KS3

Rewarding Learning

METACOGNITION IN THE NORTHERN IRELAND CURRICULUM

Metacognition in the Northern Ireland Curriculum

Contents

Metacognition in the Northern Ireland Curriculum

Overview

Evidence suggests that metacognitive techniques can improve educational outcomes and help pupils perform better in the classroom. As part of learnable intelligence, metacognition is important to many aspects of education, including:

- pedagogy that elicits metacognitive responses from pupils;
- teaching pupils to use self-monitoring strategies to help them learn to self-regulate for better learning;
- the potential to contribute to aspects of formative assessment; and
- helping pupils self-assess their own responses.

In educational terms, metacognition is a cognitive skill which involves directing thinking. It becomes more secure over time by using educational approaches that develop pupils' habits of self-reflection.

However, while metacognition is commonly associated with educational benefits, it is not always clear how to encourage pupils to develop this sort of thinking. This is partly because, like any educational intervention, how you implement a strategy depends on the context. In short, you need to adapt the general principles to suit your own circumstances and those of your pupils. This makes it nearly impossible to specify a definitive method that will work in all situations. In some ways that is a good thing, because a poorly considered method tends to turn into a mere tick-box exercise that subverts the original intentions. Instead, explore the implications of using metacognition in more detail, and then create a customised plan that suits your own circumstances. Once you have planned the way you intend to implement attention to metacognition, monitor the effect of the intervention. It may require some fine-tuning and several attempts before you decide whether or not the approach is working for your pupils.

How can you use metacognition to benefit your pupils? Christopher Day, Professor of Education at the University of Nottingham, offers some hints when he says:

> *Effective metacognitive strategies are those that are well structured and accompanied by intensive professional development and support for teachers. They focus on explicitly teaching pupils how to plan, monitor and evaluate their own learning, and provide opportunities for them to try these strategies out. Additionally, they tend to be group-based and specifically focused on raising attainment of children from poor backgrounds. (Day, 2015, p.13)*

This quote points out that metacognition involves planning, monitoring and evaluation; in this sense it resembles study skills. You can help your pupils to use metacognitive strategies to understand their own performance, and how to improve it. Do this by identifying when and where to prompt pupils to reflect and self-regulate their thinking.

This implies that you should know how to teach habits of reflection and self-monitoring. It's true that such approaches have always formed part of the teacher's repertoire. Metacognition is currently in demand because the research evidence suggests that using strategies like this can benefit pupils significantly.

This document considers these benefits and suggests how you can adapt approaches to suit your pupils and your own circumstances. It includes some accounts from educational literature to help you understand what's involved. It also considers how pupils can use metacognitive skills to develop their own persistence and resilience when facing learning challenges, especially when the learning is difficult.

Metacognition in the Northern Ireland Curriculum

What is metacognition?

Detailed definition

Professor Robert Swartz and Professor Carol McGuinness define metacognition in their report, *Developing and Assessing Thinking Skills* (Swartz and McGuinness, 2014, p.12).

They say that metacognition refers to cognitive monitoring, or having strategic control of your own thinking. It is central to the aim of developing pupils' thinking skills in order to enhance the quality of learning. The psychological literature around learnable intelligence suggests that metacognition involves:

- knowing about thinking strategies in general;
- becoming aware of your own thinking strategies; and
- reflecting on and evaluating thinking strategies, to plan and direct future thinking more skilfully.

Metacognition (sometimes written as meta-cognition) is usually described as *thinking about the thinking*. It is also associated with the terms *learning how to learn* and *becoming a self-regulating learner.* When pupils use metacognitive techniques, they reflect on learning to evaluate how it went, what worked and what didn't, and why. Metacognition also depends on attitudes, dispositions and emotional responses and considers wider influences on performance as they affect learning.

Building pupils' metacognitive faculties involves these reflective routines:

- signalling when to step back and pause when they are considering an activity, and
- encouraging them to ask themselves questions to unpick and negotiate their school experiences.

Over time the aim is for pupils to internalise these reflective routines so that they often pause in their work to consider how it's going. They should also ask themselves mental questions to guide and structure their activities and respond to problems, and think about how to respond should they get stuck.

You can help your pupils to develop these skills in two ways:

- firstly, by reminding them to check if things are going to plan until they are used to doing so themselves;
- secondly, by suggesting how to deal with problems as they arise, so that they adopt a c**ycle of checking** their own progress and can build a **repertoire of approaches** that they can use once they know the type of problem they are facing.

You might expect this to be true of any learning topic, but it's wrong to assume that metacognition is banal and unworthy of serious consideration. In fact, metacognition is a subtle and nuanced topic.

Becoming more aware of its possibilities and pitfalls can help you use it more effectively in the classroom.

Initially, pupils won't know how to self-regulate their thoughts in class. You need to tell them what metacognition is and why it's useful, so that they can use these skills productively. That means scaffolding the process through staged introduction and letting them practise applying the ideas to their own work. You can also talk through your own thought processes, modelling how to reflect and self-question when considering an issue and formulating a response. Talking through your own thinking makes the internal voice tangible. It also shows pupils the value of metacognitive strategies, as they discover how asking questions and considering alternatives helps them resolve an issue.

