

MENTOR HANDBOOK

S5 | SUBJECT: ACQUISITION BEFORE APPLICATION

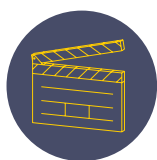
STUDY

KEY TAKEAWAYS FOR THIS MODULE

Your teacher can help pupils to acquire and apply ideas by:

- > Sequencing subject knowledge and concepts and linking them to pupils' prior knowledge.
- > Modelling new processes and ideas, linking concrete and abstract models.
- > Checking pupils' understanding before encouraging independent practice.

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SUMMARY BELOW:**

TEACHING CHALLENGE

Ms Smith has a clear sense of her learning goals and is confident at breaking the curriculum down into small, meaningful components. However, she struggles to know how quickly can she get pupils doing complicated thinking and when should she introduce more sophisticated tasks.

KEY IDEA

Students must develop solid foundations of knowledge through carefully sequenced teaching and practice if they are to develop and apply sophisticated mental models.

MASTERING FOUNDATIONAL KNOWLEDGE AND LINKING USING CORE CONCEPTS

Ms Smith is already aware of the value of building her pupils' subject knowledge, the risks of pupils' misconceptions and the potential for knowledge gaps. She wants her students to solve problems and think critically, but they cannot do so if they have critical knowledge gaps and she has noticed that weak prior knowledge leads to misconceptions. This is because pupils use knowledge integrated in their long-term memory to learn more complex ideas and successfully apply what they have learned (Deans for Impact, 2015).

This implies that:

1. The sequence in which knowledge is introduced is crucial. For example, pupils are likely to struggle to evaluate the effectiveness of international aid if they are unclear about the challenges facing developing countries. They are likely to struggle to master algebra if their grasp of number is weak. This means Ms Smith needs to sequence the introduction of new ideas carefully so that foundational knowledge is introduced first. It also means she needs to check pupils have relevant prior knowledge before she introduces new ideas.
2. Ms Smith needs to highlight the link between past learning and new ideas to pupils – or help pupils to make those links themselves – so that they gain a deeper and better organised understanding of the subject. Pupils learn new ideas with reference to what they already know (Deans for Impact, 2015), but Ms Smith cannot be sure they will make these links unprompted. Using core concepts help with these links.

Having broken down the knowledge she hopes pupils will gain and sequenced this carefully through one or more lessons, she can identify effective ways to introduce these ideas.

TEACHING ABSTRACT IDEAS

Ms Smith needs to ensure pupils acquire foundational knowledge and core concepts successfully, and that she does not begin more complicated activities too soon. It's easy for a relative expert in a topic – like Ms Smith – to grasp the abstract concepts and apply them. For example, she sees ongoing struggles over how much power ordinary people have throughout the political events of the nineteenth century; she uses symbolic representations of chemical reactions to understand what is happening in an (invisible) chemical reaction; and she can use the slope and intercept within a line graph to write an equation for that graph. However, for novices, abstract ideas can be particularly hard to grasp. If Ms Smith opens each of these topics with the abstract ideas, pupils may struggle to grasp them.

Concrete examples are much easier to understand (Willingham, 2009): in each case, pupils are likely to find it easier to first encounter the concrete example then

to identify the underlying abstract principle. For pupils to be able to use both, Ms Smith needs to connect and integrate abstract and concrete ideas, and show the links between them (Pashler et al., 2007). An understanding of the abstract features allows pupils to successfully apply subject knowledge and concepts in new situations: for example, an understanding of the structure of a narrative can help them comprehend a new text.

CHECKING PUPIL UNDERSTANDING AND OFFERING OPPORTUNITIES FOR PRACTICE

Ms Smith needs to check pupil understanding before beginning tasks which ask pupils to apply their new learning. She could use diagnostic questions, presenting pupils with several options, working with colleagues to identify answers which are either correct or common misconceptions. Pupils responses allow her to identify pupils who hold misconceptions and ensure they have grasped key ideas before continuing (Christodoulou, 2017). Ms Smith needs to ask herself, "how would I know pupils have acquired enough knowledge to practise successfully?"

Once pupils have enough knowledge, Ms Smith can ensure pupils practise applying it through meaningful tasks which promote their learning of new ideas (Willingham, 2009). Although pupils will initially have inflexible knowledge – knowledge which they struggle to apply to new contexts – through continued thinking and processing of new ideas, they will come to use this knowledge increasingly flexibly (Willingham, 2002).

NUANCES AND CAVEATS

Ensuring pupils have mastered foundational knowledge and core concepts depends on first identifying what is core – fundamental to understanding the topic and discipline – which she will return to many times to ensure pupils have successfully acquired them.

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
Planning for acquisition	<ul style="list-style-type: none"> > Teacher links new material to pupils' existing prior knowledge. > Teacher plans to secure critical knowledge, skills and concepts before they are applied or more complex content is encountered. > Teacher, with the support of a colleague, plans to use powerful ways to convey knowledge, skills and concepts to pupils. > Teacher introduces abstract concepts in the form of concrete examples and explains the link between them. 	<p>If your teacher is...</p> <ul style="list-style-type: none"> > Not doing it at all: Plan to introduce critical knowledge and skills or check pupils know them before having pupils apply them or encounter more complex content. > Doing it but needs some improvement: Plan for pupils to have multiple exposures to critical knowledge and skills before they apply them or encounter more complex content. > Doing it well, but needs some stretch: Plan for pupils to have to retrieve critical knowledge and skills over time to support them to remember it before they apply them without support or encounter more complex content.
Checking for acquisition	<ul style="list-style-type: none"> > Teacher plans times into the lesson when they will check pupils have understood the critical knowledge and skills they need before they apply them. > Teacher, with the support of a colleague, plans and checks whether pupils have gaps, errors or misconceptions in their understanding of the knowledge and skills before they apply them. > Teacher addresses gaps in knowledge, errors or misconceptions related to the knowledge or skills before increasing complexity for pupils. 	
Independent practice for application	<ul style="list-style-type: none"> > Teacher uses an activity for application of previously taught material. > Teacher plans to guide pupils to apply previously taught material so they experience success. > Teacher uses guides or scaffolds to help pupils apply previously taught material independently and removes them when pupils are achieving a high degree of success. 	

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:

- > Link what pupils already know to what is being taught.
- > Sequence lessons so that pupils secure foundational knowledge before encountering more complex content.
- > Balance exposition, repetition, practice and retrieval of critical knowledge and skills.
- > Identify essential concepts, knowledge, skills and principles of the subject and provide opportunity for all pupils to learn and master these critical components.
- > Use concrete representation of abstract ideas.
- > Remove scaffolding only when pupils are achieving a high degree of success in applying previously taught material.
- > Provide sufficient opportunity for pupils to consolidate and practise applying new knowledge and skills.
- > Work with experienced colleagues to accumulate and refine a collection of powerful analogies, illustrations, examples, explanations and demonstrations.

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.

REFERENCES

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