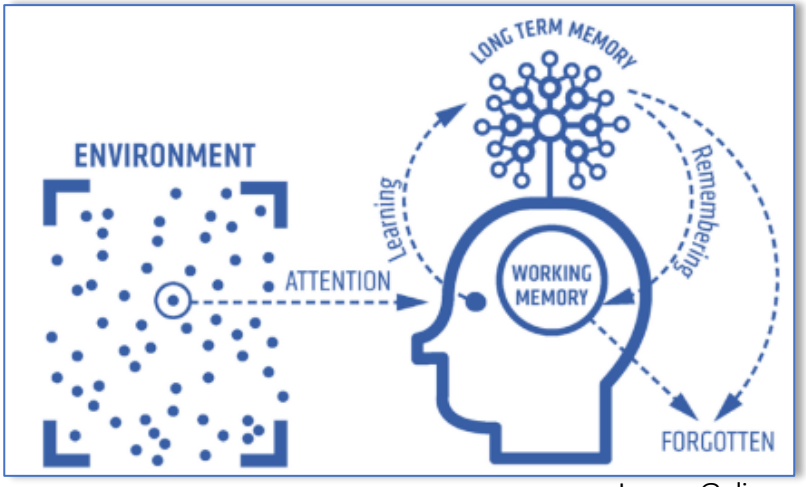
Teaching and Learning Framework

Conceptual Framework for the curriculum and effective teaching and learning



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This framework sets out the key principles and theoretical perspectives that inform curricular thinking at EMAT across all our schools. It describes what we believe are important features of the most effective teaching, learning and assessment practices. This framework is informed by reliable research. The principles we have chosen are not a 'checklist', but a framework that underpins our work to enable our pupils' successful learning.

The framework should be read in conjunction with our trust and school policies for reading, assessment, feedback and marking, behaviour and our curriculum policies.

Every child deserves to be the best they can be

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1. EMAT's curriculum vision

Every school in EMAT is committed to providing the highest standard of education so that **all** children are supported to be the **best that they can be**. Our curriculum is underpinned by the National Curriculum aims and programmes of study. Our curriculum is broad and balanced, rich and varied. We provide pupils with high-quality education and experiences to ensure they are ready for the next stage in their education and prepared for their lives in modern Britain. We are committed to making every day count for our pupils.

The curriculum is the totality of our pupils' experiences of education from the Early Years to Post 18. This includes the knowledge they gain in subject because of high-quality teaching, assessment and feedback on learning. Our curriculum includes the teaching of metacognitive skills and techniques to aid pupils' independent learning, extra-curricular opportunities, and the development of 'cultural capital' and broader employability skills and personal qualities. The curriculum in all our schools in underpinned by our values:

Inspiration

We believe in the tranformational power of education. We aim to provide a broad and balanced curriculum that will prepare children for future learning and their adult lives. We inspire children to be curious, teach them how to investigate, research and learn for themselves, and encourage them to become increasingly independent as they progress towards adulthood.

Inclusion

We ensure all pupils can access a wide and relevant curriculum. Our schools adapt the curriculum so that it is ambitious for all learners and meets their needs. This means that all young people, including those who are disadvantaged, learners with special educational needs and/or disabilities, those who speak English as an additional language and vulnerable learners can access the curriculum effectively. We offer high quality provision which enables young people to acquire the necessary knowledge, skills attributes and attitudes to to lead happy and successful lives.

Innovation

We use research from the forefront of educational research to inform and continually improve our curriculum. We ensure our staff use the most effective, research informed teaching strategies to promote pupils' learning. We apply the principles in this framework to, for example, ensure our curriculum is coherently planned and sequenced to enable pupils to build constantly on their prior learning and develop and deepen their understanding. Our application of our understanding of cognitive load theory help us ensure pupils move knowledge short top their long-term memory. Pupils acquire an increasing array of broader skills such as critical thinking, resilience, working effectively with others, problem solving and leadership.

Integrity

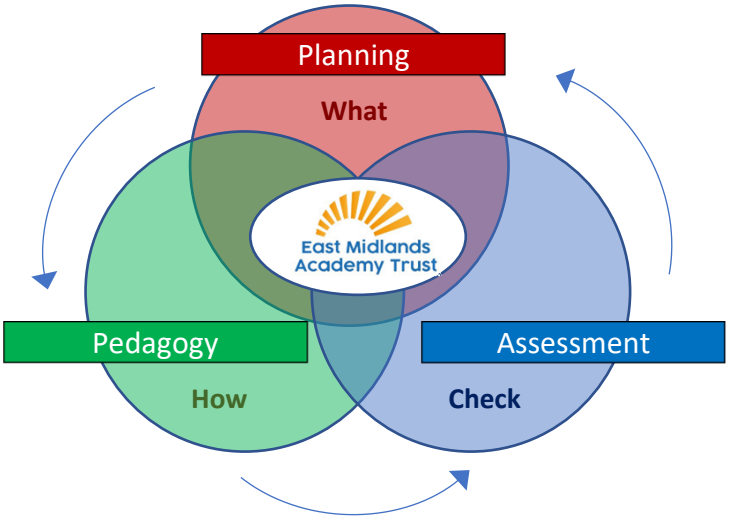
We nurture and promote in our pupils a set of core values. We teach our pupils to have integrity and repapre them to be responsible, respectful and active citizens. We encourage our pupils to contribute positively to society and uunderstand, appreciate and respect diversity.

Impact

Our ambition is that all pupils make good progress, both academically and in their personal development and achieve the best possible outcomes. We know our curriculum has positive impact by checking that our pupils know and remember more. The impact of our curriculum is also reflected in our pupils' outcomes of summative assessments including statutory assessments and examination results, employability and ensuring pupils gain the personal skills which will enable them to succeed in the world of work.

2. CSP: EMATs' three theoretical perspectives that underpin effective teaching and learning in our schools

At EMAT, our curriculum identifies clearly *what* will be taught – the important knowledge we want pupils to learn and remember - and *how* this will be taught – the most appropriate and effective pedagogical approaches. We also assess to check that we 'got there'. We ensure our curriculum has impact and this means that pupils get better at subjects and achieve well. To 'get better' at maths or history means that pupils know and remember more. The test of the effectiveness of our curriculum is how well pupils remember what they have learned. Our curriculum is made up of three main elements:



Put simply, **our teachers plan what they are teaching, how they will best teach it, and how they will check that pupils have learned it**.

