

Rosenshine's 10 principles linked to Teaching for Mastery

01 DAILY REVIEW



Daily review is an important component of instruction. It helps strengthen the connections of the material learned. Automatic recall frees working memory for problem solving and creativity.

Recall and Retrieval

Asking pupils to remember and recall information from the long-term memory helps to strengthen connections when recapping learning from the previous lesson. This helps pupils make connections in their learning and see how their knowledge is being built upon and drawn upon. Each lesson is a key small step in their learning journey.

Recapping previous learning also provides opportunity for additional practice to develop fluency and automaticity. This in turn helps pupils build confidence and self-belief as they see the success in their own work.

02 NEW MATERIAL IN SMALL STEPS



Our working memory is small, only handling a few bits of information at once. Avoid its overload — present new material in small steps and proceed only when first steps are mastered.

Coherence



Small connected steps are easier to take. Focusing on one key point each lesson allows for deep and sustainable learning. Getting the sequencing of these right is an important skill in planning teaching for mastery lessons. 'Go slow to go fast' and 'pace not race' are two phrases used to show the importance of breaking the learning down into manageable chunks which allows pupils to build firm foundations and develop a depth of understanding which they can then apply.

03 ASK QUESTIONS



The most successful teachers spend more than half the class time lecturing, demonstrating and asking questions. Questions allow the teacher to determine how well the material is learned.

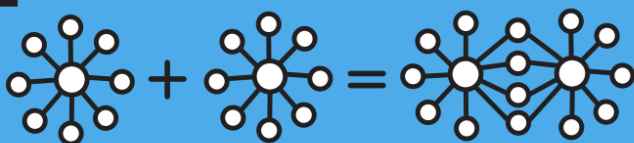
Questioning

Simply asking 'What do you notice?' or 'What's the same? What's different?' encourages children to look and explain their thinking.

'The answer is only the beginning' is used to get children to explain their thinking and to prove or convince others. Using STEM sentences, to help structure answers, ensures connections are made and answers are given in full sentences.

Whole class discussions and partner talk enable ideas to be clarified and verified using correct mathematical vocabulary.

04 PROVIDE MODELS



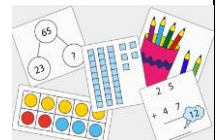
Students need cognitive support to help them learn how to solve problems. Modelling, worked examples and teacher thinking out loud help clarify the specific steps involved.

Representation and structure

Well-chosen manipulatives enable mathematical structures to be exposed.

The concrete use of manipulatives enables children to 'see it for themselves'. This is so much more powerful than just being told. The progression and connections made through concrete, pictorial and abstract representations is crucial to build on from what they know. Imagining becomes a vital skill as children visualise the manipulative to scaffold their understanding.

The 'I do, we do, you do' technique scaffolds learning for pupils through carefully modelled examples.



05 GUIDE STUDENT PRACTICE



Students need additional time to rephrase, elaborate and summarise new material in order to store it in their long-term memory. More successful teachers built in more time for this.

I do, we do, you do

Carefully structured lessons which model first and guide the learning enable pupils to then be successful in their own independent practice.

Fluency sessions

Additional fluency sessions, planned in daily, help to give additional time to allow pupils to practise and secure understanding.

06 CHECK STUDENT UNDERSTANDING



Less successful teachers merely ask "Are there any questions?" No questions are taken to mean no problems. False. By contrast, more successful teachers check on all students.

Pupils explaining

Getting children to explain their thinking and giving answers in full sentences exposes the depth of understanding. Explaining their work to a peer shows the level of understanding they have.

Exit tickets can be used to show individual pupil understanding which is key if a lot of partner work has taken place.

07 OBTAIN HIGH SUCCESS RATE



A success rate of around 80% has been found to be optimal, showing students are learning and also being challenged. Better teachers taught in small steps followed by practice.

Positive Attitudes – everyone can be a mathematician

Having high expectations for all pupils is a key feature of Teaching for Mastery. The small, coherent approach to learning enables all pupils to succeed. Using a ping pong approach to guide the learning through the lesson enables important modelling to take place and sufficient practice.

Whole Class teaching

Whole class teaching removes the ceiling for the lowest ability pupils and the small step approach allows even the least able to develop the kind of thinking associated with high attainment in maths through explicit teaching.

08 SCAFFOLDS FOR DIFFICULT TASKS



Scaffolds are temporary supports to assist learning. They can include modelling, teacher thinking aloud, cue cards and checklists. Scaffolds are part of cognitive apprenticeship.

Concrete Manipulatives

Carefully chosen manipulatives can help scaffold learning for pupils as they draw attention to the structure and expose connections. Hands on experience can then be visualised to help work more abstractly.

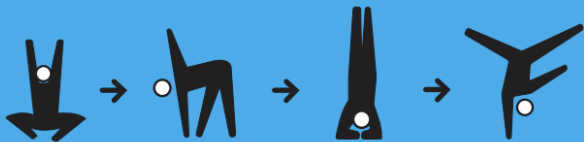
STEM Sentences

STEM sentences provide a support for children to answer questions asked. They help draw attention to the connections in number and help children make senses of the mathematical structures faced. They also encourage children to give answers in full sentences.

Non-examples

Getting pupils to look at examples and non-examples helps to clarify definitions. It draws attention to 'What it is' and develops depth of understanding.

09 INDEPENDENT PRACTICE



Independent practice produces 'overlearning' — a necessary process for new material to be recalled automatically. This ensures no overloading of students' working memory.

Intelligent/Purposeful Practice

Questions are carefully chosen to ensure intelligent rather than mechanical practice takes place. Pupils are encouraged to focus on relationships, not just the procedure. They make connections between problems. Providing opportunities for partner talk enables mathematical discussion to take place.

Getting children to 'explain how' they worked something out rather than just giving an answer will expose if there is depth of understanding. Did they use an efficient method?

10 WEEKLY & MONTHLY REVIEW



The effort involved in recalling recently-learned material embeds it in long-term memory. And the more this happens, the easier it is to connect new material to such prior knowledge.

Retrieval Practice

Fluency sessions can be a great way of ensuring additional practice of key skills. Regularly coming back to and reinforcing learning helps to secure understanding. Making connections between units of work (e.g. applying multiplication skills when calculating area) helps to give additional practice to apply skills and knowledge.

Planning in opportunities for learning to be reviewed from yesterday, last week, last month, last term or last year helps to secure retention and depth of knowledge.