/challenges as assessment tools.

Briefing Sheet 3: Effective Questioning

Questions and questioning techniques influence pupils' achievement, attitudes and thinking skills. The level of the question tends to obtain a similar level of answer. Achievement can improve if high levels of questions are accompanied by wait-time, redirection, and probing techniques.

(taken from www.muskingum.edu/~cal/database/general/questioning.html)

Getting Started

Moving on

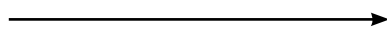
<ul style="list-style-type: none"> • Plan a few higher order questions that go beyond checking knowledge and begin to: <i>look for reasons, seek examples and alternatives, elicit emotions and encourage reflection.</i> • Use Bloom's taxonomy to help plan higher order questions (a sample of this is located in the <i>AfL Delivery Materials for CPD Units 1-5</i> booklet in Unit 4's Handout 1). • Focus on quality rather than quantity of questions. • Explain to pupils the purpose of 'new' questioning strategies. • Build in 'thinking time' or wait time for pupils to respond. • Encourage collaborative responses to question (<i>e.g. think - pair - share</i>). • Try a 'no hands' day (<i>e.g. get a selection of responses and discuss the differences in them</i>). • Prompt pupils to encourage extended responses. • Use games/stimulus to encourage pupil questions. • Invite pupil questions at start of class (<i>e.g. 'What questions do we need to ask about the ...'</i>). 	<ul style="list-style-type: none"> • Self/peer audit. Record all the questions you/colleagues ask in a lesson and analyse them according to purpose and response. • Agree a departmental questioning strategy. Observe, monitor and evaluate the strategy in action. • Plan rich questions and write them into units of work. • Use pupil questions as a focus for discussion, enquiry, action, etc. • Encourage pupils to identify different types of questions (<i>e.g. 'fat' and 'thin' questions</i>) at the end of a topic.
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Briefing Sheet 4: Making Thinking Explicit

Imagine learning to dance when the dancers around you are all invisible. We learn much by watching, imitating and adapting what we see.

Thinking is invisible. It needs to be brought into the open and talked about.

Getting Started



Moving on

<ul style="list-style-type: none"> • Introduce a common language to talk about thinking and learning. • Model the steps in a thinking process. • Use a word bank to identify kinds of thinking. • Use questions (thinking frames) to help pupils work through the steps of a particular type of thinking. • Introduce thinking diagrams to support the questions. Consider: <ul style="list-style-type: none"> – <i>filling in one during a lesson (modelling);</i> <i>or</i> – <i>giving pupils a partially completed one to finish.</i> 	<ul style="list-style-type: none"> • Plan and use plenary activities to develop pupils' metacognition. Help pupils: <ul style="list-style-type: none"> – take stock of what they have learned; – consider how they have learned and the learning strategies they used; – develop a language for talking about thinking and learning; – set new targets for learning; and – apply the results to further learning. • Take other opportunities to probe thinking (<i>e.g. misconceptions, conflicting solutions, unusual ideas, errors, etc.</i>). • Have pupils create their own thinking diagrams and present their approach to the class.
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Briefing Sheet 5: Enabling Collaborative Learning

Collaborative learning has both a cognitive and a social function. As Costa points out, 'Together, individuals generate and discuss ideas, eliciting thinking that surpasses individual effort. Together and privately, they express different perspectives, agree and disagree, point out and resolve discrepancies, and weigh alternatives. Because people grow via this process, collegiality is a crucial climate factor.'

Getting Started

Moving on

<ul style="list-style-type: none"> • Decide what topics/themes/activities best lend themselves to collaborative work. • Teach the skills pupils need to succeed in groups. • Create tasks that require collaboration (e.g. roles, reaching consensus, etc.). • Set strict time limits for group tasks. • Introduce roles that relate to tasks (e.g. recorder, facilitator, reporter, resource officer, etc.). • Use pairs or small friendship groups to begin. This will foster trust and security. • Give groups a structure for action planning (e.g. who will be doing what and when). • Troubleshoot problems that arise in groups (e.g. freeloading, dominance, etc.). 	<ul style="list-style-type: none"> • Observe and listen to one group's discussion and use for whole class feedback, especially in relation to: <ul style="list-style-type: none"> – exploratory talk (how ideas were generated, supported, challenged, built on, agreed, etc.); and – interpersonal skills (turn taking, feedback, support, etc.). • Introduce roles that relate to different perspectives and different types of thinking (e.g. circle of viewpoints, 6 Hats, etc.). • Mix up groups so they will be less prone to consensus. • Have groups agree their own ways of working. • Have groups self-assess their performance. • Ask individuals to assess their contribution to the group. • Enable peer coaching and mentoring (e.g. pupil – pupil and teacher – teacher).
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Briefing Sheet 6: Promoting Independent Learning

