

BOOKLET

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# Evidence-informed learning

A summary guide to cognitive science in  
Curriculum 22.

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# Introduction

In recent years, cognitive science has become hugely influential in designing and implementing the primary curriculum. This emerging evidence has provided us here at Cornerstones with a new and exciting way of thinking about how we design our curriculum so that we can help children to know and do more.

As a result, we have now developed an evidence-informed curriculum called Curriculum 22. This curriculum takes the most robust aspects of cognitive research and applies them in intelligent and practical ways. Not only will this save you time, but it will also ensure your curriculum is completely up to date with the latest cognitive theory.

While we have incorporated many aspects of current research into Curriculum 22, we remain a strong advocate of the power of professional knowledge. The flexibility of Curriculum 22 and Curriculum Maestro's impressive functionality means that you can use, adapt and tailor the curriculum to meet your school's specific needs and aims.

In this booklet, you'll learn about the cognitive and educational theories that influence our work. You'll see how we have translated and integrated elements of this research into the curriculum in both practical and helpful ways.

If you want to know more or see any of these theories in action, please get in touch with our team, who can demonstrate this for you online.

Best Wishes,

*Melanie Moore*

Melanie Moore  
Curriculum Director



# A concept-led curriculum (H. Lynn Erickson)

While many commercial curriculum schemes focus solely on objective-led topics, Curriculum 22 is concept-led, with macro and micro concepts providing the structure for the essential knowledge and skills of the curriculum. Organising the curriculum this way means that children are better able to develop deep conceptual understanding rather than simply learning a menu of disconnected facts and information. This rationale is taken from Ron Ritchhart (2015) in his book *Creating Cultures of Thinking: The 8 Forces We Must Master to Truly Transform Our Schools* and later discussed by H. Lynn Erickson, Lois Lanning and Rachel French: 'The conceptual mind uses facts and skills as tools to discern patterns, connections, and deeper transferable understandings' (Erickson, Lanning and French, 2017, p. 11).

You can read more about concept-led curriculum design in the book by Erickson, Lanning and French: *Concept-Based Curriculum and Instruction for the Thinking Classroom*.

Figure 1 on the following page, shows the architecture of Curriculum 22.

<p><b>Tier 1</b> <b>Big Ideas</b> (macro concepts)</p>	<p>The Big Ideas are the macro concepts that drive the curriculum. They provide broad categories for organising the curriculum’s micro concepts, knowledge and skills.</p> <p>These macro concepts are transferable across the subjects included in Curriculum 22.</p>	
<p><b>Tier 2</b> <b>Disciplinary concepts</b> (micro concepts)</p> <p><b>Aspects</b> (subcategory not a concept)</p>	<p>Micro or disciplinary concepts derive from the Big Ideas of the curriculum. These smaller more specific concepts allow us to plan for deep learning in each subject discipline.</p> <p>Aspects are subcategories of micro concepts and relate to parts of a discipline that are not concepts. An example of this includes map work in geography.</p>	<p><b>National curriculum programmes of study run throughout the curriculum architecture.</b></p>
<p><b>Tier 3</b> <b>Knowledge and skills</b></p>	<p>Conceptual understanding requires content knowledge (Erickson, 2017). The knowledge and skill statements set out the substance needed to develop children’s understanding of the macro and micro concepts. They also ensure comprehensive coverage of the national curriculum programmes of study.</p>	

**Figure 1** *Architecture of Curriculum 22*

# Cultural capital

## (P. Bourdieu)

Cultural capital theory has important implications for designing the curriculum. Developed by Pierre Bourdieu in 1977, the theory predominantly focuses on the disparities between classes and how middle-class children have significantly more cultural opportunities than children from disadvantaged backgrounds. Cultural capital also refers to the knowledge and skills an individual can draw on to give them an advantage in life.

Curriculum 22 is based on a framework of powerful knowledge, linked to concepts, aspects and Big Ideas of the curriculum. Each project has a range of first-hand experiences that relate specifically and meaningfully to the knowledge and skills of the curriculum. Such activities range from educational visits to expert visitors. In addition, technical vocabulary is mapped across the curriculum with some projects supplemented with novel or book studies.

Curriculum 22 resources also incorporate high-quality photographs, images and videos that actively reveal and engage children in new and exciting worlds they might not have the opportunity to ever see in their everyday lives.

