

Gareth Rein



St Joseph's School Penarth





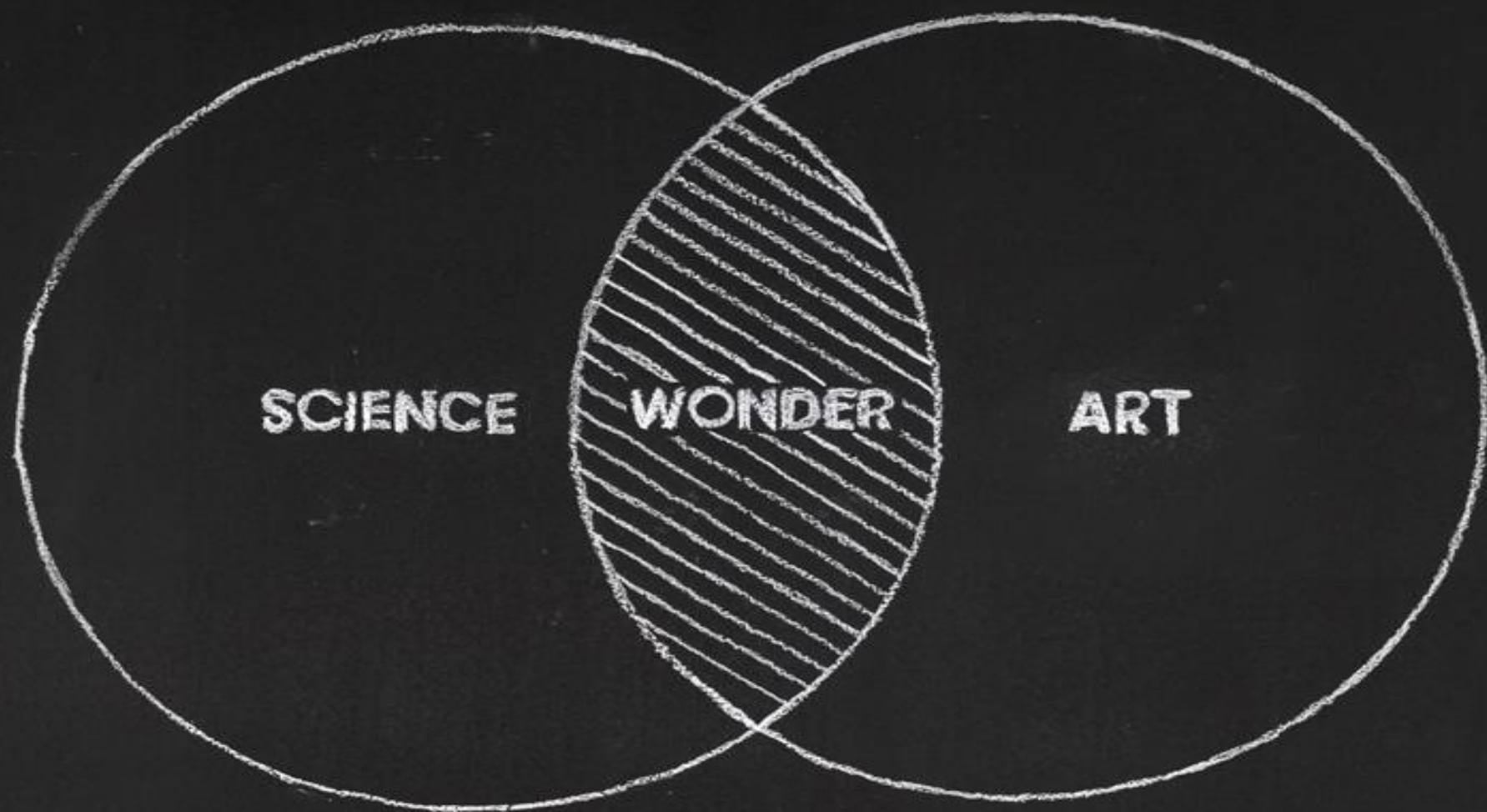
21st Century Skills

- ✓ Literacy and communication
- ✓ Numeracy
- ✓ Working with others
- ✓ Problem solving
- ✓ Managing own learning

- ✓ Digital technologies



Leonardo Effect





Syllabus

1. A ~~~~~

B ~~~~~

2 A ~~~~~...

B ~~~~~...

C ~~~~~...

3 A ~~~~~...

B ~~~~~...

Leonardo Effect

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graph TD; A[Leonardo Effect] --- B[Capturing imaginations]; A --- C[Developing and experimenting]; A --- D[Creating and applying]; A --- E[Reflecting and reinforcing];
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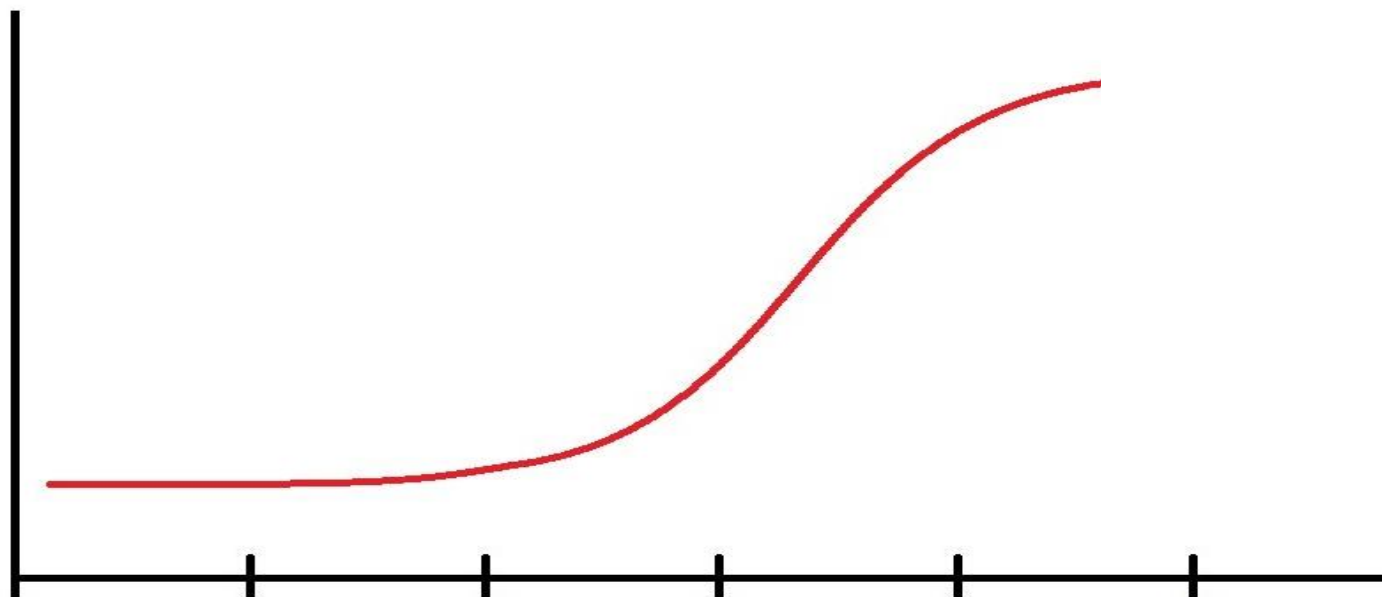
Capturing
imaginations