Effective pupils regulate their own learning by observing what they are able to do, evaluating this in relation to agreed or self-set goals and planning what to do next. This requires the pupils to develop a variety of planning, organisational, social, and metacognitive skills.

Getting Started



Moving on

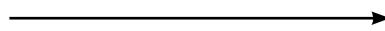
<ul style="list-style-type: none"> • Help pupils: <ul style="list-style-type: none"> – set a realistic target for a piece of work; – develop a step-by-step plan for the work; – carry out a piece of work and review plan if necessary; and – evaluate both their product and their process in order to identify strengths and weaknesses by, for example: <ul style="list-style-type: none"> ~ annotating a notebook; or ~ using a self-assessment rubric. • Give quality feedback to help pupils set further goals. • Give pupils a variety of strategies and tactics to help them manage their time, thoughts, and actions (<i>e.g. diaries, lists, mind-maps, glossaries, etc.</i>). • Help pupils recognise the ‘highs and lows’ of learning. 	<ul style="list-style-type: none"> • Set expectations to encourage forward planning and goal setting. • Have pupils use learning logs or ‘thinking books’ to record their goals, plans and progress, to express their thinking, and make it explicit to themselves. The following questions/prompts are helpful: <ul style="list-style-type: none"> – The questions I still have are.... – I wonder how? Why? – I think/feel ... – The problem is ... my solution is ... – I now think ... – I need to know • Promote and use a range of personal learning strategies (<i>e.g. flow charts, annotations, concept maps, summary diagrams, study buddies, etc.</i>). • Help pupils to develop strategies to persevere, deal with negative feedback and maintain confidence.
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Briefing Sheet 7: Making Connections

Enabling pupils to connect or apply the concepts and skills learned in one classroom to other topics, subjects and contexts is one of the primary goals of education. However this does not happen automatically and pupils generally do not make these connections.

Opportunities for transfer need to be planned and made more explicit for the pupil.

Getting Started



Moving on

- Use strategies to help connect new and previous learning (*e.g. a KWL list*).
- Introduce a thinking skill (*e.g. developing an argument or weighing up options in a personal or real life context before applying to a curriculum context*).
- Make opportunities for transfer explicit (*e.g. set it as a learning intention*).
- Create transfer opportunities soon after an initial learning opportunity.
- Begin to draw a distinction between 'near' transfer to similar learning contexts and 'far' transfer to more novel contexts.

- Ensure that attempts are consistently made to make connections between knowledge and skills in different/novel/unseen contexts.
- Use strategies like analogies and thinking diagrams to bridge original and new learning contexts.
- Make sure that transfer is made both across the curriculum and to everyday contexts.
- Reward pupils' attempts at transfer.
- Use regular plenaries to encourage pupils to think about transfer opportunities.

Appendix 2: From-To Progress Maps

Progress map from Foundation to KS 1

Pupils begin working on structured tasks, involving only a small number of steps and aspects, relating to familiar and concrete contexts, and move towards less structured tasks with more steps relating to contexts beyond their immediate experience. From an early stage, pupils should be given opportunities to work independently and to take initiatives.