Planning	Pedagogy	Assessment
WHAT is taught	**HOW** the curriculum content is taught	**CHECK** and ensure desired outcomes and measures of those outcomes

At EMAT, we have chosen **three main theoretical perspectives** to inform the curriculum in our schools which we call the EMAT '**CSP**':

(i) **C: *Cognitive load theory***, as described by John Sweller

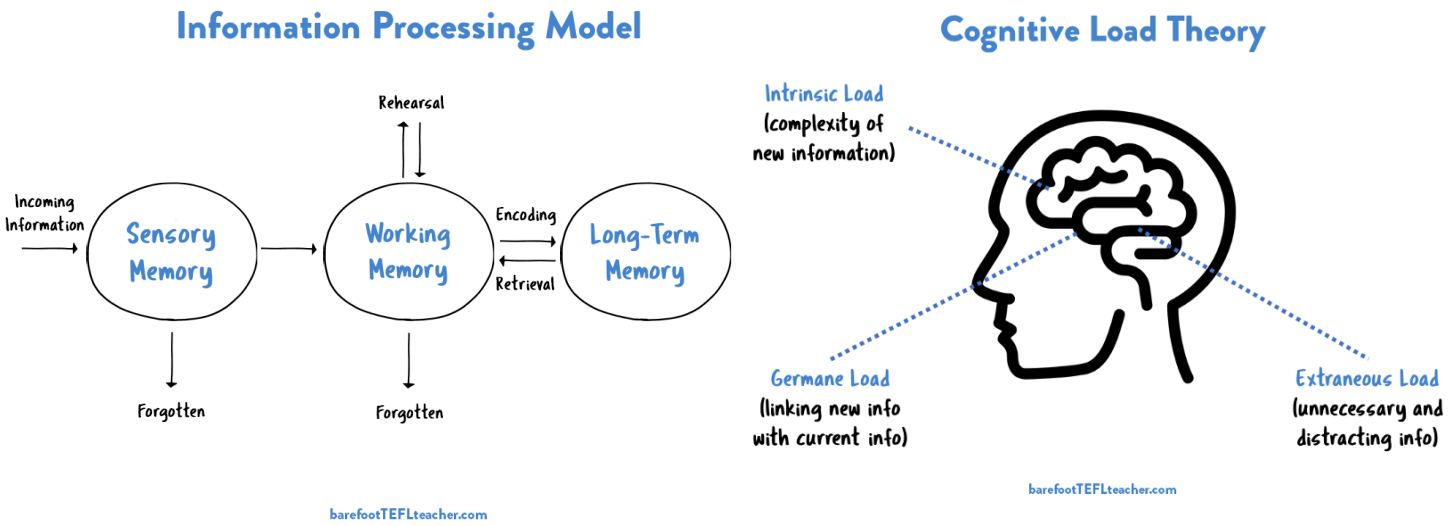
(ii) **S**: *the **Schema theory*** of Jean Piaget

(iii) **P**: *the **Principles of effective pedagogy*** (teaching) as described by Barak Rosenshine

We combine these three perspectives to provide a solid foundation for teaching and learning in our schools, inform the training and support we provide for our staff and how we evaluate and improve our curriculum.

i) Sweller's Cognitive load theory

John Sweller's cognitive load theory describes how we learn using our 'cognitive architecture'. In a classroom, when a teacher teaches something, pupils take information in through their senses – mostly through sight and sound. Sweller says we take in information through our visual and auditory 'channels'. Information, from hearing the teacher talking or showing or demonstrating something using pictures, images, or text enters through these channels into our working or short-term memory (STM). This is where we take in and make sense of (process) information from the 'outside world'.



The STM acts as a filter for all the information and knowledge we receive. We cannot keep everything - we have to prioritise and decide what to keep. If information just stays in the working memory it will probably be forgotten. However, in the right conditions, knowledge goes from our STM into our long-term memory (LTM). When this happens, we can remember it after a period of time. Knowledge from the LTM can be retrieved back into the STM: in the classroom, pupils can remember and use it.

Moving knowledge into the long-term memory

New learning is a *change* in **long-term memory**:

> *Learning is defined as an alteration in long-term memory. If nothing has altered in long-term memory nothing has been learned. (Sweller, J., Ayres, P., & Kalyuga, S. (2011). Cognitive load theory (Vol. 1). Springer Science & Business Media.*

However, the process of moving knowledge from the STM to the LTM is not straightforward. Pupils' STM can only deal with (process) a limited amount of new information before it becomes 'overloaded'. There is a limit to how much information can be processed. If pupils' working memory is overloaded, then the content being taught will not be understood and pupils will likely just be confused. Sweller says, 'Our working memory is a high maintenance mechanism…(if we) …'Give it *too little* to play with it begins to look for more interesting fodder. Give it too much to juggle and it will drop all the balls'. When this happens, pupils experience what Sweller calls 'cognitive overload'. When this happens, it is unlikely the new knowledge will be stored in pupils' long-term memory.

We draw upon three key elements from Sweller's cognitive load theory to help our pupils better remember what they are taught:

1. We aim to *minimise cognitive overload.*
2. We create the right conditions for knowledge to be *transferred into long term memory.*
3. We make sure our pupils are given opportunities to *recall* knowledge back into their short-term memories and use it because this helps them remember and connect knowledge.

In our curriculum planning, we plan how we revisit important knowledge. We use assessment to check and build pupils' memory. We use different teaching strategies that build memory. In our classrooms, to minimise cognitive overload and ensure knowledge is transferred into long term memory we:

- **focus on one task at a time**; we break learning down ('chunk') into parts; we **sequence learning carefully.**
- make sure **tasks, information and instructions are clear and unambiguous**. Teachers **reduce the number of simultaneous elements that pupils have to think about**. If there are multiple sources of information, this will split pupils' attention and add to the cognitive load.
- provide **worked examples and scaffolding** to help pupils understand how to complete tasks.
- take advantage of **auditory and visual channels** of pupils' short-term working memory.
- **build effectively on pupils' prior knowledge** to help pupils construct and remember ever more complex schema. (see ii on page 7)
- always **review knowledge** in lessons to help pupils transfer knowledge into their long-term memory.
- **rehearse the components of complex composite tasks** (see below) so that pupils' recall becomes automatic, thus freeing up the capacity of pupils' short-term working memory.
- **revisit previous content** to embed what pupils know. We build practice and repetition of the most important things. Some things are 'overlearned'. Sweller says the more you search for a memory, the easier it becomes to find it and memory gets stronger.
- **remove unnecessary distractions** and **signal the important information**. Staff draw pupils' attention to it, whether spoken, visual or written.
- plan to **help pupils to connect new knowledge** with what they already know. (building schema)
- **promote metacognition** by encouraging pupils to think about their own thought processes and how easy it was to recall the information.

