POWER UP Your Pedagogy

Bruce Robertson

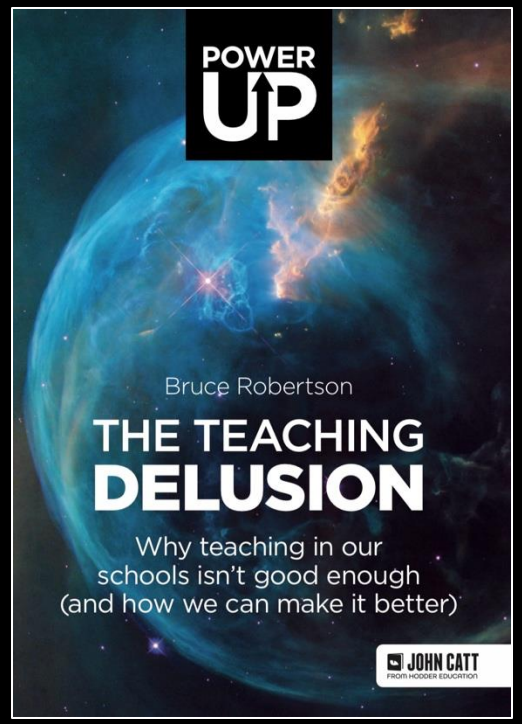
St Andrew's High School, Kirkcaldy, 25th and 26th June 2025

