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Foundation

Metacognition and Self-Regulated Learning

Guidance Report



Education Endowment Foundation

About the Education Endowment Foundation

The Education Endowment Foundation (EEF) is an independent charity dedicated to breaking the link between family income and educational achievement. We do this by supporting schools, colleges, and early years settings to improve teaching and learning through better use of evidence.

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Introduction

There is a strong body of research from psychology and education demonstrating the importance of metacognition and self-regulation to effective pupil learning. The EEF's Teaching and Learning Toolkit, which summarises a large body of international evidence, rates 'metacognition and self-regulation' as a high impact, low-cost approach to improving the attainment of disadvantaged learners.[1]

Teachers can use metacognition and self-regulation approaches to support pupils to think about learning more explicitly, often by teaching them specific strategies for planning, monitoring, and evaluating their learning.

- **Metacognition** is the learner's ability to be aware of, reflect on, and direct their thinking.
- **Self-regulated learners** apply metacognitive strategies to their learning. They demonstrate **self-regulation** of their learning by managing their motivation, thoughts, and learning behaviours. This can be achieved by setting goals, monitoring and reviewing their progress, and reflecting on their learning processes.

More detailed definitions of these terms are given in the first section of this report.

For younger children, self-regulation is often considered alongside executive function and—fitting the learning goals of children in this age group—is focused on managing emotions and adapting behaviour. Guidance for this aspect of self-regulation can be found in the **Self-Regulation and Executive Function strand** of the EEF Early Years Evidence Store.[2]

When considered as part of the social and emotional aspects of learning, self-regulation is more focused on the self-management of intense emotions alongside focus and impulse control during tasks. Further guidance on social and emotional learning for primary school practitioners can be found in the EEF's **Social and Emotional Learning in Primary Schools** guidance report.[3]

For learners with Special Educational Needs and Disabilities (SEND), self-regulation often refers to supporting learners to manage their emotions, manage the sensory environment, and maintain focus, ultimately so they can successfully access the learning. Guidance on this aspect of self-regulation can be found in the EEF's **Special Educational Needs in Mainstream Schools** guidance report.[4]

What does this guidance cover?

This guidance report focuses on metacognitive strategies and promoting self-regulation in primary and secondary schools. We have focused on how metacognition and self-regulated learning can be used in real-world settings and on the strategies that teachers can use to develop these skills in their pupils.

Who is this guidance for?

This guidance is applicable to both primary and secondary schools. The evidence reviewed covered studies for ages two to 19 and shows a positive effect of using metacognitive strategies and promoting self-regulated learning across this whole age range. Most of the examples included in this report, however, are from Key Stages 1 to 4, where the research is strongest.

While some recommendations in this report may be relevant for early years education, other resources may speak more directly to it. We would suggest referring to our **Early Years Evidence Store Self-Regulation and Executive Function** strand.[5]

This guidance report is aimed primarily at senior leaders and teachers responsible for staff development. It will also be useful for class teachers with an interest in how research can improve their teaching. Metacognitive strategies can particularly support the learning of many pupils with SEND,[6] therefore this guidance report may be useful for anyone looking to develop inclusive practice within their setting. Further audiences who may find the guidance relevant include governors, parents, programme developers, and educational researchers.

About the update

This is an update to the previous guidance report on metacognition and self-regulated learning. While the previous report was based on a broad overview of the literature,[7] this updated report draws on a more detailed review of 355 studies.[8] This new **evidence review** has provided a clearer picture of the approaches and strategies that teachers can use to promote metacognition and self-regulated learning in their settings.

Where appropriate, this report also draws on evidence from the wider suite of EEF evidence reviews. Insights into current practice have been drawn from a range of available recent research and from the input of the advisory group, Research Schools, and a user group. A full list of references can be found at the end of this report and in the **Evidence to Decision framework.**

Explainer

An **Evidence to Decision** (EtD) framework is a structured and systematic approach used in evidence-based decision-making processes to ensure that decisions are transparent, consistent, and based on the best available evidence.

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Summary of recommendations

Recommendation 1

Schools should support teachers to understand the importance of using strategies to develop their pupils' metacognitive knowledge.

- Self-regulated learners are aware of their strengths and weaknesses and can motivate themselves to engage in, and improve, their learning.
- Developing pupils' metacognitive knowledge of how they learn—their knowledge of themselves as a learner, of strategies, and of tasks—is a common feature of successful metacognition approaches.
- Teachers should support pupils to plan, monitor, and evaluate their learning through explicitly teaching, modelling, and scaffolding the use of metacognitive strategies.

09

Recommendation 2

Explicitly teach pupils metacognitive strategies, including how to plan, monitor, and evaluate their learning.

- Explicit instruction in metacognitive strategies can improve pupils' learning.
- While concepts like 'plan, monitor, evaluate' can be introduced generically, the strategies are mostly applied in relation to specific content and tasks and are therefore best taught this way.
- A series of steps—beginning with activating prior knowledge and leading to independent practice before ending in structured reflection—can be applied to different subjects, ages, and contents.

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Recommendation 3

Model your own thinking to help pupils develop their metacognitive and cognitive skills.

- Modelling by the teacher is a cornerstone of effective teaching; revealing the thought processes of an expert learner helps to develop pupils' metacognitive skills.
- Teachers should verbalise their metacognitive thinking as they approach and work through a task —'What do I know about problems like this?', 'What ways of solving them have I used before?', 'What do I need to do to be successful in my learning?'
- Scaffolded tasks, like worked examples, allow pupils to develop their metacognitive and cognitive skills without placing too many demands on their mental resources.

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Recommendation 4

Promote and develop metacognitive talk in the classroom.

- As well as explicit instruction and modelling, classroom dialogue can be used to develop metacognitive skills.
- Pupil-to-pupil and pupil-teacher talk can help to build knowledge and understanding of cognitive and metacognitive strategies.
- However, dialogue needs to be purposeful, with teachers guiding and supporting the conversation to ensure it is challenging and builds on prior subject knowledge.

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Summary of recommendations

Recommendation 5

Set an appropriate level of challenge to develop pupils' self-regulation and metacognition.

- Setting the right level of challenge is crucial to allow pupils to develop and progress their knowledge of tasks, strategies, and of themselves as learners.
- Teachers need to ensure that challenge is set at an appropriate level.
- Teachers can support pupils' motivation by giving feedback on a range of goals.
- Tasks should be created that do not overload pupils' cognitive capacity, particularly when they are expected to apply new strategies.

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Recommendation 6

Explicitly teach pupils how to organise, and effectively manage, their learning independently.

- Teachers should explicitly support pupils to develop independent learning skills.
- Carefully designed guided practice, with support gradually withdrawn as the pupil becomes proficient, can allow pupils to develop skills and strategies before applying them in independent practice.
- Pupils will need timely, effective feedback and strategies to be able to judge accurately how effectively they are learning.
- Teachers should also support pupils' motivation to undertake the learning tasks.

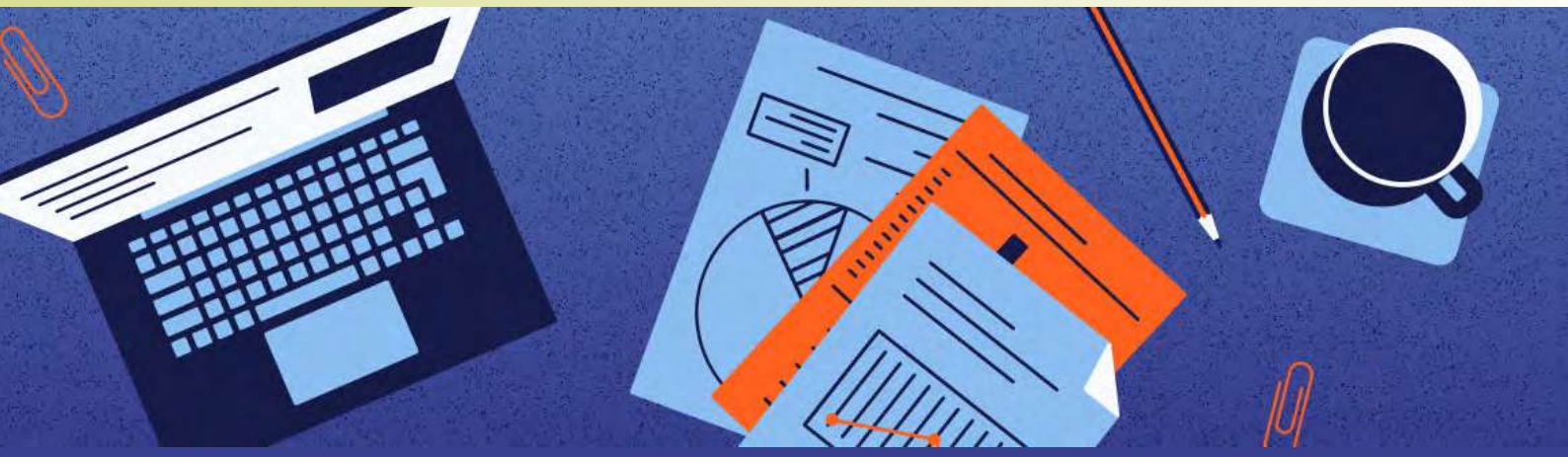
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Recommendation 7

Schools should develop effective implementation processes to promote metacognition and self-regulated learning.