Retrieval practice

Retrieval practice is the act of recalling learned knowledge from our memory. Every time knowledge is retrieved it changes the original memory and makes it stronger. At EMAT, we use retrieval practice to help pupils remember the most important knowledge. Fluency (ready recall or 'automaticity') requires 'overlearning' through repeated recall. We say that pupils move well beyond the point of accuracy to automaticity: they can recall knowledge without cognitive effort. This means they are in a strong position to learn and connect new knowledge.

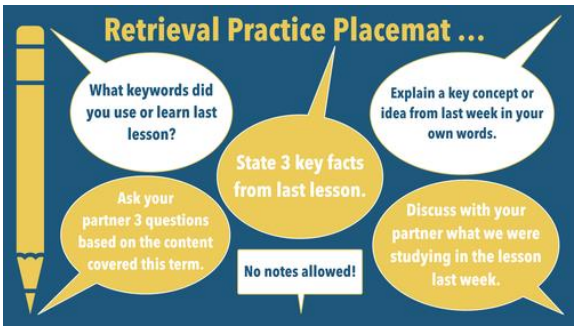
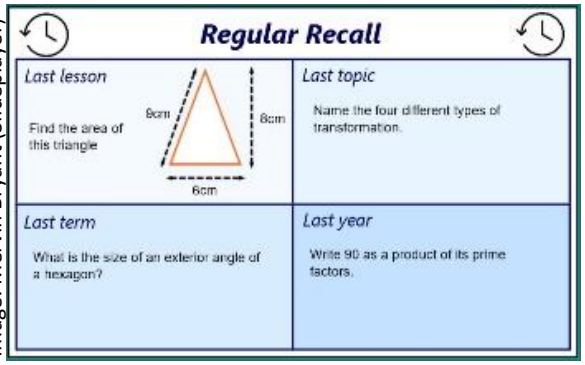


Image: KATE JONES (TES)



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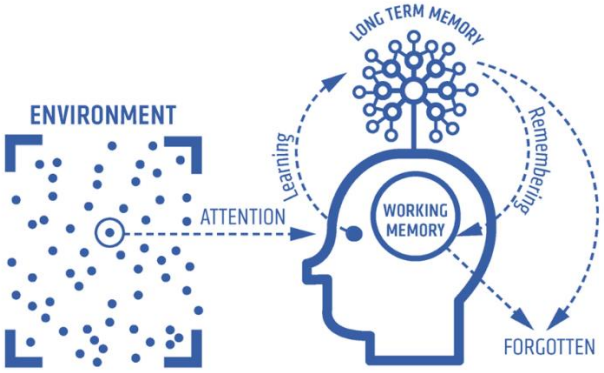
Our teachers make sure they revisit crucial knowledge taught previously. We help pupils remember the right things because we know they cannot remember everything. Our teachers focus is on the most important knowledge pupils need, the core knowledge and skills that will be used again and again. Our schools use *knowledge organisers* for the different subjects. These identify the most important knowledge we want our pupils to learn, revisit and remember. They identify the most important concepts and vocabulary. We use these to make sure we revisit this core content in our medium and short-term planning. We use assessment to identify any gaps in pupils' prior knowledge and check for automaticity.



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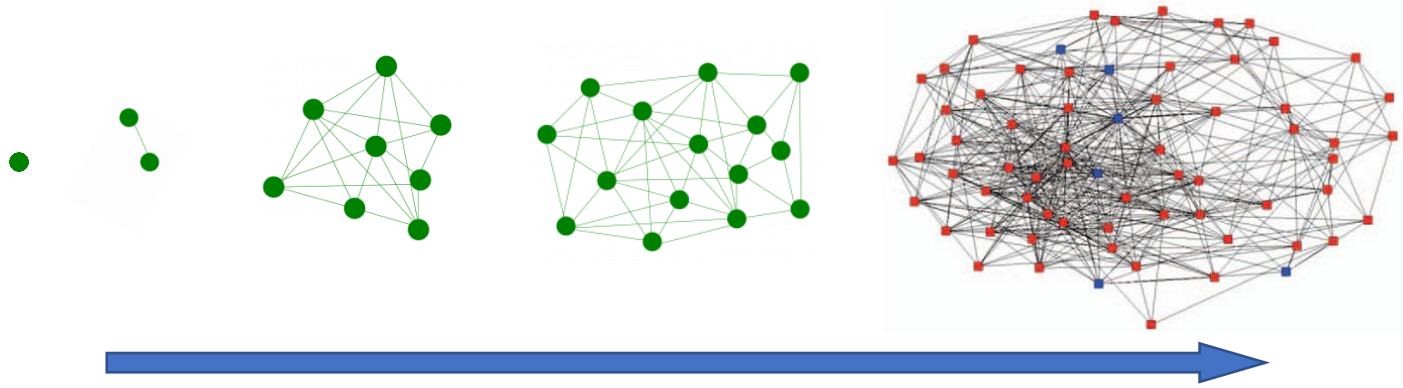
ii) Piaget's schema theory: building and connecting knowledge

Jean Piaget's schema theory builds on the importance of long-term memory. Piaget identified in his theory of cognitive development that children cannot undertake certain tasks until they are psychologically mature enough to do so. He identified four stages of development:

1. *Sensorimotor stage: thought, memory, and imitation begin to be used*
2. *Preoperational stage: recognising the symbolic form and language development*
3. *Concrete operational stage: ability to solve hands-on problems using logic*
4. *Formal operational stage: ability to solve abstract problems using logic.*

Understanding these stages of development affects how we teach pupils in the classroom. For Piaget, cognitive development is a progressive re-organisation of mental processes. Schemas or schemata are 'cognitive structures' or webs of knowledge that are the building blocks of cognitive development and learning. Our long-term memory consists of lots of schemata built up over time that link knowledge and create meaning. Learning is about changing those schemata by acquiring new knowledge and making connections with different schemata.



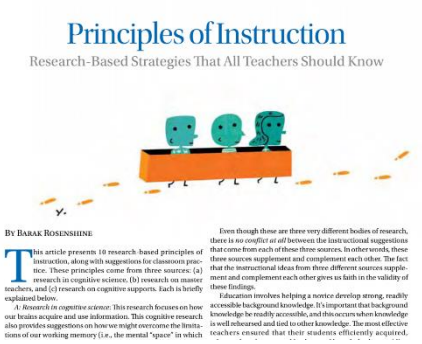
Schema are increasingly complex, interconnected webs of knowledge that build up over time.

We enable our pupils to create schemas by building new knowledge on pupils' prior learning. We know that discrete and disconnected knowledge (on the left of the diagram above) is much harder for pupils to retrieve. When pupils are taught to connect new pieces of knowledge to what they have learned previously it becomes *easier* for them to remember. Pupils store the new connected pieces of knowledge as 'one piece' and this reduces the cognitive load. As stated above, when pupils can automatically and effortlessly recall most of the items within a schema, we regard them as 'fluent'.

