

# New thinking from old tools: why knowledge matters in shaping a curriculum

Schools North East  
16 January 2020

**Christine Counsell**

# *The Lost Queen*

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## *Rulers passing on their power*

- dynastic marriage to strengthen a family's position & pass on land
- marriages to other powerful people – princes, caliphs, dukes, pharaohs
- family, dynasty, house
- struggles for the throne, rival families/houses
- inheritance
- keeping faith with the vision of ancestors

## *Rulers displaying their power*

- signs, symbols, messages
- monuments, badges, art, flags, liveries
- telling stories, spreading propaganda, celebrating their....
- ....**families**

# National Curriculum content at KS2

- changes in Britain from the Stone Age to the Iron Age
- the Roman Empire and its impact on Britain
- the Viking and Anglo-Saxon struggle for the Kingdom of England
  
- the achievements of the earliest civilizations – an overview of where and when the first civilizations appeared and a depth study of one of the following: Ancient Sumer; The Indus Valley; Ancient Egypt; The Shang Dynasty of Ancient China
- Ancient Greece – a study of Greek life and achievements and their influence on the western world
- a non-European society that provides contrasts with British history – one study chosen from: early Islamic civilization, including a study of Baghdad c. AD 900; Mayan civilization c. AD 900; Benin (West Africa) c. AD 900-1300.
  
- a study of a theme that extends pupils' chronological knowledge beyond 1066
- a local history study

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Two neglected areas of research from the 1970s:  
**Prototypes and schema theory (plural: schemata)**

- Eleanor Rosch, 1977, discovered the central importance of **prototypes** in reading
- Consider the prototypes you hold for:
  - bird?
  - symbol?
  - institution?

The specific sits  
underneath the  
general

**This is an article about the dodo,  
a bird that is now extinct.**

An artist's impression of the  
dodo from 300 years ago.



# The Way of the Dodo

The dodo was first sighted around 1600 on an island in the Indian Ocean. It was extinct by 1680. Since then the phrase 'dead as a dodo' has been used to describe something which is lifeless or has disappeared from the world completely. Because of its rapid disappearance, a number of myths developed about the dodo, for example that it was a fat, silly creature that brought its fate upon itself.

But what is the **truth** about the dodo?

For thousands of years the island of Mauritius was a paradise. It was spat out of the ocean floor by an underwater volcano 8 million years ago. With warm sun, plentiful food and no predators to speak of, the isolated island became a haven for a variety of unusual species, including reptiles and flightless birds.

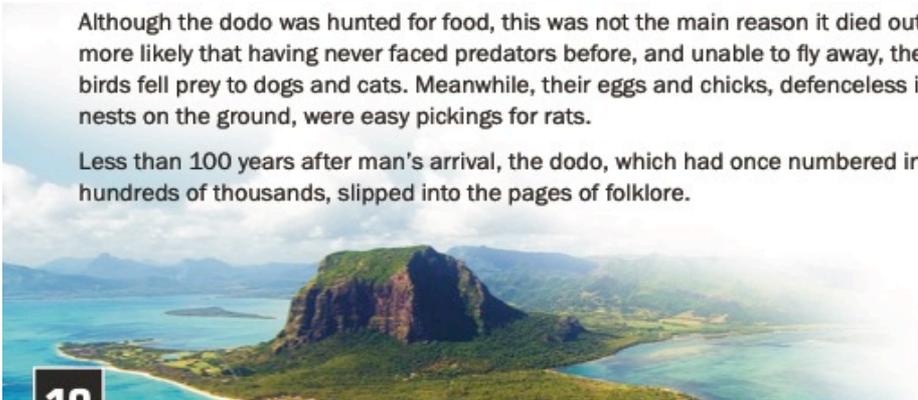
Then, in 1598, humans descended on this paradise, accompanied by their own animals – dogs, goats, cats (and a fair number of rats!). Curious and unafraid, the animals of Mauritius offered themselves up for slaughter and, within just a few decades, much of the island's unique wildlife had been wiped out forever.

One of the victims was a large, flightless relative of the pigeon. The island invaders started to call the bird a 'dodo', which meant 'silly bird'.

Although the dodo was hunted for food, this was not the main reason it died out. It is more likely that having never faced predators before, and unable to fly away, the adult birds fell prey to dogs and cats. Meanwhile, their eggs and chicks, defenceless in their nests on the ground, were easy pickings for rats.