- Develop teachers' knowledge and understanding through high-quality professional development and resources.
- Senior leaders should provide teachers with time and support to make sure approaches are implemented consistently.
- Teachers can use tools such as 'traces' and observation to assess pupils' use of self-regulated learning skills.
- Metacognition shouldn't be an 'extra' task for teachers to do but should be built into their teaching activities.

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The following vignette describes a teacher using metacognitive strategies to meet pupils' needs.

Vignette

What are metacognition and self-regulated learning?

Over the past half-term, Mr Thomas noticed pupils struggling with spelling tests. In response, he slowed the pace and made his teaching more explicit.

Thinking aloud, Mr Thomas shared examples like, 'I sometimes forget tricky endings too. What helps me remember? A rhyme, a rule, or grouping the words.' To deepen understanding, he led peer discussions on tricky spellings, modelled using mnemonics, and demonstrated how to follow them up with low-stakes strategies like partner checks or self-quizzing, explaining how and when to use them effectively.

After each test, Mr Thomas set aside time for evaluation, using prompts like: 'What worked?', 'What will you do differently next time?' He also encouraged pupils to apply these strategies at home, building their independence as learners.

Call for reflection

- How has Mr Thomas supported pupils in planning their learning by helping them choose appropriate strategies?
- How does Mr Thomas help pupils monitor their understanding during a task and make adjustments when needed?
- What other opportunities could Mr Thomas use to support pupils in evaluating their work?

What are metacognition and self-regulated learning?

This spelling test vignette is a familiar scene that is played out in classrooms across the country. The strategies that Mr Thomas has introduced and the pupils' application of them as they are learning their spellings, inside and outside of the classroom, is simply the typical stuff of everyday learning and school. And yet, without the explicit teaching of ways to plan, monitor, and reflect on learning, these strategies can remain hidden and implicit in the classroom. Without Mr Thomas' explicit modelling, his pupils may not have been able to exhibit the thoughts and actions of successful self-regulated learners and deploy the crucial metacognitive strategies that they have now been taught.

Essentially, self-regulation is about the extent to which learners are aware of their strengths and weaknesses and the strategies they can use to learn. It describes how they can motivate themselves to engage in learning and develop strategies to enhance their learning and to improve. It will look different for learners of different ages, and for different tasks, but teachers will recognise these characteristics in their most effective learners.

Some pupils, including some with SEND, will find self-regulation harder than their peers. Informed by a knowledge of their pupils, teachers may therefore provide additional modelling, adapt the metacognitive questions they ask, or take advice around how to support a pupil to self-regulate in class.

Explainer

What does a self-regulated learner look like?

Zimmerman (2002) gives a helpful description of what a successful self-regulated learner looks like:[9]

'These learners are proactive in their efforts to learn because they are aware of their strengths and limitations and because they are guided by personally set goals and task-related strategies, such as using an arithmetic addition strategy to check the accuracy of solutions to subtraction problems. These learners monitor their behavior in terms of their goals and self-reflect on their increasing effectiveness. This enhances their self-satisfaction and motivation to continue to improve their methods of learning.'



"It is impossible to be metacognitive without having different cognitive strategies to hand."

What are metacognition and self-regulated learning?

Metacognition is one of the three essential components of **self-regulated learning** that teachers need to know about to help their pupils to develop into successful learners. The three components are:

- **Cognition** is the mental process involved in knowing, understanding, and learning. By cognitive strategies, we mean skills like memorisation techniques or subject-specific strategies like making different marks with a brush or using different methods to solve equations in maths. This is the bread and butter of good teaching: cognitive strategies are fundamental to acquiring knowledge and completing learning tasks.
- **Metacognition** is about the ways learners monitor and purposefully direct their learning. For example, having decided that a particular cognitive strategy for memorisation is likely to be successful, a pupil then monitors whether it has indeed been successful and then deliberately changes (or not) their memorisation method based on that evidence. By metacognitive strategies, we mean the strategies we use to monitor or control our cognition, such as checking that our memorisation technique was accurate or selecting the most appropriate cognitive strategy for the task we are undertaking.
- **Motivation** is about our willingness to engage our metacognitive and cognitive skills and apply them to learning. Motivational strategies will include convincing oneself to undertake a tricky revision task now—affecting our current well-being—as a way of improving our future well-being in the test tomorrow.

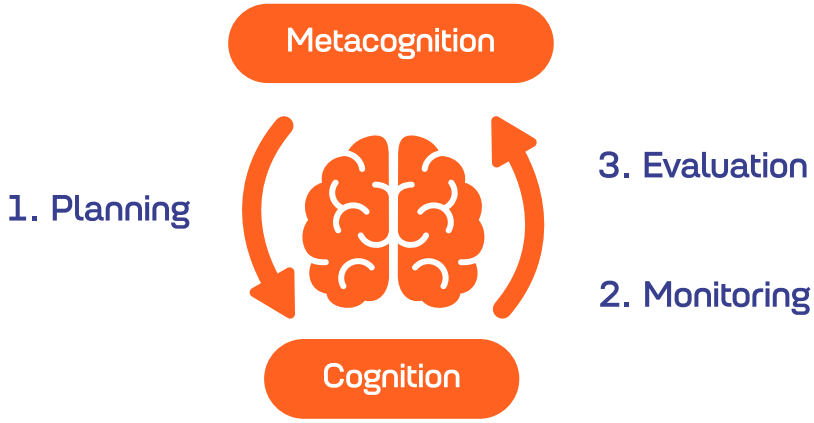
Cognition, metacognition, and motivation all interact in complex ways during the learning process. Mr Thomas guided his pupils to deploy cognitive strategies, like using mnemonics and self-testing practice at home. The class are then able to use the metacognitive strategies to plan their spelling practice, recognising why using a mnemonic might be the right tool for the job, while monitoring their own difficulties with time pressures during the test.

Metacognition is the focus of this guidance report but that does not mean cognition and motivation are any less important. In fact, it is impossible to be metacognitive without having different cognitive strategies to hand and possessing the motivation and perseverance to tackle problems and apply these strategies.

Recommendation 1

Schools should support teachers to understand the importance of using strategies to develop their pupils' metacognitive knowledge.

Self-regulated learners are aware of their strengths and weaknesses and can motivate themselves to engage in, and improve, their learning. At the heart of this is metacognition. This term is increasingly well known in schools, but beyond a simple definition of 'thinking about thinking', teachers can quickly run out of classroom examples to describe it accurately. Understanding what is meant is the first step in helping teachers to improve pupils' metacognition.



Learners approach any learning task or opportunity with some metacognitive knowledge about:

- their own abilities and attitudes—knowledge of themselves as a learner;
- what strategies are effective and available—knowledge of strategies; and
- the particular type of activity—knowledge of the task.

When undertaking a learning task, learners start with this knowledge then apply and adapt it. This is metacognitive regulation. It is about planning how to undertake a task, working on it while monitoring the strategy to check progress, then evaluating the overall success. The diagram above represents the metacognitive regulation cycle.

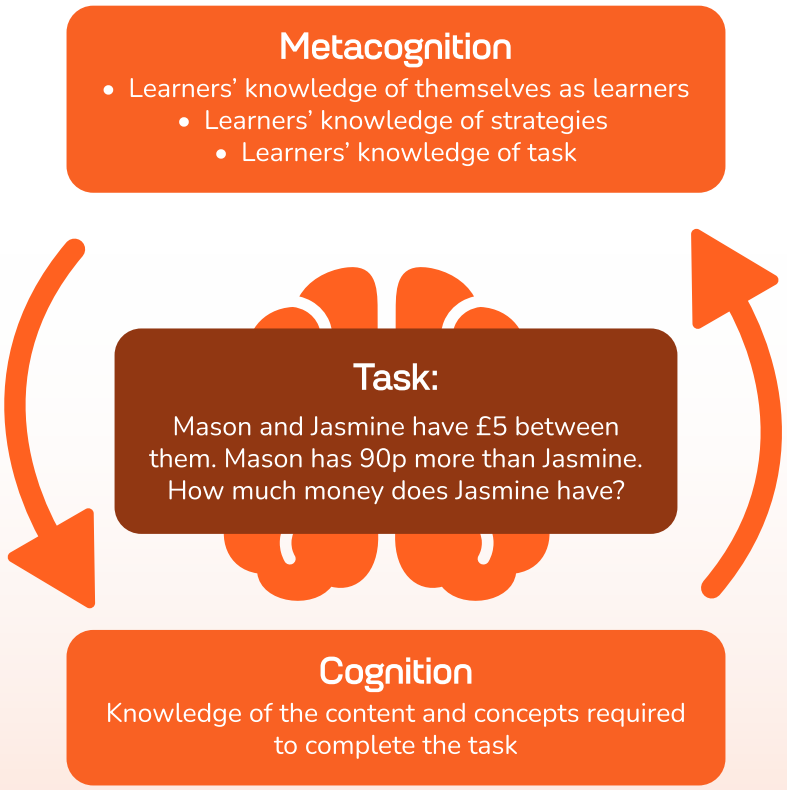
This is not a one-off process of discrete steps but an ongoing cycle. As learners progress through the task applying metacognitive and cognitive skills, they update their metacognitive knowledge (of themselves, strategies, and tasks), as well as updating their subject knowledge and skills.