Evidence base for metacognition

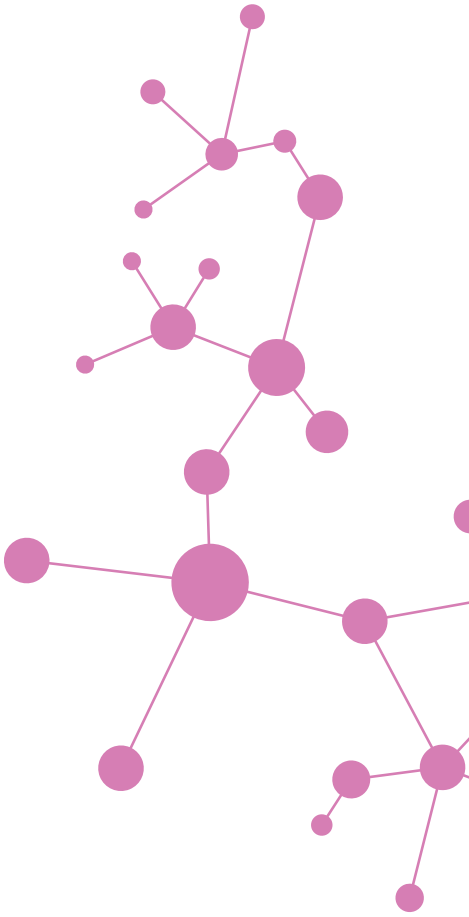
Metacognition is a key educational strategy backed up by solid evidence. It can lead to real benefits for pupils. The Education Endowment Foundation Toolkit suggests that metacognitive strategies can advance pupils' progress by up to eight months (Education Endowment Foundation, 2016).

The only other intervention with equally significant learning gains is the use of feedback (one of the central components of Assessment for Learning). For more information on using feedback as part of Assessment for Learning, visit www.ccea.org.uk and select Curriculum/Assess and Progress, then click 'Types of Assessment'.

However, the Toolkit acknowledges that introducing metacognition is not straightforward:

> *The potential impact of these approaches is very high, but can be difficult to achieve as they require pupils to take greater responsibility for their learning and develop their understanding of what is required to succeed. There is no simple strategy or trick for this. It is possible to support pupils' work too much, so that they do not learn to monitor and manage their own learning but come to rely on the prompts and support from the teacher. 'Scaffolding' provides a useful metaphor: a teacher would provide support (scaffolding) when first introducing a pupil to a concept, then remove the scaffolding to ensure that the pupil continues to manage their learning autonomously. (Education Endowment Foundation, 2016)*

The Toolkit also provides links to further reading and suggests ways to use metacognition in the classroom. David Didau has a useful article on his Learning Spy blog, 'What is meta-cognition and can we teach it?' (Didau, 2013). This article analyses the EEF Toolkit's stance on metacognition and explores the issues in a way that models a process of self-reflection.



Metacognition in the Northern Ireland Curriculum

Metacognition and Thinking Skills and Personal Capabilities

Metacognition is central to the TS&PC framework within the Northern Ireland Curriculum, where it is defined as 'the ability of the learner to plan, monitor, redirect and evaluate how they think and learn.' (CCEA, **Thinking Skills and Personal Capabilities for Key Stage 3**, p.11)

This broad definition aligns with the TS&PC framework, where thinking skills are closely connected to dispositions, emotions and behaviours (i.e. personal and interpersonal skills).

Knowledge and Control

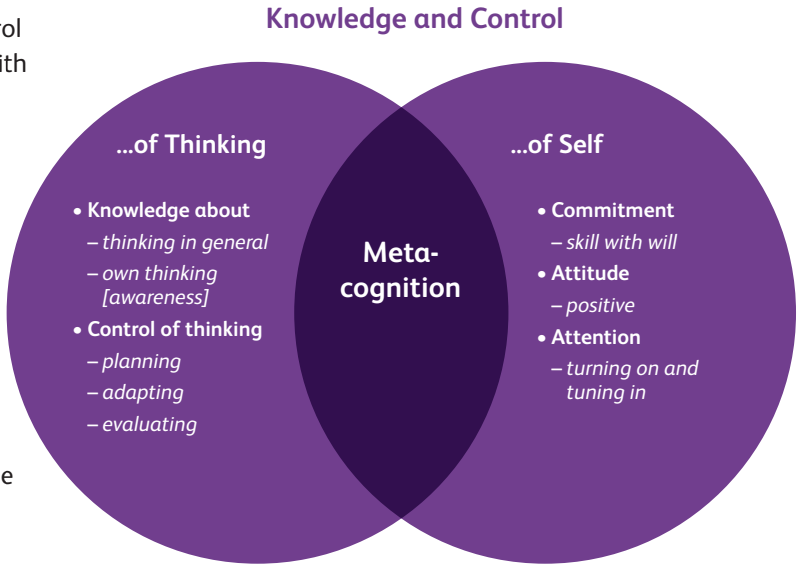
Metacognition includes the knowledge and control of both one's thinking and of one's self. Pupils with metacognitive skills have:

- knowledge about thinking in general: they recognise the different mental strategies required for different tasks (for example memorising, understanding, reasoning and problem-solving); and
- knowledge about their own thinking: they understand the mental strategies that they find easy or difficult.