Less than 100 years after man's arrival, the dodo, which had once numbered in the hundreds of thousands, slipped into the pages of folklore.

SATS  
2016



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Prior subject knowledge makes the following

comprehensible:

relative ('relative of the pigeon')

predators, prey

reptile, species, anatomy

ocean floor, volcano

isolated island

environment

Indian Ocean

offered themselves up

sacrifice, paradise

decades

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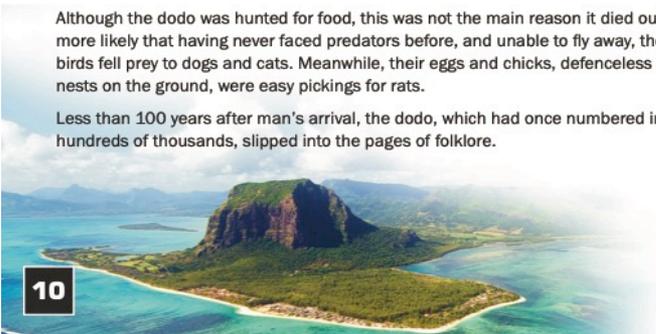
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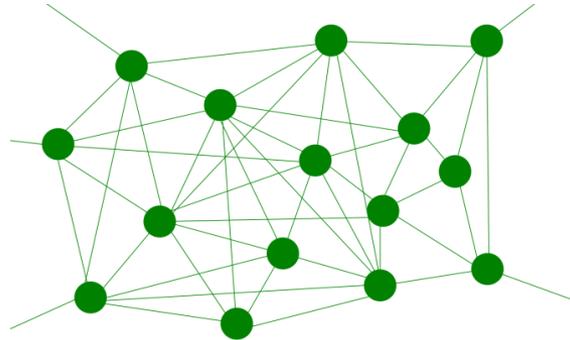
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# Schema theory and curriculum



Relevant schema of a child who achieves a **high** outcome

**Schema theory** (Anderson) built on the earlier work on **prototypes** (Rosch) in the mid 1970s.

# What is in my schema for the word 'sacrifice'?

- religion
- ritual
- altar
- blood
- animal sacrifice
- offering
- burnt offering
- offering up
- pagan
- Christian
- Jesus Christ
- selflessness
- giving up something valuable
- offering freely
- offering willingly
- giving to get something in return
- sacred
- sacrificial
- sacrificial lamb
- being offered by someone else
- being offered in ignorance
- being offered to a great power

double crown

Pharoah

administration

visible power and control  
(pyramids)

Portrait of  
Henry VIII

Controlling  
the nobles

Henry VIII

Civil Service

Councillors  
advising the king

Westminster

**government**

Ruling party

Collecting taxes

Prime  
Minister

governor of a province  
of ancient Rome

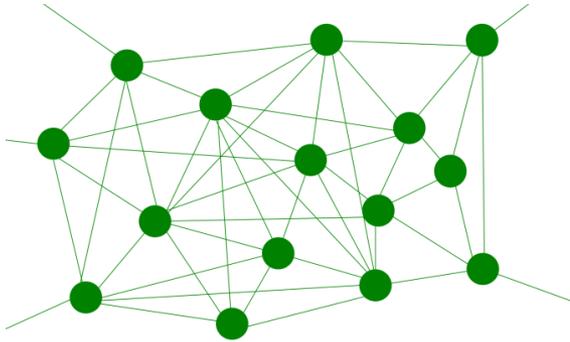
General  
Elections

Houses of  
Parliament

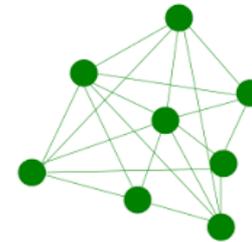
Building forts  
and roads

Controlling  
barbarians

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Relevant schema of a child who achieves a **high** outcome



Relevant schema of a child who achieves a **low** outcome

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# Kate Hammond and the indirect manifestation of knowledge

*Teaching History, 157, Assessment Edition*

## The knowledge that 'flavours' a claim:

towards building and assessing historical  
knowledge on three scales

While marking some Year 11 essays, Kate Hammond found her interest caught by significant differences between one kind of strong analysis and another. Some scored high marks but were less convincing. The achievement in these essays was superficially high, but somehow fragile. But in what way? And why? Putting GCSE markschemes to one side, Hammond used her Year 11 students' work to investigate the true nature of their historical accomplishment. What was really

It all began one Saturday in September. I sat down with a rather-less-than-positive attitude to mark a set of Year 11 essays on the Tet Offensive. My students were enthusiastic and had written substantial pieces of causal analysis: this was going to take some time.