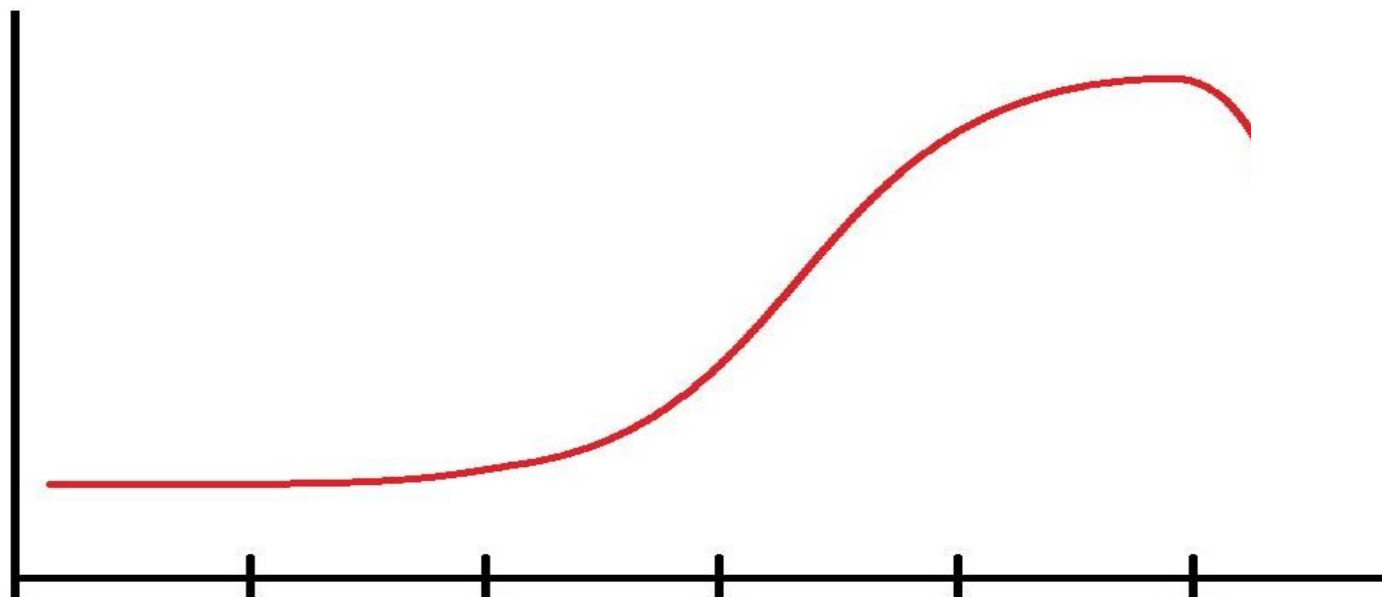
Developing and
experimenting

Creating and
applying

Reflecting and
reinforcing







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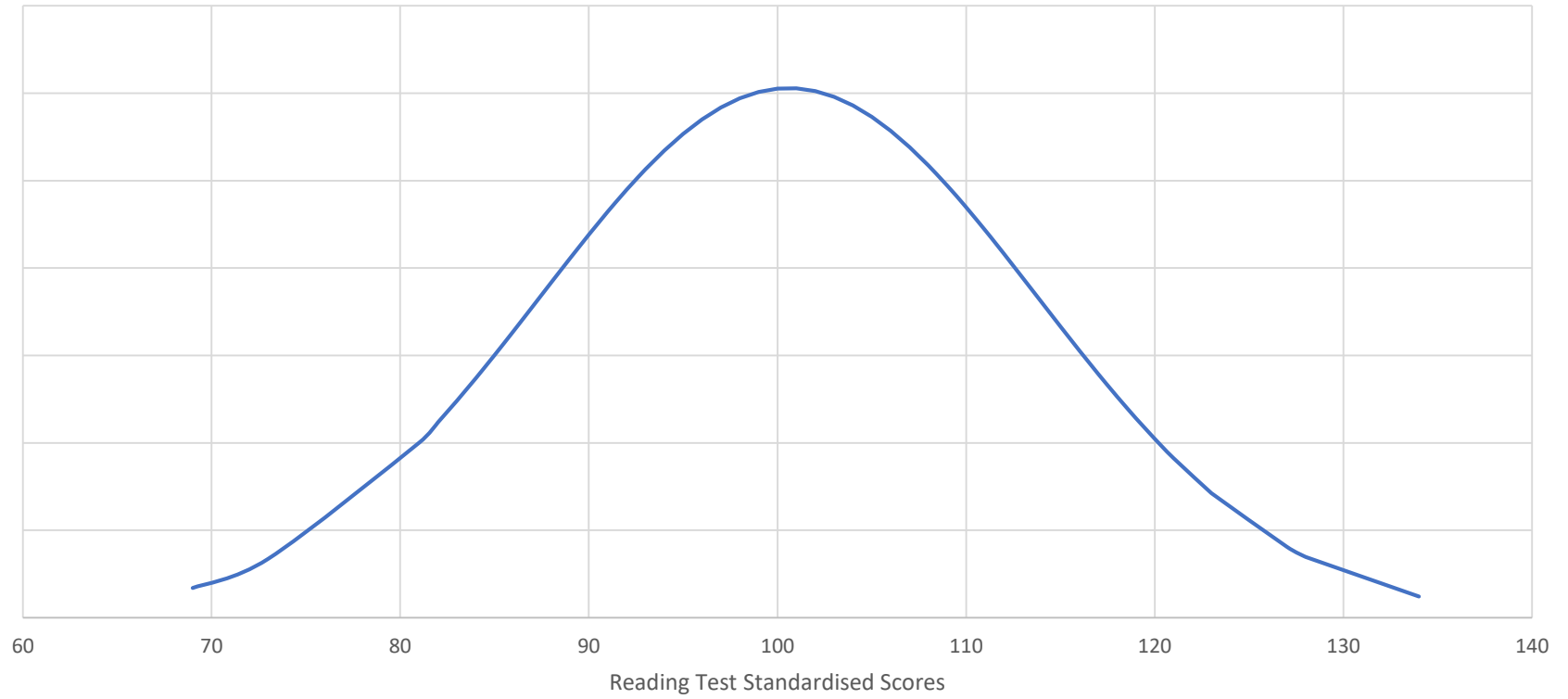
goda



Estyn

Rhagoriaeth i bawb - Excellence for all

2014





1

How effective is our curriculum & pedagogy?

- * How effectively does our curriculum develop the 4 Purposes, provide enriching experiences, use effective AfL and A of L?
- * All stakeholders, governors, staff, parents & pupils asked to identify the knowledge, skills & attitudes they wanted St Joseph's to develop.
- * Is our pedagogy & practice evidence based & meet our learners' needs?



NATIONAL BESTSELLER

CULTURAL LITERACY

WHAT EVERY
AMERICAN
NEEDS TO KNOW

▼
Includes 5,000 essential
names, phrases, dates, and concepts

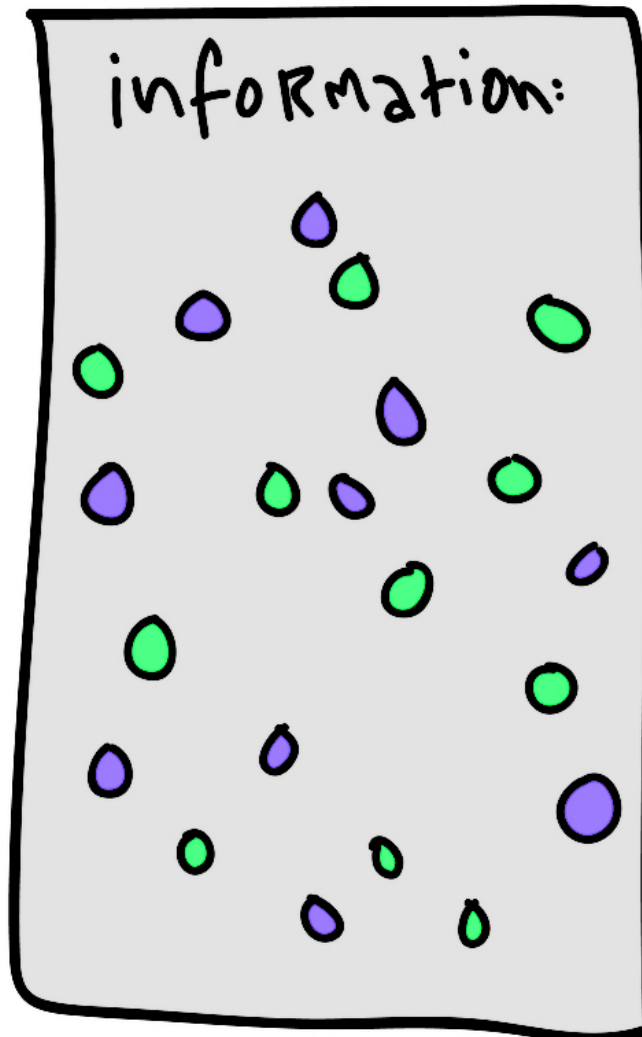
UPDATED AND EXPANDED

E. D. HIRSCH, JR.

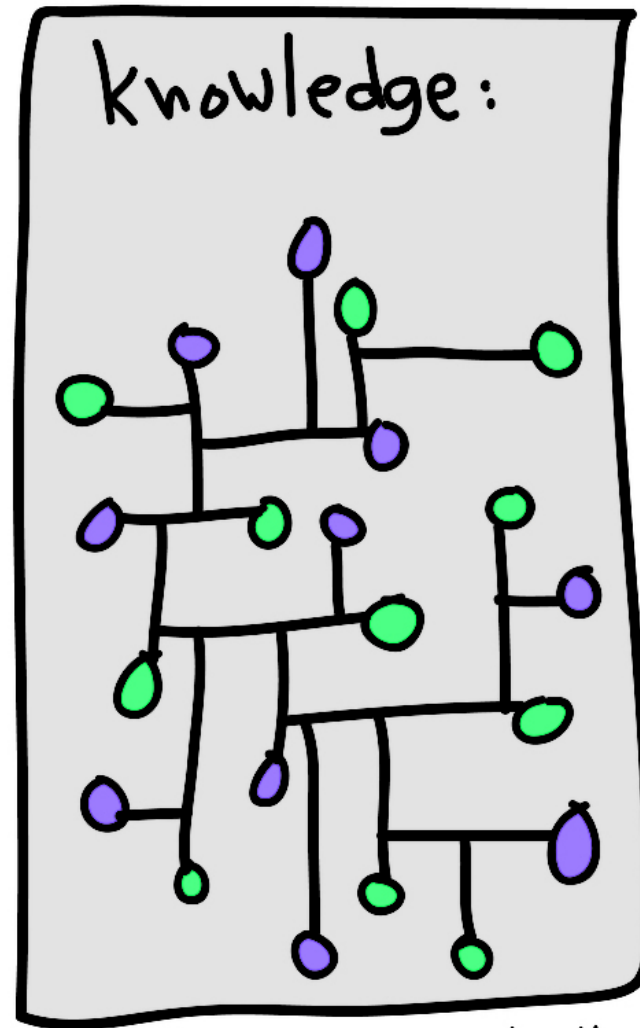
E. D. HIRSCH, JR.

WHY KNOWLEDGE MATTERS

RESCUING OUR CHILDREN FROM
FAILED EDUCATIONAL THEORIES



@gapingvoid



@gapingvoid

**FOR TO ALL THOSE WHO
HAVE, MORE WILL BE GIVEN,
AND THEY WILL HAVE AN
ABUNDANCE; BUT FROM
THOSE WHO HAVE NOTHING,
EVEN WHAT THEY HAVE WILL
BE TAKEN AWAY.**

MATTHEW 25:29







DANIEL T.
WILLINGHAM

WHY DON'T
STUDENTS

Like

SCHOOL?



A **COGNITIVE SCIENTIST**
ANSWERS QUESTIONS ABOUT HOW
THE MIND WORKS AND WHAT IT
MEANS FOR **THE CLASSROOM**

WHEN CAN YOU
Trust
THE EXPERTS?

HOW TO TELL
GOOD SCIENCE
FROM **BAD** IN EDUCATION

Daniel T. Willingham



1. People are naturally curious, but they are not naturally good thinkers.
2. Factual knowledge precedes skill.
- 3. Memory is the residue of thought.**
4. We understand new things in the context of things we already know.
5. Proficiency requires practice.
6. Cognition is fundamentally different early and late in training.
7. Children are more alike than different in terms of learning.
8. Intelligence can be changed through sustained hard work.
9. Teaching, like any cognitive skills, must be practised to be improved.