# Knowledge

## (E. D. Hirsch)

A school's curriculum should have a clear and progressive knowledge and skills framework. When planning Curriculum 22, great attention was given to the knowledge and skills included in the progression framework that underpins the curriculum. When choosing core knowledge, our research referenced E.D. Hirsch's work and subject-specific organisations.

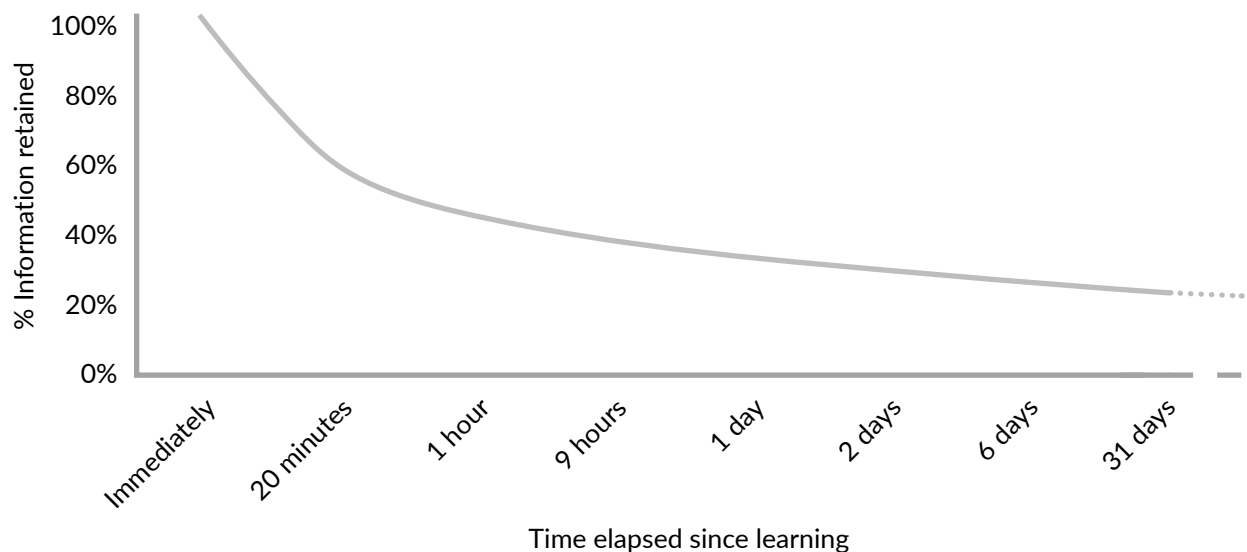
The national curriculum released in 2014 was said to be highly influenced by the work of E.D. Hirsch. Hirsch proposed that: 'children need to learn facts in a highly organised and structured way... therefore creating the imperative to get back to the basics with a robust core curriculum.'

Our research for Curriculum 22 resulted in an intelligently planned progression framework with knowledge and skills statements mapped out incrementally across all year groups and subjects. To provide even greater depth, lesson-specific knowledge is provided in each lesson plan and in our excellent knowledge organisers.

# Retrieval

(H. L. Roediger and J. D. Karpicke)

One of the most robust learning theories is retrieval practice (Roediger and Karpicke, 2006). We can track research in this area back to the work of German psychologist Hermann Ebbinghaus, who pioneered the development of experimental methods for measuring rote learning and memory. You may already be familiar with Ebbinghaus' 'Forgetting Curve' shown below, which demonstrates how learned information can slip out of our memory over time unless we try to keep it there, in this case, by retrieving it at regular intervals.

