



## Metacognition

### Summary Sheet



#### Why metacognition?

*Metacognition is a critically important, yet often overlooked component of learning. Highly metacognitive pupils have developed skills that help them to direct, consider and evaluate their own thinking and their own learning. They are attuned to their own thought processes which allows them to be very reflective, aware of their own learning, able to see their strengths and areas for development, consider the strategies they use as a learner and be pro-active in making changes to how they process thinking. It's "knowing about knowing" and "thinking about thinking".*

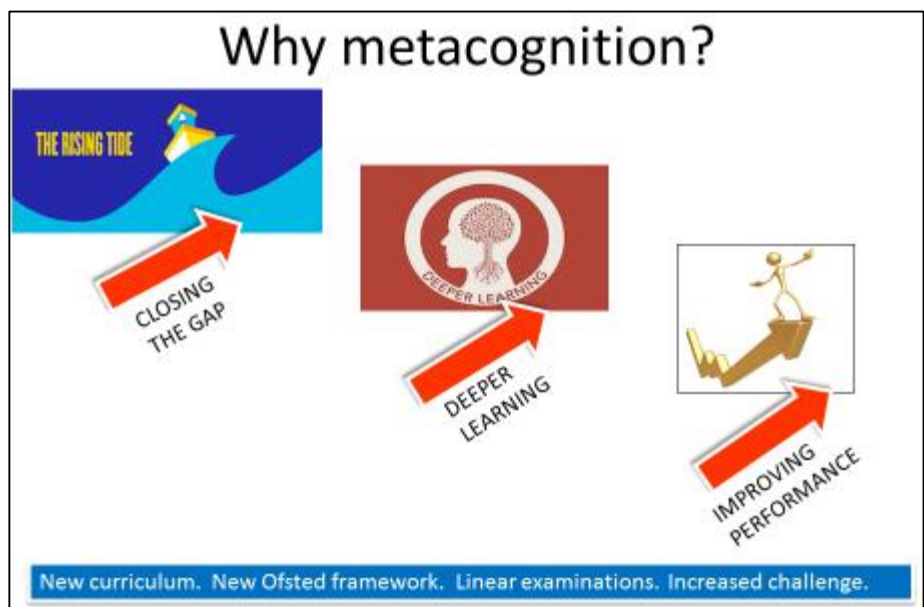
#### **Metacognition can be taught and developed!**

**1. Successful pupils are highly metacognitive.** Highly metacognitive pupils make faster progress and attain higher grades. We want all our pupils to be successful. We want pupils to love learning and therefore to be life-long learners; part of which is understanding that being a 'successful learner' is something they can control. 'Learning' and 'how to learn' should not be a mystery. Metacognition helps to take away some of the mystery of learning and supports them in become more effective and efficient learners. It gives them a 'mental skillset' and helps them have increased self-awareness.

**2. Developing pupils' metacognitive skills helps to close the gap for disadvantaged pupils.** Metacognition can be taught and developed. Developing metacognition is like a 'rising tide that lifts all ships' – all pupils benefit, but it has a **disproportionate positive impact** on disadvantaged pupils, leading to a narrowing of the performance gap between disadvantaged and non-disadvantaged pupils. Research shows that metacognitive skills can be taught to students to improve their learning (Nietfeld & Shraw, 2002; Thiede, Anderson, & Therriault, 2003).

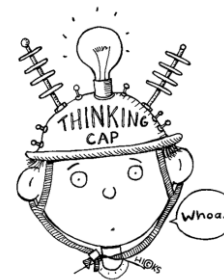
#### **3. Meeting the demands of national changes.**

If we want our pupils to be able to meet the increased demands of the national curriculum, achieve well in linear examinations, and become independent learners they need to be highly metacognitive. As leaders, it is important to keep a strategic eye on how harnessing the power of metacognition can help us to meet the increased national demands and respond to the emphasis Ofsted places on children having 'ownership' of their learning. It is a useful strand to have in a school improvement plan.