It did turn out to be something of a marking marathon, but by the time that I had finished, something had captured my interest. My students had all written well, but there were marked differences between those students who produced the best historical analyses of the Offensive and those whose work was secure but less convincing. The GCSE mark scheme led me to explain these differences in terms of the students' differing success in grasping and analysing the causal problem.<sup>1</sup> It seemed to me, however, that rather than their second-order concept knowledge being the biggest variable, it was their substantive historical knowledge that seemed to be having a larger effect on the success of their work.<sup>2</sup>

This is hardly rocket science. Many in the history education community have acknowledged the interplay and interdependence of substantive historical knowledge

Second paragraph of **Alice's** essay

How important was the Nazi propaganda campaign in helping Hitler to become Chancellor in January 1933?

*However, it could be argued that the Depression was the most important factor in helping Hitler to become Chancellor as the Nazis relied on it to be noticed at all. In times when **the public** as a whole were more happy with their situation and the situation of Germany, votes for extreme parties (the Nazis were one of those) decreased rapidly. **So the Nazis could be argued to be relying on the Depression and the apparent lack of leadership caused by it to be noticed by the public and to retain their attention from that point.** This allowed them to gain more seats in the Reichstag and ended in Hindenburg having no choice but to appoint Hitler as Chancellor.*

Kate Hammond 2014,  
in *Teaching History*, 157, Assessment Edition

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# How did Hammond alter teaching and assessment in Years 7 to 9 as a result?

In her planning she paid much more attention to:

- classifying substantive knowledge types in subject-specific ways;
- incidence of substantive knowledge types;
- interplay and revisiting of substantive knowledge types;
- positioning and use of story in the curriculum as a whole.

**The magic of schemata:  
chunking  
cheats the limitations of  
short-term memory**

# *The Lost Queen*

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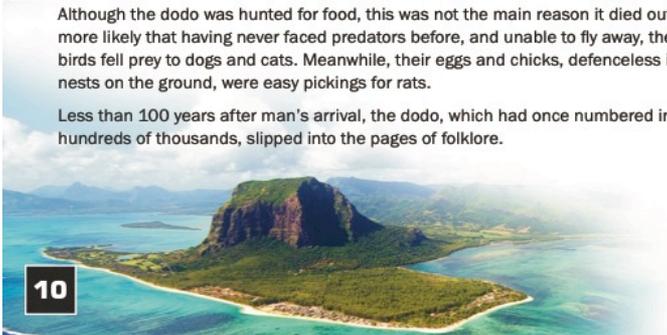
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Your schemata allowed you to

'chunk' these...

'...relative of the pigeon'

'...faced predators'

'...fell prey to'

'...spat out of the ocean floor''

'...the isolated island'

'...offered themselves up for'

'...this island paradise'

'...a number of myths developed'

'...within just a few decades'

**It's all about speed.**

**Word associations need to be  
available immediately if pupils are  
to avoid working memory overload**

See Hirsch, E. D. (1988) *Cultural Literacy*, Chapter 2.

# Schema theory and curriculum

## A schema is:

- a mental structure of ideas/words
- a framework representing some aspect of the world
- a system influencing how we perceive and what we notice in any new information

The accessibility of a schema (how quickly it comes to mind) influences the **attention** we can give to new information. Readers and listeners are more likely to **notice** things that fit into an existing schema.

Rapid noticing enables ‘**chunking**’ of familiar ideas or words. This frees up working memory to embrace new content, take in the overall flow of a text or think about what is being apprehended.

# Schema theory and curriculum

Schemata therefore affect **uptake & absorption** of new content.

“The limits of short-term memory do not allow the integration of ‘unchunked’ material, and so crucial parts of meaning are lost to memory while other parts are being painstakingly worked out.... In this process, speed of comprehension is equivalent to quality of comprehension, because without the speed and the shorthand provided by well-organised schemata our circuits get overloaded”.

E.D. Hirsch Jr (1988), *Cultural Literacy*, p.57

Once children can decode, they need broad knowledge if they are to improve reading comprehension.