The more pupils learn, the more they can remember because it becomes easier to draw a schema into working memory rather than lots of separate bits of information. Pupils' understanding deepens as these structures of knowledge stored in long-term memory become increasingly complex. New knowledge, ideas and concepts become 'sticky' when we help our pupils relate them to ones they already know. When this happens, we say that pupils have a 'deep understanding'.

At EMAT, we identify the most important knowledge our pupils need to learn and remember. We help pupils acquire knowledge through our well-planned and carefully sequenced curriculum. This enables pupils to build interconnecting schema. We plan how pupils will build ever more complex schema. Our teachers anticipate how new knowledge fits into the bigger picture. We know our pupils' understanding deepens as structures of knowledge stored in long-term memory become increasingly complex.

iii) Rosenshine's Principles of effective teaching



Principles of Instruction

Research-Based Strategies That All Teachers Should Know

By Barak Rosenshine

In 2012, Professor Barak Rosenshine wrote *Principles of Instruction: Research-based Strategies that Teachers Should Know*. Rosenshine's work also emerged from research in cognitive science on how the brain acquires new information and research into effective classroom practice. Rosenshine summarised his findings in ten key principles which link to Sweller's cognitive load theory and Piaget's schema theory. **The principles apply to teaching all subjects and all educational phases**:

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1) *Begin a lesson with a short review of previous learning.* ***Daily review*** *strengthens previous learning and enables fluent recall.*

Reviewing previously learned material strengthens connections between pieces of knowledge. It enhances understanding. Automatic recall frees working memory. Rosenshine suggests a five to eight-minute review of the previously covered material, including peer marking, asking questions, checking for misconceptions, correcting homework, and others.

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2) ***Present new material in small steps*** *with pupil practise after each step. Only present small amounts of new material at any time, and then support pupils at they practise this material.*

There is only so much information pupils can process at one time. If you ask pupils to do too much at the same time, they will have cognitive overload and likely become confused. ***Present new information in small, bite-sized chunks to reduce cognitive load. Proceed only when the first steps are mastered.***

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3) *Ask a large number of* ***questions*** *and check of the responses of all pupils. Questions help pupils practise new information and connect new material with their prior learning*

Questioning is a teacher's most powerful tool. Questions can highlight misconceptions, keep learning flowing and challenge pupils to think more deeply about a subject. They enable pupils to practise retrieval, strengthen memory and help build schema. Every time a pupil answers a question they retrieve that knowledge and this enables knowledge to be transferred to the long-term memory.

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4) ***Provide models.*** *Providing pupils with models and worked examples helps pupils learn to solve problems faster.*

Provide concrete examples and models when introducing a new concept. This provides cognitive support. Give worked out example, use 'thinking out loud', provide explicit demonstrations, explanations and instructions.

5) ***Guide pupil practice****.*

Pupils need additional time to rephrase, elaborate and summarise new material to store it in their long-term memory. Spend time building pupils' confidence check for errors or misconceptions.

6) ***Check pupils' understanding****. Checking pupil's understanding at each point helps pupils learn material with fewer errors*

Constant checking of pupils' understanding means the teacher knows that pupils are ready to move on to the next step and prevents pupils from making errors, misunderstanding or carrying misconceptions into their future learning. It helps teachers know if key knowledge needs reteaching. Rosenshine suggests that teachers ask direct questions, instead of asking pupils if they have questions and assume that silence means a full understanding of the topic.

7) ***Obtain a high success rate****. It is important for pupils to achieve and be successful in the classroom.*

Rosenshine suggests a success rate of 80% is optimal, showing pupils are learning and being challenged. It suggests teaching and learning is ambitious. For Rosenshine, 70% is too low, 95-100% is too easy. Small steps followed by practice means that pupils master the current important knowledge and concepts before moving on.

8) *Provide* ***scaffolds for difficult tasks****. Provide pupils with temporary supports and scaffolds to help them when they learn difficult tasks.*

Provide pupils with a framework to support their understanding. Sequencing is key. Scaffolds can then be gradually removed as pupils' understanding and fluency grows. Rosenshine suggests modelling, teachers thinking aloud, using e.g. cue cards, checklists, worked examples and models. Teachers can also anticipate commonly made errors or misconceptions in the scaffold tasks and reduce the chances of pupils making the same mistakes.

9) *Require and check pupils'* ***independent practice****. Pupils need extensive, successful independent practice for knowledge and skills to become automatic.*

Independent practice means there are opportunities for pupils to work with little or no assistance. Independent practice should be used after scaffolded, guided practice. That is, when pupils are already competent in a task, they should be expected to practise the task independently to become fluent and retrieve knowledge automatically. Rosenshine calls this repetition of a task to promote fluency 'overlearning'. Independent practice should cover the same topic covered in guided practice as pupils need to be fully prepared for it.

10) *Engage pupils in* ***weekly and monthly reviews****. Students need to be involved in extensive practise to develop well-connected and automatic knowledge.*

The effort involved in recalling recently learned material embeds it in long-term memory. The more this happens, the easier it is for pupils to connect new material to prior knowledge. Rosenshine advocates monthly and weekly reviews of previous learning to aid recall of the most important knowledge and skills and build stronger schema.

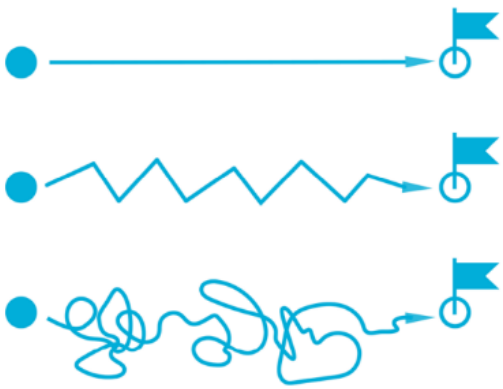
Appendix 1 is a poster of these ten principles of effective teaching. We do not see these principles as 'checklist' of what should be included in every lesson, but as a framework or 'toolkit' to support the effective implementation of our curriculum as well as our teachers' professional development.

Appendix 2 is a pupils' version of the principles which might be displayed in the classroom. We help pupils gain an understanding of how they learn and remember. We believe the age-appropriate understanding of metacognition we give to our pupils is a crucial to being and effective and lifelong learner.

*At EMAT, we use Sweller's **cognitive load theory**, Piaget's **schema theory** and **Rosenshine's principles**, inform teaching and learning in our schools. This informs our thinking in many areas.*

3. Planning the curriculum: a knowledge-rich curriculum

Pupils need to gain a rich body of knowledge so that they are equipped for each stage of their education and for their future lives. At EMAT, we believe that knowledge comes first because pupils cannot acquire higher-level 'skills' without first learning the content of our curriculum. Subject leaders embed a well-sequenced curriculum which identifies the most important knowledge and concepts that are revisited time and time again so that pupils remember what they have learned in their long-term memories.