	From Foundation Stage	Towards the end of Key Stage 1
Managing Information	Work with a focus, ask and respond to questions to clarify the task. Select, with help, information from materials and resources provided and suggest ways to obtain information. Follow directions in relation to a task. Begin to plan. Identify and use simple methods to record information.	Ask more focused questions about the task, clarify purpose and what needs to be done. Recognise where similar tasks have been done in the past. Use their own and others' ideas to identify, locate and select various sources of information. Set goals for their work, break tasks into smaller parts and plans the next steps. Record information in a variety of formats. Begin to identify audience and purpose when communicating.
Thinking, Problem-Solving and Decision-Making	Show their ability to memorise by recalling and restructuring experiences and stories. Make close observations and provide descriptions of what they notice. Show the ability to sequence and order events and information, and to see wholes and parts. Identify and name objects and events as same/different, sort and put objects into groups. Make simple predictions and see possibilities. Give opinions and reasons. Ask different types of questions.	Show their understanding by organising and summarising. Sequence, order and rank along different dimensions. Identify similarities and differences by making simple comparisons and connections. Begin to test predictions and to look for evidence. Make decisions and generate options. Suggest possible solutions to problems. Be systematic and work through the stages in a task. Explain their methods and opinions, and the reasons for choices and actions. Recognise the differences between why, what, where, when, and how questions.
Being Creative	Be curious and ask questions about the world around them, using all the senses to explore and respond to stimuli. Talk about their memories and experiences. Play for pleasure and as a form of creative expression. Show excitement, enjoyment and surprise in learning. Be willing to take on new challenges. Experiment with ideas through writing, drawing, mark making, model making.	Show curiosity when approaching new tasks and challenges. Have experiences with all the senses. Listen to and share ideas and experiences. Generate as many ideas and options as possible, building and combining ideas. Take time to use imagination for enjoyment. Enjoy the unexpected, unusual and surprising. Experiment and investigate real life issues.

	From Foundation Stage	Towards the end of Key Stage 1
Working with Others	Be willing to join in. Learn to work and play cooperatively. Develop routines of listening, turn-taking, sharing, co-operating, and reaching agreement. Be able to learn from demonstration and modelling. Be aware of how their actions can affect others. Learn to behave and to use words to suit different purposes. Develop confidence at being with adults and other pupils in a variety of contexts.	Develop further the habits of collaborative learning. Become more adept at turn-taking, sharing and co-operating when working in a group or team. Decide what needs to be done in a group and take responsibility for aspects of the work. Show the ability to learn from shared and modelled activities. Adapt behaviour and language to suit different situations. Show fairness to others. Recognise and respect other people's feelings and ideas.
Self-Management	Talk about what they are doing and what they have learned. Develop the ability to focus, sustain attention and persist with tasks. Develop awareness of emotions about learning, their likes and dislikes. Be able to make choices and decisions. Ask an adult or friend for help.	Check that they are achieving their purpose by talking about what they are learning, how the work was carried out and some aspect that might be improved. Check their work routinely for accuracy and precision. Persist with tasks until an appropriate endpoint, with teacher prompting. Seek help from other people. Work towards personal targets identified by teacher. Develop an awareness of what they enjoy and what they find difficult, their personal strengths and limitations.

Progress map from KS 1 to KS 2

Pupils work on tasks that involve a number of steps or aspects and require pupils to deal with more wide ranging information. The learning opportunities will increasingly deal with contexts beyond the immediate and observable. Pupils should have opportunities to demonstrate more independence and consistency in their work throughout the key stage.

	From the end of Key Stage 1	Towards the end of Key Stage 2
Managing Information	Ask more focused questions about the task, clarify purpose and what needs to be done. Recognise where similar tasks have been done in the past. Use their own and others' ideas to identify, locate and select various sources of information. Set goals for their work, break tasks into smaller parts and plan the next steps. Record information in a variety of formats. Begin to identify audience and purpose when communicating.	Be able to ask deeper and wider questions to clarify the task, to plan and to set goals. Begin to challenge conventions and assumptions. Be able to classify, compare and evaluate information, and to select the most appropriate methods for the particular task. Develop methods for collating and recording information and monitoring progress on a task. Have a sense of audience and purpose.
Thinking, Problem-Solving and Decision-Making	Show their understanding by organising and summarising. Sequence, order and rank along different dimensions. Identify similarities and differences by making simple comparisons and connections. Begin to test predictions and to look for evidence. Make decisions and generate options. Suggest possible solutions to problems. Be systematic and work through the stages in a task. Explain their methods and opinions, and the reasons for choices and actions. Recognise the differences between why, what, where, when, and how questions.	Show the ability to use memory strategies to deepen understanding and comprehension. Identify and order patterns and relationships through a range of strategies such as grouping, classifying and reclassifying, comparing and contrasting. Make and test predictions, examine evidence and make links between possible causes and effects. Discriminate between fact and opinion and question the reliability of evidence. Explain and justify methods, opinions and conclusions. Understand more than one point of view. Examine options and weigh up pros and cons. Try alternative problem-solving solutions and approaches. Use different types of questions systematically and with purpose.

