Amadeus Primary Academies Trust Principles of Curriculum, Teaching & Learning

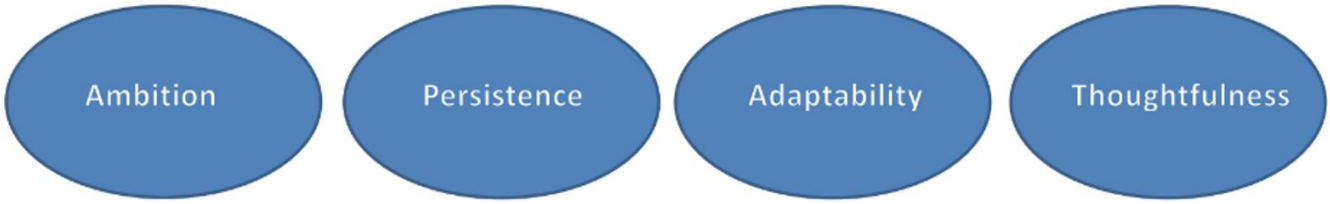
Rationale

Developments in our understanding of how children learn and research including Sweller's cognitive load theory, Rosenshine's principles of instruction guided by Cain and Oakhill's vocabulary instruction and Fiorella and Mayer's generative learning practice, have helped us as a Trust to develop a deeper understanding of effective teaching and learning in our classrooms which enables us to expand upon the expectations of the revised National Curriculum, ensuring a well sequenced curriculum, meeting the needs of all children but tailored to our different communities at each school. Our shared values are based on knowledge and understanding gained through collaborative working, training and reflective practice.

We believe as an educational Trust and a learning community, that our key responsibility is high quality teaching and learning in every classroom every day. Embedded and sustained improvement is dependent on this. Our expectation therefore is that all pupils are provided with quality learning experiences that lead to consistently high levels of achievement and engagement in order to become confident, articulate and independent learners.

Aims

By promoting a consistent and coherent approach to teaching and learning across the Trust, we aim to fulfill the Trust Values:



- ✓ to ignite a lifelong love of learning and equip children with skills and confidence to thrive in an ever changing world;
- ✓ to provide a safe and happy learning environment;

- ✓ provide high standards of teaching and learning in every class, by all staff members;
- ✓ to enable teachers and support staff to teach as effectively as possible;
- ✓ to understand the National Curriculum's age related expectations for each year group;
- ✓ to understand each child's attainment, progress and gaps in learning;
- ✓ to enable children to know and remember more;
- ✓ to give children the skills, knowledge and understanding they require to become confident, articulate and independent;
- ✓ to provide an inclusive education for all children;
- ✓ to appreciate British values and Christian beliefs;
- ✓ to provide a diverse curriculum that enables our children to develop a global perspective and better understanding of the world around them;
- ✓ to raise expectations for all pupils, to enable them to fulfil their full potential;
- ✓ to develop high levels of emotional intelligence to promote cooperation and collaboration in learning;
- ✓ to promote high standards of behaviour through clear expectations and by the example of the adults;
- ✓ to develop a clear sense of personal responsibility as a member of the school community and the Trust.

Teaching and learning in each school needs to be adaptable and focused on the needs of each group of pupils in each lesson. This policy outlines the key elements which are crucial to raising standards in teaching and learning, setting out a model structure for lessons based on best practice and research linked to how we learn effectively.

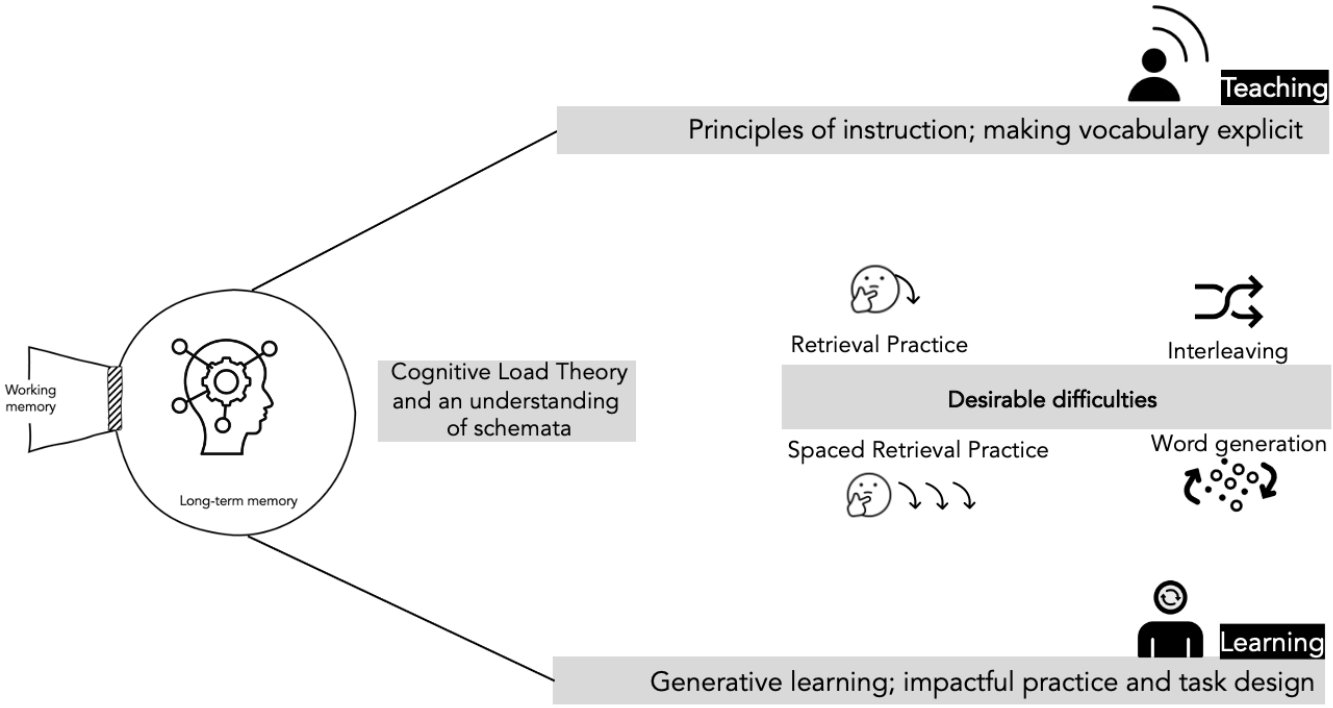
(See Appendix 2)