They can control their own thinking and choose strategies to deal with different tasks, for example by asking themselves questions such as those in the table below when planning, adapting, and evaluating.

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 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 their attention also helps them understand that the level of attention required for a task varies, and they can adjust their focus accordingly. This sense of personal control helps pupils perform tasks efficiently.



When planning	When adapting	When evaluating
• How am I going to do it? • Is it similar to anything I've done before? • Is it one of those?	• 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?	• How did I do it? • What method/strategy worked? • What did I learn? • Did my plan work out? • Can I learn from my mistakes? • What can I do better next time?

Metacognition in the Northern Ireland Curriculum

See also the sections on metacognition on pages 11–13 in the Thinking Skills and Personal Capabilities guidance booklets on the CCEA website:

- **Thinking Skills and Personal Capabilities for Key Stages 1 & 2**
- **Thinking Skills and Personal Capabilities for Key Stage 3**

Thinking Cards
The Thinking Cards are a resource tailored to the TS&PC framework. You can use them to support effective questioning, pupil questioning and metacognition. More details about using this resource are available in the supporting documentation for the Thinking Cards. This is available on the CCEA website:
An introduction to Thinking Cards

Reasons to use metacognition

There are many good reasons to use metacognitive techniques when teaching. Research evidence shows that metacognitive approaches generate significant classroom benefits.

Benefits for learners
Metacognitive approaches help learners to:

- build independence in terms of:
  - ownership of their learning;
  - insight into their learning;
  - recognising the quality of their learning;
  - recognising underlying reasons for success or failure; and
  - recognising and diagnosing problems when confronted with difficulties;
- build habits of self-regulation in learning such as:
  - valuing mistakes;
  - resilience;
  - persistence;
  - adaptability; and
  - tolerance of ambiguity;
- reinforce and extend their range of learning strategies;
- transfer their learning to new situations; and
- develop more efficient and more thorough approaches to their work that lead to deeper learning.

Benefits for teachers
Metacognitive approaches help teachers to:

- encourage pupils to become more independent;
- give learners more responsibility over time;
- shift pupils' attitudes from fixed mindsets towards growth mindsets;
- address how learners get to grips with subject content as they reflect on their growing understanding of concepts and incorporate new material into their mental schemata;
- motivate learners as they start to own their learning and understand processes involved in building and reinforcing understanding;
- potentially free up time so that pupils can apply learning in new contexts and in real-world situations once they have grasped fundamental concepts;
- make learning deeper and more secure for pupils;
- encourage pupils to self-regulate, leading to improved outcomes (like better exam technique);
- build engagement in learning; and
- prepare pupils for lifelong learning.

Of course, you can only achieve these reported benefits by making metacognition work for pupils during your lessons.

This resource offers an overview of how to use metacognitive strategies, and outlines how to get started. You will need to adapt the ideas in this document to support your pupils to develop their own metacognitive skills.

You must translate the ideas into a format that works for you: there is no one-size-fits-all method that guarantees success. You may have to redraft and adapt your strategy over time to make it work.

Metacognition in the Northern Ireland Curriculum

Metacognition and the European Union Key Competencies

Attention to Thinking Skills, and to metacognition in particular, is a feature of many high-performing educational systems. In the EU this can be seen within the documentation associated with key competencies, where it is referred to in the context of 'learning to learn'.

An outline of what is meant by learning to learn is given on page 10 of the publication **Key Competences for Lifelong Learning: European Reference Framework**. (European Commission, 2007)

Additionally, details are provided in the publication **Learning to Learn: What is it and can it be measured?** (Hoskins and Fredriksson, 2008)

The EU working group on 'Key competences' defined 'learning to learn' as the ability to pursue and persist in learning. As a result of the outcomes of the working group, a recommendation on key competencies for lifelong learning was developed. The Council and the European Parliament adopted the recommendation in December 2006 (Education Council, 2006). The recommendation sets out eight key competencies:

1. Communication in the mother tongue;
2. Communication in foreign languages;
3. Mathematical competence and basic competences in science and technology;
4. Digital competence;
5. Learning to learn;
6. Social and civic competences;
7. Sense of initiative and entrepreneurship; and
8. Cultural awareness and expression.