Daniel Willingham: to read a general text, we need knowledge that is “two miles wide and two inches thick”

**Vocabulary size is the outward and visible sign of an inward acquisition of knowledge.**

**Why does all this matter  
so much for  
disadvantaged pupils?**

It matters for disadvantaged pupils because vocabulary size correlates with social class

*The thirty million word gap by age 3*  
Hart and Risley (2003)

Middle-class children had typically heard *over 45 million words*  
*by age 3*

Children from the poorest groups had heard *an average of 13*  
*million words by age 3*

# The effects of the removal of content sequencing on the disadvantage gap in France.

The requirement to teach content (hist, geog, science, music, art) was removed from the primary curriculum in 1989.

The gap between disadvantaged and advantaged school-leavers' literacy performance widened dramatically **between 1989 and 2007.**

**Common knowledge  
amounts to a fresh way  
of thinking about  
inclusion**

# **Two kinds of thoroughness:**

**Being thorough in our  
curriculum design**

**Being thorough in our teaching**

**Sequencing a  
curriculum is  
vital**

# Implications of schemata for curriculum intent and impact

## Shaping pupil readiness

The workings of schemata mean that pupil **readiness** for something new can be deliberately created.

By attending to the cumulative effect of **specific** knowledge teachers can shape readiness because that prior knowledge shapes what pupils then see/notice.

Schools can manipulate curriculum content and structure – its choices, blends, sequencing and patterns of recall and revisiting – to ensure **readiness** for new or more demanding content and for more complex operations.

# Because of prototypes and schemata, prior knowledge affects:

- 1) what pupils can **comprehend** (in reading, listening or observing)
- 2) what **effect** a text, painting or music has on the pupil as reader, viewer or listener
- 3) pupils' capacity to **discern or comment on the effect**
- 4) pupils' capacity to **call up an apposite word or phrase** (when writing or speaking)

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How does a strong KS3 in world religions speed up and enhance access to English literature GCSE?

# *Walking Away* (1956) Cecil Day-Lewis

- the Father (the one who loves),
- the Son (the one who is loved)
- the Holy Spirit (the love itself).

Day-Lewis states that it is in the Trinity that we see love being shown 'perfectly'.

The author, an earthly father who must let go of his son is an imperfect shadow of this divine perfection: it expresses the idea of the Trinity 'roughly'.

That hesitant figure, eddying away  
Like a winged seed loosened from its parent  
stem,  
Has something I never quite grasp to convey  
About nature's give-and-take – the small, the  
scorching  
Ordeals which fire **one's irresolute clay.**

I have had worse partings, but none that so  
Gnaws at my mind still. Perhaps it is **roughly**  
**Saying what God alone could perfectly show –**  
**How selfhood begins with a walking away,**  
And love is proved in the letting go.

# Looking for evidence of quality

## Lines of questioning from inspectors on sequencing

- What is this topic/lesson/activity part of?
- How do you expect this Year 3 content to **create readiness** for Year 4/5?
- How will this history content in Y7 foster pupils' capacity to assimilate X content / notice similarities and contrasts / tackle X task later in Year 7/ in Year 10?
- How will your Year 3 geography/science content, in future, ensure that these weaknesses in Year 4 pupils' writing will be removed?
- What subject-specific themes do you deliberately revisit over time, and how do you expect this to show itself in ....pupils' extended writing or talk?
- What subject-specific vocabulary do you expect to be secure by the end of *this* unit/topic/enquiry?
- How do you check that the Year 3 content is still secure in (say) Year 5?
- How do you *use* the Year 8 content, indirectly, in Year 10?

# Implications of schemata for curriculum intent and impact

## How do we know when readiness is *not* being deliberately shaped?

- An over-reliance on a skills-based progression model
  - eg in GCSE English, treating the interpretation of poem by Wordsworth as a *skill* (eg in feature spotting or extracting meaning or ‘describing effects on the reader’) rather than attending, across Key Stage 3, to the specific poems that might build up pupils’ readiness ***to be affected as a reader*** or to notice contrasts with other poetic styles.

# Mistaken focus on skills as the progression model

Using language from the AOs in KS3 to structure tasks. Turning every lesson into an exam rehearsal.

- Read, understand and respond to texts. Students should be able to:
  - maintain a critical style and develop an informed personal response.
  - use textual references, including quotations, to support and illustrate interpretations.
- Analyse the language, form and structure used by a writer to create meanings and effects, using relevant subject terminology where appropriate.