We plan and sequence our curriculums carefully so that new knowledge builds upon pupils' prior learning in a logical way. We make sure pupils learn (remember) the knowledge they need.

We know that if lessons are not planned in a logical way, pupils will not make the progress of which they are capable.

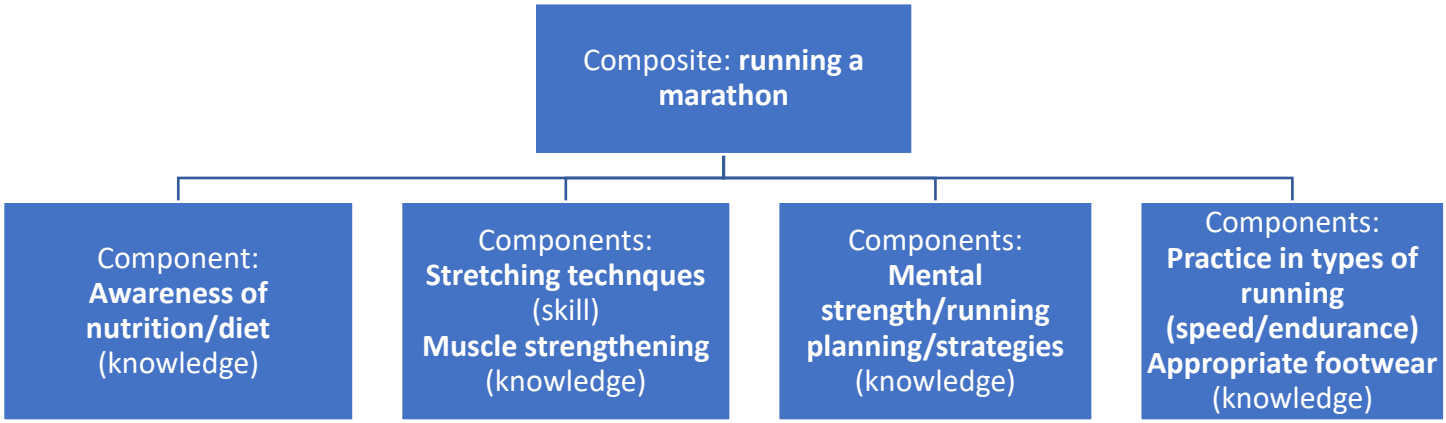
▶ We give pupils secure foundations at each stage of their education so that are ready for the next.

◀ We know that if pupils have gaps in their knowledge, over time, this will slow their learning.

We constantly check that pupils understand what they are learning and if pupils have any gaps.

Complex tasks and components

To understand complex concepts or perform complex tasks or skills requires a secure foundation of knowledge. Each complex, 'composite' task has its own set of 'components' that we need to remember and be fluent with. For example, to be able to be successful in a complex task such as running a marathon requires knowledge and expertise in a range of components. Runners will do not get better at marathons by just running more and more marathons. They need to learn and practise the components.



Components: The building blocks that together, when know, allow successful performance of a complex task

Composite: a task that requires several building blocks or components

The same principle applies to pupils' learning in lessons, for example, whether performing a mathematics calculation, writing a non-chronological report or performing a dance routine.

We plan carefully WHAT pupils need to know, building on past learning. We plan the order in which they will learn these things. We plan and check that pupils have the necessary and most important 'components' embedded in their long-term memory that they need to be successful in the more complex tasks. We check that pupils have gained automaticity or fluency in their memory of prior components so that their working memory is less likely to be overloaded when faced with a new complex task.

The difference between knowledge and skills

The OED defines a 'skill' as 'expertness, practised ability, facility in an action'. **A skill is a capacity to perform drawing on what is known.** It is knowing how to do something. How to wite a set of instructions, for example. We do not regard knowledge and skills as two things that are learned separately. Skills are dependent on relevant 'component' knowledge. 'Analysis', 'evaluation' and 'problem solving', for example, are often referred to as 'skills'. However, for pupils to be able to able to evaluate an instructional text requires them to first know the components of an instructional text. Pupils will not get better at 'evaluating' without focusing on the components. Pupils need to draw upon a range of relevant **knowledge stored in the long-term memory**. It is for this reason in EMAT that we say our curriculum is knowledge based: we focus on the deep body of knowledge we want our pupils to acquire.

Knowledge ⇨ skill = progress

Substantive and disciplinary knowledge

All subjects have *substantive* and *disciplinary* knowledge. At EMAT, we carefully sequence the curriculum for all subject areas, vocational subjects and educational phases. When planning the curriculums and sequences of lessons, our staff identify both the substantive and disciplinary knowledge we want our pupils to learn:

Substantive knowledge:
the subject content. In science, for example, this would include Newton's three laws of motion and osmosis.

***Disciplinary knowledge**:*
knowing **how** knowledge works in the subject. In history, for example, pupils do not just learn facts about the past selected by their teachers, they also learn how sources of evidence are used to interpret the past and how such interpretations can be challenged.

Sequencing and clear end points

Our subject departments, middle and subject leaders in the different educational phases decide, with our teachers, what subject content will be taught and how it should be sequenced in agreed detailed schemes of work.

Our curriculums for each subject identify the clear end points: what we want pupils to know and be able to do by the end of each unit of work, term and year. Our teachers then make further detailed content and sequencing choices as they implement our schemes in the classroom, lesson by lesson. Teachers use their subject expertise to provide effective learning opportunities in accordance with our **CSP** principles. They ensure the content of lessons is appropriate for the age group and needs of the pupils. They make sure it is suitably ambitious for all pupils. They ensure there is logic to the sequence of lessons. In accordance with the ten principles, they provide opportunities for pupils recall and practise previously learned skills and knowledge. They carefully choose the most important content they want the pupils to remember, sequence learning carefully to build more complex schema, and constantly review and revisit knowledge so that knowledge 'sticks' in pupils' long-term memories.

4. The importance of vocabulary and reading

Promoting reading, communication skills and understanding of vocabulary are at the heart of EMAT's curriculum. Being able to read is key to accessing the entire curriculum. EMAT is determined that every child will learn to read, regardless of their background, needs or abilities. The curriculum is planned so that any pupils who fall behind are supported to learn to read quickly. Reading and vocabulary are taught in all subjects. Our staff understand that teaching content in subjects such as history and geography is also teaching reading.