The same EU documentation defines learning to learn in the following terms:

> *Learning to learn is the ability to pursue and persist in learning, to organise one's own learning, including through effective management of time and information, both individually and in groups.*
> *This competence includes awareness of one's learning process and needs, identifying available opportunities, and the ability to overcome obstacles in order to learn successfully.*
> *This competence means gaining, processing and assimilating new knowledge and skills as well as seeking and making use of guidance. Learning to learn engages learners to build on prior learning and life experiences in order to use and apply knowledge and skills in a variety of contexts: at home, at work, in education and training. Motivation and confidence are crucial to an individual's competence.*
> *(European Commission, 2007, p.10)*

EU Learning to Learn Framework

Within the paper, details of the learning to learn framework are provided:

> *The new framework model is based on three dimensions of learning to learn, Cognition, Metacognition and affective dimensions. The metacognitive dimension, based on a Spanish test from University of Madrid, (Moreno, 2002) introduces from the definition the notion of the capacity to reflect accurately on your own ability. (Hoskins and Fredriksson, 2008, p.28)*

Metacognition in the Northern Ireland Curriculum

The framework is divided into three areas: the affective dimension, (which emphasises feelings and attitudes to learning), the cognitive dimension (mental skills or knowledge) and metacognition (a subset of the cognitive domain).These dimensions are then subdivided in the following terms:

Learning to learn framework
The affective dimension is comprised of 3 sub-dimensions:

- Learning motivation, learning strategies and orientation towards change
- Academic self-concept and self-esteem
- Learning environment

The cognitive dimension is based on the 4 sub-dimensions:

- Identifying a proposition
- Using rules
- Testing rules and propositions
- Using mental tools

Meta-cognition which comprises 3 sub-dimensions:

- the problem-solving (metacognitive) monitoring tasks
- metacognitive accuracy
- metacognitive confidence *(Hoskins and Fredriksson, 2008, p.29)*

As can be seen from these references, there is widespread acknowledgement of the significance of metacognition as a feature of learning how to learn. It involves aspects of cognition, self-regulation and self-management, especially as these pertain to developing skills for problem-solving. The next sections look at how to incorporate approaches to metacognition into your teaching.

When does metacognition happen?

Metacognition is involved at various stages in teaching and learning, and is typically concerned with planning, monitoring and reviewing during a sequence of instruction. In that sense there is no mystery to it. From a teacher's perspective it involves planning for and checking understanding using effective questioning. From a pupil's perspective, metacognition is closely related to so-called 'study skills', particularly where they overlap with learning how to learn.

Metacognition is a naturally occurring part of many lessons – pupils think about what they're doing all the time. The benefits come from emphasising the *quality* of thinking taking place. This involves:

- firstly, recognising what metacognition means;
- secondly, recognising when it might be taking place; and
- finally, planning how to familiarise pupils with metacognitive strategies (thinking about their thinking, learning how to learn, and self-regulating their learning).

Metacognition in the Northern Ireland Curriculum

Opportunities to use metacognition

If you want your pupils to develop metacognitive thinking, consider what makes planning, monitoring and evaluation effective:

- what works;
- what works for which purposes; and
- why does it work?

Teachers usually ask questions to check understanding and tend to assume that their pupils are thinking reflectively. However, evidence suggests that it's better to teach them:

- how to plan;
- how to evaluate; and
- how to manage time on a task.

Strategies like these support your pupils' progress. Focusing on metacognition introduces them to new subject content and also helps them to assimilate the material. In the language of cognitive psychology, that means providing mental models that pupils can use as they incorporate new materials into their developing mental schemas.

Teachers often assume that pupils are already familiar with learning how to learn, and are aware of learning strategies like making notes, asking questions and using diagrams or images to check understanding. Developing skill in these areas is cyclical, so encourage your pupils to practise them regularly.

Make sure that your pupils know how to use the planning and evaluation strategies that you specify. You should also establish routines to help classes with time management, such as insisting on deadlines.

Using metacognition in your teaching: what's involved?

Consider the three aspects of metacognition: planning, monitoring and reviewing. These are related to the launch–activity–debrief model described in the Thinking Skills and Personal Capabilities guidance booklet for Key Stage 3 (CCEA, 2007, p.10), and to the plan–do–review model for classroom activity. When using these models, you should focus on effective questioning and making the plenary session run smoothly.

The following section suggests some ways to use metacognition in your teaching. We outline suggestions for the early stages, then ways to develop approaches once pupils are familiar with the routines. Later on we suggest how to use metacognitive strategies more independently.

Many of the suggested actions will be familiar, such as effective questioning, formulating learning intentions and success criteria. They help pupils develop as reflective learners, aware of their own dispositions, emotions and behaviours, strengths and weaknesses in a particular subject or topic.

Effective questioning

If you want your pupils to become more reflective learners, you need to ask incisive questions at key moments. Research shows that teachers ask questions roughly every 72 seconds. However, 38 percent of these questions are actually answered by the teacher, not the pupils.

Effective questioning, therefore, means asking questions to elicit maximum feedback, which you can then use to evaluate, plan and expand learning.

Strategies for effective questioning
Some simple strategies include:

- asking better questions;
- asking questions better;
- dealing with answers productively; and
- encouraging pupil questions.