Evidence-Led Practice

At Amadeus we select our curriculum approaches for all subjects, with the implicit requirement that these have been built around evidence-led practice. This document summarises and directs the principles and practice that leads to excellence in the classroom. Whilst this may be through different approaches or schemes at each school, these must always be underpinned by:

Guiding research and evidence

1. Sweller's cognitive load theory
2. Rosenshine's principles of instruction guided by Cain and Oakhill's vocabulary instruction
3. Fiorella and Mayer's generative learning practice



We believe that explicit vocabulary instruction must shape the structure and language provision throughout all curriculum areas as a golden thread that links and connects the breadth, depth and value of all units of teaching. At Amadeus language is a cornerstone in our overall approach to reduce social disadvantage and embedding learning.

Clare Sealy – Memory, not memories: https://primarytimery.com/2017/09/16/memory-not-memories-teaching-for-long-term-learning/

Vocabulary Mapping

At Amadeus, all schools are required to ensure that all subjects have a clear vocabulary sequenced lesson to lesson, including etymology and morphology as a minimum. This ensures that each schools approach goes beyond the National Curriculum, which specifies that vocabulary should be explicitly instructed, but does not give the finer level of detail necessary to ensure that instruction is progressive, systematic and meaningful.

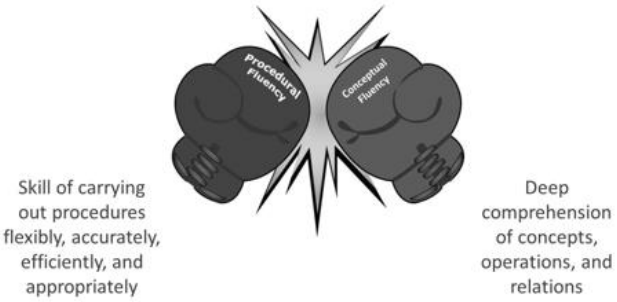
School level curriculums must be underpinned by key language that is instructed within units, in all subjects. This ensures that pupils have the opportunity to learn and rehearse vocabulary in meaningful contexts, thus committing it to the long term memory.

Our Mastery Curriculum Approach

Our work towards 'mastery', is built through carefully consider curriculum design, pedagogy and assessment operating together to create a cohesive educational experience. Clare Sealy (see above) suggests that there are three main considerations in how learning is sequenced in a way that supports this:

1. How much information is introduced
2. The pace of introduction
3. Opportunities for rehearsal and retrieval

At Amadeus therefore, sequencing of content for long-term learning must be central to our curriculum approach at every school. As a result, all Amadeus pupils who work through the curriculum journey at each school must be supported to develop both procedural and conceptual fluency.



Each school's curriculum must be structured to secure both procedural and conceptual fluency. Within each area, the deliberate retrieval and sophistication of content is planned so that pupils revisit and deepen their conceptual fluency, building on their procedural understanding.

Curriculum principles

1. Our ambition is to erode deficits in cultural capital.
2. Our priority is to improve teaching through evidence-led structure and practice, so that all children get great teaching.
3. Our end goal is for all children to succeed, regardless of their starting points. Our curriculums therefore must be deliberately designed to give our children the tools and provision to know more and remember more.

Where schools use published schemes, these will have been selected to ensure that subjects have been built around a clearly defined set of curriculum drivers that infuse all subjects. Schools at local level, supported by the wider Trust team, will evolve these to ensure that the provision is successful in addressing needs within their own context and cohorts. For example, knowledge of the world may be a chosen as a driver because pupils have limited experiences beyond their own area.

Each school's curriculum, will clearly define the content that pupils will learn, subject by subject. These are the headlines for each sequence. This will be structured as a cumulative curriculum, starting with EYFS provision, ensuring prior knowledge is always a pre-cursor to a single study. Teachers can then make skilful connections to prior knowledge as they are aware of the previous studies, over time.

Curriculum structure

To ensure this, prior learning should be mapped into every module to show and remind teachers of the previous provision pupils will have encountered. This enables teachers to orchestrate meaningful retrieval practice and connect past learning. This has an added benefit of giving new learning an organised place to be stored in the memory, and therefore retrieved.

In their long-term sequencing, schools should also deliberately plan to ensure that relevant inter-subject connections that complement each other are clear, for example, Rocks before Stone Age in a year group.

Where possible spaced retrieval practice should be incorporated to ensure areas of study are revisited, deepened and sophisticated. Some areas of the NC Science are very content heavy and as a result these

need revisiting for clarification and sophistication, later in the year and time needs carefully planning in to sequences for this.