Reading is a complex process. The 'simple view of reading' conceptual framework identifies two dimensions to reading – 'word recognition' and 'language comprehension'.

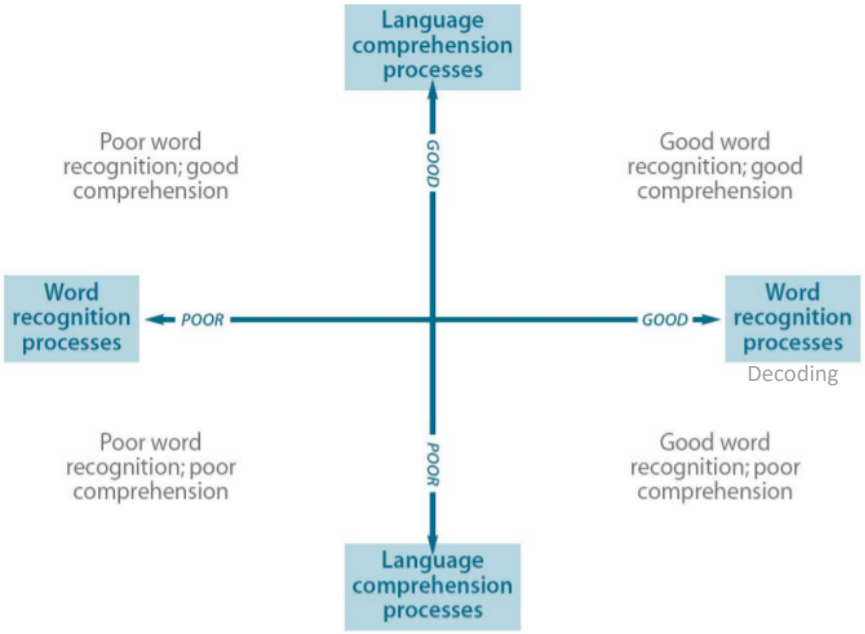


Image: Recommendations of the Independent review of the teaching of early reading (the Rose Report) March 2006

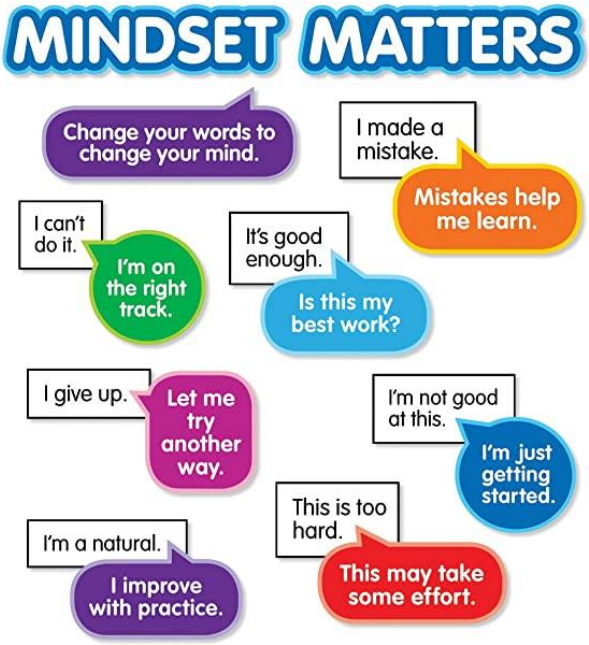
◀ The simple view of reading identifies 'word recognition' (decoding) on the x axis and 'language comprehension' on the y axis. To be successful readers, pupils need to decode and understand (upper right quadrant).

We know that the processes by which children comprehend spoken language are largely the same as those by which they comprehend words written on the page. The difference is that the first relies upon hearing the words and the second upon seeing the words in written form. To comprehend written texts, children must first learn to recognise, that is 'decode', the words on the page. When pupils are not fluent in decoding text, their short-term memory is easily overloaded and this means they will not able to focus on meaning. For this reason, it is crucial our pupils learn to decode fluently as quickly as possible.

High-quality phonics teaching secures the crucial skills of word recognition that, once mastered, enable pupils to decode fluently and automatically, freeing them to concentrate on the meaning of the text. The balance between word recognition and language comprehension shifts as children acquire secure and automatic decoding skills and progress from 'learning to read' to 'reading to learn': for both purpose and pleasure.

5) Adapting the curriculum to meet the needs of all our pupils

At EMAT we aim to ensure that all our pupils achieve their very best by accessing our ambitious, broad, balanced, and relevant curriculum. Our ambition is for all pupils to make progress by acquiring the key knowledge, skills, concepts and attributes to lead happy and successful lives.

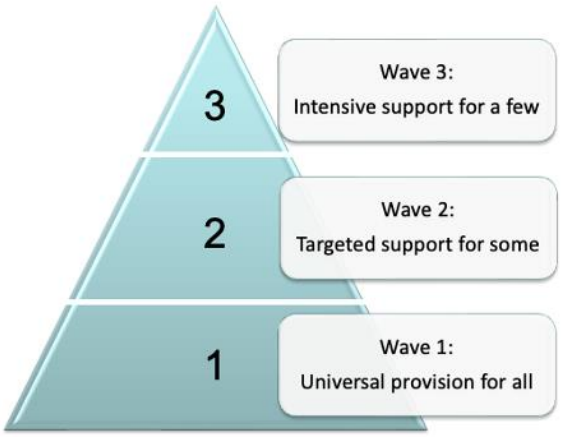


The majority of pupils, including those with special educational needs and disabilities (SEND), those who are disadvantaged and those who speak English as an additional language (EAL), will be working within the National Curriculum expectations for their age. Some pupils may access the curriculum at a different pace or depth than their peers. However, all pupils will access, and progress through, the same curriculum journey, and build their expertise through carefully mapped opportunities and experiences.

Where required, our curriculum is adapted to meet different pupils' needs. Provision to implement the curriculum is made through a whole school approach using the 'Waves' model.

The Waves Model of Provision

The Waves Model of Provision describes how different levels or tiers of provision can be understood and strategically implemented across a school:



Wave 1 (Universal) describes high quality teaching that takes into account the learning needs of all the children in the classroom.
Wave 2 (Targeted) describes specific and additional interventions provided for some children who need help to accelerate their progress to enable them to work at or above age-related expectations.
Wave 3 (Intensive) describes targeted provision for a minority of children who require highly tailored and/or specialist intervention to accelerate progress or achieve their potential.

For those pupils who require a more bespoke curriculum offer, they will likely access wave 2 or wave 3 provision. However, the starting point for all pupils is wave 1, with teachers focusing on the adaptation of high-quality teaching (HQT) strategies.

EMAT has a separate document which accompanies the *Teaching and Learning Framework* called *Adapting the curriculum to meet the needs of all our pupils*.