DAISY CHRISTODOULOU

SEVEN MYTHS

ABOUT EDUCATION



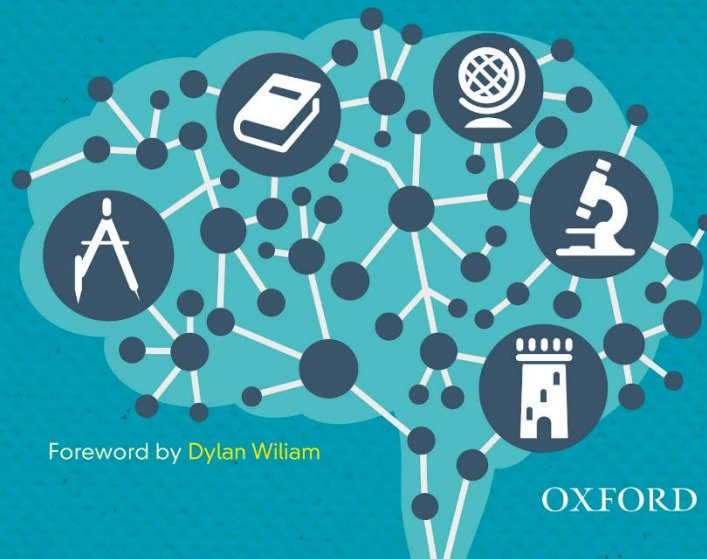
The
Curriculum
Centre
CURRICULUM KNOW-HOW



Daisy Christodoulou

MAKING GOOD PROGRESS?

The future of Assessment for Learning



Foreword by Dylan Wiliam

OXFORD

Seven Myths

1. Facts prevent understanding.
2. Teacher-led instruction is passive.
3. The twenty-first century fundamentally changes everything.
4. You can always just look it up.
5. We should teach transferable skills.
6. Projects and activities are the best way to learn.
7. Teaching knowledge is indoctrination.

ORIGINAL

GENIUS

THINKING

POSITIVE

MIND

IN

CREATIVITY

BRAIN
FORMING

INVENTION

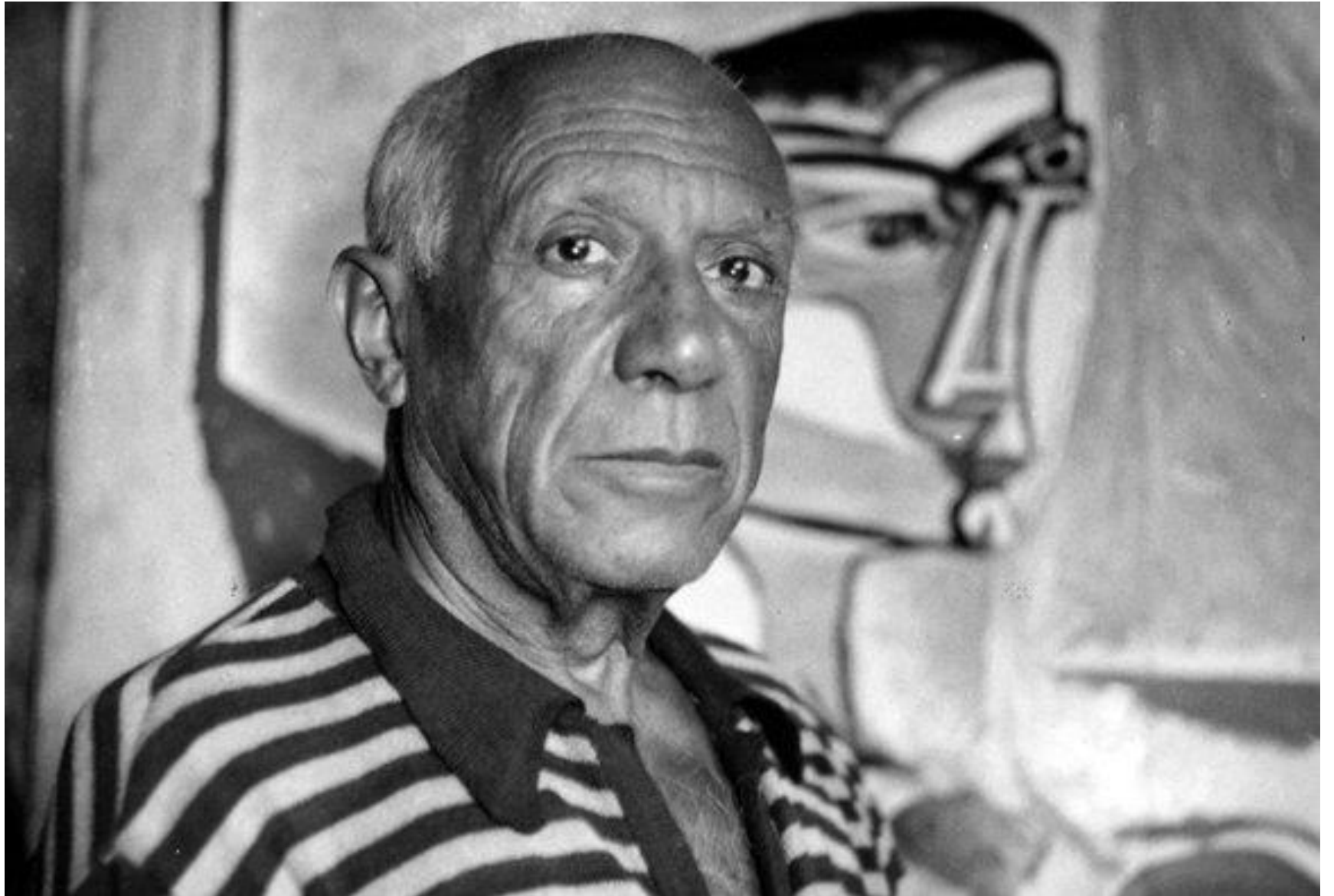
IDEAS

IN
LIC

INNO
VATION

ART













Six Strategies for Effective Learning

www.learningscientists.org

In this series, we provide information so students can learn how to study using..

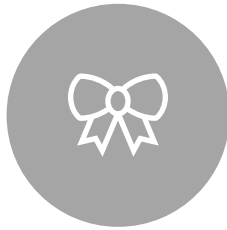


All of these strategies have supporting evidence from cognitive psychology. For each strategy, we explain how to do it, some points to consider, and where to find more information.

Perception



SENSATION



BOTTOM UP



TOP DOWN



THE CURSE OF
KNOWLEDGE





Attention



Limited capacity resource.



Selective focus.



Switching tasks slows reaction speeds.



Saliency drives attention.

THINKING,
FAST AND SLOW



DANIEL
KAHNEMAN

WINNER OF THE NOBEL PRIZE IN ECONOMICS

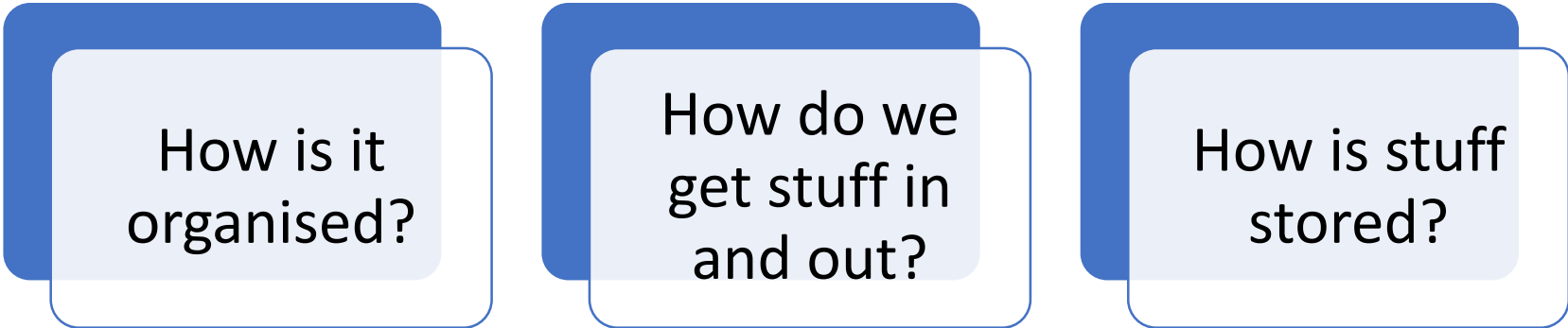
Task

- Count from 1 to 26.
- Say the alphabet.
- Count from 1 to 26 and say the alphabet alternatively:

1 – a – 2 – b – 3 – c



Memory

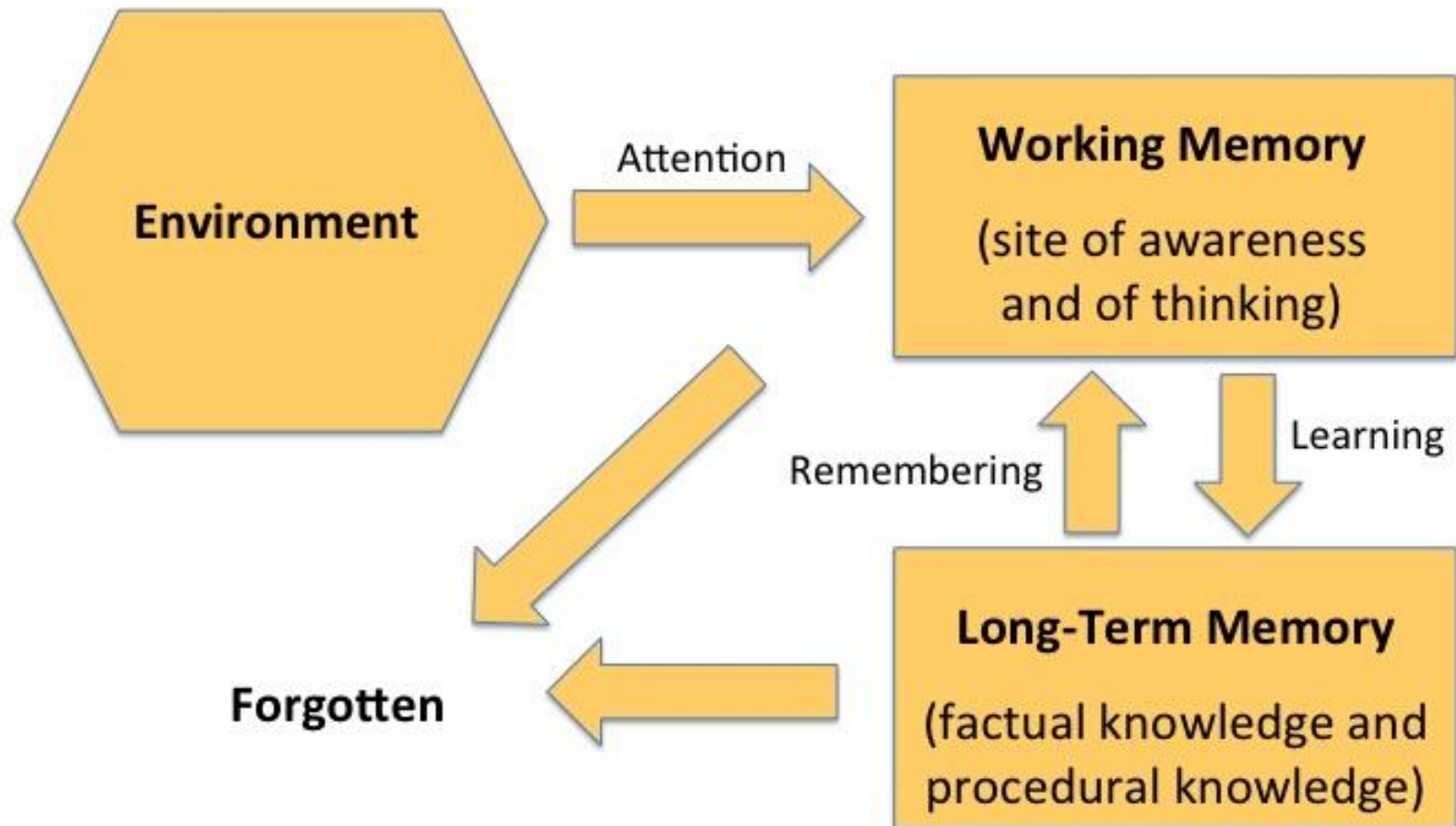


How is it
organised?

How do we
get stuff in
and out?

How is stuff
stored?