In all schools the English offer must be planned with a rich literature spine comprising ambitious texts that inspire and challenge pupils. This should be systematically mapped to enable children to experience breadth and depth of social, moral and ethical dimensions as well as a wide range of authors, matching the broad make-up of the school.

English

Where possible Writing should draw on taught content from the wider curriculum. Writing modules must be developed to provide teachers with the opportunity to teach and rehearse key knowledge and skills before applying this learning to meaningful extended outcomes. The careful architecture of this curriculum must ensure that pupils build on prior learning and maximise purposeful curriculum connections to become writers for life.

The whole school Reading strategy must be deliberately designed to be ambitious and aspirational, ensuring that every child leaves our schools as a competent, confident reader. Drawing on the latest research around explicit vocabulary instruction, reading fluency and key comprehension strategies, our curriculums must be a synthesis of what we know works in helping children make outstanding progress in reading and distil this into consistent, well-structured practice. Pupils will receive a consistent diet of excellent reading teaching and this will be supplemented by regular opportunities to engage with shared reading experiences, promoting the joy of reading with the whole school community. Whilst the whole school reading strategy may differ school to school, the clear structure and principles must ensure that teaching is progressive, challenging and engaging and the rich, diverse literature spine acts as both a mirror so that every child can see themselves in the core texts and as a mirror to engage pupils with experiences beyond their own field of reference.

The curriculum at Amadeus Primary Academies Trust will ensure that each schools resources support a knowledge-rich curriculum structure that is coherent and cumulative. Within this:

- Core knowledge is defined and articulated across subjects through a focused teaching sequence that is coherent, interleaved and built around spaced retrieval practice.

- At the start of every lesson the knowledge and vocabulary to be taught is clear. This may be through Knowledge notes, segments of Knowledge Organisers or through directed teaching (clear in short term planning) to support each lesson. This element of the lesson will be used to elaborate on the core concepts and content.

- Vocabulary is mapped across EYFS – Y6 for all subjects. It includes sequenced Tier 2 and Tier 3 words as well as etymology, morphology as a minimum for each learning module.

- Each study sequence is planned lesson by lesson using a centrally (school level) prescribed learning question or objective to focus the learning. Foundational knowledge is identified as an essential component within the sequence of learning.

- We use cumulative learning objectives or questions. These are designed to sequence each lesson and following teaching and practice to test the understanding of the taught content, lesson by lesson.

Whilst feedback /marking policies are set at school level, Trust thinking about how feedback can be used effectively within these sequences is informed by the Mark less, Mark better research, where feedback is used to reshape learning rather than just narrate outcomes. Assessment through observed practice, whole class marking strategies and cumulative quiz outcomes are encouraged across the Trust to inform teachers and children how well the content is understood, along with any misconceptions that need addressing. As a minimum, Feedback strategies must respond to incorrect lesson specific vocabulary and misconceptions. See Appendix 3

https://assets.website-files.com/60ae1aa7637f8ec801c3e7fa/60faad990650d95e6def6ee6_mark-less-mark-better-autumn-2019.pdf

- Subject leaders' quality assures learning by observing teaching and quality assuring books, but with a priority of talking with a varied group of pupils using their books to explain how well they know, can use and connect learning. The process is underpinned by Pupil Book Study – a structured and evidence-led guide to quality assuring the curriculum, teaching and learning by Alex Bedford.

- Where beneficial technology supports teaching and learning through the use of devices in the classroom to enhance the teaching and learning practice. We do not encourage unguided / unplanned discovery research using iPads or laptops at the beginning of a learning sequence. This will only increase the load on the working memory and be counter-intuitive.

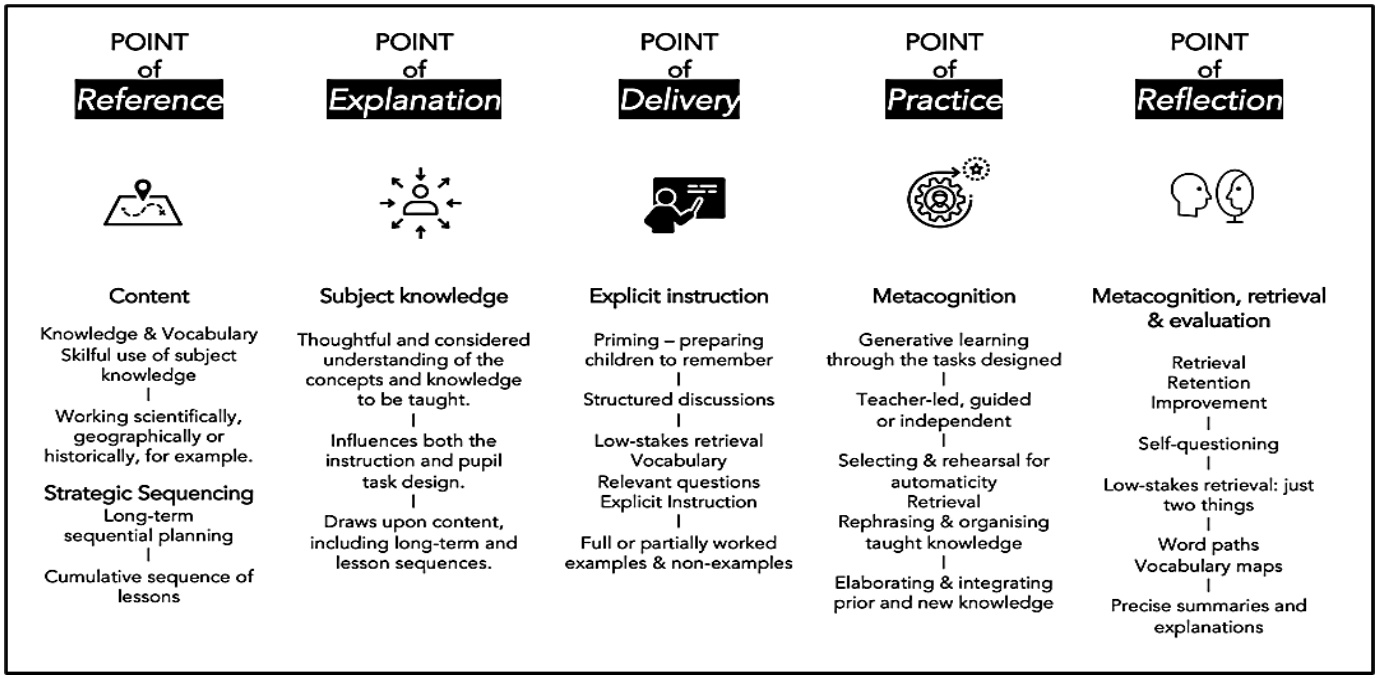
- Pupils' books are repurposed, so they become more than just a place to collect completed work from a lesson. Pupils' books, supported by resources at school level should be developed so they are used to engage children in a variety of teacher-led, guided and independent tasks to help them generate, build on and connect prior learning, with the book as a retrieval tool.