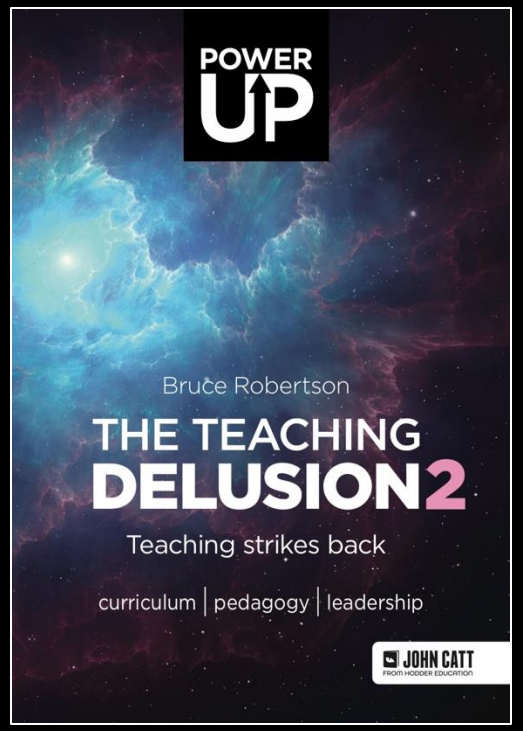
NEXT LEVEL EDUCATIONAL

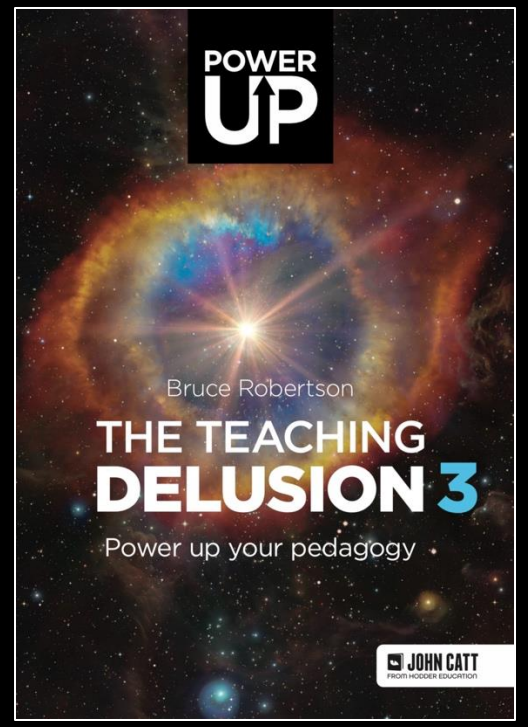
NextLevelEducational.com

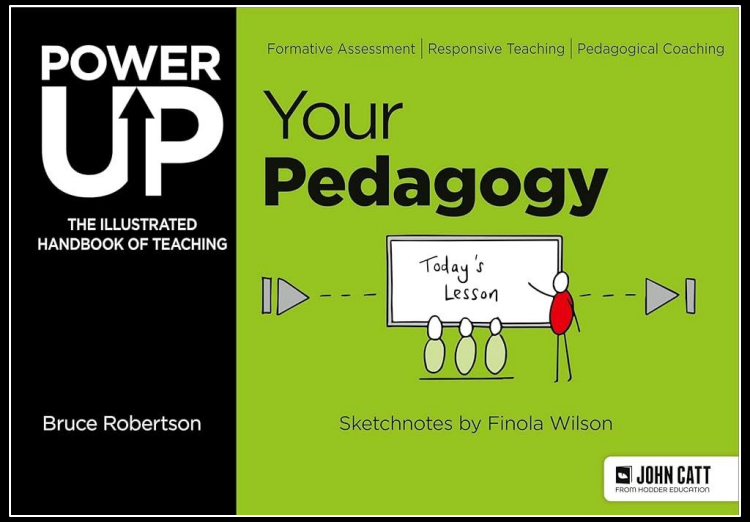
bruce@nextleveleducational.com | @BruceNextLevel

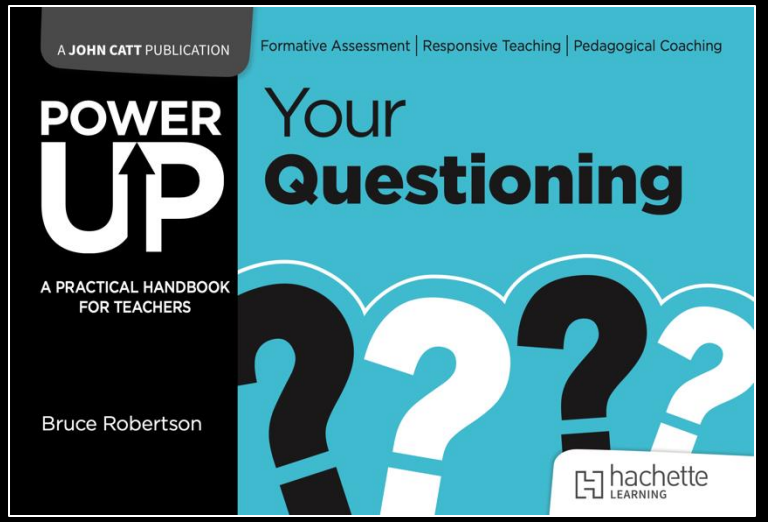
POWER UP


POWER UP
Bruce Robertson
THE TEACHING DELUSION
Why teaching in our schools isn't good enough (and how we can make it better)
JOHN CATT FROM HODDER EDUCATION


POWER UP
Bruce Robertson
THE TEACHING DELUSION 2
Teaching strikes back
curriculum | pedagogy | leadership
JOHN CATT FROM HODDER EDUCATION


POWER UP
Bruce Robertson
THE TEACHING DELUSION 3
Power up your pedagogy
JOHN CATT FROM HODDER EDUCATION


POWER UP
THE ILLUSTRATED HANDBOOK OF TEACHING
Bruce Robertson
Formative Assessment | Responsive Teaching | Pedagogical Coaching
Your Pedagogy
Today's Lesson
Sketchnotes by Finola Wilson
JOHN CATT FROM HODDER EDUCATION


A JOHN CATT PUBLICATION
POWER UP
A PRACTICAL HANDBOOK FOR TEACHERS
Bruce Robertson
Formative Assessment | Responsive Teaching | Pedagogical Coaching
Your Questioning
hachette LEARNING

POWER UP

Aim

To develop your understanding of key messages from **cognitive science** and **educational research** about ***principles*** that underpin high-quality pedagogy, with a focus on how these can be **applied in the classroom**.

POWER UP

Make you think – *extended learning sessions*

Challenge and consolidate

Spark your interest

Support you to make your teaching *even better* than it is already

POWER UP

Teaching

The **most important** job in the world…

…but also one of the most challenging.


WRONG DIRECTION

POWER UP

Strengths…

- You used digital technology.
- It seemed fun.
- The learning intention was written on the board.
- You smiled a lot.

Areas for improvement…

- You need to talk less.
- You need to differentiate more.
- Students should be allowed to lead their own learning.
- There wasn’t enough higher-order thinking.
- There should be more group work.