**4. Continual cycle of improvement.** Increasing pupils' metacognition helps them become more self-aware and reflective. Self-awareness plays a critical role in improved learning because it helps pupils become more efficient at focusing on what they still need to learn. In addition, it helps them to consider how effective they are being as a learner and what they need to alter and adjust to improve performance.

## Summary guide to Metacognition



Metacognition is a transcendent and executive type of thinking that can positively affect learning outcomes. When learners use metacognition, they become more aware of their own thought processes, plan and monitor their own progress, and evaluate the products of their efforts. These actions result in development of progressively greater degrees of self-awareness and self-regulation. It follows, then, that practicing metacognition leads to learner independence and life-long learning.

Metacognition is the ability to use prior knowledge to plan a strategy for approaching a learning task, take necessary steps to problem solve, reflect on and evaluate the results, and modify one's approach as needed. It includes:

- Learning about how people learn
- Developing an awareness of one's own learning processes
- Monitoring one's learning strategies and assessing their effectiveness (this is called self-regulation, self-monitoring, or self-assessment)
- Consciously managing one's own motivation and attitudes toward learning
- Making adjustments to one's learning strategies when appropriate

### PMC – a practical approach

Three useful ways to support learners to direct their own learning involves helping them to learn skills in the following categories **PMC**:

- **Plan** for a learning tasks – identify the problem, choose strategies, organise their thoughts, and predict outcomes.
- **Monitor** thought processes during a learning task– consider if their approach is effective, are on the right track, are any corrective measures needed, revise the work and adjust as necessary. Considering questions such as : 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? Do I need to re-read that section?
- **Check** outcomes – evaluate the outcomes/learning objectives against specific criteria, consider what went well and how learning could be improved, consider the approach they took to achieving their goal and if it was effective. Answering questions such as : How did I do it? What method/strategy worked? What did I learn? Did my plan work out? Can I learn from my mistakes? Can I do better next time?

Different researchers refer to these stages in a range of language, but what is common is the using metacognition skills as specific activities requiring learners to demonstrate mindfulness in a sequential manner throughout the learning task.

Learners who exhibit the ability to monitor their learning, through all the stages, exhibit higher levels of achievement.

### To what degree are students in your classroom applying metacognition?

At a glance, the list of skills and components of metacognition appear to be a common sense list of thinking habits used by excellent students in any educational setting. Educators recognise that good students engage in these behaviours on a regular basis. At the same time, educators also recognise that not all students use metacognitive skills naturally or routinely. Many students learn by rote, expecting their teacher to spoon-feed information to them every step along the way. Although physically present in a classroom, these students do not cognitively engage in learning tasks in an active and independent way. Students need a 'minds on' approach.

As the processes of metacognition is happening inside the head of the learner, it is often difficult to assess how well students are using metacognitive approaches – particularly if they are doing so in a planned and deliberate way.

“Metacognitive thoughts are deliberate, planful, intentional, goal-directed, and future-oriented mental behaviours that can be used to accomplish cognitive tasks.” (Flavell, 1971)

### What does metacognition look like?

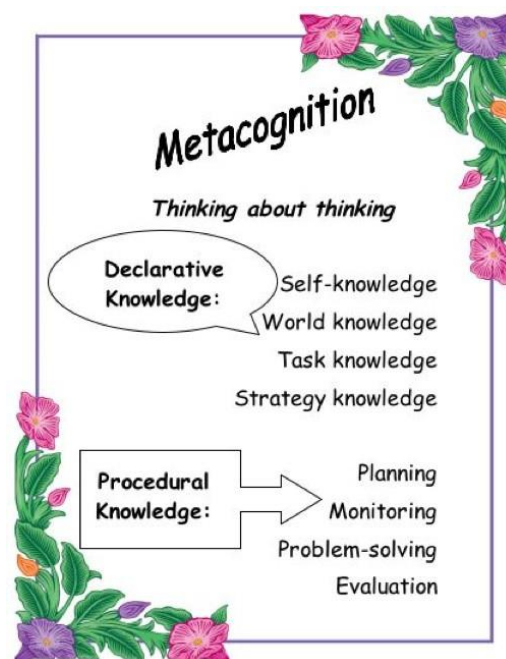
Flavell (1979) and other researchers divide metacognitive knowledge into categories.