Asking better questions
If you want to ask better questions, plan more carefully and take more care when framing your questions. Ask yourself:

- What do I want my pupils to learn?
- How do I want them to learn it?
- How will I find out if they have learned it?

Encouraging pupils' questions
As a teacher, you ask most of the questions in the classroom (around 50 to 70 percent more than your pupils). Encouraging pupils to ask questions is a key part of learning, and:

- promotes pupil involvement;
- develops their independence;
- helps pupils to work through difficulties (rather than automatically asking for help);
- helps them to explain topics more easily; and
- promotes reflection and evaluation of their own learning.

There is more detail available on effective questioning in the CCEA booklets **Assessment for Learning for Key Stages 1 & 2** and **Assessment for Learning for Key Stage 3.**

Metacognition in the Northern Ireland Curriculum

Using metacognition in your teaching

Planning

Using metacognition means getting classes to talk about thinking using a shared language. It can take time before pupils are familiar with the routines. Encourage pupils to use strategies to plan, monitor, and review their own learning to develop those routines.

Use planning and evaluation to frame discussions about quality thinking and demonstrate how the evidence of pupils' thinking is visible in their work. For example, ask them to make plans, using templates that you provide to guide them through the process. The plans then become records to help pupils discover which aspects of the plan were successful, and which were less effective or unnecessary. Over time, you can gradually withdraw pre-made planning templates and instead ask pupils to construct their own plans.

Early stages	Some familiarity with plans	Later stages
• Model how to plan work by showing pupils examples of different planning methods or structures useful for different situations, such as: – describing intentions; – storyboarding; – mind maps; – writing frames; – bullet point lists; – notes; – drawings; – sketches; – flow charts; or – annotated diagrams. • Model the thinking to show pupils how to divide a task into manageable stages. • Show pupils how to break a task down into smaller sub-tasks. • Provide a sequence to follow. • Give examples of the stages involved in working through an activity (show pupils a finished version). • Give success criteria in pupil language.	• Ask pupils to decide on the stages into which to divide a larger task: – how many stages; – how long to allow for each; and – state which are most important. • Ask pupils to identify in advance the key features they need to include in order to meet the requirements of a task. • Ask pupils to choose from several possible structures or planning methods appropriate to the proposed activity. (Pupils should be familiar with using different approaches at different times for various purposes i.e. have seen and used several possibilities beforehand.) • Give success criteria in subject language.	• Ask pupils to produce a plan of their own. • Involve pupils in formulating success criteria for their work. • Ask pupils to show the sequence they intend to use when completing an activity as part of the plan. • Encourage pupils to prioritise the order in which to tackle parts of an activity as part of the plan. • Ask pupils to explain why they made particular planning decisions. They should include a justification for the stages in the plan. • Refuse to accept slap-dash planning by asking pupils to retrospectively show how their planning was successful or where refinements could have led to improved outcomes.

Metacognition in the Northern Ireland Curriculum

Monitoring

There are two parts to metacognitive monitoring. The first is getting pupils to manage their time, so they:

- recognise how much time to allow for different parts of an activity;
- learn to anticipate which parts of a sequence might cause delays or bottlenecks; and
- monitor elapsed time so that they know when to finish up.

The second is encouraging pupils to reflect on how they are performing as they go along:

- asking themselves if everything is going smoothly and according to plan;
- recognising when particular aspects of an activity are causing difficulty;
- identifying a course of action to keep work on track;
- spotting when a sudden breakthrough means more time for another part of the activity; or
- recognising if their attention is drifting or if they are being distracted from the task.

Once pupils become good at self-monitoring, it means they have a skill to help them check that learning is on track. For example, if pupils face a timed test, it's helpful for them to scan the questions, work out roughly how much time to allow for each, and therefore avoid spending too long on one section and running out of time.

The aim is to introduce habits of focusing attention and good time management until pupils:

- recognise that they need to adjust concentration if they start to drift off-task;
- internalise the idea that they have to meet deadlines; and
- have good self-regulation strategies as part of their repertoire of skills.

Metacognition in the Northern Ireland Curriculum

Early stages	Some familiarity with time management	Later stages
• Chunk the time available for an activity, allocating set periods for parts of the work, bearing in mind the age and readiness of the pupils. For example, you could allow pupils: – ten minutes to set up the equipment; – ten minutes to carry out the activity; – five minutes to write down the outcomes; and – five minutes to prepare an answer. • Pause the activity at various points and ask the class to indicate how much of an activity they have completed and how much they still have to do. • Ask pupils to give an update on their progress during an activity. • Give regular reminders of how much time is remaining.	• Appoint a pupil to act as an observer or timekeeper during an activity. • Ask each group to appoint a timekeeper to manage the sequence of a group activity. • Give occasional reminders of how much time is remaining. • Remind the class to keep an eye on the time.	• Ask pupils to meet deadlines. • Ask pupils to manage their time during in-class and out-of-class activities.