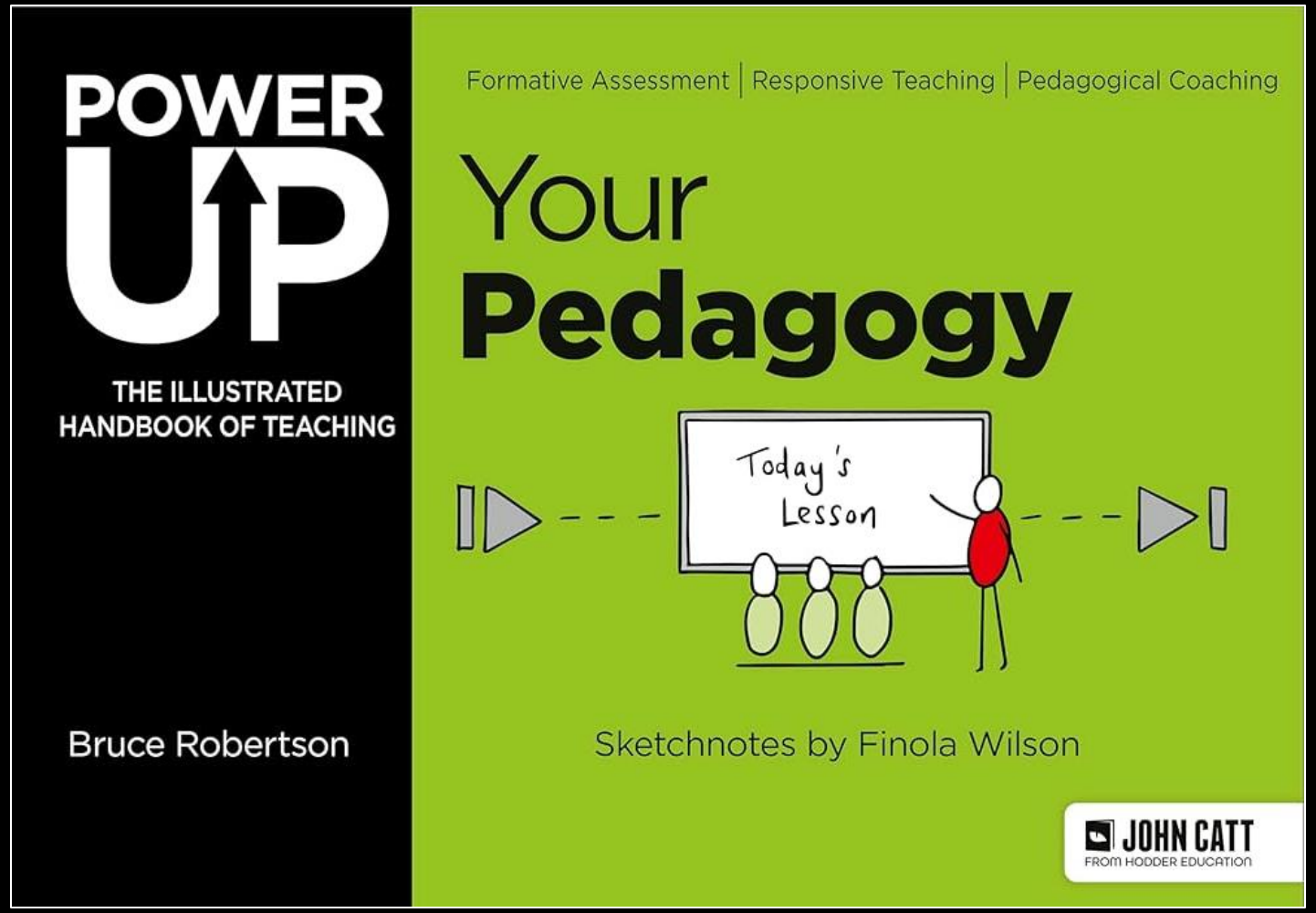
POWER UP

Ideology

vs

Cognitive science & educational research