	From the end of Key Stage 1	Towards the end of Key Stage 2
Being Creative	Show curiosity when approaching new tasks and challenges. Have experiences with all the senses. Listen to and share ideas and experiences. Generate as many ideas and options as possible, building and combining ideas. Take time to use imagination for enjoyment. Enjoy the unexpected, unusual and surprising. Experiment and investigate real life issues.	Pose questions that do not have straightforward answers, seek out problems to solve and challenge the routine method. See opportunities in mistakes and failures. Use all the senses to stimulate and contribute to ideas. Experiment with different modes of thinking (e.g., visualisation). Learn from and build on own and others' ideas and experiences. Value other people's ideas. Experiment with objects and ideas in a playful way. Make ideas real by experimenting with different designs, actions and outcomes. Begin to develop their own value judgements about the merits of their work.
Working with Others	Develop further the habits of collaborative learning. Become more adept at turn-taking, sharing and co-operating when working in a group or team. Decide what needs to be done in a group and take responsibility for aspects of the work. Show the ability to learn from shared and modelled activities. Adapt behaviour and language to suit different situations. Show fairness to others. Recognise and respect other people's feelings and ideas.	Become more independent in their social and interpersonal skills. Show that they can work in different roles in a group and take responsibility for appropriate tasks. Be willing to help others with their learning. Understand and learn to respond to feedback. Work with their peers to reach agreements and begin to manage disagreements.
Self-Management	Check that they are achieving their purpose by talking about what they are learning, how the work was carried out and some aspect that might be improved. Check their work routinely for accuracy and precision. Persist with tasks until an appropriate endpoint, with teacher prompting. Seek help from other people. Work towards personal targets identified by teacher. Develop an awareness of what they enjoy and what they find difficult, their personal strengths and limitations.	Evaluate what they have learned and compare their approaches with others. Make links between their learning in different contexts. Become self-directed by working on their own or with a group. Learn ways to manage their own time. Seek help from a variety of sources. Work towards personal targets identified by themselves, or jointly with the teacher. Be more confident in their knowledge of personal strengths and weaknesses.

Progress map from KS 2 to KS 3

Pupils engage in increasingly multi-dimensional and multi-step tasks. They deal with an increasingly wide range of information and work on more open-ended tasks. Pupils should have opportunities to demonstrate more independence and consistency in their work throughout the key stage, to identify their own learning needs and to set their own learning goals.

	From the end of Key Stage 2	Towards the end of Key Stage 3
Managing Information	Be able to ask deeper and wider questions to clarify the task, to plan and to set goals. Begin to challenge conventions and assumptions. Be able to classify, compare and evaluate information, and to select the most appropriate methods for the particular task. Develop methods for collating and recording information and monitoring progress on a task. Have a sense of audience and purpose.	Be able to identify challenging questions to ask and problems to solve. Evaluate the appropriateness of information/resources thus showing increased critical ability. Select, combine and synthesise information to meet the needs of the situation. Be able to use and adapt a range of methods for collating and recording information. Communicate confidently with a sense of audience and purpose and in a range of situations.
Thinking, Problem-Solving and Decision-Making	Show the ability to use memory strategies to deepen understanding and comprehension. Identify and order patterns and relationships through a range of strategies such as grouping, classifying and reclassifying, comparing and contrasting. Make and test predictions, examine evidence and make links between possible causes and effects. Discriminate between fact and opinion and question the reliability of evidence. Explain and justify methods, opinions and conclusions. Understand more than one point of view. Examine options and weigh up pros and cons. Try alternative problem-solving solutions and approaches. Use different types of questions systematically and with purpose.	Generate new interpretations and ideas through comparing and classifying. Pose questions about the reliability of evidence and the consequences for reaching conclusions. Develop an argument and decide to what extent conclusions support a prediction. Draw generalisations and recognise their limitations. Analyse a range of viewpoints. Spot biases and errors in arguments. Be able to examine the pros and cons of a decision, predict likely consequences and evaluate the outcomes from a range of perspectives. Be able to engage with a range of problem-solving methods and to evaluate solutions. Refine and modify methods and ideas in new situations and in a range of contexts. Apply understanding and make connections across the curriculum.

