

## Handout 10.1: Retrieval and spaced practice

We can think of retrieval as bringing information to mind; whenever we are required to think about something, we retrieve information from our long-term memory into our working memory.

**Retrieval practice involves engaging pupils in activities with the intention of purposefully retrieving information from their long-term memory.**

Every time we retrieve something from our long-term memory, the knowledge itself is altered – the connections are strengthened, and the ability for us to retrieve information is improved. The main benefit of retrieval practice is that it enables us to build stronger and more robust schemata, which in turn helps improve our understanding.

However, there are other direct benefits of engaging pupils in retrieval practice:

- **Fluent/automatic recall:** the more often pupils retrieve information, the easier it is to recall in future.
- **Reduces cognitive load:** the more secure pupils' knowledge is, the less they have to rely on their working memory, thus reducing cognitive load.
- **Facilitates learning of new material:** the more prior knowledge pupils have, the easier it is to connect new material.

There are also some 'indirect' benefits to retrieval practice:

- **Metacognition:** by engaging in retrieval practice, pupils become more aware of what they know and don't know, meaning they can focus their attention on filling the gaps.
- **Responsive teaching:** retrieval activities also provide teachers with information about pupils' learning, which we can use to provide feedback and adapt our teaching.
- **Workload:** with retrieval practice, the onus is on the pupils rather than the teacher – it also helps if they are involved in checking whether they are right or not, so when using retrieval activities, it helps if pupils self-mark their responses wherever possible.

**Any activity that requires pupils to bring information to mind is retrieval practice.**

Over time, pupils will forget new information they are given. By engaging pupils in retrieval practice and prompting pupils to recall information from their long-term memory, we can improve long-term learning and decrease the chances of them forgetting.

This can take the form of:

- Asking questions
- Low-stakes quizzes
- Independent tasks.

For retrieval practice to be effective, we need to ensure pupils are successful. This may mean that we need to provide scaffolding to support them, guiding and prompting recall (Rosenshine, 2012).

Scaffolding may take the form of questions:

- Closed questions may focus pupils more than open questions.
- Multiple choice questions will provide options.
- 'Push' questions will guide them towards a particular idea.

Or teachers might find it useful to use written or visual prompts to scaffold retrieval, such as:

- Partially completed sentences
- Cloze-type activities
- Partially completed concept maps.

### Interleaving practice and spaced practice

Interleaving practice involves mixing multiple subjects or topics together – for example, an activity that involves adding, subtracting, multiplying and dividing.

Spaced practice involves returning to previous content after a gap of time – for example, a starter activity that requires pupils to recall facts that they learned the previous term.

**Spacing and interleaving are different strategies**, but there is some crossover between the two:

- Interleaving can be used as part of spaced practice – so giving pupils mixed sets of questions to review previously taught content might be more beneficial than giving pupils blocked questions of previously learned material, which would still be spaced practice but would not be interleaved.
- Whenever you are interleaving practice, this automatically creates short-term spacing as the interleaved items create a delay between practice of the different types of material.

### Key points to think about:

- Identify when it would be most helpful to introduce interleaving into independent practice.
- Be mindful of Rosenshine's principle that suggests pupils need to experience a high degree of success before moving onto more challenging material. For novice learners, we may need to make sure they fully grasp the concept before introducing interleaved practice.
- Ensure that all pupils have the opportunity to undertake interleaved practice at some point within a learning sequence so that they can all reap the benefits of both spacing and interleaving.