Memory and Learning



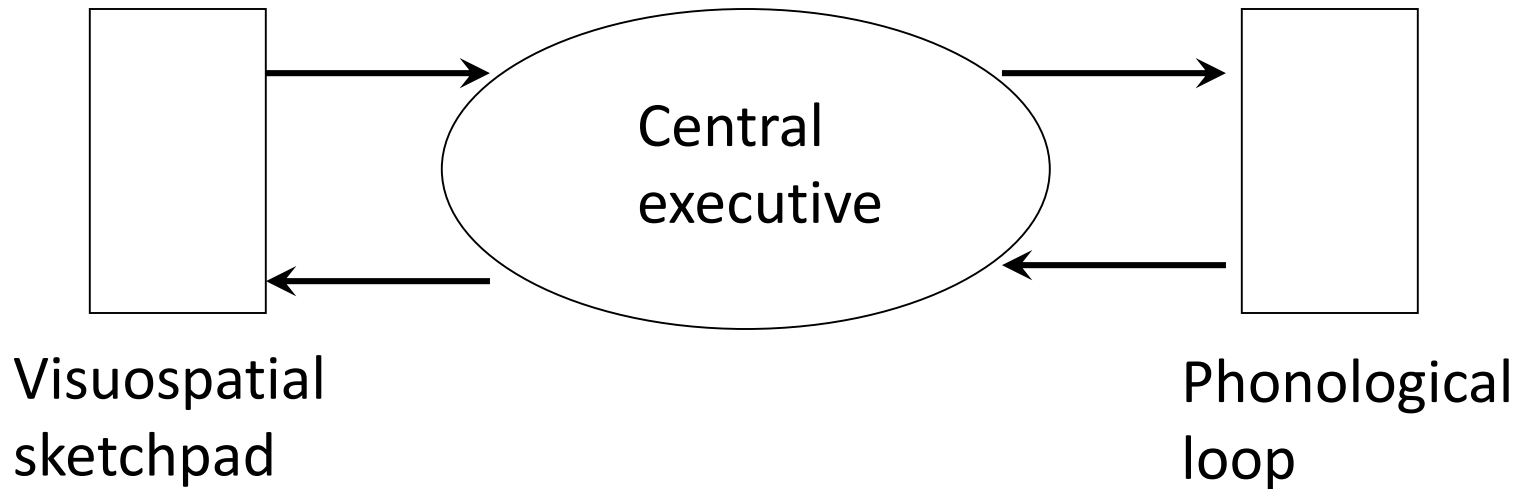




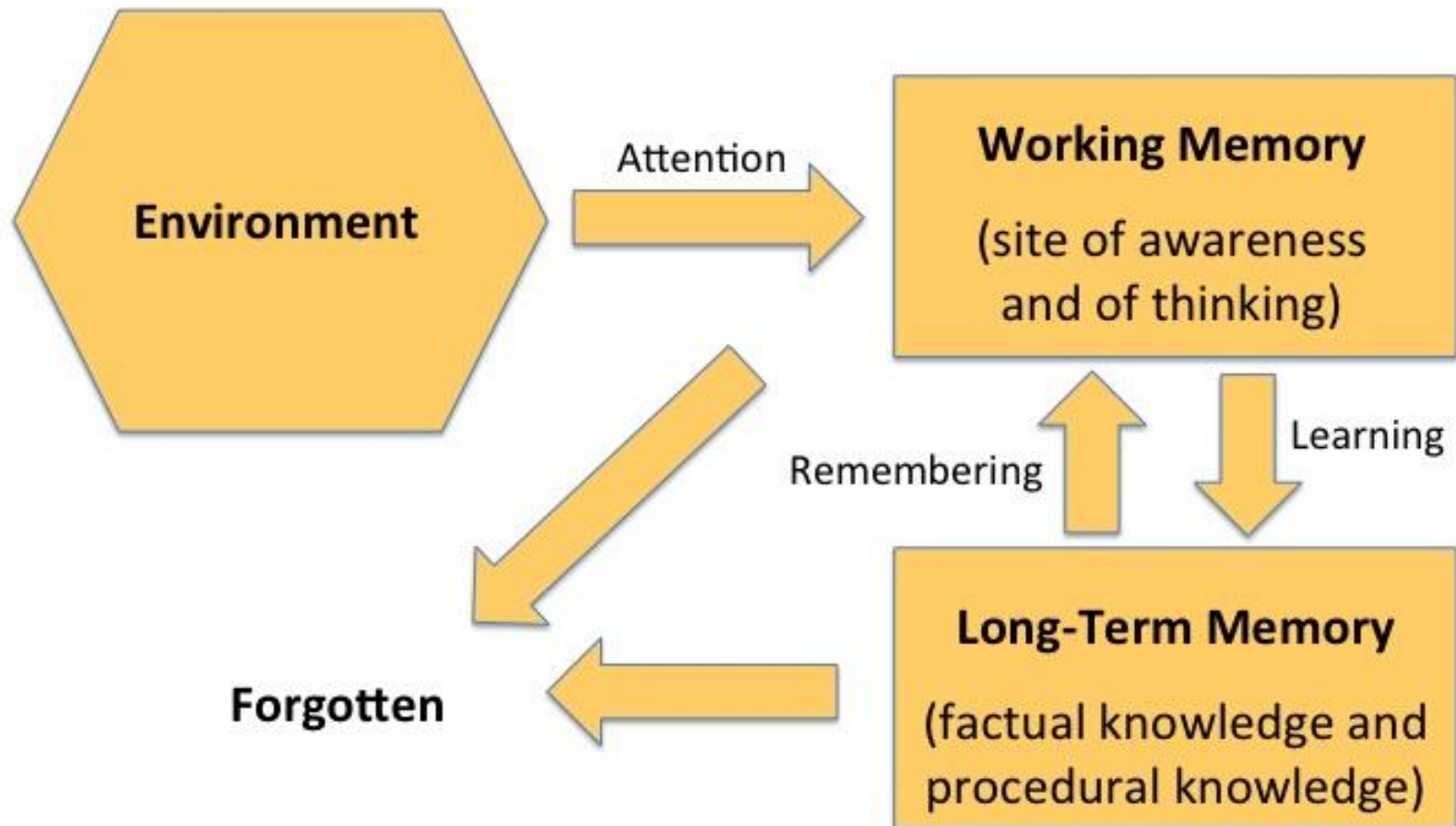


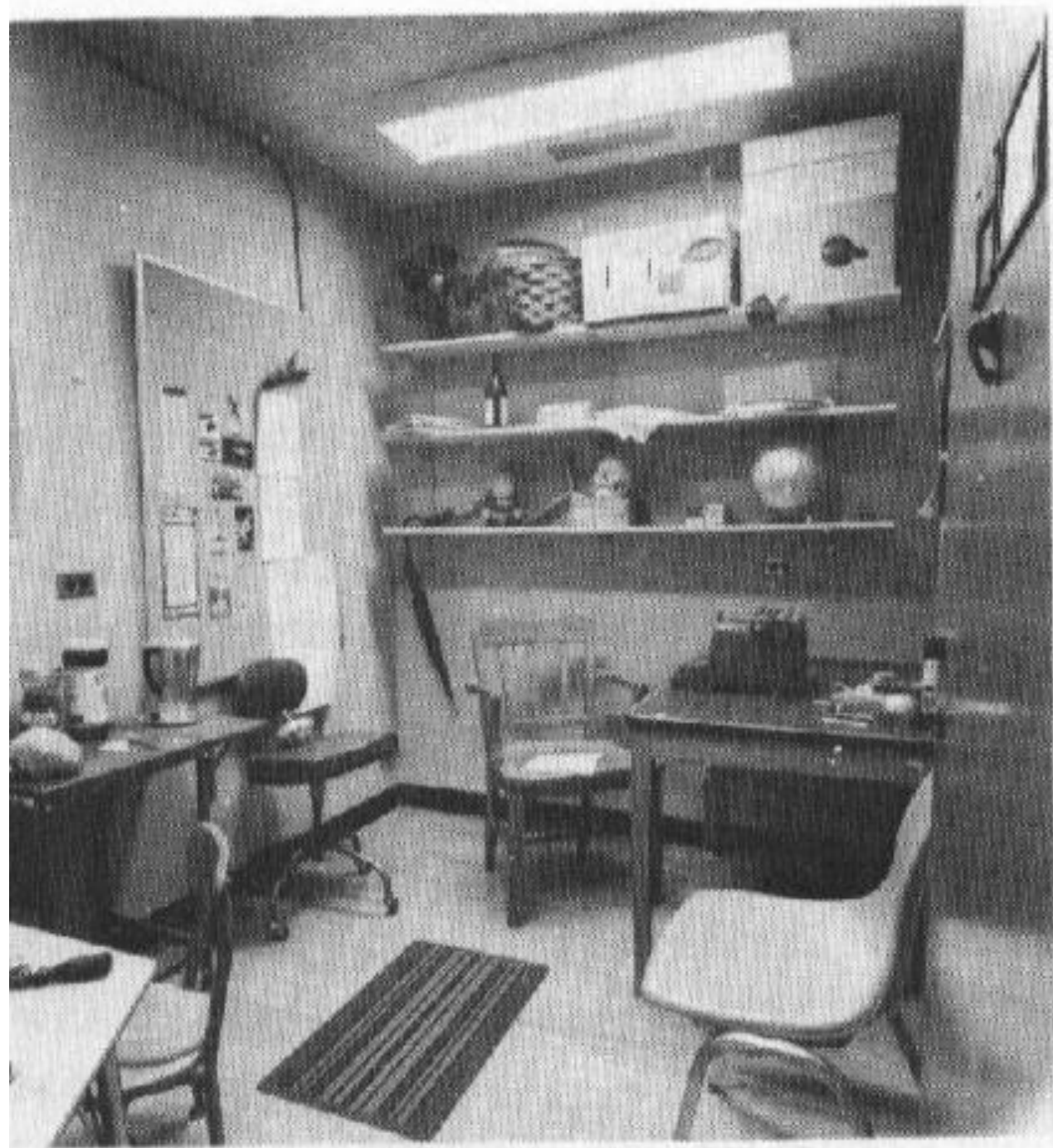


Working Memory



Memory and Learning

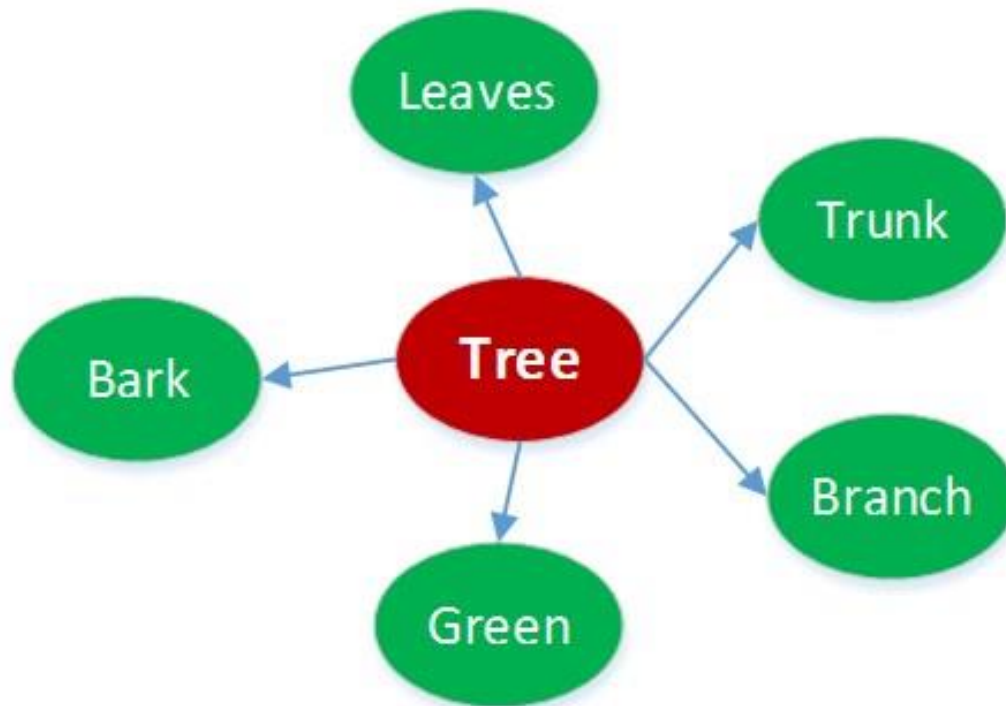


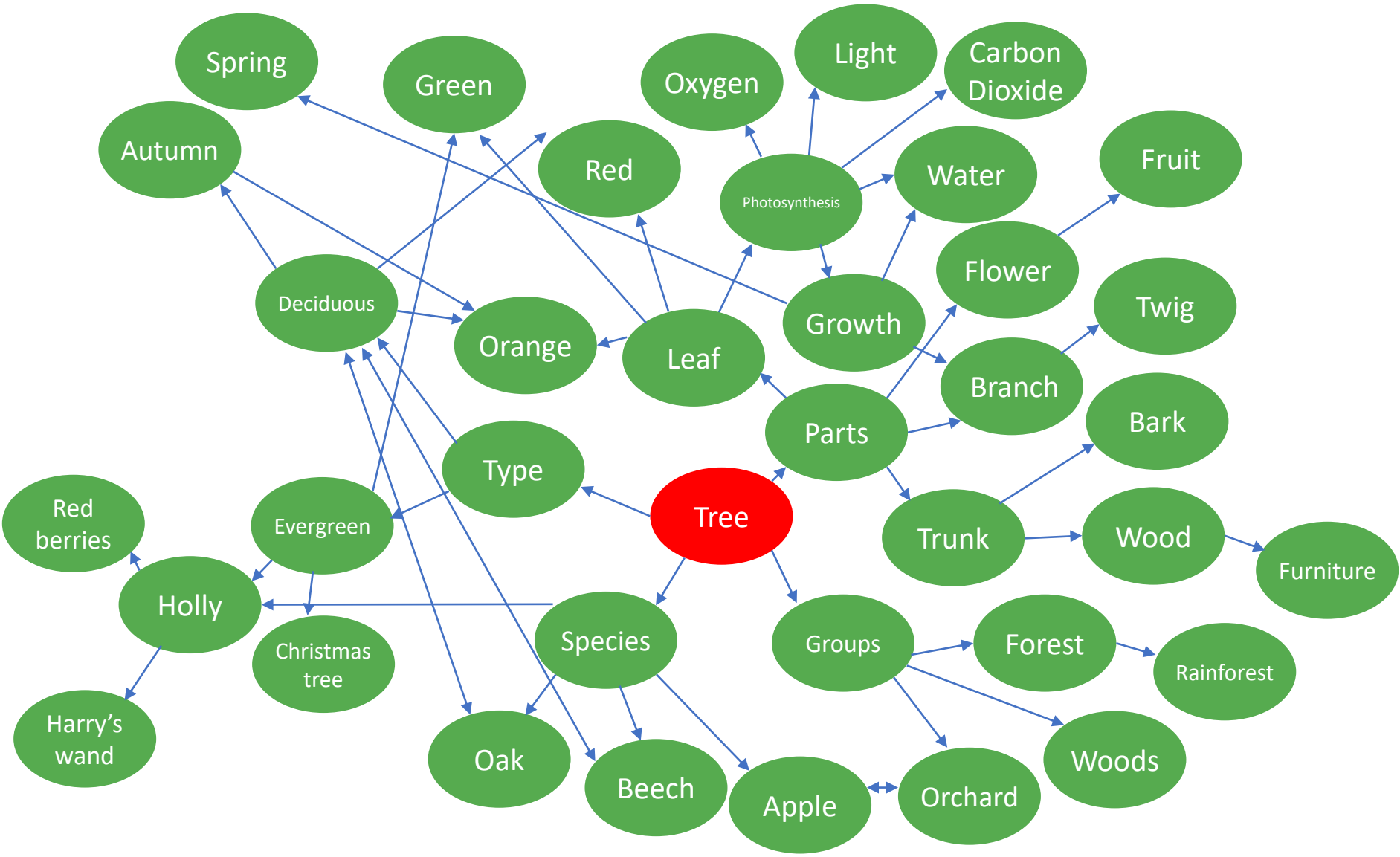


Schema and inference

- Thirty subjects brought to room shown and told it was experimenter's office. Left for 35 seconds.
- Subject taken to nearby room, asked to write down everything they could recall about experimenter's office.
- Descriptions influenced by “office schema”
 - nearly all recalled desk, chair, walls
 - only 8 recalled skull, bulletin board
 - 9 recalled books (there weren't any)

Schema





Implications for schools

- Knowledge is foundational.
- Development of skills is underpinned by knowledge.
- By understanding how memory works, we can teach for retention.
- Practise, practise, practise!
- Build on prior knowledge and experiences.
- Curriculum coherence and progression are essential.



2

Plan & Prepare for Change

- * Team of 5 staff members to lead development of a knowledge-rich curriculum
- * Headteacher sets the vision by identifying key educational research reading
- * Professional Learning opportunities are expert/research informed & collaborative.







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All of these strategies have supporting evidence from cognitive psychology. For each strategy, we explain how to do it, some points to consider, and where to find more information.