The cycle of plan, monitor, evaluate and the different aspects of metacognitive knowledge (learner, strategies, task) are recurrent themes throughout this guidance. Teachers should consider these when setting learning tasks and supporting pupils to complete them. In an expert learner, these processes are unconscious and automatic. In novice learners, however, it can be valuable to make them explicit.

To use an example to make the cycle more concrete, imagine a maths teacher, Mr Garcia, preparing his class to answer a maths question.

1. Teaching strategies to support **planning** could include:

- *Scaffold activation of prior knowledge*
- *Provide a worked example*
- *Model thinking aloud to create success criteria*



3. Teaching strategies to support **evaluation** could include:

- *Provide a scaffold to support a peer evaluation activity*
- *Model the use of self-reflection questions*
- *Provide a task to assess progress against shared success criteria*

2. Teaching strategies to support **monitoring** could include:

- *Provide questions that prompt pupils to reflect*
- *Provide a self-test check (for example, estimation)*
- *Pause the learning to model the use of a checklist*

In this example, Mr Garcia knows that the class has already worked on similar problems in previous lessons. He could, therefore, decide to provide or model a scaffold that prompts his pupils to draw on their prior knowledge of similar problems. Mr Garcia might then use the lesson to introduce a new strategy for monitoring by pausing the lesson and modelling the use of some questions that prompt the pupils to check whether they have selected the correct type of equation. Mr Garcia might then use a low-stakes assessment or a peer activity that provides the pupils with the opportunity to evaluate their answers through paired discussion.

Mr Garcia should aim to support the independent use of metacognitive strategies by providing opportunities to practice them and also plan for the gradual reduction of any scaffolding. Learners will then have developed a repertoire of different cognitive and metacognitive strategies and be able to effectively use and apply these in a timely fashion. They will use these strategies to help them self-regulate and will, over time, find ways to increasingly motivate themselves when they get stuck. This can further increase their motivation as they become more confident in undertaking new tasks and challenges.

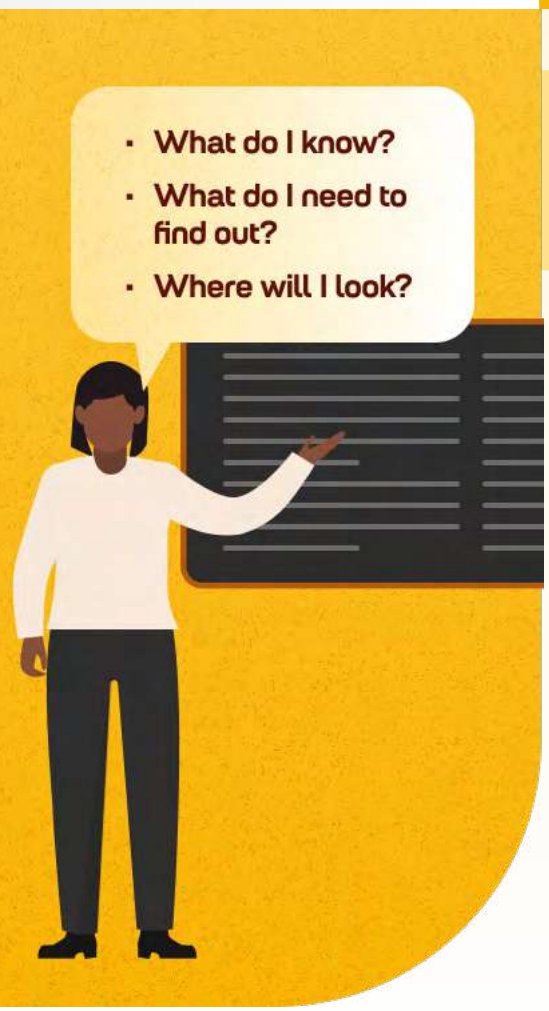
As with other aspects of knowledge and skills, pupils will develop differently. The extent to which skills are acquired is in part dependent on the opportunities pupils receive to develop them outside of school and in the home, which is likely (though not necessarily) to be correlated with social background.

Metacognition is part of the fabric of successful learning but it can prove both complex and subtle. It is ever-present in the classroom but unless teachers have a strong understanding of the metacognitive demands of the topics they are teaching, they may miss opportunities to develop pupils' knowledge and skills. Various studies have shown that self-regulated learning—and in particular metacognition—has a significant impact on pupils' academic performance beyond that predicted by prior achievement.[10]

This recommendation introduces the key concepts teachers should be aware of. The rest of the guidance focuses in more detail on how teachers can improve pupils' learning by integrating these concepts into their teaching and how leaders can support this through high-quality professional development.

Recommendation 2

Explicitly teach pupils metacognitive strategies, including how to plan, monitor, and evaluate their learning.



The following vignette describes a teacher explicitly teaching and modelling pupils' planning and evaluation for an independent learning task.

Vignette

When Ms Dawes set the rainforest ecosystems presentation, she didn't just want her students to gather facts, she wanted them to think carefully about how they would approach the task. In the lesson beforehand, she modelled how to plan a research task, saying: 'First, I think about what I already know. Then I decide what I need to find out and where I might look. I might start with the textbook, but I'd also line up two or three other sources we have used in previous lessons, just in case I can't find what I need.'

She provided a planning scaffold: a three-column chart labelled What I Know, What I Need to Find Out, and Where I'll Look. She also encouraged students to evaluate past strategies that had worked for them, and why.

After the presentations, Ms Dawes guided students through a peer-to-peer protocol for evaluation using sentence stems:

- 'One thing that worked well for me was … because …'
- 'Something that didn't go as planned was … and I think this happened because …'
- 'Next time, one thing I will do differently is … because …'

Call for reflection

- What strategies did Ms Dawes use to support learners to plan their work?
- How could Ms Dawes make her teaching more explicit?

> **"Explicit instruction does not denote simply 'telling' but describes all the activities that a teacher orchestrates to affect learning in their pupils."**

While all children develop metacognition to some extent — and this will continue to develop further as they mature — the extent to which this happens differs significantly between learners; most will not spontaneously develop all the strategies they need or would find useful and therefore initially require explicit instruction in key metacognitive strategies. There is some evidence to suggest that disadvantaged pupils are less likely to use such strategies and are, therefore, most likely to benefit from the whole range of approaches to supporting metacognitive and self-regulatory skills, including explicit teaching.[11,12]

Explicit instruction does not denote simply 'telling' but describes all the activities that a teacher orchestrates to affect learning in their pupils. It is not to be confused with a lecturing approach but combines explicit teacher input with interactive questioning and feedback. This supports all pupils because implicit knowledge is voiced and made accessible to everyone. It is important to provide explicit instruction in metacognitive regulation strategies, in particular:[13]



Planning

encouraging pupils to think about the goal of their learning (set by the teacher, or themselves) and to consider how they will approach the task; this includes ensuring they understand the goal, activate relevant prior knowledge about the task, select appropriate strategies, and consider how to allocate their effort;



Monitoring

emphasising the need, while undertaking the learning task, for pupils to assess the progress they are making; this includes the self-testing and self-questioning activities that are necessary to control learning, and making changes to their chosen strategies; and



Evaluating

appraising the effectiveness of their plan and its implementation.

These underlying strategies are relevant to most learning choices a pupil makes. During a lesson, a pupil must decide how much effort to put into listening to the teacher's explanation of a new topic (planning). While listening, they can consider whether they are understanding the teacher (monitoring) and what to do if they don't (planning a good question to ask and evaluating if they have now understood the explanation successfully and are ready to move on).

In order to encourage the development of metacognitive reflection, teachers can provide questions for pupils to use at each stage of a learning task. For example, a common activity in art is to draw or paint a self-portrait.



Planning

- What resources do I need to carry out a self-portrait? Have I done a self-portrait before and was it successful?
- What have I learned from the examples we looked at earlier?
- Where do I start and what viewpoint will I use?
- Do I need a line guide to keep my features in proportion?