- When developing the curriculum towards short term planning, task design must specifically take account of the need to build pupils' conceptual fluency. By building pupils' confidence and competence in tried and tested learning approaches, we can refocus their cognitive capacity to the most important thing – the content that they are learning. An example of this could be the use of an organisational Venn diagram in multiple contexts. At first it could be used for example to categorise Animals, including humans in early KS1 and then later in the sequence, through spaced retrieval practice, children could compare and contrast Animals, including humans, using the same diagram. Likewise, pupil should meet similar response frameworks throughout for example Reading units for skills such as retrieving facts to complete a table or sequencing events from a narrative and this will allow them to approach this task in the context of ever-more challenging texts.

Teaching and Learning

Excellent teaching is built around coherent and cumulative curriculum structures. Central to the structure is the evidence-led practice that reflects the strong curriculum offer. The curriculum structure directly supports excellent teaching and learning.

To support excellent teaching, we underpin our expectation of great teaching with Alex Bedford's Five Point Provision:



- Teachers use resources such as CUSP as the **POINT OF REFERENCE**.

- The resources directly support the point of explanation. This means that teachers understand the subject knowledge and are able to explain it in multiple ways, which leads to thinking carefully about task design.

- Clear connections between past, present and planned future learning are considered by teachers.

- Explicit instruction techniques are used at the point of delivery, where teachers model and explain foundation concepts and knowledge.

- Carefully designed knowledge notes, organisers or clear sections in short term planning must underpin the point of practice**,** ensuring clarity of what we want children to know and remember from each lesson. Pupils are expected to draw upon prior learning - this could be from the last lesson or from the last term.

At Amadeus we believe that great teachers use professional and evidence-led understanding along with a wide range of tools articulated in teaching toolkits. Typically, teachers have autonomy about when and how they deploy and use these tools within lessons. The areas below form the basis of our teaching toolkit, informed by evidence-led practice.
(See more detail in Appendix 1)

Amadeus Primary Academies Trust Principles of Curriculum, Teaching & Learning

Connections: ○ Curriculum long and medium-term sequences position knowledge coherently and cumulatively. ○ Prior knowledge is made obvious to position new or abstract content. ○ The bigger picture of the study is deliberately brought to the attention of children. ○ Teachers articulate how content is related and connected by moving between the big ○ ideas and today's focus knowledge.
Vocabulary: ○ Explicit vocabulary instruction of Tier 2 and Tier 3 words. Teach a few words regularly and use them all the time. ○ Use vocabulary on working walls and incorporate into pupil practice to remember and connect meaning. ○ Teach etymology and morphology of words help to unwrap meaning. This makes sense of vocabulary in context, helps pupils acquire a deeper understanding and unlocks thousands of other words. ○ Vocabulary on maps or working walls help construct long-term memories through oral rehearsal and conscious use.
Explanations and Worked Examples: ○ Where relevant, prior knowledge is clearly referenced and ○ brought to the attention of pupils, so they can think about it. Lesson questions or objectives are posed / used, drawing upon prior knowledge. ○ Fully worked examples are clearly modelled when knowledge is new. ○ Partially worked examples are used to build upon knowledge which has been taught. Resources clearly supporting explanations, including high quality books, maps, images, atlases, globes, diagrams and video (if appropriate). ○ My turn, our turn, your turn mastery techniques are used to support guided and independent practice. ○ Pupils have resources to support independent practice.
Retrieval Practice: ○ Techniques used to support retrieval practice, include: Developing cumulative questions or low stakes testing into each lesson sequence to be used diagnostically. ○ Using end of unit assessments to summarise what children know and can retrieve. (This is useful as a retention record and for future use.) ○ Using retrieval checks to help children show what they know at the start of each lesson