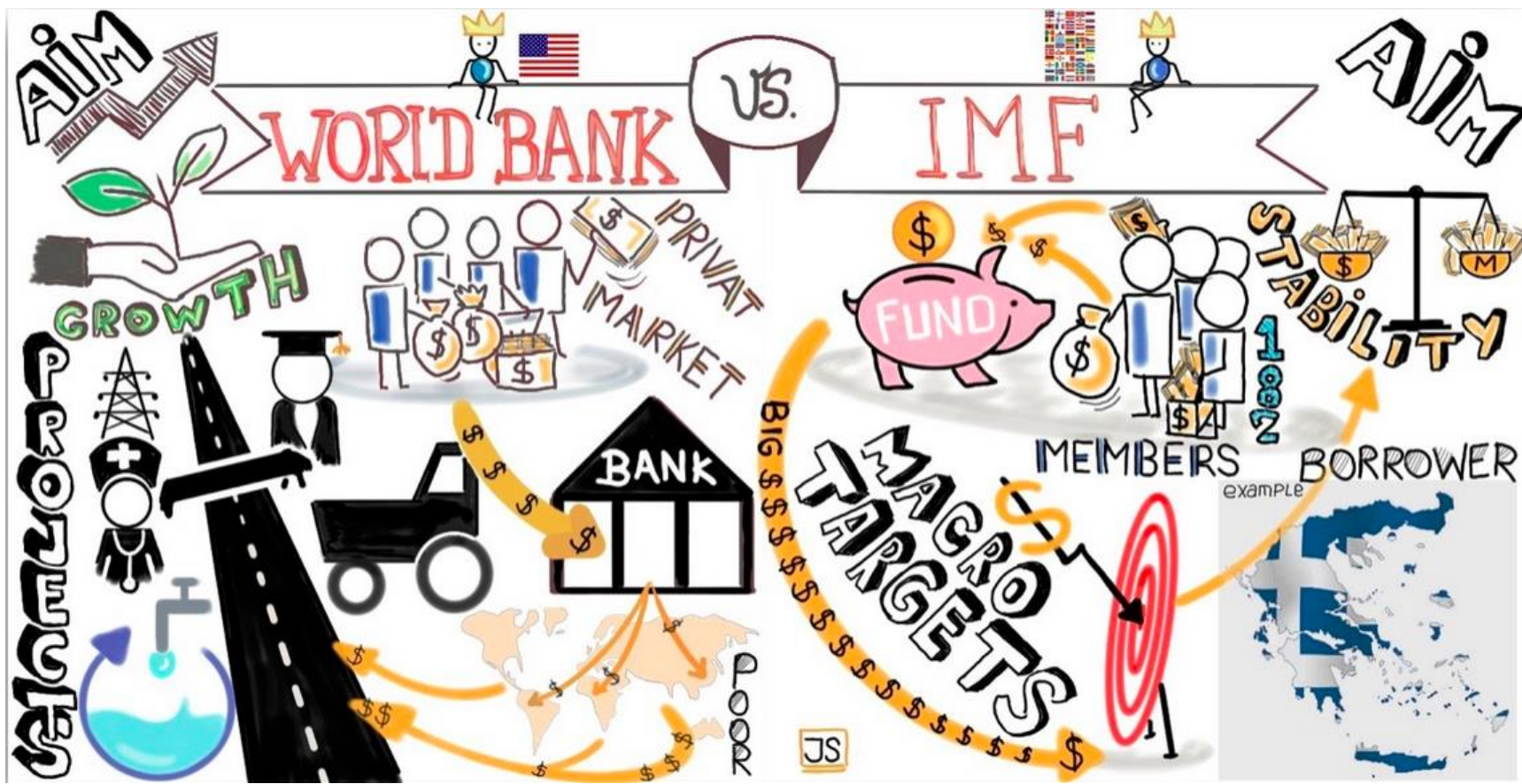
Dual Coding

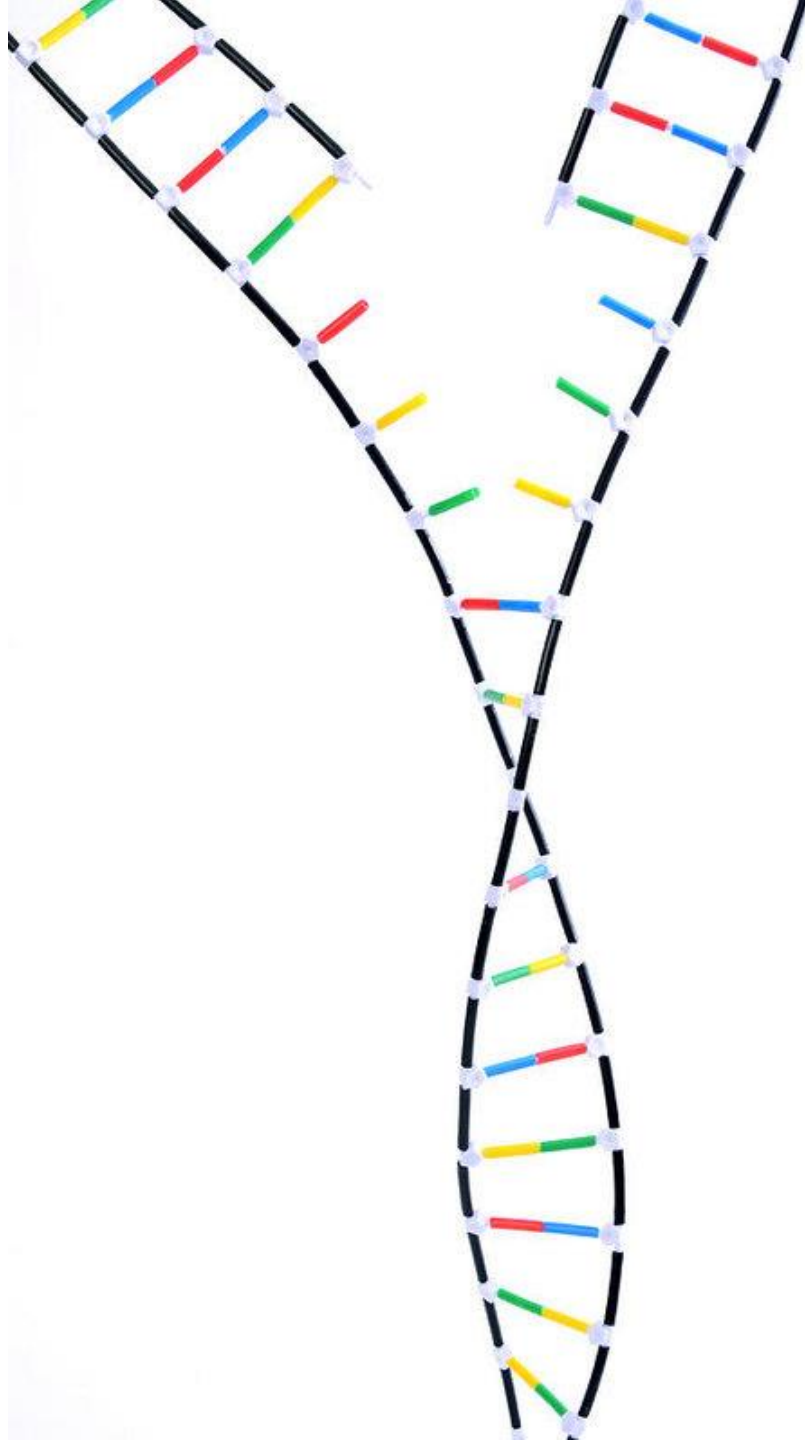
Combining verbal with visual materials.

Two formats provide two ways of remembering.

The visuals must be relevant.

Helpful to all learners.







3 Realise the change

- * Whole school trial of Domain Units, using immersion, knowledge acquisition & application through writing.
- * Whole school collaborative approach to Domain & Skills Unit planning.
- * Professional learning within & across schools continues to underpin curriculum & pedagogy.

Working definition of the curriculum

'The curriculum is a framework for setting out the aims of a programme of education, including the knowledge and understanding to be gained at each stage (**intent**); for translating that framework over time into a structure and narrative, within an institutional context (**implementation**) and for evaluating what knowledge and understanding pupils have gained against expectations (**impact/achievement**).'

STAGE 4 APPLICATION &
EXIT CELEBRATION

→ Pupils apply what they've learnt to new situations & celebrate their learning with a wider audience.

STAGE 3
BUILD UP TO WRITING

→ We use 5 steps to build up to an extended piece of writing. 1- Hook & features
2- Plan & Practice 3- Draft 4- Edit
5- Publish

STAGE 2
KNOWLEDGE ACQUISITION

→ Pupils need a foundation of factual, conceptual & procedural knowledge to underpin their learning.

STAGE 1
ENGAGEMENT & IMMERSION

→ Learning should engage, enrich & excite learners. We provide immersive experiences to develop their interest in learning.

Year group	Domain 1	Domain 2	Domain 3	Domain 4	Domain 5	Domain 6	Domain 7	Additional
Reception (90 lessons)	Classic Tales (12)	All About Me Narrative Paintings (18)	Families & Communities Chinese New Year Elements of Line (18)	Animals DT: Cooking Elements of Colour/ Colour mixing (18)	Plants (18)	Habitats (18)		Nursery Rhymes Taught in LLC (10) Classic Tales These are spread out throughout the year and stories match the domain. (20)
Year 1 (93 lessons)	Plants and Plant growth (15)	Farms (13)	Prehistoric Britain (Ice age to Iron age) (12)	Kings, Queens and Rulers UK Nations/ Regions of the UK (12)	Seasons and Weather Wales (12)	Taking care of the Earth The Seven Continents North and South Pole Oceans and Seas (14)	Materials and their properties & Magnetism Art/DT: Junk modelling Paintings of children (15)	Nursery Rhymes & Fables These are spread out throughout the year and stories match the domain. Stories Taught in skills units.
Year 2 (90 lessons)	Human body and the senses. Self portraits (18)	Our Local Area Geology Types of Art Architecture (12)	Early World Civilisations Middle East & Northern Africa Art of Ancient Egypt (12)	Animals & Habitats – Classification of animals / Living things and their environment (UK) Element of Art – Colour, Shape and Texture (18)	The Celts and the Romans in Wales Line - Celtic Art (15)	Electricity, Light & Sound (15)		Fables & Stories Taught in skills units.



Geology is the study of the makeup of the Earth and the processes that change and shape it.

Types of Rock

Sedimentary - a rock that is made of sediments that have been naturally compacted and cemented together.

Igneous - a rock that forms when magma cools and solidifies.

Metamorphic - a rock that forms when minerals in other types of rocks are altered due to extreme heat and pressure.

Erosion - a process that moves sediments to new locations.

Physical weathering - a process that breaks big rocks into smaller rocks without changing the minerals they contain.

Chemical weathering - a process that breaks down rocks by changing the minerals they contain.

The **rock cycle** explains the changes that occur in rocks over very long periods of time.

Rocks are created, destroyed, and recreated in a continuous cycle.