Monitoring

- Am I doing well?
- Do I need any different techniques to improve my self-portrait?
- Are all of my facial features in proportion?
- Am I finding this challenging?
- Is there anything I need to stop and change to improve my self-portrait?



Evaluating

- How did I do?
- Did my line guide strategy work?
- Was it the right viewpoint to choose?
- How would I do a better self-portrait next time?
- Are there other perspectives, viewpoints or techniques I would like to try?

These examples of metacognitive questions show that some questions for planning aim to activate prior knowledge (resources, previous exemplars) whereas others model deploying the right cognitive strategies (viewpoint, line guides). The monitoring questions emphasise both general progress (proportion, editing) alongside checking general motivation (meeting goals and dealing with challenge). Finally, the evaluation questions concentrate upon the success of the cognitive strategies (line guide, viewpoint, comparison with other techniques) and on what can be taken forward from the learning. For more examples of metacognitive questions see the table in Recommendation 4.

As discussed, these prompts must accompany instruction in the relevant specific cognitive strategies. In this example, pupils will only be able to consider these questions and approaches if they understand the importance of perspective and the different techniques.



Case study

Using strategies to improve reading comprehension

An EEF-funded study aimed to use reciprocal teaching principles to support pupils who were struggling with reading comprehension. Reciprocal teaching involves strategy instruction, modelling of strategies by an adult, and student practice of the strategies.

Led by FFT Education, staff received training, resources, and in-school support visits to deliver the reciprocal reading programme. Pupils with poor comprehension skills were selected to work in small groups twice a week and were taught the four reading comprehension strategies of:

- **Predict** – for example, what might happen next to a character in a story;
- **Clarify** – for example, discuss the meaning of unfamiliar words;
- **Question** – for example, why a character is behaving in a certain way; and
- **Summarise** – for example, a pupil will summarise what has been read and another pupil may add information.

There was both adult modelling of the strategies and also opportunities for pupils to interact and collaboratively problem-solve with texts. The repeated use of these strategies encouraged pupils to apply the strategies to their own independent reading.
Overall, pupils in the FFT Reciprocal Reading targeted groups made the equivalent of two additional months' progress, on average, in both overall reading and reading comprehension compared to equivalent children in the control schools. This result has a moderate to high security rating.[14]

"Some questions for planning aim to activate prior knowledge, whereas others model deploying the right cognitive strategies."

How should teachers teach metacognitive strategies?

While there may be some benefit to introducing pupils to the general importance of planning, monitoring, and evaluating, the particular strategies are often quite subject- or task-specific and the evidence suggests that they are best taught through subject content. The selection and use of metacognitive strategies is specific to the task being undertaken and is stronger where learners have a grounding in subject knowledge. It is very hard to have knowledge about learning without the relevant subject knowledge.

Caution

Metacognition isn't a stand-alone skill. It works best when tied to strong subject knowledge—students can't think about how they're learning in a subject without first understanding the subject itself.



The following seven-step model is one that exemplifies a 'gradual release of responsibility'.[15] It can be used for explicitly teaching metacognitive strategies to learning different subject content at different phases and ages. It involves:

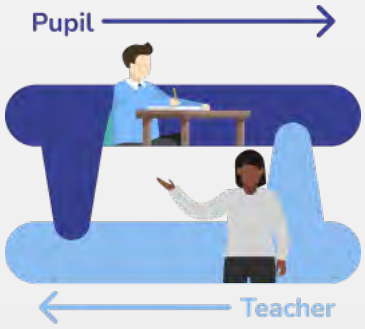
Seven-step model

1. **Activating prior knowledge;**
2. **Explicit strategy instruction;**
3. **Modelling of learned strategy;**
4. **Check understanding of strategy;**
5. **Guided practice;**
6. **Independent practice; and**
7. **Structured reflection.**

This model can be applied flexibly based on the needs of a class, including where a class has a higher proportion of pupils with SEND. A teacher might spend longer modelling the learned strategy (step 3) to the whole class, might create a flexible group to provide additional guided practice to those who require it, or may provide a visual scaffold that enables a pupil to successfully complete independent practice.

Worked example

Seven-step model



Let's consider a worked example of the seven-step model. Graphic organisers support learning in various ways, from notetaking to essay planning. They help pupils connect ideas, such as linking beliefs and practices in religious education or analysing themes in literature. In a Year 9 history lesson on the Industrial Revolution, the teacher uses a concept map to help pupils visualise the interconnected social, economic, and technological changes that took place during this period.

1 Activating prior knowledge

The teacher discusses what pupils already know about the Industrial Revolution, noting their ideas on the board and adding key knowledge not recalled through retrieval.

2 Explicit strategy instruction

The concept map is introduced as a strategy for showing how ideas are meaningfully connected. The teacher explains that, unlike timelines or lists, concept maps support broader historical explanations by helping people visualise and articulate the relationships between interconnected concepts.

3 Modelling of learned strategy

Using the board, the teacher models generating a concept map around 'Industrial Revolution' linking to 'technology' with the phrase 'led to changes in' to show the relationship, emphasising that these links are what make it a concept map, not just a spider diagram.

4 Check understanding of strategy

The teacher selects pupils to share additional content for the map using prompts to check they understand that concept maps require meaningful, linked connections between ideas.

5 Guided practice

The teacher facilitates creating a new branch of the concept map with the class, with pupils suggesting and justifying connections.

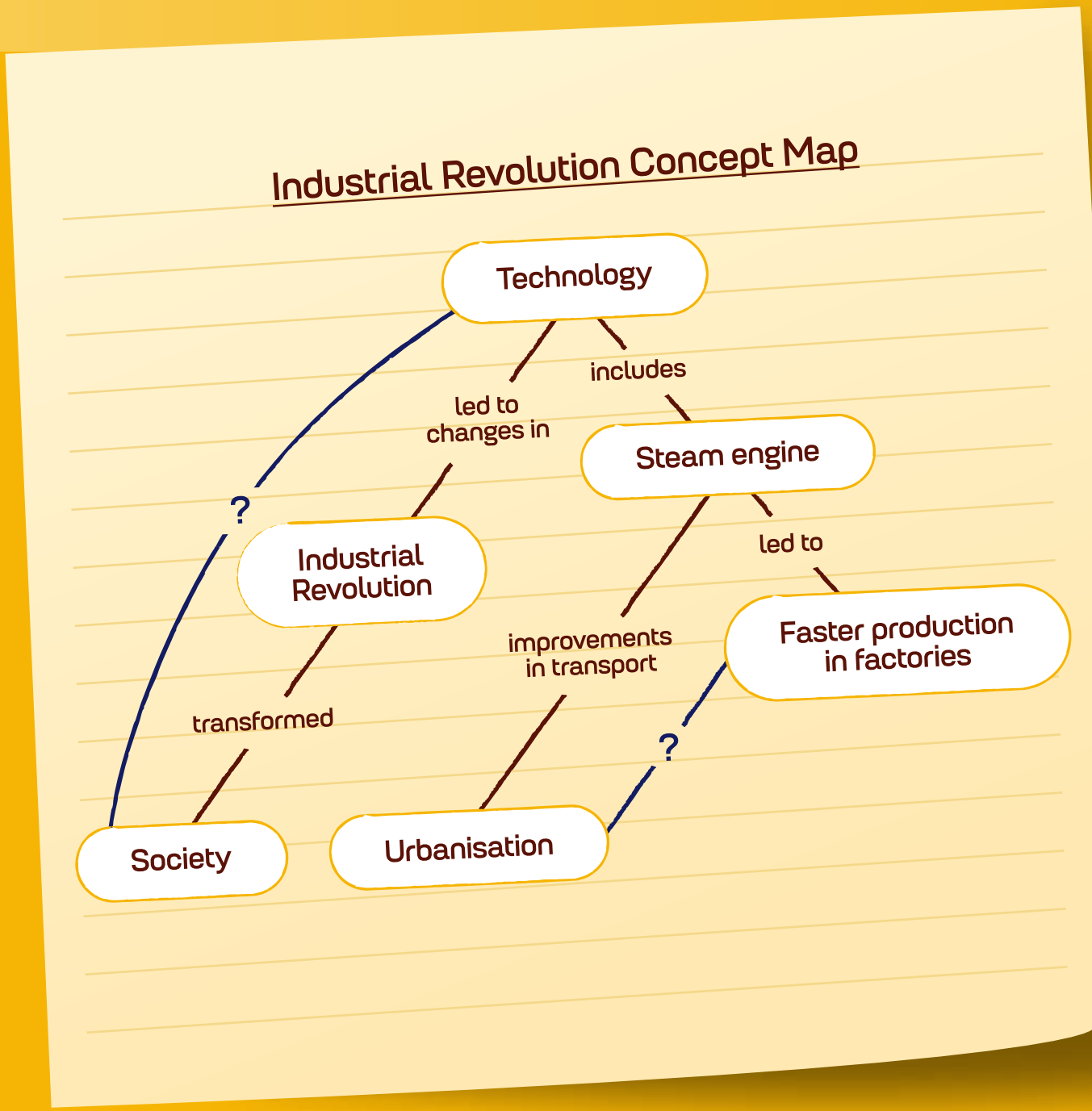
6 Independent practice

Pupils complete their own concept maps, adding new connections.