○ Using word connections maps and adapted explanations to support pupils to draw on prior knowledge. ○ Knowledge is compared and contrasted through structured organisational diagrams or explanative diagrams. ○ Self-questioning strategies increase the retrieval of taught knowledge using question and statement stems.
Spoken Language: ○ Vocabulary is live modelled with attention paid to the phases of vocabulary acquisition: ○ Vocabulary promotes the level of ambition across the curriculum through precise disciplinary literacy. In lessons pupils define, decode, use, connect, deconstruct and analyse. ○ Oral modelling and rehearsal. A variety of models are used to affect the impact of oracy, including rote and recitation techniques, instruction, discussion and dialogue.
Self-Regulation (Metacognition): ○ Self-regulation is made visible through clear modelling. ○ Resources that guide and instruct are used by pupils to plan, monitor and evaluate their own learning. ○ Pupils evaluate their studies through self-regulation techniques such as flick-back techniques (using prior learning in books for retrieval), marking up on knowledge organisers, knowledge notes or wider resources. ○ Early in lessons children are directed to make cross-subject connections drawing on current and new understanding.
Classroom Strategies: ○ Pupils know and use examples from live modelling – My turn. Children can explain what examples / resources are for and how they help. Vocabulary, diagrams and explanations are modelled and clearly accessible. Vocabulary connections maps, explanative or organisational drawings help pupils make sense of knowledge taught. ○ High quality books and images create a sense of wonder, for example, and curiosity. ○ World maps, newspaper articles, and events bring items in the news, for example, to the attention of pupils.
Assessment: How well pupils know and can apply learning ○ Formative assessment (lesson to lesson and in lesson) draws upon a range of tools that help pupils and teachers know where learning is strong and where misconceptions lie. Questions around the key knowledge of each lesson frame the lesson content. These are designed to act as a hinge for testing out how well pupils know and can use current learning and connect to prior learning. ○ As a result of formative and summative assessment, post- or pre-teaching is planned to close any knowledge gaps.

New Trust Model

1) **(I do) Model with a worked model**
2) **(We do) Then do together with a partially completed model**
3) **(You do) Adapted Independent Work**

APPENDIX 1:

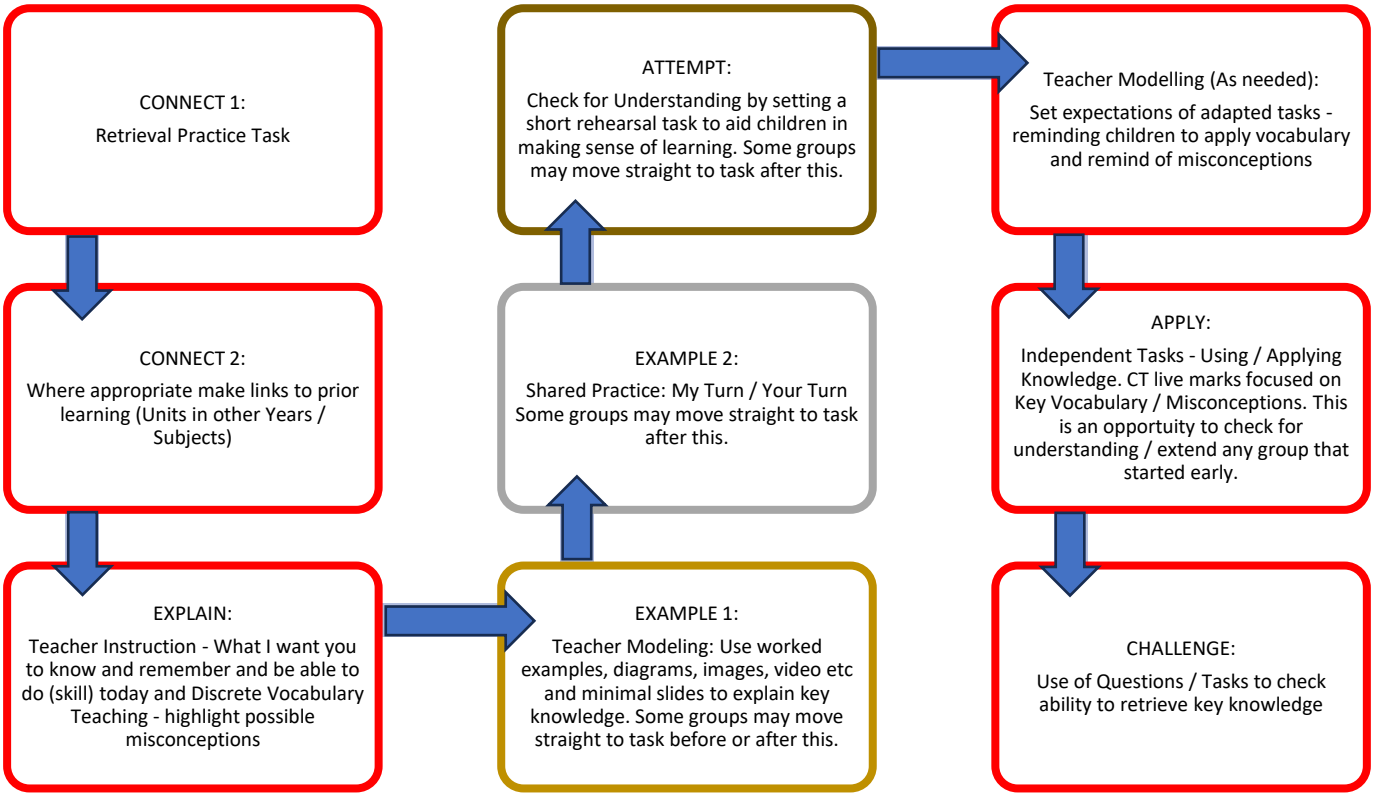
The 'Teaching Walkthrus' give further examples and practical guidance. These match are key areas of classroom practice above:

CONNECTIONS (BIG PICTURE and PRIOR KNOWLEDGE)	P26 – 27 P50 – 51	P54 – 59 P62 – 63
VOCABULARY	P26 P54 – 55	P60 – 61 P72 – 73 P103 – P104
EXPLANATIONS and WORKED EXAMPLES	P52 – 53 P68 – 71	P76 – 81 P116 – 117 P124 - 131
TASKS	P20 – 23 P27	P82 – 87 P124 - 131
RETRIEVAL PRACTICE	P68 – 75	P82 – 87 P112 - 117
ASSESSMENT HOW WELL PUPILS KNOW AND CAN USE LEARNING	P28 - 29	P94 – 95 P96 – 99 P104 – 109 P120 - 123
SPOKEN LANGUAGE	P90 - 93	P96 – 99 P118 – 119 P120 - 121
CLASSROOM ENVIRONMENT	P30 – 31	P36 - 47
SELF REGULATION (METACOGNITION)	P27 P82 - 87	

APPENDIX 2: Model of Teaching and Learning

This is a model of how the Trust Curriculum, Teaching and Learning Policy **could** be delivered in practice, however this would look different in every classroom, based on topic, prior knowledge and links, the cohort and assessment for learning information.

This should be looked at alongside the policy, the school level curriculum and the research which underpins it.



APPENDIX 3: Learning Analysis Sheet

ALL MONITORING SHOULD BE UNDERPINNED BY WHETHER PRACTICE IS IN ACCORDANCE WITH:

The curriculum at Amadeus Primary Academies Trust

Amadeus Primary Academies Trust is committed to providing high quality learning experiences enabling our children to become confident, articulate, independent, life-long learners ready for the challenges of a society that is fluid and ever evolving. The location of our schools, on the borders of London and Kent, allow our pupils to access the variety and richness this valuable resource provides.

Ambition	Persistence	Adaptability	Thoughtfulness
Through our curriculum we set out to ensure that all children, regardless of starting points achieve their full potential. Our language rich curriculum allows children to build on their learning progressively acquiring the knowledge and skills needed for the next stage in their education.	The APAT curriculum facilitates our children to become resilient, self-challenging, curious learners.	Our holistic approach begins with key knowledge and skills of the National Curriculum and EYFS framework which is thoughtfully adapted and built upon to meet the needs of all our children ready for the next stage in their learning journey.	Our mindful approach to the curriculum reflects the uniqueness of each of our schools, communities and the pupils within. We nurture the wellbeing of the individual to promote a culture of kindness, respect and empathy in line with our own schools and the British Values to become a well-rounded member of society.

School vision:

Focus Linked to school development:

Strengths:

Next Steps (limitations):

Staff member comments

This monitoring was completed and quality assured by:

I have received oral feedback and read my Feedback:

Signed Staff Member: Date:

Teacher:		Date:		Class:		Monitored by:	

SCHOOL: DIAGNOSITIC BOOK ANALYSIS

PUPIL SAMPLE INCLUDE PUPILS FROM SCHOOL FOCUS/AREA OF CONCERN/KEY MARGINAL GROUPS	CONTENT AND KNOWLEDGE		TEACHING SEQUENCE		VOCABULARY (PUPILS)		Presentation		Learning objectives/question		QUESTIONING AND RETRIEVAL		FEEDBACK and MARKING	
	Are there new skills/knowledge? Does learning match the NC for this Year Group/pupil?		Can you see how lessons connect/ progress over time? Is there evidence of adaptive teaching/bespoke support?		Is the evidence of ambitious word choices (conferencing)? Can pupils recall, apply and explain word choices?		Is the pupils' presentation appropriate for the child/age/stage? Is there progress from start of year? Comments made?		Work is adaptive in order to meet the needs of the child – progress is clearly being made		What types of questions are asked? Self-regulation? Subject specific? Evidence of retrieval practice (RP)		Summative and/or formative comments are diagnostic (linked to LO) and make clear how to improve classwork Does it match policy?	
	PLEASE GREEN AND PINK													
Name:	Yes	Not yet	Yes	Not yet	Yes	Not yet	Yes	Not yet	Yes	Not yet	Yes	Not yet	Yes	Not yet
Name:	Yes	Not yet	Yes	Not yet	Yes	Not yet	Yes	Not yet	Yes	Not yet	Yes	Not yet	Yes	Not yet
PP Pupil:	Yes	Not yet	Yes	Not yet	Yes	Not yet	Yes	Not yet	Yes	Not yet	Yes	Not yet	Yes	Not yet
SEND pupil:	Yes	Not yet	Yes	Not yet	Yes	Not yet	Yes	Not yet	Yes	Not yet	Yes	Not yet	Yes	Not yet
Comments: Record general observations here for the group of books sampled How or how not achieved?														

Professional growth:

Next Pupils should:

Record a specific CPD needs to assist the teacher securing the EBIs you have listed above. And by what date?

Teacher:		Date:		Class:		Monitored by:	

APPENDIX 4: Glossary

Glossary of terms:

Cognitive load - Cognitive load refers to the amount of information our working memory can process at any given time. For educational purposes, cognitive load theory helps us to avoid overloading learners with more than they can effectively process into schemas for long-term memory storage and future recall.

Cultural capital - the essential knowledge that children need to be educated citizens

Etymology - the study of the origin of words and the way in which their meanings have changed throughout history. The origin of a word and the historical development of its meaning.