	From the end of Key Stage 2	Towards the end of Key Stage 3
Being Creative	Pose questions that do not have straightforward answers, seek out problems to solve and challenge the routine method. See opportunities in mistakes and failures. Use all the senses to stimulate and contribute to ideas. Experiment with different modes of thinking (e.g., visualisation). Learn from and build on own and others' ideas and experiences. Value other people's ideas. Experiment with objects and ideas in a playful way. Make ideas real by experimenting with different designs, actions and outcomes. Begin to develop their own value judgements about the merits of their work.	Recognise and identify new problems to solve. Regularly challenge conventions and assumptions. Experiment and build on different modes of thinking (e.g., visualisation, role-play, simulation). Make new connections between ideas and information. Follow intuition and take risks for success and originality. Actively learn from mistakes and setbacks. Value the unexpected or surprising. Make value judgements about both the process and outcome of their work. Make connections between creativity in the classroom and in other contexts.
Working with Others	Become more independent in their social and interpersonal skills. Show that they can work in different roles in a group and take responsibility for appropriate tasks. Be willing to help others with their learning. Understand and learn to respond to feedback. Work with their peers to reach agreements and begin to manage disagreements.	Become capable of harnessing social and interpersonal resources for the purpose of learning. Take increasing responsibility for work assigned in teams. Be willing to critically evaluate and change the approach in a group if necessary. Be willing to take the lead in demonstrating learning to others. Be able to give and respond to feedback from peers and adults. Be willing and able to reach agreement through compromise.
Self-Management	Evaluate what they have learned and compare their approaches with others. Make links between their learning in different contexts. Become self-directed by working on their own or with a group. Learn ways to manage their own time. Seek help from a variety of sources. Work towards personal targets identified by themselves, or jointly with the teacher. Be more confident in their knowledge of personal strengths and weaknesses.	Identify the types of thinking and learning engaged in and see what might be useful in new contexts. Seek out and act on guidance and feedback. Identify and prioritise own learning needs. Show greater independence in setting personal goals and targets and working towards them. Prioritise the most important things to do. Use time effectively and persist with tasks in the face of frustrations. Be aware of where learning fits into the 'big picture' and be prepared to comment on the originality and value of work.

Appendix 3: Strand Development

This appendix includes details on how specific statements in the From-to-Progress Maps build up in a progressive way. For each strand there is a statement indicating the general direction of progression. This is followed by a detailed analysis of each statement or group of statements at each curriculum stage.

NOTE: When referring to this appendix, please remember that progression in Thinking Skills and Personal Capabilities is likely to be non-linear for many pupils.

Managing Information

Pointers for progression:

As pupils progress they will begin to work on more challenging tasks that are appropriate to their age and stage. The main shift in progression is from the skills of accessing, locating and recording information to those of evaluating, combining, synthesising and communicating with a sense of audience and purpose. As they progress, pupils will plan and work more independently with a greater sense of confidence and fluency.

By the end of Foundation Stage

Start work with a focus, ask and respond to questions to clarify a task (focus, question, clarify).

Select, with help, information from materials and resources provided and suggest ways to obtain information (access, select).

Follow directions in relation to a task. Begin to plan (planning and direction).

Identify and use simple methods to record information (recording).

By the end of Key Stage 1

Ask more focused questions about the task; clarify purpose and what needs to be done. Recognise where similar tasks have been done in the past (focus, question, clarify purpose, make links with prior knowledge).

Use their own and others' ideas to identify, locate and select various sources of information (identify, locate and select, use others as a resource).

Set goals for their work, break tasks into smaller parts and plan their next steps (goals and plan).