7 Structured reflection

Peers or the teacher provide quick feedback by suggesting or refining linking branches to strengthen connections. The teacher encourages pupils to reflect on how useful the concept map was, how well they applied it, and how they could use it in future tasks.

This structured approach builds understanding and supports increasingly independent thinking as the teacher gradually withdraws scaffolding. They might revisit steps like modelling and guided practice as needed over multiple lessons, depending on the stage pupils are at in their metacognitive development. Metacognitive strategies are improved through this practice and their application to specific tasks.


Industrial Revolution Concept Map
Technology
led to changes in
includes
Steam engine
?
Industrial Revolution
led to
Faster production in factories
improvements in transport
transformed
?
Society
Urbanisation

Recommendation 3

Model your own thinking to help pupils develop their metacognitive and cognitive skills.

"The most effective teachers—like a skilled craftsperson working with their novice apprentice—are aware of their expertise and of how to reveal their skills to learners."



Case study

This case study demonstrates modelling writing through 'think alouds'

Across schools in the WISE Academies Trust, teachers use 'think aloud' modelling to develop pupils' writing skills. This aligns with the school's 'tight but loose' framework: clear expectations applied flexibly to suit needs.

Using the gradual release model ('**I do, we do, you do**'), teachers verbalise writing decisions. For example, during the '**I do**' stage, a teacher might say: 'I want to show contrast, so I'll start this sentence with "however" and follow it with a comma.' This helps pupils learn how to structure sentences, choose cohesive devices, and shape their tone with intent.

In the '**we do**' phase, teachers and pupils co-construct writing, with pupils increasingly verbalising their choices. As confidence grows, scaffolds are removed. During '**you do**' phase, pupils write independently, supported by feedback and reflection time.

The '**you do together**' phase encourages pupils to choose and explain a 'stellar sentence' or revise a weaker one with their partner. For example, 'This sentence is cluttered—I'll shorten it for clarity.'

Teachers also model how to give effective feedback using think alouds. This shared approach is embedded through professional development, promoting consistent methods and helping pupils become strategic, independent writers.

WISE Academies is a multi-academy trust in the north-east. The trust has 16 primary schools and one SEND primary school



All teachers use modelling to some extent. The most effective teachers, like a skilled craftsperson working with their novice apprentice, are aware of their expertise and of how to reveal their skills to learners and how to assess whether their pupils have understood them; they are metacognitive about their teaching.

Teacher modelling

Teachers can model their thinking about the metacognitive strategies they are using as they approach a task to reveal the reflections of an effective learner: for example, while teaching young pupils how to perform a forward roll safely in PE, a teacher might talk through her actions as she demonstrates:

'I don't want to hurt my neck and want to do this neatly. So first, to protect my neck, I need to tuck my chin to my chest like this. Then when I start to roll, if I start rolling onto my head, I correct myself and, instead—look how I'm going to roll onto my back and shoulders. This also means my back is round, so I can smoothly roll like this. Now, who can remember what I did first to protect my neck?'

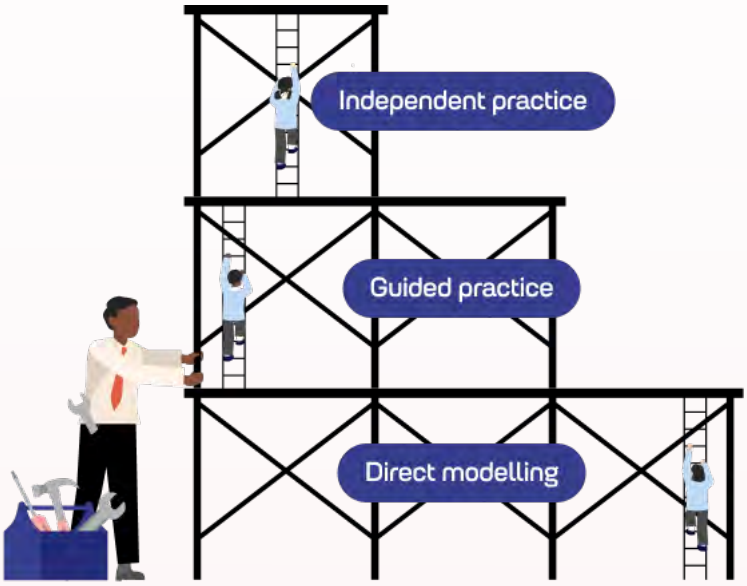
Such modelling is only effective if the pupils have access to relevant knowledge. (In this example, if these are very young children, they may not even know what a forward roll is supposed to look like, so the teacher might perform one without talking it through first.) It is also more effective when pupils are engaged in the task being modelled and have the opportunity to practise it immediately after the demonstration.

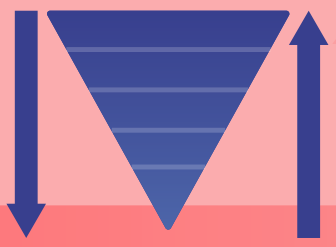
Modelling of this type is rarely planned by teachers as these metacognitive processes or skills can seem obvious to them, but that risks these important prompts remaining implicit, which is particularly ineffective for novice pupils. Teachers need to make these largely implicit processes explicit to novice learners.

There is some evidence, at least in terms of metacognition, that such scaffolding should not be too specific as this may inhibit reflection. Some '**deliberate difficulty**'[16] is required so that pupils have gaps where they have to think for themselves and monitor their learning with increasing independence. Reinforcing the value of the processes modelled by engaging the pupils in reflecting on how successful they were at the end of the activity, or lesson, is also important.

Removing the scaffolding

Ultimately, the purpose of modelling is to help novice pupils become more capable of learning independently and thinking metacognitively. The modelling process involves teachers making gradual changes in support. Initially, scaffolding, such as direct modelling and support from the teacher, is necessary but as guided practice moves to independent practice, teacher input will change to monitoring and intervening only when necessary. Practice and independent work help to develop cognitive and metacognitive knowledge. Over time, such thinking becomes habitual—acting as 'internal scaffolding' that will support future learning.





Further support

A tool to support teaching assistants and their pupils move between the different levels of scaffolding is available as one of the Deployment of Teaching Assistant Guidance Report tools:

Scaffolding framework | Education Endowment Foundation

So, just as a PE teacher might begin by modelling a forward roll, in a maths lesson, a model worked example of a given task or problem can be used.[17] For example, a teacher first shares a completed worked example of adding fractions before looking more closely at the steps involved in working out the solution, maybe including a deliberate error that they then 'correct'. After the step-by-step modelling, the teacher gradually removes the scaffold, getting pupils to undertake a partially completed equation.

Teachers should be aware that some pupils may find it hard to articulate their thoughts while doing a task and doing so may interfere with their ability to complete the task successfully. It may be that metacognitive reflection needs to follow the completion of the task for novice pupils, and not occur concurrently, as task completion may demand all of a pupil's mental resources.

> **"It may be that metacognitive reflection needs to follow the completion of the task for novice pupils, and not occur concurrently."**

Recommendation 4

Promote and develop metacognitive talk in the classroom.

Metacognitive talk in a Year 4 science lesson

Vignette

In Year 4, Mrs Matthews set her class the challenge of sorting different materials into solids, liquids, or gases. Working in pairs, the pupils examined mystery samples, diagrams, and photos. To support their thinking, Mrs Matthews shared some question prompts to elicit metacognitive talk: 'What do you already know?', 'What makes you think that?', and 'Could it be something else?'

She provided a planning scaffold: a three-column chart labelled What I Know, What I Need to Find Out, and Where I'll Look. She also encouraged students to evaluate past strategies that had worked for them, and why.

Amelia and Jamal picked up a picture of shaving foam. 'I think it's a solid', Amelia said, squinting at the image. 'It looks like it keeps its shape.'

Jamal shook his head. 'But it can be squirted out and poured … like a liquid.'

They looked back at the definition table. 'Wait', Amelia said, 'do you think the shape only changes when we squeeze it?'
'Yeah, like squishing it changes it', Jamal replied. 'Maybe it's kind of both?'

Mrs Matthews walked past and gently reminded them, 'What evidence can you use to back that up?' They talked it through again using sentence starters like, 'I think it might be … because …'

Later, Amelia said, 'Talking about it helped us figure it out better.' Jamal added, 'Yes, and we didn't just guess, we had to explain it.'

Listening to their conversation, Mrs Matthews responds: 'Yes, discussing together and explaining your reasoning supported your understanding today. When else could you use this strategy?'