Interleaved – the sequencing of tasks/learning and purposeful revisiting of subjects to make connections

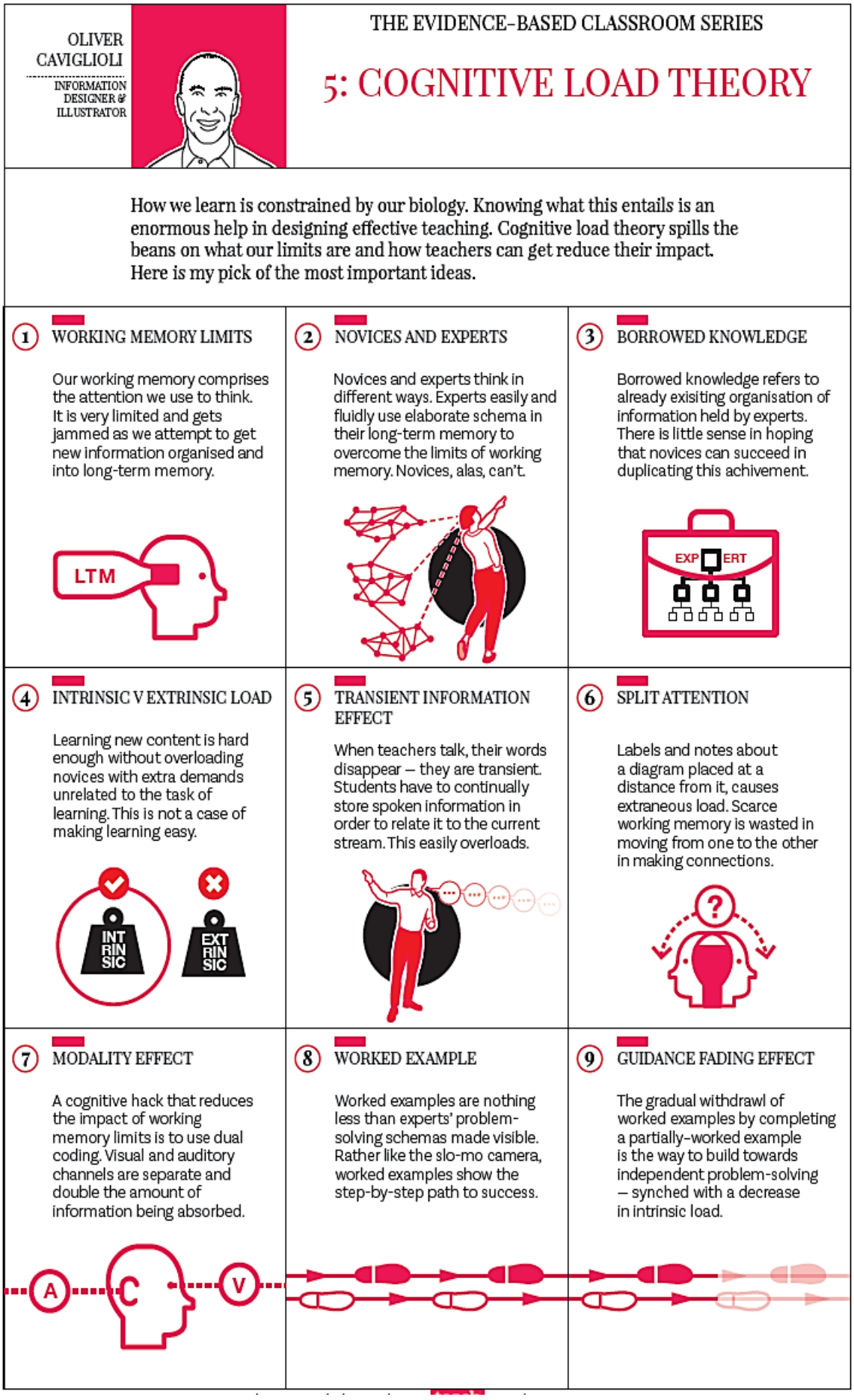
Metacognition - awareness and understanding of one's own thought processes.

Morphology - Morphology is the study of words and their parts. Morphemes, like prefixes, suffixes and base words, are defined as the smallest meaningful units of meaning. Morphemes are important for phonics in both reading and spelling, as well as in vocabulary and comprehension.

Pedagogy - the method and practice of teaching, especially as an academic subject or theoretical concept.

Retrieval (practice) - Retrieval practice is a strategy in which bringing information to mind enhances and boosts learning. Deliberately recalling information forces, us to pull our knowledge “out” and examine what we know.

Return to Aims


OLIVER CAVIGLIOLI
INFORMATION DESIGNER & ILLUSTRATOR
THE EVIDENCE-BASED CLASSROOM SERIES
5: COGNITIVE LOAD THEORY
How we learn is constrained by our biology. Knowing what this entails is an enormous help in designing effective teaching. Cognitive load theory spills the beans on what our limits are and how teachers can get reduce their impact. Here is my pick of the most important ideas.
1 WORKING MEMORY LIMITS
Our working memory comprises the attention we use to think. It is very limited and gets jammed as we attempt to get new information organised and into long-term memory.
LTM
2 NOVICES AND EXPERTS
Novices and experts think in different ways. Experts easily and fluidly use elaborate schema in their long-term memory to overcome the limits of working memory. Novices, alas, can't.
3 BORROWED KNOWLEDGE
Borrowed knowledge refers to already exisiting organisation of information held by experts. There is little sense in hoping that novices can succeed in duplicating this achivement.
EXP ERT
4 INTRINSIC V EXTRINSIC LOAD
Learning new content is hard enough without overloading novices with extra demands unrelated to the task of learning. This is not a case of making learning easy.
INT RIN SIC
EXT RIN SIC
5 TRANSIENT INFORMATION EFFECT
When teachers talk, their words disappear – they are transient. Students have to continually store spoken information in order to relate it to the current stream. This easily overloads.
6 SPLIT ATTENTION
Labels and notes about a diagram placed at a distance from it, causes extraneous load. Scarce working memory is wasted in moving from one to the other in making connections.
?
7 MODALITY EFFECT
A cognitive hack that reduces the impact of working memory limits is to use dual coding. Visual and auditory channels are separate and double the amount of information being absorbed.
A
C
V
8 WORKED EXAMPLE
Worked examples are nothing less than experts' problem-solving schemas made visible. Rather like the slo-mo camera, worked examples show the step-by-step path to success.
9 GUIDANCE FADING EFFECT
The gradual withdrawl of worked examples by completing a partially-worked example is the way to build towards independent problem-solving – synched with a decrease in intrinsic load.