Record information in a variety of formats (record).

Begin to identify audience and purpose when communicating (communicate information).

By the end of Key Stage 2

Be able to ask deeper and wider questions to clarify a task, to plan and set goals. Begin to challenge conventions and assumptions (question, clarify, set goals, plan, go beyond the immediate demands of the task).

Be able to classify, compare and evaluate information, and to select the most appropriate methods for a task (access information but also begin to evaluate and make choices more independently).

Develop methods for collating and recording information and monitoring progress on a task (record, integrate, monitor).

Have a sense of audience and purpose (communicate).

By the end of Key Stage 3

Identify challenging questions to ask and problems to solve (question, challenge, purpose, plan).

Evaluate the appropriateness of information and resources thus showing increased critical ability (access, evaluate, select).

Select, combine and synthesise information and/or methods to meet the needs of the situation (select, combine, evaluate).

Be able to use and adapt a range of methods for collating and recording information (record, adapt).

Communicate confidently with a sense of audience and purpose and in a range of situations (communicate).

Thinking, Problem-Solving and Decision-Making

Pointers for progression:

Even from an early stage pupils should begin to engage with a range of different kinds of thinking appropriate to their age. As pupils progress, they will begin to work on more challenging tasks that draw on wider perspectives and a deeper knowledge base. In the early stages, the focus is on developing pupils' attention, concentration and memory, so that they can build up their pattern-making abilities and solve problems in concrete situations. As they progress they will be able to deal with more dimensions of information at the same time and will extend their range of thinking skills to become more reasoned in their explanations and justifications. In the longer run, pupils should be able to engage with a variety of patterns of thinking, deal with a range of evidence, and see problems from multiple perspectives and from a more systemic point of view. As they progress, pupils will be capable of adopting a metacognitive perspective and become more adept at managing their own learning and at seeing and making connections.

By the end of Foundation Stage

Show their ability to memorise by recalling and structuring experiences and stories (**memory**).

Make close observations and provide descriptions of what they notice (**attention and concentration**).

Show the ability to sequence and order events and information and to see wholes/parts. Identify and name objects and events as same/different and put objects into groups (**patterns and relationships**).

Make simple predictions (**early causal reasoning**) and see possibilities (**alternatives**).

Give reasons and opinions (**justification, point of view**).

Ask different types of questions (**not a type of thinking per se, but a more general means of interrogating the world**).

By the end of Key Stage 1

Show their ability to organise and summarise to show understanding (**use memory for understanding**).

Sequence, order and rank information along different dimensions. Identify similarities and differences by making simple comparisons and connections (**patterns and relationships**).

Begin to test predictions and to look for evidence (**early causal reasoning, drawing conclusions**).

Make decisions and generate options. Suggest possible solutions to problems.

Be systematic and work through the stages in a task. (decision-making, problem-solving, managing steps).

Explain their methods and opinions, and the reasons for choices and actions (justification, points of view).

Recognise the differences between why, what, where, when and how questions (ways of interrogating the world).

By the end of Key Stage 2

Show the ability to use memory strategies to deepen understanding (memory for understanding).

Identify and order patterns and relationships through a range of strategies such as grouping, classifying and reclassifying, comparing and contrasting (patterns and relationships).

Make and test predictions, examine evidence and make links between possible causes and effects. Discriminate between fact and opinion and question the reliability of evidence (causal reasoning, bias and reliability of evidence).

Understand more than one point of view (multiple perspectives).

Examine options and weigh up pros and cons (decision-making).

Try alternative problem-solving solutions and approaches (problem-solving).

Use different types of questions systematically and with purpose (recognise the importance of using questions to further own learning).

By the end of Key Stage 3

Generate deep interpretations and new ideas through comparing and classifying (patterns and relationships).

Pose questions about the reliability of evidence and the consequences for reaching conclusions (bias, reliability of evidence, corroboration).

Develop an argument and decide to what extent conclusions support a prediction or an idea. Spot biases and errors in arguments (argument, causal reasoning, probabilistic reasoning).

Draw generalisations and recognise their limitations (reaching conclusions).

Analyse a range of viewpoints (multiple perspectives).