6) The role and uses of assessment

Formative and summative assessment is an integral part of teaching and learning and planning and delivering the curriculum. Effective assessment means that pupils experience a curriculum in which they can achieve their potential.

Assessment is a continuous process derived from clear curriculum intentions outlined in curriculum policies and long, medium and short-term planning. Assessment opportunities are built into planned learning activities and information and outcomes gained inform our curriculum planning and pupils' progress. We use three different types of assessment that serve different purposes:

1. Formative assessment *for* learning

We use regular formative assessments on an ongoing basis to check pupils can remember the most important knowledge. We check pupils' learning of the 'components'. We check whether pupils remember important prior knowledge and vocabulary. We check if there are any specific gaps in pupils' prior knowledge and check for pupils' fluency. Formative assessment enables teachers to identify when pupils are struggling, when they are fluent and when they are ready to deepen their understanding. It guides teachers to provide appropriate support or extension as necessary. It enables teachers to evaluate the impact of their teaching of knowledge or concepts and plan future lessons accordingly.

2. Summative assessment *of* learning

We use summative assessments of pupils' learning to check what pupils can remember about what they have been taught – a sample of some of the key components and composites - at the end of a unit of work, term, year, or key stage. Summative assessments help us evaluate the impact of teaching. Information from these assessments helps teachers to plan for subsequent teaching and learning. National standardised tests and examinations are a form of summative assessment.

3. Assessment *as* learning

At EMAT, we also see assessments as a tool to help pupils remember some of the most important knowledge. These include the range of formative assessments as well as informal assessments such as quizzes, class discussions, spelling and times tables practise. As stated earlier, the retrieval of knowledge strengthens long-term memory.

7) Quality assurance of our curriculum

Progress

Pupils make good progress if they know and remember more of the curriculum. We have well-sequenced curriculums for all subjects and phases, and teachers apply the EMAT **CSP** framework of effective teaching and learning. If pupils remember the curriculum, they are making progress. The purpose of quality assurance is to ensure that pupils are making good progress and achieve well in all subjects and year groups. We evaluate:

Intent: leaders specifically plan what our pupils need to know in total, in each subject and the order to teach it. We evaluate to make sure we identify ambitious end points and goals for our pupils – at the end of units of work, terms, or the year, for different subjects and pupils in all year groups.

Implementation: how the curriculum content is taught: pedagogy. The curriculum for each subject is designed, over time, to maximise the likelihood that children will remember and connect what they have been taught. We evaluate if the curriculum is planned, sequenced and taught well.

Impact: how well pupils make progress; we evaluate whether pupils, including those with SEND, EAL or who are disadvantaged, know and remember what they have been taught in different subjects and year groups, because progress is knowing and remembering more.

We evaluate our curriculum by looking at subject planning, visiting lessons and looking at pupils' work. We talk to pupils about their learning and what they remember. We discuss with our staff, the teaching approaches they use. We look at information from formative and summative assessments. Formative assessment provides a level of assurance for school leaders. If school leaders are confident their staff are carrying out effective formative assessment, they can be assured that problems will be identified at the individual level and that every child will be appropriately supported to make progress and meet expectations.

Summative assessment enables school leaders to monitor the performance of pupil cohorts, to identify where interventions may be required and to work with teachers to ensure pupils are supported to achieve sufficient progress and expected attainment. Nationally standardised summative assessments enable school leaders and school governors to benchmark their school's performance against other schools locally and nationally, and make judgements about the school's effectiveness.

Appendix 1. Rosenshine's Principles of Instruction

Barak Rosenshine's

PRINCIPLES OF INSTRUCTION

A thematic interpretation for teachers by **Tom Sherrington**

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VISUALISED BY OLI CAV Oliver Caviglioli @olicav

REVIEWING MATERIAL

1 Daily review

10 Weekly and monthly review

Daily review is important in helping to resurface prior learning from the last lesson. Let's not be surprised that students don't immediately remember everything. They won't! It's a powerful technique for building fluency and confidence and it's especially important if we're about to introduce new learning – to activate relevant prior learning in working memory.

QUESTIONING

3 Ask questions

6 Check for student understanding

The main message I always stress is summarised in the mantra: ask more questions to more students in more depth. Rosenshine gives lots of great examples of the types of questions teachers can ask. He also reinforces the importance of process questions. We need ask how students worked things out, not just get answers. He is also really good on stressing that asking questions is about getting feedback to us as teachers about how well we've taught the material and about the need to check understanding to ensure misconceptions are flushed out and tackled.

SEQUENCING CONCEPTS & MODELLING

2 Present new material using small steps

4 Provide models

8 Provide scaffolds for difficult tasks

Small steps – with practice at each stage. We need to break down our concepts and procedures (like multi-stage maths problems or writing) into small steps that each be practised.

Models – including the importance of the worked-example effect to reduce cognitive load. We need to give many worked examples; too often teacher give too few.

Scaffolding is needed to develop expertise – a form of mastery coaching, where cognitive supports are given – such as how to structure extended writing – but they are gradually withdrawn. The sequencing is key. Stabilisers on a bike are really powerful aids to the learning and confidence building – but eventually they need to come off.

STAGES OF PRACTICE

5 Guide student practice

7 Obtain a high success rate

9 Independent practice

Teachers needs to be up close to students' initial attempts, making sure that they are building confidence and not making too many errors. This is a common weakness with 'less effective teachers'. Guided practice requires close supervision and feedback.
High success rate – in questioning and practice – is important. Rosenshine suggests the optimum is 80%. i.e. high! Not 95-100% (too easy). He even suggests 70% is too low.

Independent, monitored practice. Successful teachers make time for students to do the things they've been taught, by themselves... when they're ready. *"Students need extensive, successful, independent practice in order for skills and knowledge to become automatic"*

Barak Rosenshine's

Principles of Instruction

How our teachers help us learn

We review our learning daily – this is to help us to remember!

We review our learning from previous weeks, months and even years!

Our teachers ask us questions to help us think harder!

We explain how we solve problems, not just give the answer.

Our teachers break down our learning into small steps and ask us to practise.

We have models and examples which help us understand.

We are given support in different ways to help us to complete our work.

Teachers help us become more confident and make fewer mistakes.

Teachers help us to be successful when answering questions.

We complete work by ourselves when we are ready.

Appendix 3. Strategies to support pupils' recall and memory

Ten strategies to recall learning and support memory

1. Quick Fire Quiz

Teacher reads out the question or presents them via slides or an audio tape (e.g. in MFL). The questions can be spontaneously generated or prepared. Questions can be simple factual recall, mental maths or multiple choice; All pupils write down their answers. Teacher reveals answers, one by one or all at once. Pupils check which they got correct. If prepared in advance, it is much more time efficient if pupils can see the answers all at once to check rather than wait for each to be read out. It is crucial that the teacher discusses common errors/misconceptions. If the teacher initially provides lots of confidence-building questions quickly this build pupils' confidence and enjoyment.