Call for reflection

- How did Mrs Matthews' prompts encourage metacognitive talk rather than simple answers?
- In what ways did peer discussion help the pupils to clarify their understanding?

The use of dialogic talk by teachers is a good way to share and develop effective learning.18 For example, a teacher might ask questions with an appropriate level of challenge (see Recommendation 5)—guiding pupils with oral feedback and prompting dialogue—scaffolding productive 'exploratory' talk where appropriate.

Interactions with others are one way to test metacognitive strategies and knowledge, so both peers and teachers have a role to play here. As you can see from the example above, classroom talk can develop understanding.

The teacher first helps pupils to use metacognitive strategies by providing the question prompts. These prompts encourage the metacognitive talk that activates prior knowledge ('What do you already know?'), they also encourage pupils to consider their decisions ('What makes you think that?'), and also to check their answers ('Could it be something else?').

When Jamal and Amelia are struggling, Mrs Matthews prompts further metacognitive talk with a question. The children can use a sentence stem to help them to evaluate their answers. The final question in the vignette prompts the pupils to reflect on their use of the metacognitive strategies, helping to both increase their understanding of the strategies and their motivation to draw on these skills again.



A number of classroom interventions that aim to develop the quality of classroom talk can also be effective ways of improving and practising learners' metacognitive skills. As devised by Robin Alexander, 'Dialogic teaching'[19] (which is listed as a **Promising Programme**[20] by the EEF), for example, emphasises classroom dialogue through which pupils learn to reason, discuss, argue, and explain.

A key element of the dialogic approach is to encourage a higher quality of teacher talk by going beyond the closed 'teacher question—pupil response—teacher feedback' sequence. Importantly, in this and other successful interventions, dialogue needs to be purposeful and not just conversation, with teachers using questions to elicit further thought.

Common teaching strategies to better organise and structure classroom talk and dialogue include Socratic talk, talk partners, and debating (each strategy having its own clear parameters and rules for responsible dialogue). Such strategies, provided they are sufficiently challenging, build on firm pupil subject knowledge, are realistic, and, suitably guided and supported by the teacher, can help develop self-regulation and metacognition.

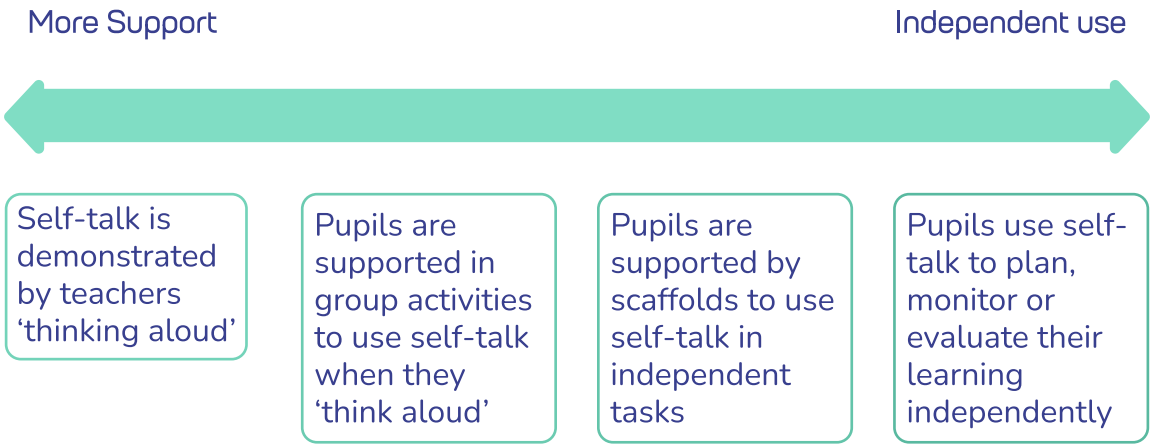
Teachers should take care, therefore, not to focus on dialogue simply as an end in itself without it being wedded to these necessary conditions. It should also be remembered that not all metacognitive talk needs to be out loud. Internal dialogue, or self-talk, can also be a successful form of metacognitive talk.

Explainer

Self-talk

Self-talk refers to pupils' internal dialogue or vocalisations that are used to plan, monitor, and reflect on their thinking processes. Through practice, this can become habitual and support learners to become more independent

Self-talk continuum



Metacognitive questioning

Many metacognitive strategy interventions use questions as ways of explicitly foregrounding and supporting the use of the metacognitive strategies. Questions could include those that teachers ask pupils, that pupils may talk about with their peers, and that pupils are prompted to ask themselves. Questions can be used to promote planning, monitoring, and evaluation strategies.

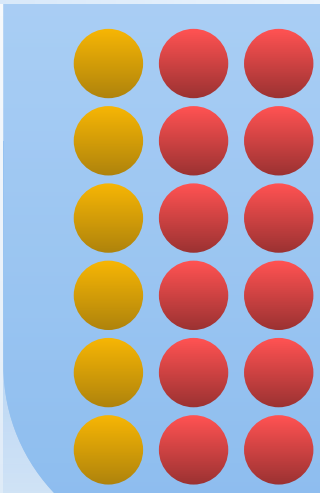
	Teacher questioning	Peer questioning	Self-questioning
Planning	What is important to remember? What steps do you need to take?	What do we know already? How will you approach this task?	What are the similarities to problems that I've seen before?
Monitoring	Are the strategies you have chosen right for this task? How did you get to that answer?	What methods have we all used? Why did we select this method?	Does my answer make sense?
Evaluation	Did you complete the task as expected?	Did our work achieve our learning goal? How do we know?	What could I have done differently?

Recommendation 5

Set an appropriate level of challenge to develop pupils' self-regulation and metacognition.

The following examples illustrate some ways that teachers can adapt their teaching to ensure an appropriate level of challenge to develop pupils' self-regulation and metacognition in maths.

Vignette



Knowledge of task

In a Year 6 'ratio and proportion' lesson, Mrs Lunn gave pupils a worded problem to assess their understanding of the task type. She observed how they unpacked the question and applied prior knowledge, focusing on how well they understood what was being asked and adjusting support based on their responses.

Reya read the question aloud, highlighted key words, and used counters to model her thinking. Her explanation showed strong understanding. Mrs Lunn extended the challenge by asking, 'How could you solve this without counters?' Reya suggested drawing the counters and used this strategy independently on the next task, building confidence and flexibility.

Noticing some pupils were unsure how to start, Mrs Lunn regrouped them at a spare table. She modelled a problem-solving strategy using manipulatives and then guided them through a shared example. With support, pupils attempted the next problem, developing understanding through structured practice.

Knowledge of self

During a maths lesson, Ms Lee asked her Year 3 class to decide whether '¼ is bigger than 1/3' was true or false. Pupils worked in pairs, justifying their answers. Ashton and Lyla were purposefully paired. Ashton showed strong self-awareness in maths and supported others, while Lyla sometimes lacked confidence.

When Lyla said, 'I always get a bit confused with fractions', Ashton replied: 'Sometimes they can be a bit tricky. You know what helps me, drawing a picture.'

They each sketched same-sized squares and shaded one part to represent the fractions. 'Seeing it really helps', Ashton said, as they agreed 1/3 was bigger. Lyla added, 'So that must be false because 1/3 is the biggest. But Ms Lee said we need to prove our thinking.'

Listening in, Ms Lee asked, 'I notice your squares are the same size. Does that matter?' Lyla responded, 'I know what to do, let's draw a picture and see', showing growing confidence and self-awareness in using strategies to support her thinking.

Call for reflection

- How did each teacher create challenge that stretched pupils' thinking while keeping them engaged and motivated?
- What did the teachers do to help pupils reflect on and adjust the strategies they were using?
- How might you design tasks that include challenge and prompt metacognitive reflection in your own lessons?

Challenge is key to developing self-regulation and metacognition: if learners are not challenged, they will not develop new and useful strategies, nor will they reflect deeply on the content they are engaging with, or on their learning strategies, or stretch their understanding of themselves. Put simply—and somewhat paradoxically—teachers should make sure that sometimes pupils undertake tasks that make them struggle ('deliberate difficulties'); this will make learners more likely (in the future) to recall information from such tasks from their long-term memory.[21]

Teachers should ensure that their pupils regularly engage in metacognitive reflection by giving them opportunities to ask questions about the strategies they are using when they take on challenging tasks, as outlined below.