Be able to examine the pros and cons of a situation, predict likely consequences and evaluate the outcomes from a range of perspectives (decision-making).

Be able to engage with a range of problem-solving methods and to evaluate solutions (problem-solving).

Refine and modify methods and ideas in new situations and in a range of contexts. Apply understanding and make connections across the curriculum (see the bigger picture, reformulate and transfer both knowledge and skills across the curriculum).

Being Creative

Pointers for Progression:

In the early stages the focus for development will be capitalising on pupils' natural curiosity about the world, on their ability to ask questions and to explore and experiment through play. As pupils progress, it will be necessary to build on these tendencies, and to ensure that they value personal and individual responses to learning. In addition, pupils will develop more specific methods for exploring and generating ideas, building on and combining ideas in different contexts. Often, the challenge is to keep these personal and individual responses to learning alive in the face of the more external demands of the curriculum. Another important dimension for development is to enable pupils to take risks and become more resilient in their outlook by learning from their mistakes and perceived failures. A more advanced indicator of creativity is pupils' capacity to develop internal values and standards about the merits of their own work.

By the end of Foundation Stage

Be curious and ask questions about the world around them, using all the senses to explore and respond to stimuli (**exploring and investigating the world**).

Talk about their memories and experiences (**valuing the pupil's experiences**).

Play for pleasure and as a form of creative expression. Show excitement, enjoyment and surprise in learning. Be willing to take on challenges (**encouraging creative dispositions**).

Experiment with ideas through a performance (**experimenting and showing through performance**).

By the end of Key Stage 1

Show curiosity when approaching new tasks and challenges. Have experiences with all the senses (**exploring and investigating**).

Listen to and share ideas and experiences (**valuing pupil's experiences**).

Generate as many ideas as possible, building and combining ideas (**building and constructing ideas**).

Take time to use the imagination. Enjoy the unexpected, unusual and surprising (**dispositions**).

Experiment and investigate real life issues (**experimenting in a real world context**).

By the end of Key Stage 2

Pose questions that do not have straightforward answers, seek out problems to solve and challenge the routine method (**problem seeking, challenging**).

Use all the senses to stimulate and contribute to ideas. Experiment with different modes of thinking (e.g., visualisation) (**alternative modes of thinking**).

See opportunities in mistakes and failures (**resilience**).

Learn from and build on their own and others' ideas and experiences. Value other people's ideas (**constructing and valuing**).

Experiment with objects and ideas in a playful way. Make ideas real by experimenting with different ideas, actions and outcomes (**being imaginative, constructing and making real**).

Begin to develop their own value judgments about the merits of their work (**developing own values and standards**).

By the end of Key Stage 3

Recognise and identify new problems to solve. Regularly challenge conventional answers and assumptions (**problem seeking, challenging**).

Experiment and build on different modes of thinking (e.g., visualisation, role-play, simulation). Try to make new connections between ideas and information (**modes of thinking, making connections**).

Follow intuition and take risks for success and originality. Value the unexpected or surprising. Actively learn from mistakes and setbacks (**valuing originality, being resilient**).

Make value judgments about both the process and outcomes of their own work (**values and standards**).

Make connections between creativity in the classroom and in other contexts (**seeing the big picture and making connections**).

Working with Others

Pointers for progression:

The capacity to work with others is integral to pupils and young people's personal, social and emotional development. In specific learning contexts, the focus is on ensuring that pupils recognize the value of collaboration and make the most of their learning when working with others. In the early stages this will involve developing confidence to join in and to participate. As pupils progress, they begin to recognize different roles that can be adopted in face-to-face groups and they develop some capacity to participate in these different roles. Collaborative work offers opportunities to see the extent to which pupils develop negotiation skills and a sense of fairness and respect for other points of view. An important pointer for progression is when pupils not only participate in collaborative work but begin to take advantage of the opportunities for learning afforded by social situations – learning from others, giving and responding to feedback, taking the lead, helping others and so on.

By the end of Foundation Stage

Be willing to join in. Learn to work and play co-operatively (**developing confidence and willingness to join in**).

Develop the routines of listening, turn-taking, sharing, co-operating (**social skills in face-to-face groups**).