Metacognition in the Northern Ireland Curriculum

Checking work in progress

Early stages	Some familiarity with checking work in progress	Later stages
• Introduce pupils to the idea of work in progress and indicate that they might not complete an activity in one sitting. • Get pupils used to the idea of checking on work in progress, including rereading and correcting. • Suggest keeping a snapshot of work in progress that pupils can refer to later. This could be a screenshot or a note to use as a reminder. • Ask individuals to report to the class on what they've done so far. • When pupils hit problems in their work, use them to point out potentially difficult aspects of a task to the class. • Ask the class to identify where they had difficulties in an activity, and where the process was smoother or more straightforward.	• Pause the activity, pick an individual pupil or member of a group and ask them to report to the class: – what stage they are at; – how they got there; and – what was involved in reaching that stage. • Bounce the report to another pupil or group and ask them to comment on similar or different experiences. • Break tasks down into subsections, and require pupils to complete parts of it after a set period of time. For example, if a report on an experiment begins with drawing a diagram of the apparatus, pause after the time allowed for the drawing and ask to see what's been completed. Ask what caused delays. • Encourage pupils to pause occasionally, step back and check their own progress as a way to monitor how learning is going. • Give pupils a format for compiling a project diary or learning log that prompts them to comment on their work at various stages in its completion.	• Ask pupils to keep occasional notes on work in progress, including comments identifying which parts of an activity presented challenges, which parts were easy to manage, and why. • Pause the activity and invite individuals or groups to report to the class on issues they've encountered so far, and what they did to solve the problems they faced. • While classes are working on an assignment, bring up individuals for a one-to-one conversation about how they're doing and how they view their progress on an activity. • Ask pupils to maintain a project diary or learning log with regular annotations to work in progress such as: – screenshots; – vocabulary notes; – records of sources; – product comparisons; – rough drafts; – prototypes; – feedback requests; – comments from 'critical friends', for example other class or group members; or – reminders.

Taking the time to emphasise standard classroom routines may at first seem obvious or laborious. However, the aim is to draw pupils' attention to various stages of an activity so that they consider their own performance. This helps them activate their thinking, instead of rushing to complete an assignment. At first it can be time-consuming to get pupils to self-regulate and self-monitor, but once they are used to it, it should take less time and become almost automatic.

Of course, you can overdo such techniques. There's no need to introduce this sort of approach to every activity: instead, use the ideas sparingly to build pupils' insight into their own progress.

Similarly, if you want to develop your pupils' independence, sometimes you need to step back and leave them to struggle with difficulties. That can feel counterintuitive, but too much spoon-feeding will stop them becoming more self-reliant.

Reviewing

Pupils often find it difficult to assimilate new learning successfully.

Periodically stepping back and reviewing what's happened during a learning sequence or over the course of several lessons is a good way for pupils to consolidate learning. Successful evaluation should explore what's happened, with reference to the starting point and the learning intentions. If pupils restate the stages of the learning journey when summarising their experiences, you can check that everyone has a firm grasp of the learning. As a result, pupils are likely to retain more content knowledge and understand how to use the information.

Opportunities to reflect are crucial to help pupils assimilate material. Without such opportunities, learning might move on to the next topic before everyone fully understands the topic.

There are many approaches to evaluation that you can try when reviewing learning, such as:

- inviting individuals or groups to explain their work to the rest of the class;
- asking for a section in the project diary that includes comments on the pros and cons of what's been produced; or
- holding a 'class crit' where the class look at the finished products and comment on each other's work.

Making the review work successfully means having a range of possibilities available, so that reviewing doesn't become monotonous.

This can be hard to manage, despite the obvious benefits of reflection. Often evaluation gets cut short or ignored in the rush to move on to the next topic.

It's also worth taking account of the so-called 'testing effect'. Giving a test after instruction can help check pupils' understanding, but also helps them retain information, because of the effort of having to recall learning for the test. A test can allow pupils to reflect as much as a discussion. Note that the testing effect is also reinforced if you schedule another test after successively longer delays between testing.

Metacognition in the Northern Ireland Curriculum

Ways to run plenaries
Plenary comes from the Latin plenum meaning 'full space', as in the opposite of a vacuum. A plenary session is a time for everyone to have a say. It's used as a summing-up session at the end of an activity.

In a classroom environment, plenaries are periods of time set aside to:

- summarise what's taken place;
- encourage class participation;
- consolidate the learning;
- draw out the messages;
- check what pupils have understood;
- reflect on the process; and
- decide on some way to record the outcomes and ensure that learning moves from short-term into long-term memory.

Running successful plenaries is not easy: there are several well-worn formats for a 'closing session'. Usually these happen as an end-of-task summary where the teacher recaps the main points and asks a few questions to check that everyone is ready to move on. Three things tend to sabotage the 'debrief' phase of a learning sequence:

1. Not doing any summary or reflection at all, and rushing on to the next topic.
2. Not leaving enough time for meaningful reflection and glossing over the 'closure' part of a session with several confirmatory questions answered only by a few successful pupils.
3. Using a repetitive approach to winding up class activities that only serves to keep early finishers occupied: for example, asking early finishers to evaluate a recently completed task while the rest of the class catch up.