YEAR 5 GEOLOGY

Hydrothermal vent - a deep-sea geyser that forms as seawater sinks down through cracks in the oceanic crust and then releases extremely hot, mineral-rich water back up through cracks in the crust.

Seamount - an underwater volcano that forms wherever magma is erupting through oceanic crust.

Tsunami - a gigantic wave of seawater caused by an earthquake in oceanic crust. A tsunami can travel as fast as 500 miles per hour.



A – inner core
B – outer core
C – mantle
D – crust

What is a Volcano?

A **volcano** is a hill or mountain that forms over a crack in Earth's crust from which lava erupts.

The **crack** leads down to a **chamber**, or huge space, filled with **magma**, which comes from the **mantle**.

Tremendous **pressure** and **heat** in the mantle force magma in the chamber upward through the crack.

If the pressure is great enough, magma **erupts** on the surface as lava.

Types of Volcano

Extinct volcano - a type of volcano that has not erupted for at least 10,000 years and is not likely to erupt again.

Active volcano - a type of volcano that has erupted in the past 10,000 years and is likely to erupt again.

Dormant volcano - a type of volcano that is considered active but hasn't erupted for a very long time.

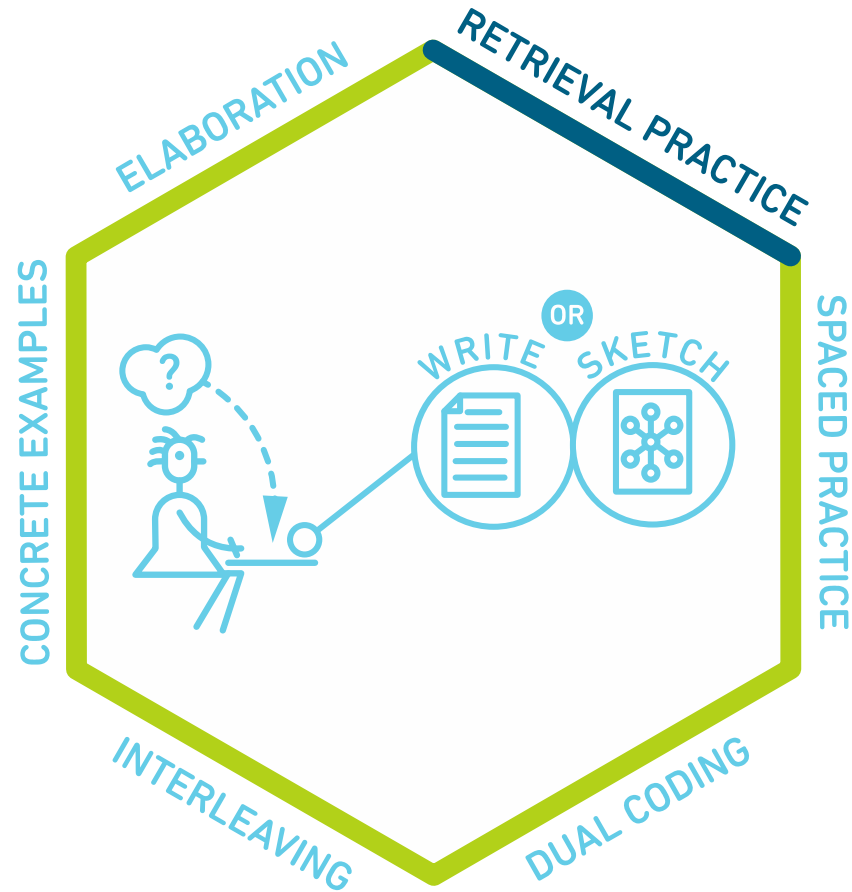
Geysers, volcanoes, and hot springs all form both along **plate boundaries** and above **hotspots**.



LEARN TO STUDY USING...