APPENDIX 6:
Rosenshine's Principle

Barak Rosenshine's

PRINCIPLES OF INSTRUCTION

A thematic interpretation for teachers by Tom Sherrington

@teacherhead

VISUALISED BY OLI CAV Oliver Caviglioli @olicav

REVIEWING MATERIAL

❶ 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

❸ Ask questions ❻ 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

❷ Present new material using small steps ❹ Provide models ❽ 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 so that each can be practised.

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

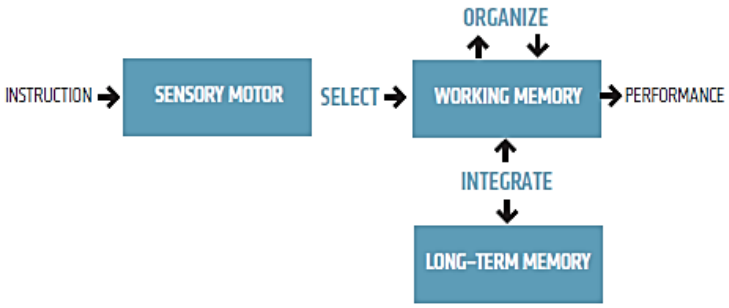
❺ Guide student practice ❼ Obtain a high success rate ❾ Independent practice

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"*

APPENDIX 7: Generative Learning Practice

THE SOI MODEL | SELECT→ORGANISE→INTEGRATE



Everyone knows that learning must be 'active', but it's not obvious how you're supposed to put that commonplace advice into action. Learning as a Generative Activity tells you and provides an explanation of the supporting research that is both thorough and clear.

DANIEL WILLINGHAM

LEARNING AS A GENERATIVE ACTIVITY

Eight Learning Strategies that Promote Understanding

CAMBRIDGE UNIVERSITY PRESS

Logan Fiorella Richard E Mayer

1 SUMMARIZING — EFFECT SIZE: 0.5

DEFINITION Restate the main ideas of a lesson in one's own words.

RESEARCH Beneficial in 26 of 30 studies.

BOUNDARY CONDITIONS Best when summary skills directly taught. Less effective when lesson content contains complex spatial relations, as in Physics and Chemistry.

2 MAPPING — EFFECT SIZE: 0.62

DEFINITION Convert a text lesson into a spatial arrangement of connected key words.

RESEARCH Beneficial in 23 of 25 studies.

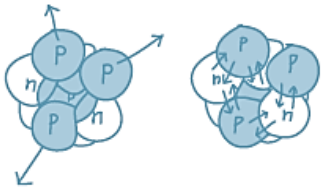
BOUNDARY CONDITIONS Best for novices — low knowledge base or young in age.

3 DRAWING — EFFECT SIZE: 0.4

DEFINITION Create a drawing to illustrate content of a lesson

RESEARCH Beneficial in 26 of 28 studies.

BOUNDARY CONDITIONS Best when drawing skills directly taught, and lessening cognitive load by providing partially-drawn illustrations.



4 IMAGINING — EFFECT SIZE: 0.65

DEFINITION Form internal images to illustrate the content of a lesson

RESEARCH Beneficial in 16 of 22 studies.

BOUNDARY CONDITIONS Best when students have experience in the content and it is well designed.

5 SELF-TESTING — EFFECT SIZE: 0.62

DEFINITION Test one's self on previously studied content by answering practice questions.

RESEARCH Beneficial in 44 of 47 studies.

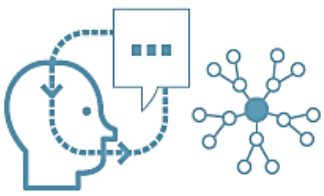
BOUNDARY CONDITIONS Best when receiving corrective feedback following practice testing in free-recall or cued-recall format. Less effective when demanding only recognition (eg MCQ).

6 SELF-EXPLAINING — EFFECT SIZE: 0.61

DEFINITION Explain the content of a lesson to oneself by elaborating on the material covered.

RESEARCH Beneficial in 44 of 54 studies.

BOUNDARY CONDITIONS Best when studying diagrams and conceptual materials, for novices and with focused prompts.



7 TEACHING — EFFECT SIZE: 0.77

DEFINITION Teach others about previously studied material.

RESEARCH Beneficial in 17 of 19 studies.

BOUNDARY CONDITIONS Best when students study the material knowing they will later be teaching it and, so, reflect on their own understanding, as well as answering peers' deep questions.

8 ENACTING — EFFECT SIZE: 0.51

DEFINITION Engage in task-relevant movements during learning.

RESEARCH Beneficial in 36 of 49 studies.

BOUNDARY CONDITIONS Best when students already have relatively high knowledge base, as well as receiving guidance and practice. Mainly for younger children.

OLIVER CAVIGLIOLI | @oliCav | oliCav.com