POWER UP

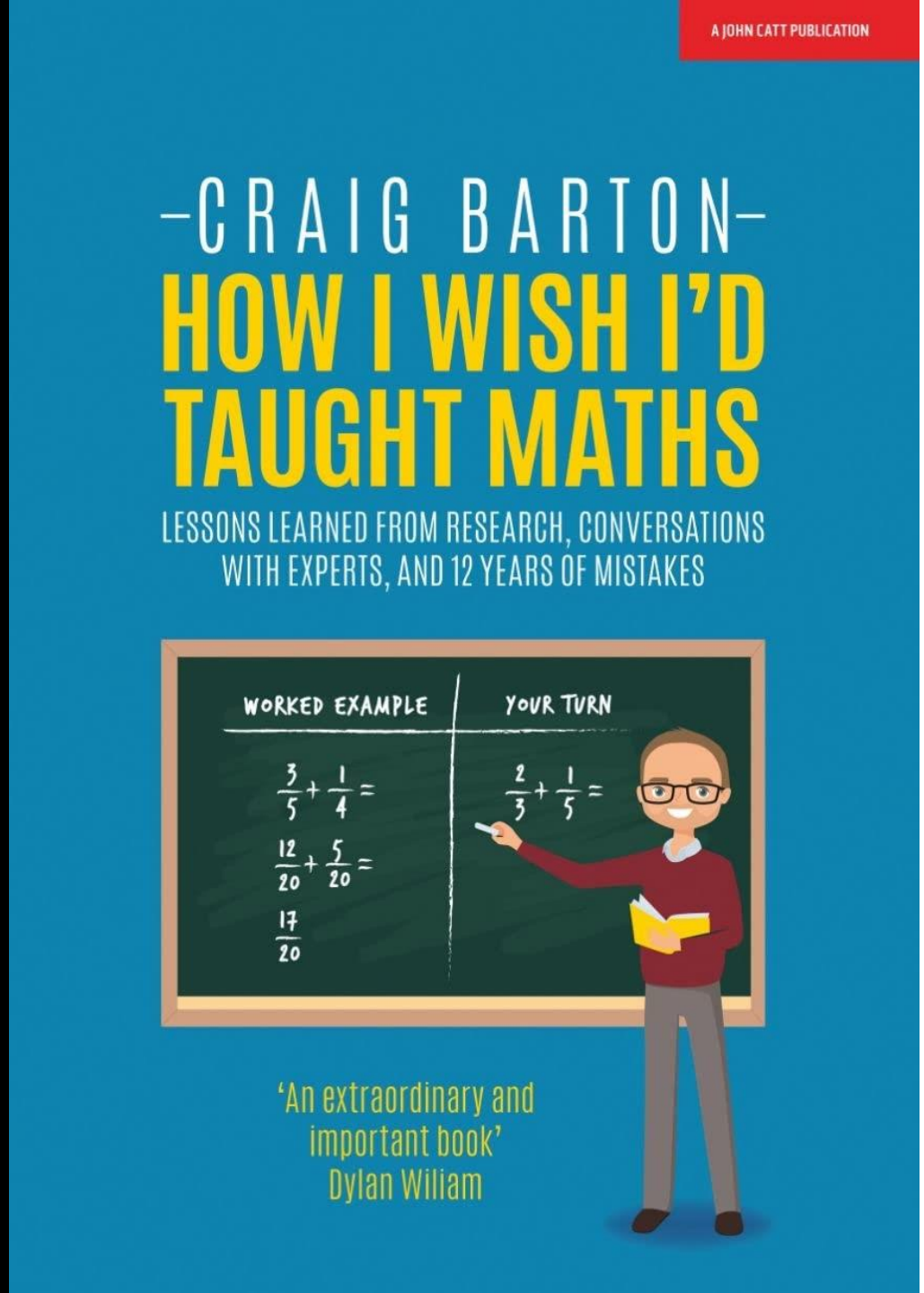


Learning Lessons

POWER UP

How does learning **happen**?