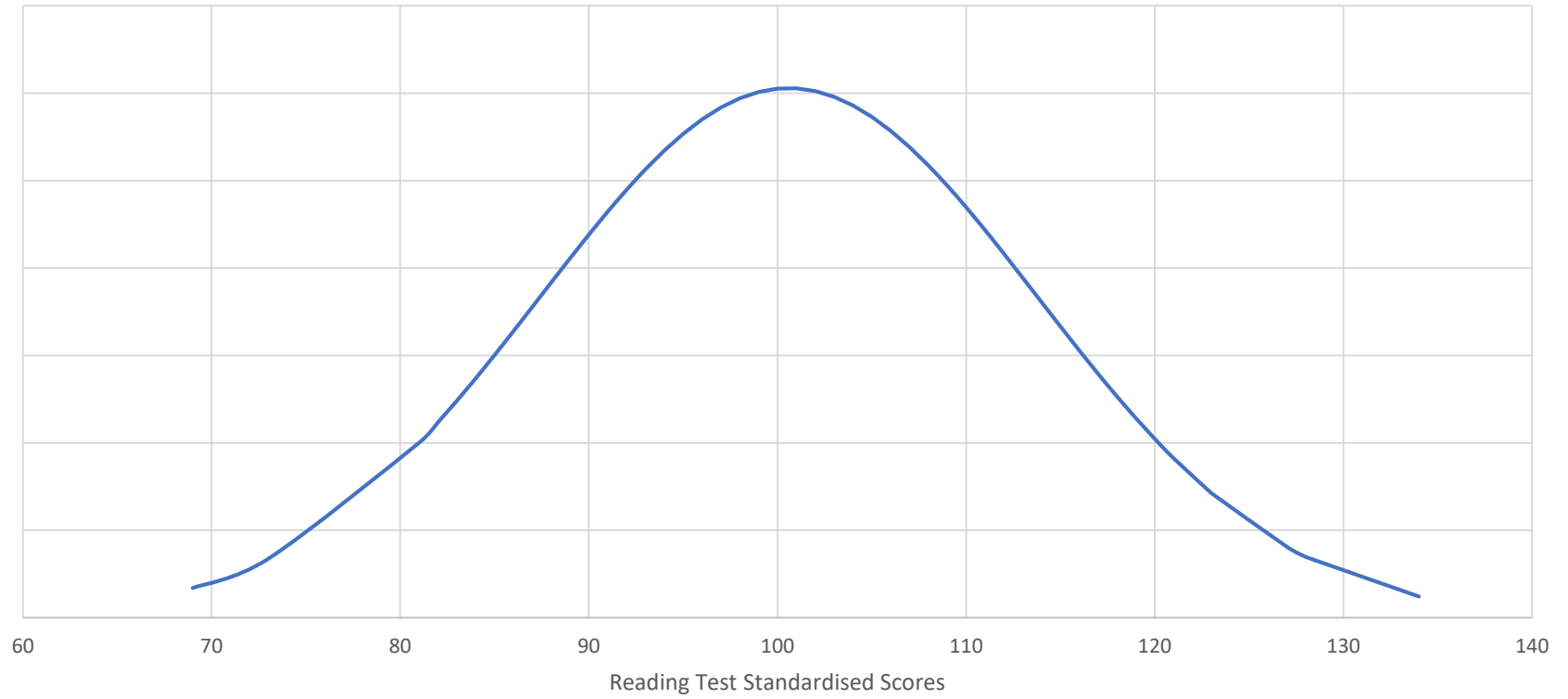
Retrieval Practice

PRACTICE BRINGING INFORMATION TO MIND

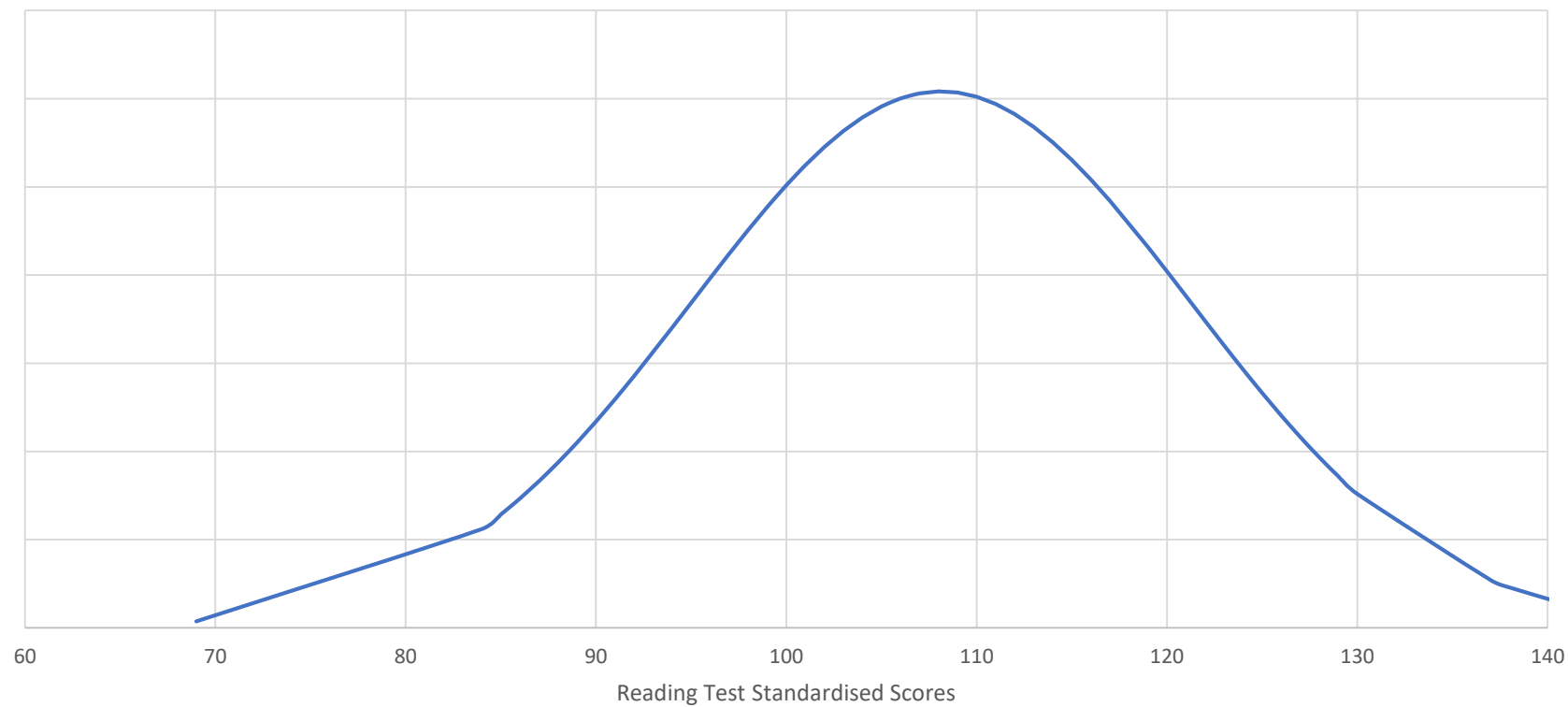


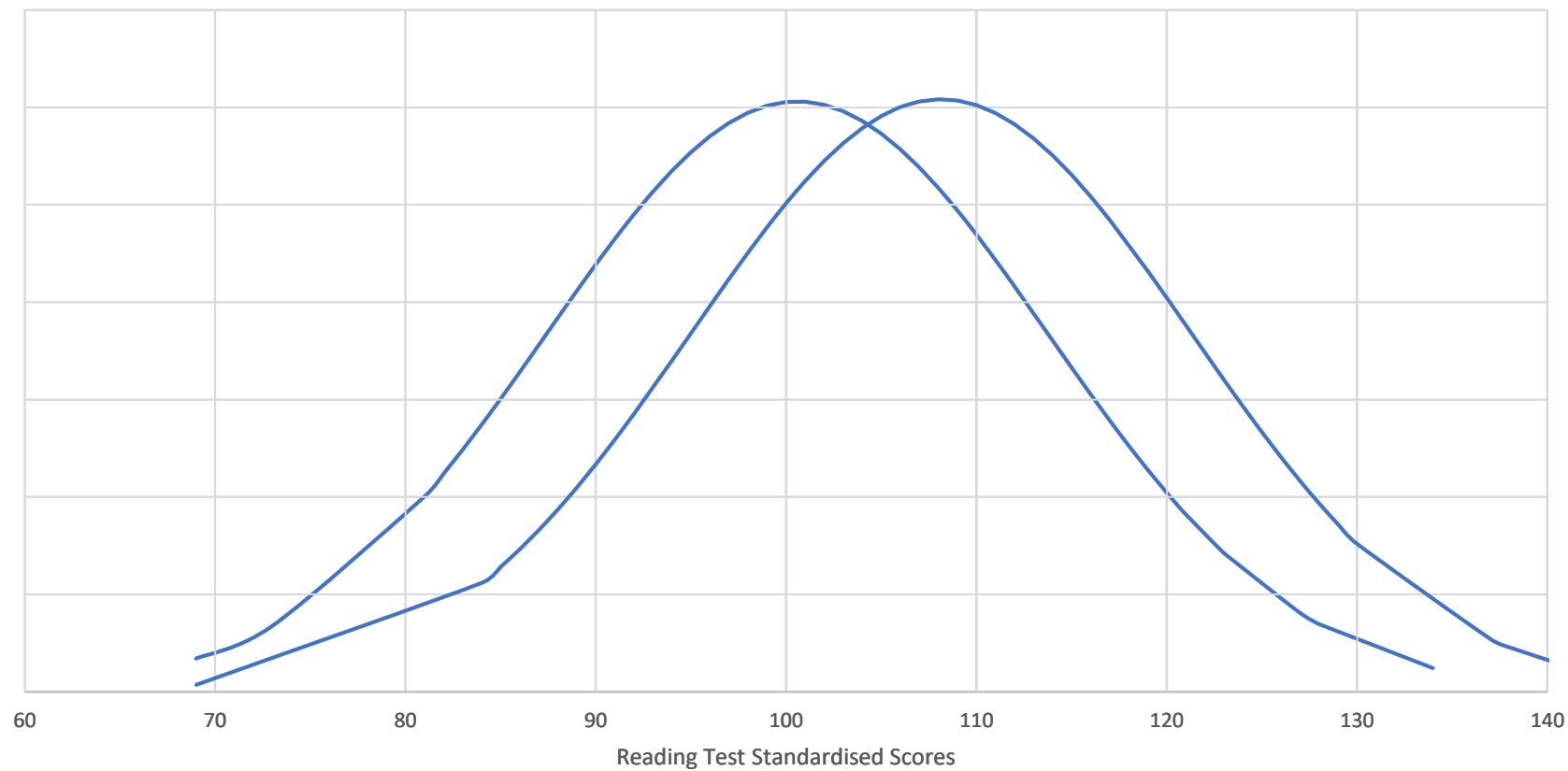
What is coronary heart disease and what risk factors may increase the risk of developing coronary heart disease?	Can you give the different components of the blood and explain their structure and their function?	Can you define the processes of diffusion, osmosis and active transport?	Can you explain the structure of arteries, veins and capillaries and how this relates to their function?
Why do large organisms need a transport system?	Can you draw and label a bacterial and yeast cell?	How does clotting work?	Can you explain the cardiac cycle?
Why is clotting necessary?	Can you explain how the heart rate changes during exercise and under the influence of adrenaline?	Can you draw a sketch diagram of the heart and label the vessels entering and leaving it?	Can you compare and contrast the parts of animal, plant, bacterial and yeast cells?
Last lesson (1)	Two weeks ago (2)	Last month (3)	Way back (4)

2014



2019





Welsh National Tests - Reading Results

	Mean		Median	
Group	<i>2015</i>	<i>2019</i>	<i>2015</i>	<i>2019</i>
Year 6	95	101	93	102
Difference	+6		+9	

	Mean		Median	
Group	<i>2016</i>	<i>2019</i>	<i>2016</i>	<i>2019</i>
Year 5	101	108	100	105
Difference	+7		+5	

	Mean		Median	
Group	<i>2017</i>	<i>2019</i>	<i>2017</i>	<i>2019</i>
Year 4	106	117	111	116
Difference	+11		+5	

	Mean		Median	
Group	<i>2018</i>	<i>2019</i>	<i>2018</i>	<i>2019</i>
Year 3	111	112	110	113
Difference	+1		+3	

Welsh National Tests - Reading Results

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Difference	+11		+5	

	Mean		Median	
Group	2018	2019	2018	2019
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Difference	+1		+3	

National Reading Tests

NRT	Mean		Median	
	<i>2014</i>	<i>2019</i>	<i>2014</i>	<i>2019</i>
Whole School	101	108	100	110

NRT	<i>2014</i>	<i>2019</i>
<85	12%	2%
85 - 115	72%	71%
>115	16%	27%

4 Evaluate & Refine

- * Monitoring processes evaluate the effectiveness of new Domain Units
- * Audit of provision for strengths & barriers to success, standards, Cross curricular responsibilities, 4 Purposes, Welsh Dimension & international perspective.





St Joseph's RC Primary Leadership Journey to CfW

@ImpactWales

FINISH HERE ↴

Robust, progressive,
coherent curriculum in
line with Successful Futures
supported by excellent
professional learning.

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2 Plan & Prepare for Change

- * Team of 5 staff members to lead development of a knowledge-rich curriculum
- * Headteacher sets the vision by identifying key educational research reading
- * Professional Learning opportunities are expert/research informed & collaborative.

START HERE ↴

JAN 2017 - Develop a coherent & progressive curriculum, that is knowledge-rich, develops skills & provides experiences to open minds & broaden horizons.



1 How effective is our curriculum & pedagogy?

- * How effectively does our curriculum develop the 4 Purposes, provide enriching experiences, use effective AFL and A of L?
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5 Repeat

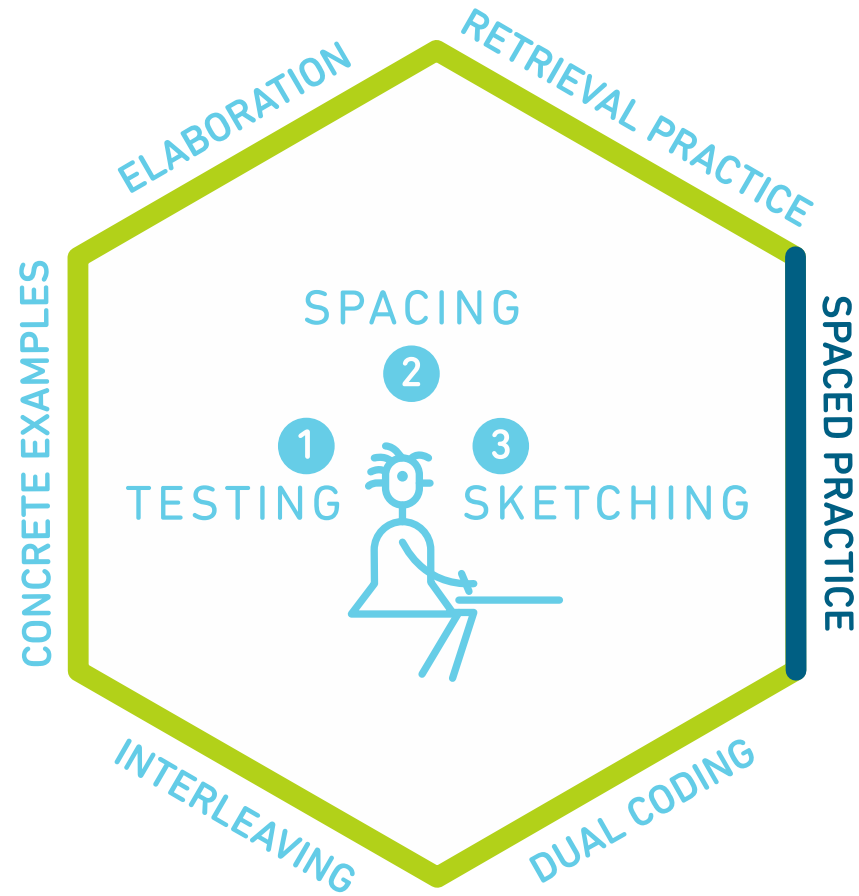
Return to step 1 and further refine & adjust.



LEARN TO STUDY USING...

Spaced Practice

SPACE OUT YOUR PRACTICE OVER TIME





Thank you



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@garein