Metacognitive skills only develop if pupils have time and opportunity to practice them. For example, if evaluation merely involves asking for 'two stars and a wish' (or some similar exercise), it devalues the importance of the reviewing process.

Debrief or plenary sessions should make room for metacognitive knowledge. The following suggestions look at ways to draw out the details of the learning process. For example, teachers can:

- point out where particular strategies have been used;
- suggest alternative or more appropriate strategies;
- encourage pupils to recognise where they have used an approach in their work;
- ask pupils to consider how they might re-use an approach in other contexts; and
- help pupils understand that their learning will be useful again in other circumstances.

If pupils step back from time to time, they can become more reflective learners and take greater ownership of their own learning processes.

Note
Mike Gershon has produced a useful free resource with ideas for plenaries. It's called the Plenary Producer, and it contains many examples of how to run class plenary sessions. This resource is available as a **PowerPoint presentation** from the TES website, or alternatively you can download it from **Gershon's own website**.

Metacognition in the Northern Ireland Curriculum

Early stages	Some familiarity with reviewing	Later stages
• Set clear learning intentions and success criteria for the activity and run the review process with reference to these. • Prepare key questions in advance. • Prepare examples that illustrate outcomes you want pupils to produce so that they can compare their work against them. • Prompt pupils to develop their own effective questions to use. • Use thinking frames as the basis for reflecting on the stages pupils pass through while completing work. • Introduce routines of displaying and discussing pupil work. • Run end-of-topic debrief sessions to talk about experiences and to draw out the learning. • Build familiarity with thinking language to discuss how things went so that comments move on from 'I liked that', 'I didn't like that', or 'that was hard'. Instead to ask pupils to explain in detail what caused their likes, dislikes and difficulties.	• Get groups to report on their experiences to the rest of the class. • Ask pupils to evaluate their work using the success criteria. • Ask pupils to identify where they encountered most difficulties, and what they did in response. • Involve pupils in self- and peer assessment, checking their own and each other's work.	• Ask pupils to reflect and comment on the advantages and disadvantages of particular tools and strategies they used when doing the work. • Ask pupils to compare their approach with ways they completed work on other occasions. • Ask pupils to identify the strengths and weaknesses within their own work. • Have pupils identify areas for continued development, for example what to concentrate on or do differently next time. • Ask pupils to show where within the work they were able to incorporate priorities they identified from previous instances. For example, ask them to show where they acted on an earlier round of evaluation to make progress in their work. • Have pupils keep a record of their review as part of a project diary or learning log, and include reasons for their decisions, justifying their course of action. • Run a plenary session, with pupils taking responsibility for managing the activity. • Vary the timing of review sessions so that they are not always at the end of a sequence.

Metacognition in the Northern Ireland Curriculum

Summary

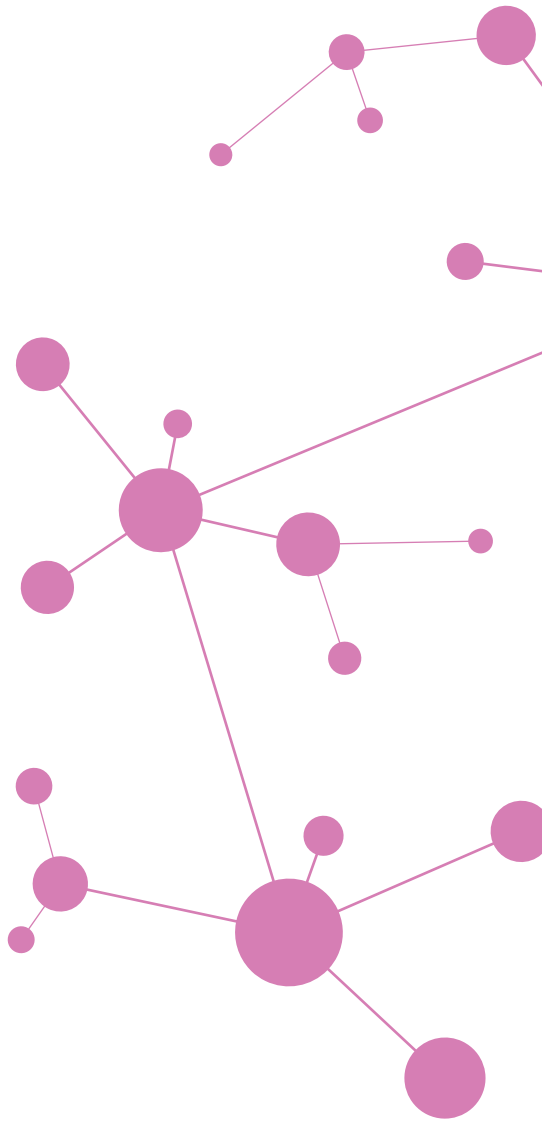
Using metacognition when teaching means encouraging your pupils to self-reflect, so that their performance improves. You want them to think reflectively so that they recognise what's involved in their learning, including their attitudes and dispositions to school-work. You can't reduce this to a formula: the approaches, techniques, methods and activities described here are no more than a starting point. You must adapt the suggestions and introduce them to your classes, taking account of their individual requirements.