*Instead:*

**What knowledge of specific texts is actually going to make the difference, especially for low attainers, disadvantaged and disaffected?**

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- A retreat into genres that are familiar or deemed engaging rather than craft a journey towards the less familiar.
  - eg in Year 9 music, arguing that the modern Scottish composer, James Macmillan is 'too difficult' and selecting popular/familiar genres on grounds that these are more engaging, *rather than using Years 7 & 8 to introduce pupils systematically to J.S. Bach, Benjamin Britten, developments in European choral music, Scottish folk music and other Scottish composers* so that Year 9 pupils are ready to appreciate, enjoy and comment on the 'soundworld' of Macmillan.

## Implications of schemata for curriculum intent and impact

# How do we know when readiness is *not* being deliberately shaped?

3. A failure to identify and teach to security the forward projecting foundational knowledge components

- eg in MFL allowing pupils to hit Year 10 still unable to recognize and use *avoir* & *etre* in simple sentences, unable to create the past tense using these verbs and unable to convert simple sentences into questions.

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The biggest question is WHY have some children gone through schooling and yet not acquired the necessary schemata that others, equally capable, do acquire?

Perhaps the component content:

- was not identified and taught
- did not receive necessary emphasis
- was not delivered in a coherent sequence
- was not taught using effective approaches
- was not practised till deeply embedded and readily recalled

Essential curriculum questions.  
How strong is each subject in terms of:

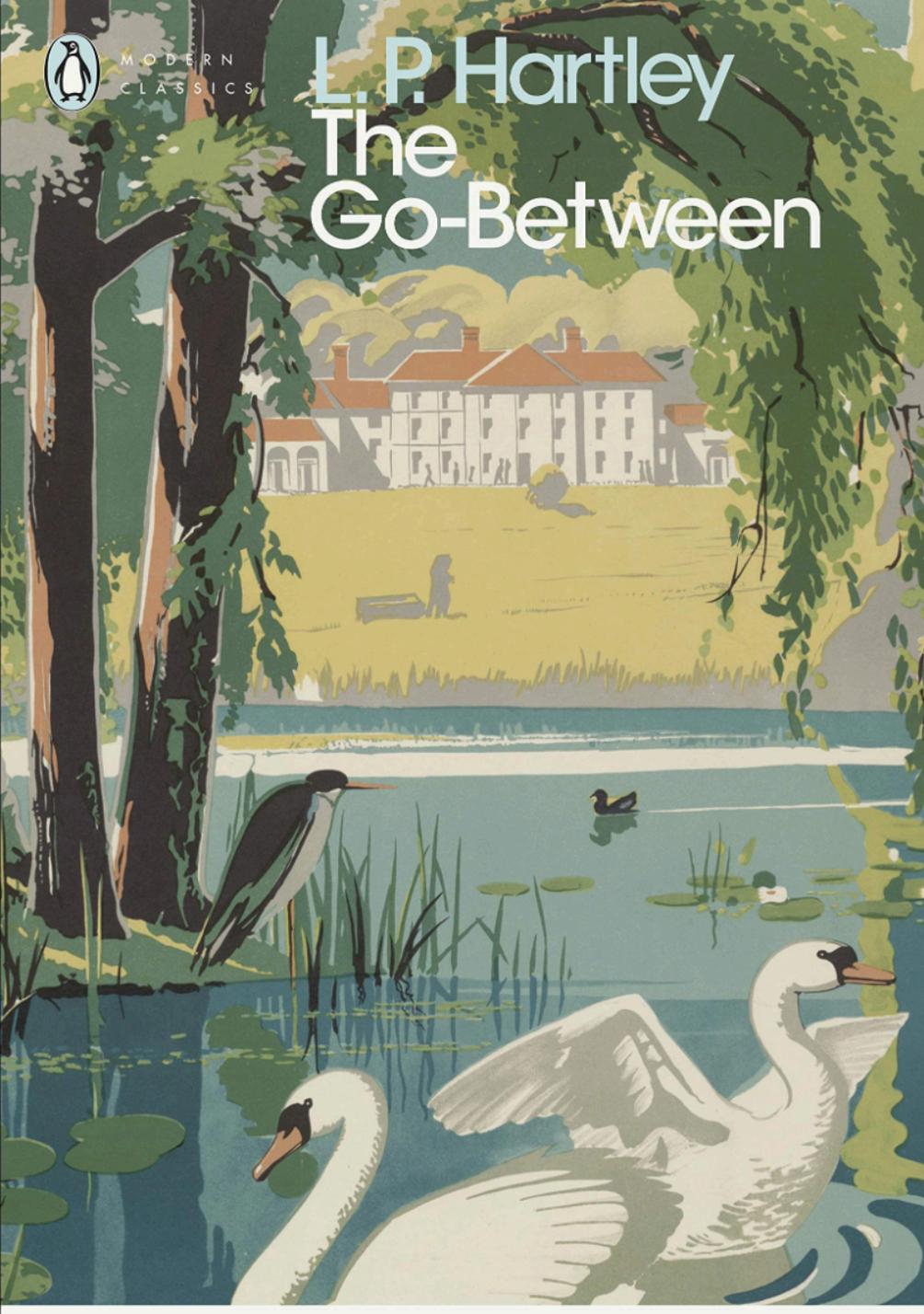
- scope?
- rigour?
- coherence?
- sequencing?





