

# MENTOR HANDBOOK

## 14 | INSTRUCTION: PRIOR KNOWLEDGE

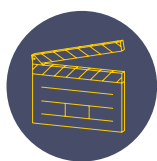
### STUDY

#### KEY TAKEAWAYS FOR THIS MODULE

Your teacher can begin to improve their instruction by understanding that:

- > Drawing on existing mental models helps us to learn new information and solve new problems more effectively.
- > Weak prior knowledge can lead to misconceptions. Your teacher must make the effort to diagnose what their pupils do know, don't know and misunderstand.
- > Your teacher can build on this by reviewing pupil prior knowledge and introducing new material in steps while asking lots of questions.
- > By carefully activating pupil prior knowledge and challenging pupils' incorrect beliefs, they can support pupils to develop accurate mental models.

Get yourself into a strong position to mentor your teacher by working through the following:



**CLICK TO WATCH  
MODULE VIDEO**

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**READ THE EVIDENCE  
SUMMARY BELOW:**

#### TEACHING CHALLENGE

Ms McShane finds it hard to ensure all pupils understand the new ideas she teaches. She has noticed that many have gaps in prior knowledge, even if they have covered related topics in previous years, or the topic is one she taught them herself. Others struggle to link new ideas to their existing knowledge. How can she check and build upon pupil prior knowledge to help them understand new ideas?

#### KEY IDEA

Pupil learning is more successful if teachers check, activate and build on pupil prior knowledge.

## PRIOR KNOWLEDGE HELPS US TO MAKE SENSE OF MATERIAL

“The most important single factor influencing learning is what the learner knows already” (Ausubel, 1968 in Simonsmeier et al., 2018). This is because pupils “come to understand new ideas by relating them to old ideas” (Willingham, 2009). Existing knowledge (stored in long-term memory) is what makes new ideas meaningful.

We can illustrate this by looking at sentences we might ask pupils to understand. As you read the sentences below, consider what pupils need to know to make sense of each one:

1. To convert a decimal to a fraction, use place value.
2. Two households, both alike in dignity,  
In fair Verona, where we lay our scene,  
From ancient grudge break to new mutiny,  
Where civil blood makes civil hands unclean.
3. Some say that Henry only made the break with Rome because the Pope would not let him have a divorce (Byrom et al., 1997).

For example, if pupils don’t know who Henry was, who the Pope was and why a divorce mattered to him, the sentence – and the topic – will make little sense.

Teachers can help pupils to learn by linking new ideas to prior knowledge. This makes it easier to process those new ideas. For example, if pupils have studied stories about adventures previously, they know what to expect in encountering a new adventure story. This then makes it easier to remember them, by connecting the new ideas to existing knowledge. The greater pupils’ prior knowledge, the easier learning becomes for them: “it is easier to learn new information... [and] to solve new problems when one has a rich, well-connected body of knowledge and strong ties and connections” (Rosenshine, 2012). Well-organised prior knowledge makes it even easier for pupils to learn new ideas.

## WEAK PRIOR KNOWLEDGE CAN CAUSE PUPILS TO MISUNDERSTAND

For prior knowledge to help pupils, it needs to be complete and accurate: if pupil prior knowledge is weak, pupils can misunderstand new material. If pupils hold misconceptions or lack correct knowledge, they can form misconceptions. For example, knowing that the surface of the Earth appears flat may lead pupils to conclude that the Earth is a disc (Simonsmeier et al., 2018). If Ms McShane tries to introduce a new idea which does not fit into a pupil’s current mental model – particularly if the pupil’s mental model is inaccurate – that pupil may misunderstand or reject this idea (Chi, 2009).

## ACTIVATING PRIOR KNOWLEDGE CAN HELP PUPILS TO SUCCEED

An effective starting point for teachers is to identify what pupils already know, and any gaps in their knowledge. Having done so, Ms McShane can seek to introduce new material in small enough chunks to be comprehensible, and to make explicit links between prior knowledge and the new ideas. Where pupils have missing or incomplete knowledge, adding new concepts will help pupils to develop more sophisticated mental models. However, where Ms McShane’s pupils already hold beliefs which happen to be wrong, she must focus on changing old concepts (Chi, 2009). When introducing new material, Ms McShane needs to develop pupils’ mental models by taking small steps and posing lots of questions which explicitly link pupil prior knowledge with the concepts being taught.