Using metacognitive strategies does not mean introducing a new form of worksheets. Instead, as Rob Coe puts it with deliberate over-simplicity: 'learning happens when people have to think hard' (Coe, 2013).

That will be true for you, as you try to implement metacognition in ways that your pupils can use. It will also be true for your pupils as they try to understand what is going on during their learning.

In high-performing education systems around the world, metacognition is widely recognised as a desirable skill. Both the Northern Ireland Curriculum and metacognition represent a shift in emphasis away from a transmission model of knowledge where the teacher 'covers' the subject content. Instead, metacognition helps pupils incorporate the learning into their developing knowledge base so that they learn to master it. That means considering how pupils can absorb the knowledge content in enduring ways. This does not imply that skills are somehow more important than knowledge. Rather, knowledge is so important that you need to think about how you can optimise both the transmission and reception of content so that pupils gain insight into their responsibility for their own learning.

That can be difficult, as post-primary pupils typically don't possess such self-reflective insight. You need to subtly coax some of them into engaging with school subjects, by making it clear what the benefits of study are and how it can be relevant to their own experiences.



List of references

Advice and guidance documents for the Northern Ireland Curriculum

CCEA Assessment for Learning for Key Stages 1 & 2,
available at **www.ccea.org.uk** (2007)

CCEA Assessment for Learning for Key Stage 3,
available at **www.ccea.org.uk** (2007)

CCEA Implementing Thinking Skills and Personal Capabilities into your school: Unit 6 – Metacognition,
available at **www.nicurriculum.org.uk** (2007)

CCEA Thinking Skills and Personal Capabilities: Thinking Cards,
available at **www.nicurriculum.org.uk** (2011)

CCEA Thinking Skills and Personal Capabilities for Key Stages 1 & 2,
available at **www.ccea.org.uk** (2007)

CCEA Thinking Skills and Personal Capabilities for Key Stage 3,
available at **www.ccea.org.uk** (2007)

Metacognition in education strategies in the European Union

European Commission,
Key Competences for Lifelong Learning: European Reference Framework,
available at **www.erasmusplus.org.uk** (2007)

Education Council,
'Recommendation of the European Parliament and of the Council of 18 December 2006 on key competences for lifelong learning', *Official Journal of the European Union*,
available at **www.eur-lex.europa.eu** (2006)

Hoskins, B and Fredriksson, U,
Learning to Learn: what is it and can it be measured?
Joint Research Centre, European Commission, available at **www.publications.jrc.ec.europa.eu** (2008)

General treatments of metacognition

Culatta, R,
Learning Concepts: Metacognition,
available at **www.instructionaldesign.org** (2015)

Didau, D,
'What is meta-cognition and can we teach it?', *The Learning Spy,*
available at **www.learningspy.co.uk** (2013)

Education Endowment Foundation,
Teaching and Learning Toolkit: Meta-cognition and self-regulation,
available at **www.educationendowmentfoundation.org.uk** (2016)

Gershon, M,
'The Plenary Producer', *Mike Gershon: great teaching made easy,*
available at **www.mikegershon.com** (2013)

Academic papers and references to metacognition

Adkins, J,
Metacognition: Designing for Transfer,
Department of Curriculum Studies, University of Saskatchewan, available at **www.etad.usask.ca** (1997)

Blakey, E and Spence, S,
Developing Metacognition: ERIC Digest,
available at **www.ericdigests.org** (1990)

Cambridge International Examinations Teaching and Learning Team,
Getting Started with Metacognition,
available at **www.cambridge-community.org.uk** (2016)

Chiu, C,
Synthesizing Metacognitive Interventions: What Training Characteristics Can Improve Reading Performance?,
Annual Meeting of the American Educational Research Association, available at **www.eric.ed.gov** (1998)

Coe, R,
Improving Education: A triumph of hope over experience,
Centre of Evaluation and Monitoring, Durham University, available at **www.cem.org** (2013)

Day, C,
The Role of Continuous Professional Development in Closing the Gap in Educational Attainment: a Review of What Works at Classroom, School and System Levels,
Public Policy Institute for Wales, available at **www.ppiw.org.uk** (2015)

Livingston, J,
Metacognition: An Overview,
available at **www.gse.buffalo.edu** (1997)

McGuinness, C, Curry, C, Eakin, A and Sheehy, N,
Metacognition in Primary Classrooms: A pro-ACTive learning effect for children,
TLRP Annual Conference 2005, available at **www.leeds.ac.uk** (2005)

Swartz, R and McGuinness, C,
Developing and Assessing Thinking Skills Project: Final Report Part 1,
available at **www.ibo.org** (2014)