MODERN  
CLASSICS

# L. P. Hartley The Go-Between



What does the Year 7 and 8 curriculum need to do in order for all pupils to be able to read this in Year 9?





Curriculum intent	Curriculum implementation	Curriculum impact
<p>1. What big ideas / wider trends/ general principles is <math>x</math> part of?</p> <p>2. What prior reference points (previous week, month, term, year?) will be enabling pupils to tackle this new topic/issue/concept without overloading their working memory?</p> <p>3. How does <math>x</math> build on, expand or newly problematise pupils' prior knowledge?</p> <p>4. What broad, recurring vocabulary/themes/principles will this detail in Year 8 help to render secure in Year 11?</p> <p>5. When will pupils revisit <math>x</math> in future?</p> <p>6. What are the most important concepts pupils learn when studying <math>x</math>?</p>	<p>1. What blend of teaching approaches do you expect to see if pupils are to gain mastery of <math>x</math>?</p> <p>2. How do you expect teachers to keep pupils focused on the big idea/central question/disciplinary problem across this lesson sequence?</p> <p>3. Why has this resource been designed in this way?</p> <p>4. Who in your department is the expert on <math>x</math>?</p> <p>5. Which members of your department need to develop their own knowledge of <math>x</math>?</p> <p>6. Show me the package of formative assessment approaches that allow you to check <math>x</math> is secure in pupils' memories.</p> <p>7. What do pupils spend time practising when learning about <math>x</math>?</p> <p>8. What do pupils write about <math>x</math> in their books?</p> <p>9. What kinds of examples of <math>x</math> do pupils learn about or practise?</p> <p>10. Which pupils may struggle with <math>x</math> and how are you tackling this?</p>	<p>1. How confident are you that pupils have remembered what they have been taught about <math>x</math>? What is the typical evidence of this (a) in lessons? (b) in certain subsequent pieces of work?</p> <p>2. How does mastery of <math>x</math> surface in later work?</p> <p>3. What does high-quality creative composition (English, art, music) or problem-solving (science, history, geography, maths) look like? What <u>specific</u> components (texts, musical repertoire, fluency in operations...) made this possible?</p> <p>4. Analyse the weaknesses in <math>x</math> work in Year 10. Which underlying curriculum components need to be more prevalent/ better sequenced/ more thoroughly taught back in Years 7, 8 and/or 9?</p> <p>5. How does the quality of the work our pupils produce on <math>x</math> compare to pupils in in subject departments in other schools as evidenced in subject professional publications?</p>

# Some key curriculum design principles

- curriculum is knowledge structured as **narrative** over time

**But what *kind* of knowledge are  
we talking about?**

**substantive knowledge**

**disciplinary knowledge**

# Substantive and disciplinary knowledge

**Substantive =**

*The knowledge that is given*

**Factual content, conventional terms, the language and 'grammar' of the subject, warranted accounts of reality**

**Disciplinary =**

*How that knowledge gets changed*

**How claims are tested, the conventions of argument, what creativity looks like, open-ended challenges, subject thinking**

# The disciplinary dimension of history

History's big ideas or structures that shape typical historical questions, drive historical analysis and organise historical accounts/arguments.

- **causation**
- **change** v. continuity
- **similarity/difference**
- historical **significance**

History's methods, conventions, rules and practices and the nature of her products. How historical claims and products are represented and used in society.