Knowledge of task:

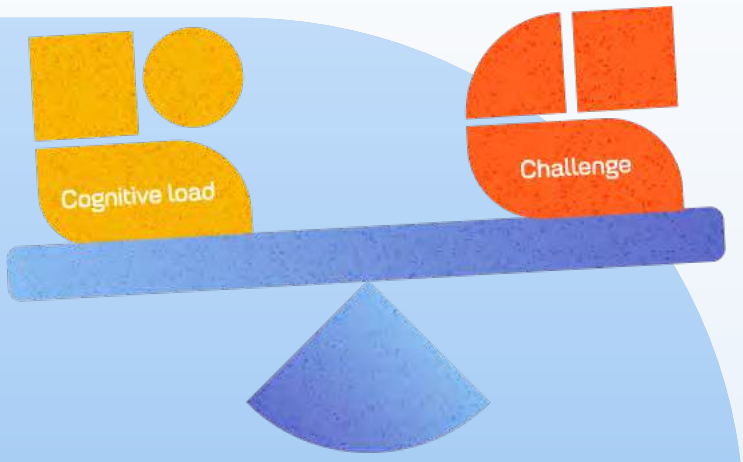
- Is this task too challenging for me?
- What are the most difficult aspects of this task?
- How much time should I devote to this task?
- Are there easy bits I can get done?

Knowledge of self:

- Is this task asking for subject knowledge I can remember?
- Do I understand the concept(s) that underpin(s) this task?
- Am I motivated to stick at this tricky task?
- What can I do to keep myself focused?

Knowledge of strategies:

- Are my notes effective for understanding this task?
- Do I need to ask the teacher for help?
- What strategies can I deploy if I am stuck?
- What can I do to ensure I remember what I've learned?



Successful metacognitive learners will ask such questions of themselves, either consciously or as an unconscious process, and typically exhibit an awareness of the degree of challenge in what they are learning. However, teachers need to ensure that challenge is set at an appropriate level otherwise one or both of the following may occur:

- the learner will not accept the challenge.
- the learner will suffer cognitive overload.

Accepted challenge and motivation

Motivation is one of the essential components of self-regulated learning. Humans and animals have been shown to opt out of difficult trials; they avoid tests they are unlikely to answer correctly.[22] Where learners are being challenged it is important to ensure they feel emotionally supported as well as being motivated to persevere. Metacognition, then, is of special importance when pupils make decisions about how to study and how to maintain effort and motivation until the task is complete.[23]

In motivating pupils to persevere at challenging tasks, it is important to reward effort rather than absolute levels of achievement—to give feedback about personal progress and to avoid social comparison. Teachers could support their learners to do this by giving feedback on a range of goals—for example, how well they used metacognitive strategies, rather than just on the task itself. In this way pupils can be helped to gradually develop intrinsic motivation.

Helping pupils reduce cognitive overload

What is an appropriate level of challenge? This question requires expert knowledge both of a given subject and of pupils in the classroom. Cognitive load theory offers a handy model to understand this.[24]

Put simply, 'cognitive load' is the amount of information working memory can hold at any one time. The working memory is where information that is being actively processed is held and is key to learning. Teachers can support pupils to maximise their working memory with a range of metacognitive strategies. For example, they could encourage pupils to rehearse components of a complex task so that it becomes automated, thus freeing up working memory capacity. For example, stories could be created from information that needs to be remembered,[25] or grouped into more accessible 'chunks' that place less load on the working memory.[26]

Understanding cognitive load in relation to self-regulation and metacognition has a number of consequences. First, when knowledge is stored in long-term memory it takes up less space in working memory. This means that where pupils can draw on existing knowledge from the long-term memory, cognitive load capacity can be increased; this is one reason why knowledge matters and why learners need to be taught to first try and activate prior knowledge. Second, learning activities should not overburden working memory: strategies need to be taught to cope with demanding tasks, for example, using diagrams, notes, and other external aids, talking through the problem out loud, or breaking the task down into simpler steps.

In terms of developing self-regulated learning and metacognition, this means teachers need to make sure that they don't give too much information at the same time (when delivering explicit instruction) and do not expect the learner to take on too much challenge when doing guided practice and independent work. The use of structured planning templates, teacher modelling, worked examples, and breaking down activities into steps can help achieve this.

> **"Teachers can support pupils to maximise their working memory with a range of metacognitive strategies."**

Recommendation 6

Explicitly teach pupils how to organise, and effectively manage, their learning independently.



The following vignette demonstrates how a teacher might support a whole-school strategy to develop independent learners.

Vignette

Mr Malik knew his science students varied in their capacity and motivation to revise at home. To support them, he aligned his approach with the school-wide strategy to develop metacognition: plan, monitor, evaluate. To support planning for revision, he provided checklists to break content into manageable chunks and shared a distributed practice plan with suggested strategies.

To help pupils revise independently, motivation and focus were discussed as a class, with students suggesting strategies like removing distractions and setting specific goals such as 'revise photosynthesis definitions' or 'complete one six-mark question'.

Mr Malik modelled how to monitor progress using past papers, success criteria, and guided practice with techniques like 'summarisation'. He showed how 'quizzing' reveals accurate recall and had students colour-code checklists (green: secure; amber: partial; and red: revisit) to identify gaps. This structured approach encouraged greater ownership and independent use of revision strategies.

Call for reflection

In the example, over time, Mr Malik has used a variety of strategies to support diverse students' needs in managing their own learning.
In their schools, leaders should consider the following questions:

- What strategies can teachers use to explicitly teach and model strategies?
- What is your whole-school approach to developing independent learning?
- What ongoing discussion, training, information, or guidance is needed to ensure that this is implemented through the curriculum?

"The aim of the skills and approaches discussed in the rest of this report is to enable teachers to develop learners' strategies and their ability to manage their learning independently."

The aim of the skills and approaches discussed in the rest of this report is to enable teachers to develop learners' ability to manage their learning independently. The phrase 'independent learning', rather like 'metacognition', is commonly used in schools but perhaps our understanding is not so commonly shared. Put simply, independent learning is when pupils learn with a degree of autonomy, making active choices to manage and organise their learning; deploying metacognitive strategies is part of the process. The GCSE revision that Mr Malik supported his class to prepare for is a typical example of independent learning.

Teachers explicitly preparing and supporting pupils to self-regulate—providing them with timely feedback and helping them to plan, monitor, and evaluate their progress—forms the basis for successful, independent learning.

There is little evidence of the benefit of teaching metacognitive strategies in generic 'learning to learn' or 'thinking skills' lessons. Instead, self-regulated learning and metacognition have often been found to be context-dependent—for example, good planning strategies in Key Stage 2 art may have significant differences to planning strategies in GCSE maths. This means that a pupil who shows strong self-regulated learning and metacognitive competence in one task or subject domain may be weak in another and metacognitive strategies may or may not be effective, depending on the specific task, subject, or problem tackled. This does not, however, mean that metacognitive knowledge and skills will automatically develop through content knowledge teaching.

Over time, pupils can build an array of metacognitive strategies that they can then judiciously apply across a range of contexts and to a range of tasks but they will also need to have built an understanding of which strategies to use when.



Caution

There is little evidence of the benefit of generic 'thinking skills' lessons—metacognition sticks when taught in real subjects, though with practice it can become more transferable over time.

Research emphasises the need for guided practice, in which the teacher provides support, prompts, and scaffolding, particularly during the initial stages of learning. The pupil can assume more and more responsibility as they become more proficient. To help them revise effectively, Mr Malik clearly modelled revision approaches for the pupils in his class—vital cognitive strategies such as using self-testing flashcards or quizzes—supporting them to gain independent expertise.

Independent practice can play an important role in developing self-regulation and metacognition provided that tasks are sufficiently challenging, build on firm pupil subject knowledge, are realistic, and are suitably guided and supported by the teacher.

Effective learners use a number of strategies to help them learn well independently. According to Zimmerman,[27] these can include:

- **setting specific short-term goals**—for example, breaking the content into manageable chunks on a plan;
- **adopting powerful strategies for attaining the goals**—for example, summarisation and quizzing
- **monitoring performance for signs of progress**—for example, practising exam questions and colour coding revision checklists;
- **restructuring one's physical and social context to make it compatible with one's goals**—for example, putting phones in another room;
- **managing time-use efficiently**—for example, working in short, focused blocks;
- **self-evaluating one's methods**—for example, reflecting on techniques; and
- **attributing causation to results and adapting future methods**—for example, using the colour-coded checklist to prioritise gaps and areas needing further practice.

Motivation and independent study

Pupils need to manage their motivation so that they are able to stick to learning, particularly when there is no teacher to guide independent study. An obvious truth is that pupils often have to make tricky choices when learning independently, such as doing their homework tasks over giving in to more immediate gratifications. Of course, this requires self-control, which is itself a metacognitive process.

Pupils therefore need to regulate their motivational investment in learning activities, not least in light of the fact that they are often confronted with a choice between immediately rewarding activities and activities that may seem less so but that support longer term learning goals. For example, one way of supporting motivation could be to ensure that messages or notifications do not distract from revision by planning to put phones in another room.

Some metacognitive strategies involve evaluating performance across a range of goals, rather than just a final attainment goal. These are not necessarily strategies that learners will spontaneously develop so it will help if they are explicitly taught and time given for their deliberate practice.