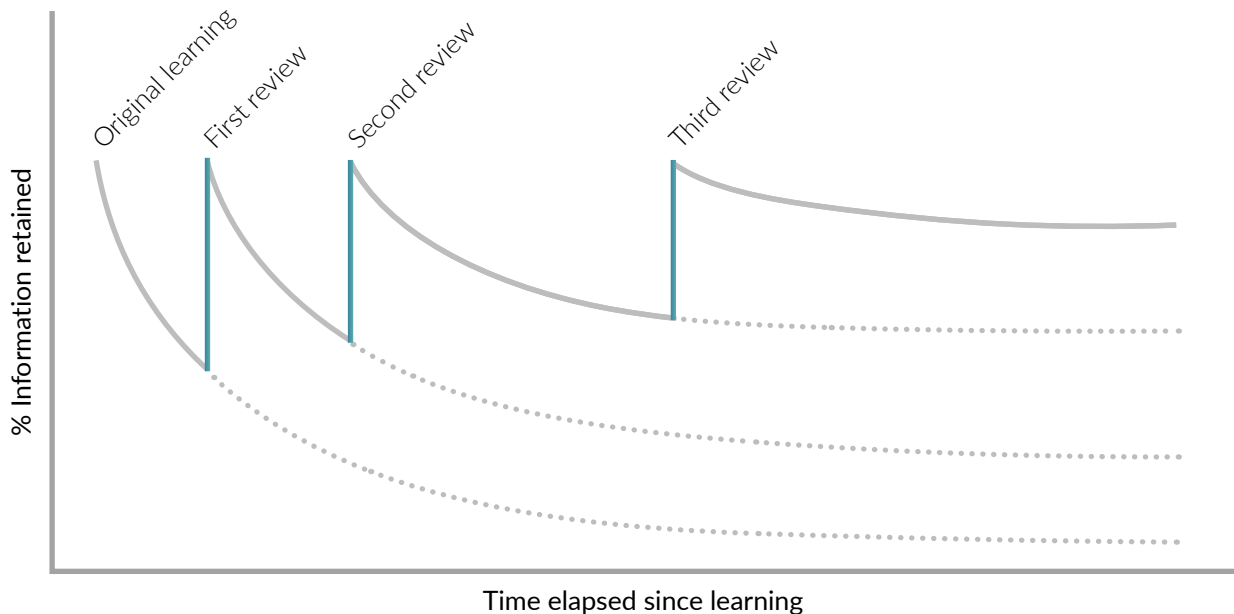


**Figure 2** Replication of Ebbinghaus' classic Forgetting Curve from 1880. (Diagram created by Cornerstones in reference to Ebbinghaus' Forgetting Curve).



Researchers point out that retrieval practice boosts children's learning by asking them to recall learned information from their long-term memories. This is best done when there is a desirable difficulty. Moreover, research suggests that each act of retrieval changes the memory itself, making it stronger.

In Curriculum 22, concepts, knowledge and skills are intelligently sequenced and spaced at different intervals across the curriculum to allow children to practice retrieval. Suggestions are made in lesson and project plans so that you know when and what resources to use to maximise children's opportunities for retrieval. Furthermore, subject leaders can quickly view and track how concepts, knowledge and skills are organised in their subject using the functionality of CurriculumPRO on Curriculum Maestro.



**Figure 3** Retrieving information at regular intervals. (Diagram created by Cornerstones in reference to Ebbinghaus' forgetting curve and review cycle).

The figure below shows just one example of spaced retrieval for the micro concept of climate.

## Climate

		Autumn term			Spring term
Year 5	Environment: Biomes				Climate and weather: Climate and land use
Year 6	Environment: Climate zones, biomes and climate change	Climate and weather: Weather and people	Physical processes: Climate change and the world		Climate and weather: Indigenous people

This is just a snippet of the full concept. Please [click here](#), if you would like to view in full.

We also provide short-term quizzes and tests for retrieval practice and low-stakes assessment opportunities with answer sheets.

The collage includes several educational resources:

- Worksheet 15:** A text-based worksheet with a 'Useful words' box containing terms like 'deserted', 'domains', 'divers', 'gains', 'halt', 'intermediate', 'shard', and 'unpopulated'.
- Worksheet 16:** A map of Europe with a grid overlay, titled 'Misty Mountain, Winding River'.
- Worksheet 17:** A 'Fact Opinion' worksheet with a quote about climate change and a section for 'Write three ways in which the Iron Age was different from the Bronze Age'.
- Worksheet 18:** A 'Tick box' worksheet with statements about Celtic beliefs and a section for 'The Iron Age ended when who invaded Britain?'.
- Worksheet 19:** A crossword puzzle titled 'and Farm quiz' with a grid and a list of words including 'agriculture', 'pastoral', 'urban', 'rural', 'industrial', 'suburban', 'peri-urban', 'rural-urban fringe', 'urban fringe', 'suburban fringe', 'peri-urban fringe', 'rural-urban fringe', 'urban fringe', 'suburban fringe', 'peri-urban fringe', 'rural-urban fringe', 'urban fringe', 'suburban fringe', 'peri-urban fringe'.