- **evidence** e.g. utility of primary sources to a particular question; how to *establish* evidence for an enquiry
- the construction, origin, audience & purpose of **interpretations**

# The disciplinary dimension in history: **the types of question that the subject examines**

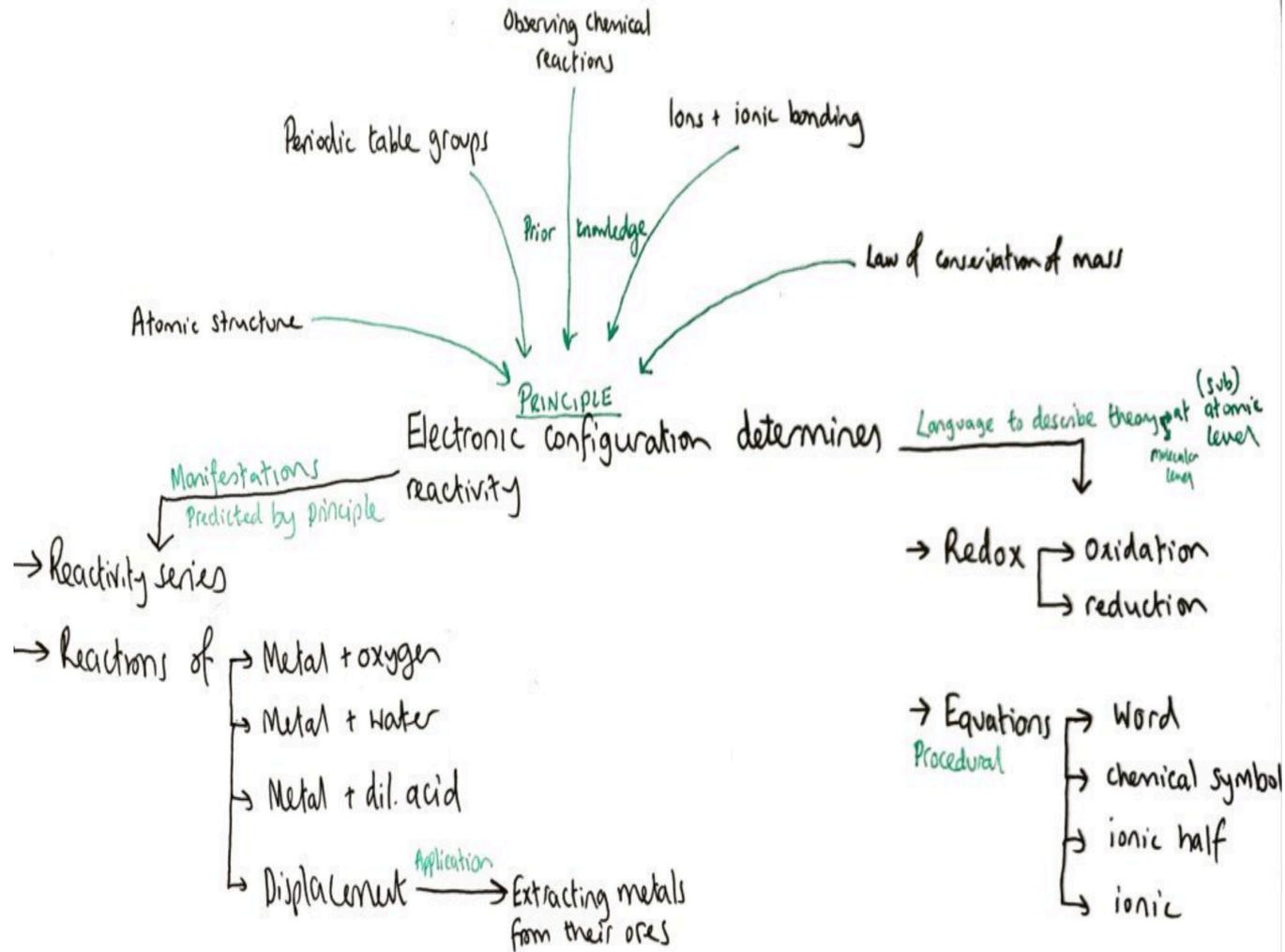
## **Causation**

- Why did the Normans win the Battle of Hastings?
- Why were the Normans able to take over so much of Europe?
- How important were military tactics in Norman success?

## **Change**

- How far was 1066 a turning point for England?
- Did eleventh century England see more continuity than change?
- How quickly did the Normans gain control of England?