Be able to learn from demonstration and modeling (**learning from others**).

Be aware of how their actions can affect others. Learn to behave and to use words to suit different people and situations (**developing empathy and a social perspective**).

Develop confidence at being with adults and other pupils in a variety of contexts (**confidence and flexibility**).

By the end of Key Stage 1

Develop further habits of collaborative learning. Become more adept at turn-taking, sharing and co-operating when working in a group or team (**social skills in face-to-face groups**).

Decide what needs to be done in a group and take responsibility for aspects of the work (**taking responsibility and roles**).

Show the ability to learn from shared and modeled activities (**learning from others and with others**).

Adapt behaviour and language to suit different situations (**social perspective**).

Show fairness to others. Recognise and respect other people's feelings and ideas (empathy, fairness and respect).

By the end of Key Stage 2

Become more independent in their social and interpersonal skills (social skills in groups).

Show that they can work in different roles in a group and take responsibility for appropriate tasks (roles and responsibility).

Be willing to help others with their learning (learning with others).

Understand and learn to respond to feedback (learning from others).

Work with their peers to reach agreements and begin to manage disagreements (negotiation skills).

By the end of Key Stage 3

Be capable of harnessing social and interpersonal resources for the purposes of learning (creating learning opportunities with and for others).

Take increasing responsibility for work assigned in teams (roles and responsibility).

Be willing to critically evaluate and change the approach in a group if necessary.

Be willing to take the lead in demonstrating learning to others (influencing others and taking the lead).

Be able to give and respond to feedback from peers and adults and understand its importance for learning (learning with and from others).

Be willing and able to reach agreement through compromise (negotiation skills).

Self-Management

Pointers for progression:

By constantly reviewing their work and how they feel about their learning, pupils build personal resources and become more aware of how their learning can be improved. Initially, the focus is on developing habits and routines, such as persistence, time-management, seeking help, and personal target setting until these are used automatically in self-directed ways. Then, an important shift in progress is the degree to which pupils become knowledgeable about their strengths and weaknesses, know what to do to improve and can set a path for their own learning.

By the end of Foundation Stage

Talk about what they are doing and what they have learned (**articulate and review**).

Develop the ability to focus, sustain attention and persist with tasks (**persist with tasks**).

Develop awareness of their emotions about learning, their likes and dislikes (**emotions about learning**).

Be able to make choices and decisions (**take responsibility**).

Ask an adult or friend for help (**knowing when to seek help**).

By the end of Key Stage 1

Check that they are achieving their purpose by talking about what they are learning, how the work was carried out and some aspect that might be improved (**articulate, review, improve**).

Check work routinely for accuracy and precision (**review for a specific purpose**).

Persist with tasks until an appropriate endpoint, with teacher prompting (**develop persistence and increasing ability to stick with an activity**).

Seek help from other people (**use others as a resource when necessary**).

Work towards personal targets identified by teacher (**review and improve**).

Develop an awareness of what they enjoy, what they find difficult, their personal strengths and limitations (**emotions about learning, interests, strengths and limitations**).

By the end of Key Stage 2

Evaluate what they have learned and compare their approaches with others. Make links between their learning in different contexts (**review, compare, make connections, improve**).

Become more self-directed by working on their own or with a group. Learn ways to manage their own time (**take responsibility, manage time**).

Seek help from a variety of sources (**evaluate the need to use resources**).

Work towards personal targets identified by themselves or jointly with the teachers (**review and improve**).

Be more confident in their knowledge of personal strengths and weaknesses (**self-awareness and self-knowledge about their own learning**).

By the end of Key Stage 3

Identify the types of thinking and learning they have been engaged in and see what might be useful in other contexts (**review, compare, make connections, improve**).

Seek out and act on guidance (**review and improve**).

Identify and prioritise their own learning needs. Show greater independence in setting personal goals and targets and working towards them (**self-evaluate, set own goals, self-motivate**).

Prioritise the most important things to do. Use time effectively and persist with tasks in the face of frustration (**set goals, plan, self-organise, self-motivate**).

Be aware of where their learning fits into the 'big picture' and be prepared to comment on the originality and value of their work (**make connections, self-evaluate**).



A PMB Publication © 2007

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