2. Paper Quiz

Everyone gets a copy of the questions and writes down answers at their own pace within a time limit. This is much less teacher directed. It frees the teacher up to circulate and spot common errors as they emerge. It allows for a wider range of question types and makes it easier to engage in with worded questions that can be hard to read from a whiteboard. The checking process is much better done with pre-prepared answers rather than reading out answers one by one. Why? Because it is quicker, allows for more detail in the answers, it allows pupils to focus on things they got wrong and helps to build their capacity for self-assessment.

3. Silent Self-Quiz

Which ones do you know? Provide answers: pupils can generate answers and then check if they were right, silently and privately. They can repeat this multiple times. Any number of resources can be used – blanked diagrams, cue cards with answers on the back, maths questions with answers kept separately. This process keeps the outcome of the assessment with the student – the most important place! They learn what they know and don't know. You can then discuss common errors and problems. It saves a lot of time with asking questions and marking them – all of that is done mentally by the pupils.

4. Paired Quiz

To maximise the extent of retrieval practice that goes on, it can be effective to get pupils to quiz each other in pairs. One pupil has the material – questions, answers, cue cards, knowledge organiser, text – and asks the other pupil questions: 'Test me'. Give a time limit and then ask pupils to swap around. You then have a room full of pupils checking their knowledge. This enables the teacher to circulate and check for errors, misconceptions or misunderstandings.

5.Self-Explanation

Beyond simple recall, ask pupils to explain something to themselves. You simply give pupils a few silent moments to complete a mental task. They have to generate a version of what they understand that they can either then self-check or write down or use to respond to a further question. The process of mental rehearsal is important and making this explicit helps to train those who may not be able to so this spontaneously. What is the story of Henry VIII's Six Wives? Run through it… then check.

6.Demonstration and Performance

Much knowledge is not quiz-able knowledge. You can ask pupils to show what they know: a procedure, technique or routine: 'Have you learned it? Show me'. As a pupil shows what they know and can do to a teacher, they are showing themselves what they can do. The intensity and frequency can be amplified by getting pupils to show each other in pairs rather than with the teacher, as long as they have the tools to evaluate success. This is common in practical/performance areas such as sport, music and art, but also can be

highly effective in, for example, science, mathematics or English where the modelling process could be framed as 'teaching', e.g. teaching the class how to answer a maths problem.

7. Paired or individual elaborative interrogation

This form of quizzing can be done in pairs or as a silent private process. Pupils explore their schema by answering 'How' and 'Why' questions. *Why does this happen? How does it work? Why does it work? Why did she say that? Why do you use that structure? Why is that the most important reason? How do you know?* When pupils become familiar using such question stems and the teacher provides resources that help them to verify their answers, this makes for deeper retrieval practice.

8: Tell the story

Rehearse the explanation; lots of knowledge forms a narrative structure: a series of events, a process, cause and effect. The retrieval practice can be formed as 'telling the story' to someone else who can play the role of verifier. Any explanation can then be improved and rehearsed. Pupils will get better at telling a story in more detail. Pupils might 'tell the story' of a water molecule as if follows the water cycle (with or without key words provided).

9: Summarising

This retrieval process can be something like: *Last week we looked at renewable energy. Summarise the main advantages and disadvantages of a wind farm: Go!* The teacher can then provide/show a definitive response for checking.

10. Map and Compare

This method enables the teacher to check pupils' capacity to make links. Pupils are asked to make a memory map of the key aspects of a topic, for example reactions of metals or themes in Hamlet or generating Electricity. Pupils then quickly make mind-maps before checking against a reliable resource: their knowledge organiser, exercise book or a teacher-completed version. *What did you get right? What did you miss out? How can you remember this next time?*

Bibliography and further reading

Christodoulou, D. (2014): *Seven myths about education.* The Curriculum Centre.

Coe, R. and Aloisi, C. and Higgins, S. and Major, L.E. (2014) '*What makes great teaching? Review of the underpinning research*.', Project Report. Sutton Trust, London.

Grimes, C. (2020): *Rosenshine's Principles in Action: The Workbook*. John Catt Educational Ltd.

Hirsch, J. (2016): *Why Knowledge Matters: Rescuing our children from failed educational theories.* Harvard Education Press.

Jones, K. (2021): *Retrieval Practice: Resource Guide: Ideas & activities for the classroom.* John Catt Educational Ltd.

Jones, K. (2021): *Retrieval Practice 2: Implementing, embedding & reflecting.* John Catt Educational Ltd.

Mccrea, P (2017): *Memorable Teaching: Leveraging memory to build deep and durable learning in the classroom.* CreateSpace Independent Publishing Platform

Rosenshine, B. (2012) *Principles of Instruction: Research-Based Strategies That All Teachers Should Know*. American Educator, 36(1), p12-39. https://www.aft.org/sites/default/files/periodicals/Rosenshine.pdf

Sherrington, T. (2019) : *Rosenshine's principles in action*. John Catt Educational Ltd.

Sherrington, T (2017): *The Learning Rainforest Great Teaching in Real Classrooms*. John Catt Educational Ltd.

Sherrington, T. & Caviglioli, O. (2020). *Teaching Walkthru's – Five step guides to instructional coaching.* John Catt Educational Ltd.

Sherrington, T. & Caviglioli, O. (2021). *Teaching Walkthru's 2 – Five step guides to instructional coaching*. John Catt Educational Ltd.

William, D, (2018), '*Creating the Schools our Children Need,*' Learning Sciences International

Willingham, T. (2009): *Why don't students like school: a cognitive scientist answers questions about how the mind works and what it means for the classroom.* Jossey-Bass.

Young, M. and Lambert, D. (2014) *Knowledge and the future school.* Bloomsbury.

(note: many of these texts are available in your school's as well as the training hub's CPD library)

Below are links to some thought-provoking blogs writing about teaching and learning:

Alex Quigley: https://www.theconfidentteacher.com/

Christine Counsell: https://thedignityofthethingblog.wordpress.com/

Clare Sealy: https://primarytimery.com/

Craig Barton: http://www.mrbartonmaths.com/blog/ (including links to podcasts)

Daisy Christodoulou: https://daisychristodoulou.com/blog/

Doug Lemov: https://teachlikeachampion.com/category/blog/

The Learning Scientisits: https://www.learningscientists.org/blog

Mary Myatt: https://www.marymyatt.com/blog

Tom Sherrington: https://teacherhead.com/