# Dual coding (A. Paivio)

Dual coding, developed by Allan Paivio in 1971, is the process of combining verbal and visual information to allow the learner two ways of remembering. While visual information is directly encoded into our working memory, verbal information is encoded sequentially in the order we read or hear it. Combining verbal and visual information in dual coding means children are better able to encode it into their brains.

In Curriculum 22, we take account of this theory by ensuring we present the knowledge children need in a variety of different ways, including verbal and visual.

Our resources often use diagrams and photographs alongside text for maximum coding. All diagrams and photographs are clear and accurate, and we always use high-quality, ambitious texts. We also include podcasts and videos.

The collage features several educational resources:

- A map of Europe with a speaker icon overlaid, suggesting an audio resource.
- A diagram titled "Ancient Egypt hierarchy" showing a pyramid with five levels, each corresponding to a different social class and their associated symbols and colors.
- A watercolor painting titled "Adding watercolour" showing a close-up of a textured surface.
- A photograph of a bronze dagger with a detailed description of its use and significance.
- A photograph of a bronze helmet with a detailed description of its construction and use.

# Pedagogy (B. Rosenshine)

Cornerstones' four-stage pedagogy Engage-Develop-Innovate-Express is influenced by Barak Rosenshine's 'Principles of Instruction' (1930–2017).

These principles run throughout project and lesson plans and provide a consistent approach to teaching across the whole school.

Projects and lesson plans are flexible and easily adapted so that you can apply your professional judgement where necessary.

The information below explains each step of our pedagogy.



## Engage

- Each project and lesson begins with a short review of previous learning, whether that be content, concept, knowledge and skills. 'Introductory knowledge' lessons support this in our project plans, but you will also see this in individual lesson plans.
- New information is presented in small steps through various means, including first-hand experiences, presentations, videos, information sheets and other sources of information.

## Develop

- Children begin to build their understanding of concepts, content, knowledge and skills through focused, high-level learning activities.
- All lessons are linked explicitly to bespoke resources that provide teaching models and scaffolding frameworks for difficult tasks.
- Lesson plans encourage teachers to ask children to talk about their learning, including asking specific questions set out in lesson plans. This helps teachers to identify any areas that need to be re-taught.
- Lesson plans provide suggestions for enhanced explanations and often offer other examples for children to compare and contrast.
- This stage of children's learning is deep and detailed and prepares all children for more independent working in the Innovate stage.

## Innovate

- Children are encouraged to work more independently, recalling learned knowledge and information to apply in a different context. This stage requires the transfer of knowledge and skills and promotes higher-order thinking.
- Teachers are encouraged to monitor children as they undertake their independent practice.

## Express

- Teachers check the outcomes of independent tasks and provide feedback and corrections as necessary.
- Children showcase learning outcomes, and a shared sense of achievement is promoted through peer review.
- Children take part in low-stakes quizzes, reflective discussions and other summary activities.

# What next?

If you want to learn more about Curriculum 22 or Curriculum Maestro, then call us now to book a bespoke curriculum consultation. One of our friendly and knowledgeable curriculum advisers will tailor the meeting to meet your specific needs and interests.

To book your call, simply visit our website and press the 'book a demo' button or call us on 03333 20 8000.

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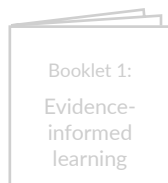
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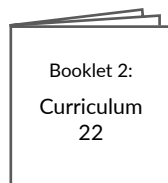
We have a series of booklets, explaining different aspects of the curriculum and platform, Curriculum Maestro. If you would like to read more, please visit

[www.cornerstoneseducation.co.uk](http://www.cornerstoneseducation.co.uk)

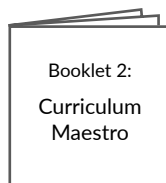
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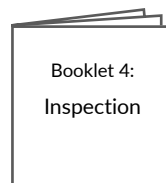
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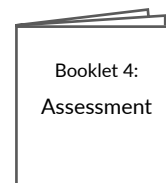
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