POWER UP

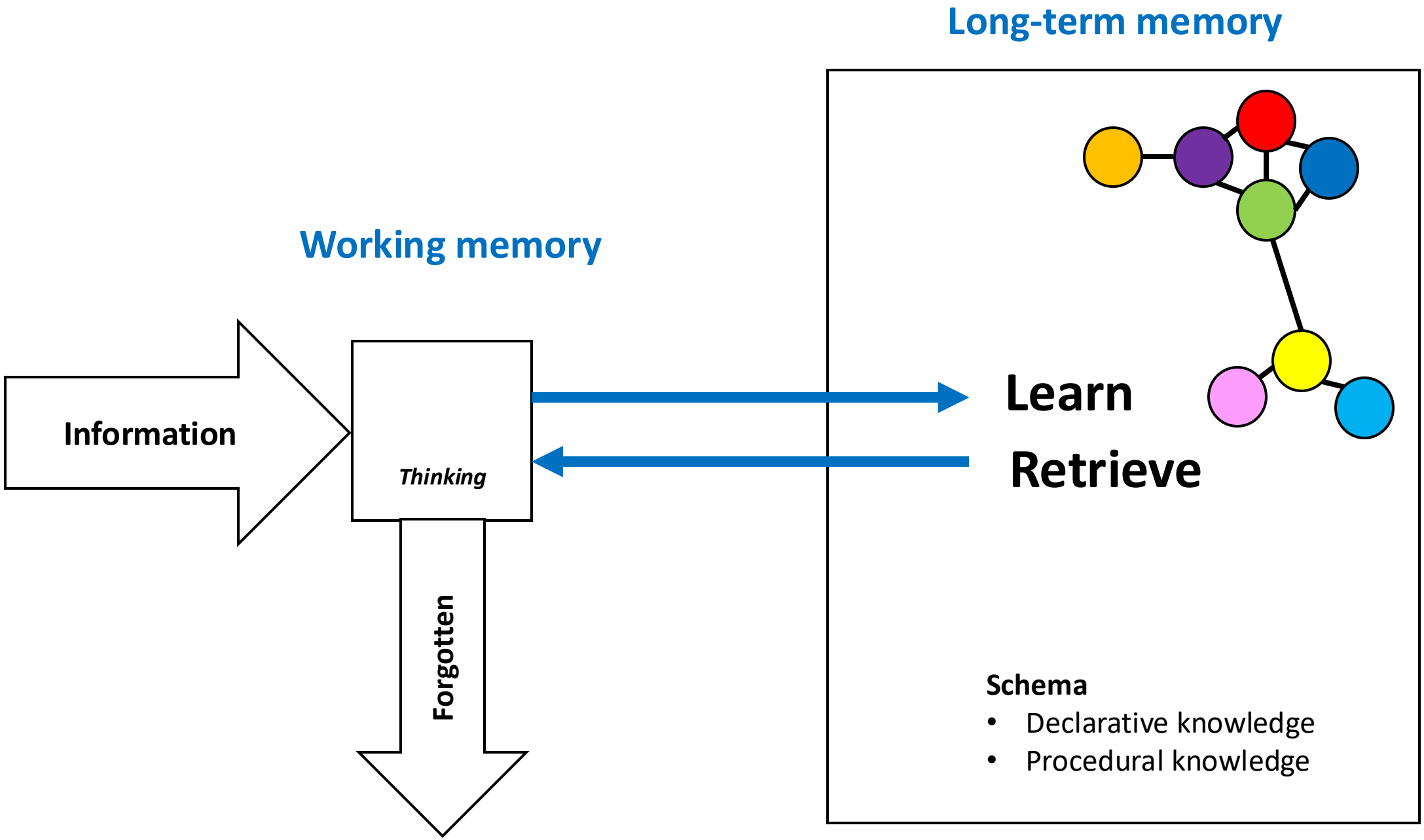


"A teacher not considering how their students think and learn is kind of like a doctor not being overly concerned about the workings of the body, or a baker taking only a casual interest in the best conditions for bread to rise."

POWER UP

Learning Lesson 1

Learning is the development of **long-term memory**, through the accumulation of **knowledge**.


Long-term memory
Working memory
Information
Thinking
Forgotten
Learn
Retrieve
Schema
• Declarative knowledge
• Procedural knowledge