Accuracy of judgements

One issue that pupils often have with independent learning is their **accuracy of judgement**. They tend not to have very realistic views of how well they have learned something or which strategy has been effective. Consequently, they can make unrealistic '**judgements of learning**'.[28] Like adults, they can suffer from the '**planning fallacy**'[29]—underestimating how much time and resource will be required to plan successfully. Improving pupils' judgements on learning and the effectiveness of particular strategies will likely require further instruction.

Pupils may not be aware of the benefits of a certain type of study, such as **spaced practice** (where practice is broken up into a number of short sessions over a longer period of time) compared to **massed practice** (when individuals practise a task continuously without rest), more commonly known as 'cramming'. Learners' inaccurate judgements of their own learning can make them feel, albeit falsely, like they are learning more successfully when 'cramming'.[30] Mr Malik's provision of checklists of manageable chunks of content and distributed practice plan will support his class to plan their revision effectively and avoid relying on last minute cramming.

Teachers can use specific strategies to improve pupils' metacognitive awareness. When learners better understand what they know, and what they don't know, they are better able to respond to feedback and reframe and redirect their learning. Tools like '**exam wrappers**' (a post-exam student self-evaluation feedback tool), journals, digital diaries, self-testing, and opportunities for metacognitive talk about processes or answers can help improve pupils' monitoring of their learning and help them develop their accuracy of judgement.

"Improving pupils' judgements on learning and the effectiveness of particular strategies will likely require further instruction."

When selecting strategies to teach to pupils, teachers should consider which have been shown to be more or less effective. The value of different techniques is summarised in Table 1 below.

Table 1: Effectiveness of ten learning techniques, from Dunlosky et al. (2013)[31]

High utility	Practice testing	Self-testing or taking practice tests on material to be learned.
	Distributed ('spaced') practice	Implementing a schedule of practice that spreads out activities over time.
	Elaborative interrogation	Generating an explanation for why an explicitly stated fact or concept is true.
	Self-explanation	Explaining how new information is related to known information, or explaining steps taken during problem solving.
Moderate utility	Interleaved practice	Implementing a schedule of practice that mixes different kinds of problems, or a schedule of study that mixes different kinds of material, within a single study session.
	Summarization	Writing summaries (of various lengths) of to-be-learned texts.
	Highlighting	Marking potentially important portions of to-be-learned materials while reading.
Low utility	Keyword mnemonic	Using keywords and mental imagery to associate verbal materials.
	Imagery use for text learning	Attempting to form mental images of text materials while reading or listening.
	Rereading	Restudying text material again after an initial reading.

Recommendation 7

Schools should develop effective implementation processes to promote metacognition and self-regulated learning.

"As with any changes to classroom practice and pedagogy, teachers will need a lot of support, training, and time to practise in order to implement them."

Case study

Building expertise in metacognition across a Trust.

At Changing Lives in Collaboration (CLIC) Trust, we set out to embed metacognitive and self-regulatory practices across all phases through sustained, high-quality professional development.

A common challenge emerged: pupils often didn't know what to do when they got stuck. Drawing on the EEF's Metacognition and Self-Regulated Learning guidance, we aimed to move beyond surface-level understanding and build a shared approach to metacognition that supports confident, independent learners.

We used the EEF's framework—knowledge of self, task, and strategies—to connect theory with practice and establish a consistent language across staff. Professional development began with a manageable first focus: activating prior knowledge.

Each school selected one subject, often science or humanities, to trial approaches. We co-developed routines and pupil-friendly language, such as the phrase 'bridging back', used to prompt recall of prior knowledge. This strategy, now embedded from Early Years Foundation Stage upwards, includes visual cues and gestures to support transitions, for example, from reception to Year 1. Teachers modelled the approach using think-alouds, supported by sentence stems, with scaffolds gradually removed as pupils gained independence.

The Professional development model was collaborative and adaptive. A 'tight but loose' structure allowed schools to shape implementation to suit their context. Over time, staff moved from a general understanding of metacognition to subject-specific application aligned with curriculum aims. Pupils now speak confidently about their learning, referring to strategies like 'bridging back' when stuck.

Embedding metacognition remains an ongoing journey. Through ongoing collaboration, monitoring, and Professional development, we continue to refine and sustain these practices to help every pupil become a reflective, independent learner.

Hannah Heron, Education Director, CLIC Trust and Jo Ashcroft, CEO, CLIC Trust



Effective implementation and professional development are key to enabling teachers and educators to promote the use of metacognitive strategies and support the development of self-regulated learning. As with any changes to classroom practice and pedagogy, teachers will need a lot of support, training, and time to practise in order to implement them. It is important that supporting pupils' metacognition and self-regulation skills is not seen as something 'extra' for teachers to do but as an effective pedagogy that can be used to support their normal classroom practice. The most effective professional development to support the use of metacognitive strategies will embed those strategies in curriculum subjects.

Effective implementation of metacognitive strategies will not only take time to train the staff involved: ongoing monitoring of the delivery of the strategies will also be needed as well as careful structured planning of how to sustain it over time. There is more advice on how schools successfully implement an approach in **A School's Guide to Implementation** guidance report.[32] This report looks at the behaviours, contextual factors, and processes that enable effective implementation. The **Effective Professional Development** guidance report[33] is also useful as it outlines the four main mechanisms for effective professional development.

Effective professional development in metacognition interventions

A variety of aspects of professional development have been found to be effective by researchers exploring different metacognitive interventions. These included:

- specific instruction on the teaching techniques and approaches to support the implementation of metacognitive strategies;
- inclusion of the theoretical background to the cognitive or metacognitive components of the intervention;
- social support through activities such as coaching, mentoring, and the availability of the trainers to troubleshoot and support;
- several studies used collaborative action planning to support teachers to adopt and adapt the approaches with their own students; and
- some studies provided modelling of the teaching approaches, gave time for rehearsing the use of the strategies, and provided feedback on teachers' practice.

Assessing the impact of self-regulation and metacognition interventions

Successful implementation of metacognitive strategies will not only require reflection and monitoring of the implementation processes used but also careful monitoring and assessment of pupils' use of the strategies. It is widely recognised that the reliable assessment of self-regulated learning and metacognition is challenging. Nevertheless, assessment is crucial to guide practice in the classroom. Alongside typical standardised test performance, there are more qualitative assessments that teachers can use.

Typical assessments of metacognition that can be used in the classroom by teachers include:

- **Traces** – asking pupils to use observable metacognitive strategies while completing a task, such as underlining a passage or making notes, can allow teachers to monitor pupils' implementation of the strategies.
- **Observation** - observing learners while they are completing a task, and estimating their use of metacognition directly, allows teachers to take non-verbal behaviours and social interactions into account. recording measures like 'time-on-task' or homework completion rates can also let teachers make inferences about self-regulated learning.
- **Visual cues** – pupils can indicate their own understanding and adoption of appropriate strategies through displaying red/amber/green cards or visuals which represent independent learning options (for example, brain, board, book, buddy, or boss). Teachers observe the use of these visual aids to observe how well pupils are monitoring their own learning.
- **Self-report questionnaires** - perhaps the most common assessment strategy is retrospective pupil self-reporting in the form of questionnaires (a note of caution should attend this method: recalling metacognitive strategies accurately is a difficult challenge for learners).
- **Structured interviews** - though challenging to implement, interviews can take the form of a hypothetical learning scenario, with pupils asked to describe how they would use self-regulated learning strategies during it, thus allowing them to access, or not, more context-specific strategies.[34]
- **Talk aloud protocols** - assessments that get pupils to express their thought processes while doing a particular task (these self-reporting measures, however, may be biased by pupils' literacy and ability to articulate their thoughts).

Research indicates that assessment during task performance appears to be more predictive and accurate than assessment before or after task performance.[35] Teacher assessments of their pupils appear moderately accurate.

Each of these assessment methods have their limitations and biases, so teachers should be circumspect in generalising their results.

What support is available for using this guidance?

These resources, all of which can be found on the EEF website, provide further support for the use of metacognition strategies and the promotion of self-regulated learning.



A range of additional practical resources are available to help leaders apply the strategies and recommendations in this guidance report within their contexts.

The EEF is also collaborating with a range of organisations across England to further support schools to implement this guidance more effectively.

The Research Schools Network is a collaboration of 33 schools across England supported by the EEF. These Research Schools work with schools, colleges, and early years settings in their regions to champion the use of evidence and improve teaching and learning with a focus on socio-economically disadvantaged children and young people.

More information about the Research Schools Network and how it can provide support on the use of EEF guidance reports can be found at **researchschool.org.uk**

Work with us

If you are interested in working with the EEF to develop additional resources or training based on guidance recommendations, or you have examples of a recommendation that has been effectively implemented in your school, then please get in touch: **info@eefoundation.org.uk**

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Notes

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