1) **Person variables** : what one recognises about his or her own strengths and weaknesses in learning and processing information. Metacognitive learners are able to step back and look at themselves, considering what they are thinking and doing. They need to be able to accurately self-assess (both in terms of big picture and in every lesson) and use the feedback of the teacher, and peers, to adjust learning.

2) **Task variables** : What one knows or can figure out about the nature of the task and the processing demands required to complete the task – for example, knowledge that it will take more time to read, comprehend, and remember a technical article than it will a similar-length passage from a novel.

3) **Metacognitive declarative knowledge**: Learners can link points 1 and 2 together. They know about their own thought processes and are, therefore, aware of their strengths and weaknesses related to learning tasks. They are aware of what they know from previous experience and what they do not know but need to know. They understand how this applies to the task at hand.

4) **Strategy variables**: The strategies a person has ‘at the ready’ to apply in a flexible way to successfully accomplishing a task; for example, knowing how to activate prior knowledge before reading a technical article, using a glossary to look up unfamiliar words, or recognising that sometimes you have to re-read a paragraph several times before it makes sense. Because they are aware of their thinking processes, metacognitive learners understanding of what they will need to do in order to accomplish learning is greater. They are able to devise and apply learning strategies that will help them to achieve their learning goal. E.g. they can select an appropriate revision technique, select and use graphic organiser to link information together, use a strategic approach to reading a text, applying memory techniques, engaging in creative thinking exercises etc, to help them achieve a goal. Metacognitive learners not only know some effective strategies for learning but they know when, why, and how to apply those strategies.



Vitally important is for students to evaluate the effectiveness of the learning strategies they have used. E.g. students may be taught two different ways of committing a list of words to memory. The students must understand the two techniques, have the opportunity to try out the techniques and the opportunity to evaluate their effectiveness. They must also have the opportunity at some point to independently select a strategy to use, and again have the opportunity to evaluate its effectiveness. This processes helps students to become increasingly independent in selecting an approach to learning.

### Goals are important – both in the lesson and longer term goals

Gangé and Driscoll identified several executive (metacognition) strategies of critical thinking, including “goal-setting, concentration, management, and self-monitoring.” The goal setting includes goal setting within lessons, as well as the larger long term goal setting and reflection activities.

## **Mindset and metacognition**

An important factor in metacognitive development are person variables : beliefs about learning, mindset, understanding about how the brain can grow and develop, beliefs about other people's thinking processes, awareness of their own learning style preferences, beliefs about how people learn and their openness to experiencing new ways of learning.

The degree to which students believe they are "agents of their own thinking" is vitally important. For example, many people are convinced they are terrible at solving mathematical word problems, and because they assume that every mathematical word problem will forever evade them, they are little motivated to attempt a solution, and even less motivated to monitor and regulate their attempts. They therefore do not engage in the purposeful application of metacognition with a determination to achieve the goal.

## **Memory**

Also included in the field of metacognition is memory. How memories are formed, how memories are stored, how memories are accessed and recalled.

## **The way forward**

***The good news is that metacognitive skills can be taught. Planned, structured approaches can be provided to help develop pupil's metacognitive skills.***

In classrooms that are highly metacognitive you might see some of the following:

### **Characteristics of the metacognitive classroom:**

- Challenging tasks
- Modelling thinking
- Thinking diagrams
- Language for thinking
- Time to think
- Thinking aloud
- Sustained dialogue about thinking
- Joint thinking
- Making connections
- Purposeful planning of how to use time
- Rich in self-evaluation, peer evaluation and teacher feedback
- Explicit teaching and evaluation of learning strategies
- Opportunities to test out and evaluate learning strategies
- Awareness and appreciation of different learning approaches and styles
- Choice, access to resources, independence in deciding how to present answers
- Purposeful planning of how to approach tasks
- Engagement in goal setting, developing success criteria, planning actions of how to achieve goals
- Growth mindsets
- Knowledge and understanding of the brain, memory and learning
- Understanding and awareness of what metacognition is and how it helps you to achieve goals
- Creative problem solving