## NUANCES AND CAVEATS

If pupils have lots of prior knowledge and are reminded of this, it can prevent them from looking for new or better problem solutions (Simonsmeier et al., 2018) – like a driver going into autopilot: they stop thinking hard and therefore don’t develop their mental model.

# SELECT

Before you observe, first select a **DEVELOPMENT AREA** to focus on. Next, familiarise yourself with the **FOCUSED DEVELOPMENT AREAS**, as you will zoom in on one of these during your observation. Finally, craft a **PRECISE TARGET** when you observe your teacher (examples are provided below).

DEVELOPMENT AREA	FOCUSED DEVELOPMENT AREA	EXAMPLE PRECISE TARGETS
Understanding pupils' prior knowledge	<ul style="list-style-type: none"> <li>&gt; <b>Teacher checks for pupils' prior knowledge before introducing new information.</b></li> <li>&gt; Teacher addresses gaps they find in prior knowledge before introducing new information.</li> <li>&gt; Teacher uses information about pupils' prior knowledge to ensure they introduce new learning in a manageable way.</li> </ul>	<p><b>If your teacher is...</b></p> <ul style="list-style-type: none"> <li>&gt; <b>Not doing it at all:</b> Plan and deliver a question(s) that enables you to check for pupils' prior knowledge.</li> <li>&gt; <b>Doing it but needs some improvement:</b> Plan and deliver a set of question(s) that enable you to check for gaps in pupils' prior knowledge.</li> <li>&gt; <b>Doing it well, but needs some stretch:</b> Plan and deliver a set of questions that enable you to check pupils' prior knowledge including any gaps they may have. Explain the link between the prior knowledge pupils have and the new material being introduced.</li> </ul>
Activating pupils' prior Knowledge	<ul style="list-style-type: none"> <li>&gt; Teacher designs a task to activate pupils' prior knowledge.</li> <li>&gt; Teacher checks for pupils' understanding of the links between their prior knowledge and new information, addressing confusion.</li> </ul>	
Addressing gaps in pupils' prior knowledge	<ul style="list-style-type: none"> <li>&gt; Teacher plans to explicitly address gaps in prior knowledge before introducing the new learning.</li> <li>&gt; Teacher ensures pupils no longer have gaps in prior knowledge before introducing the new learning.</li> </ul>	

**RECORD YOUR THINKING HERE**

DEVELOPMENT AREA	FOCUSED DEVELOPMENT AREA	EXAMPLE PRECISE TARGETS
(select before observing)	(select whilst observing)	(select/write whilst observing)

# OBSERVE

Consider the following questions based on a short (approximately 15 minute) observation of your teacher.

What was your teacher's **previous** target? Are they meeting it? How do you know?

For the **DEVELOPMENT AREA** you are focussing on for this observation, what is your teacher already doing well?

Next, go to the previous page and select a **FOCUSED DEVELOPMENT AREA** to further zoom in on. Then select (from the examples) or write one **PRECISE TARGET** (bite-sized action) to coach your teacher on. You can choose to stick with the previous target if your teacher have not made enough progress yet.

How will you model the target to your teacher to show them what good looks like? What questions will you ask to check your teacher understands the model? For example, 'How it is different from your current practice?', 'What impact might it have on your practice and pupils?', 'What links can you see between the model and the module principles (below)?'

**Reminder: Your model should help your teacher develop their ability in some of the following:**

- > Take into account pupils' prior knowledge when planning how much new information to introduce.
- > Link what pupils already know to what is being taught.
- > Encourage pupils to share emerging understanding and points of confusion.
- > Plan to connect new content with pupils' existing knowledge or provide additional pre-teaching if pupils lack critical knowledge.
- > Structure tasks and questions to enable the identification of knowledge gaps

Next, meet with your teacher to work through the 'Feedback' stage of instructional coaching. See the guidance on the feedback stage in the appendices of the Mentor Handbook for support.

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#### REFERENCES

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