# Aspects of substantive knowledge in science



# Science National Curriculum Aims

Disciplinary element: see Aim 2:

- develop understanding of the **nature, processes and methods of science** through different types of **science enquiries** that help them to answer **scientific questions**

**Aspects of  
disciplinary  
knowledge  
in science**

**What do scientists do?**

**What is a discovery?**

**How have ideas in science changed over time?**

**What is a fair test?**

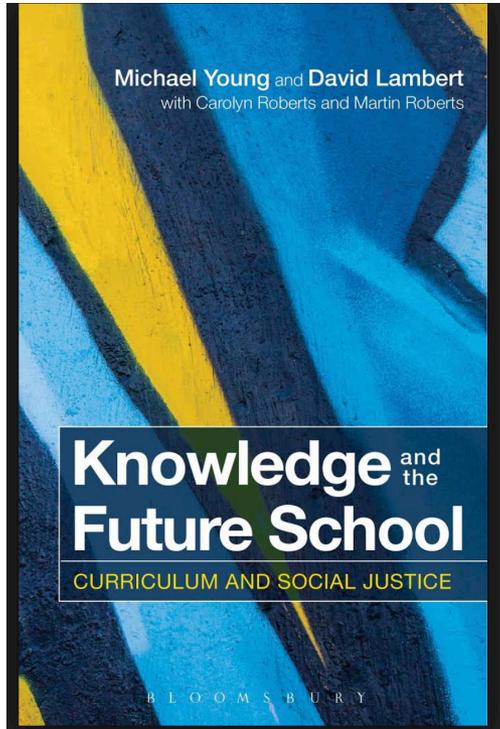
**When have scientists had to review our knowledge of the world?**

**How provisional are scientific conclusions?**

**How do scientists work in teams?**

**What counts as evidence in science?**

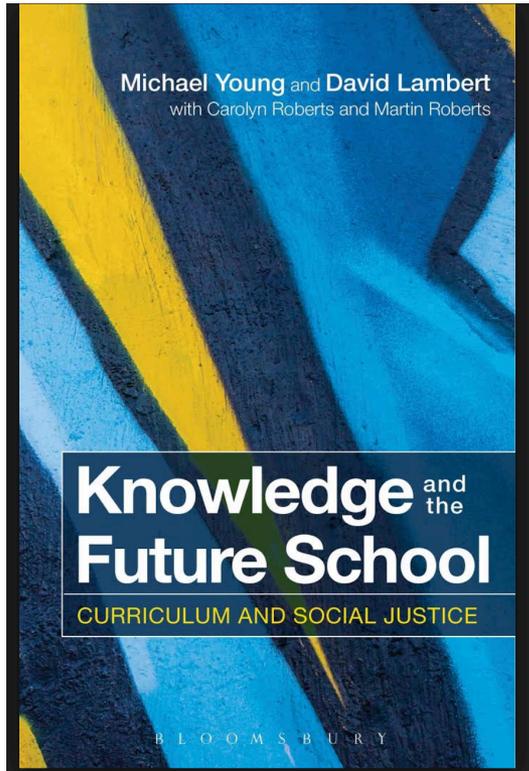
# Michael Young



## Powerful knowledge

Knowledge can escape the origins of the powerful people who produced it. Knowledge confers power on others and so brings about equity. Schools should combat disadvantage by giving all pupils equal entitlement to that knowledge.

# Michael Young



Knowledge produced by academics is special. It isn't like 'everyday' knowledge. It lifts us into abstract concepts and technical generalisations which give us power to express ideas and bring about change.

This knowledge is **structured** and **systematized**.

It is also **provisional and revisable**. We must prepare pupils to take their place in the *continuing conversation, enquiry and debates of the particular discipline*. **This is why the disciplinary dimension of a subject matters.** Each subject refers to a practice outside of school – that of scientists, historians, musicians, artists – where knowledge in that field is constantly tested, renewed, judged, nurtured. This is the disciplinary dimension – the signal to pupils that the practice is living and constitutes an ongoing and distinctive pursuit of truth.

# Some key curriculum design principles

- **curriculum is a narrative**
- **substantive** and **disciplinary**
- **core** and **hinterland**
- **proximal** purposes and **ultimate** purposes
- **the curriculum is the progression model**

**The curriculum *is*  
the progression model.**

What does this really mean?

**Test 1**

**Test 2**

**Test 3**

**Year 7  
exam**

Year 7  
content

**Year 8  
exam**

Year 7  
content

Year 8  
content

**Year 9  
exam**

Year 7  
content

Year 8  
content

Year 9  
content

# Some key curriculum design principles

- **curriculum is a narrative**
- **substantive** and **disciplinary**
- **core** and **hinterland**
- **proximal** purposes and **ultimate** purposes
- **the curriculum is the progression model**
- **components before composites**
- **teach to the domain and not to the test**