POWER UP

Knowledge is the *currency* of thinking and learning

POWER UP

Knowledge

Skills

POWER UP

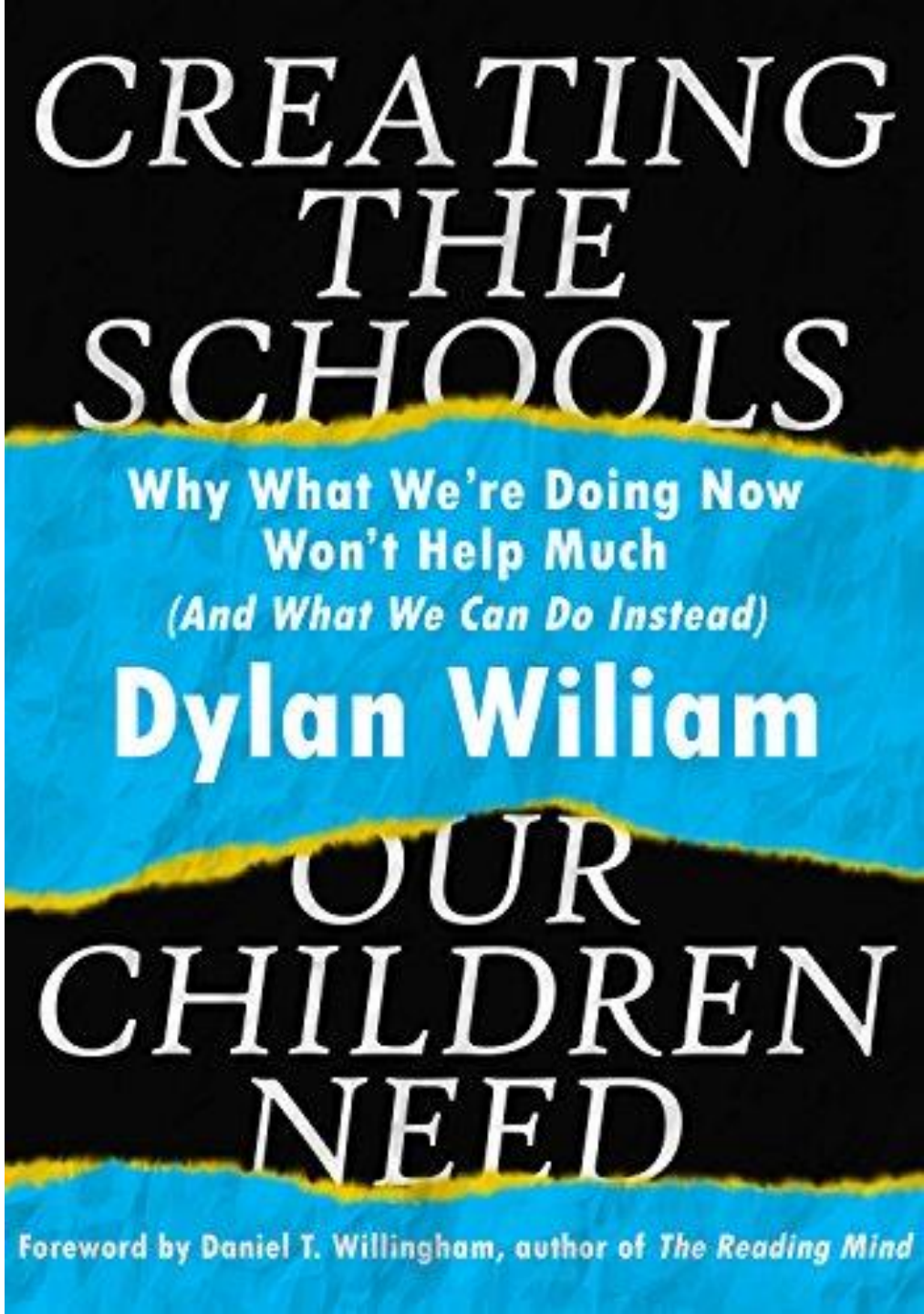
Skills are knowledge in action

POWER UP

Knowledge-based | skills-orientated

POWER UP

"The purpose of the curriculum is to **build up the content of long-term memory** so that when students are asked to think, they are able to think in more powerful ways."



POWER UP

Content clarity is crucial

POWER UP

Clearer learning intentions

Clearer success criteria

Clearer assessment

POWER UP

We are learning about the structure of an atom, *specifically* to **know about**:

- The sub-atomic particles that make up atoms.

We are learning to separate mixtures, *specifically* to **be able to**:

- Separate an insoluble substance from water.

POWER UP

1. Complete the experiment that we started in the previous lesson.

2. Answer all of the questions on page 60.

3. Take part in a group activity to investigate factors that affect dissolving.

POWER UP

Common Pitfalls

Not being clear in our own minds…

1. What we want students to learn.

2. What evidence we need to see (or hear) to be sure this learning is happening.

POWER UP

Produce a **tourist information leaflet** about attractions along the river Nile.

Students are given:

- information sheet
- range of starter sentences
- 30 minutes

What happens?

POWER UP

Most students copy different starter sentences and match them randomly with different facts.

POWER UP

POWER UP

The river Nile looks like a tree


MEDITERRANEAN SEA
BANK
Marsa
Alexandria
Tanta
Port Said
GAZA
ISRAEL
Al Arish
Al Ismailiyyah
Giza
CAIRO
Suez
Sinai
Peninsula
wah
Al Fayyum
Bani
Suwayf
Nile
Gulf of Suez
Gulf of Aden
At Tur
Al Minya
Sharm
el-Sheikh

POWER UP

What, *specifically*, do we want students to **learn**?

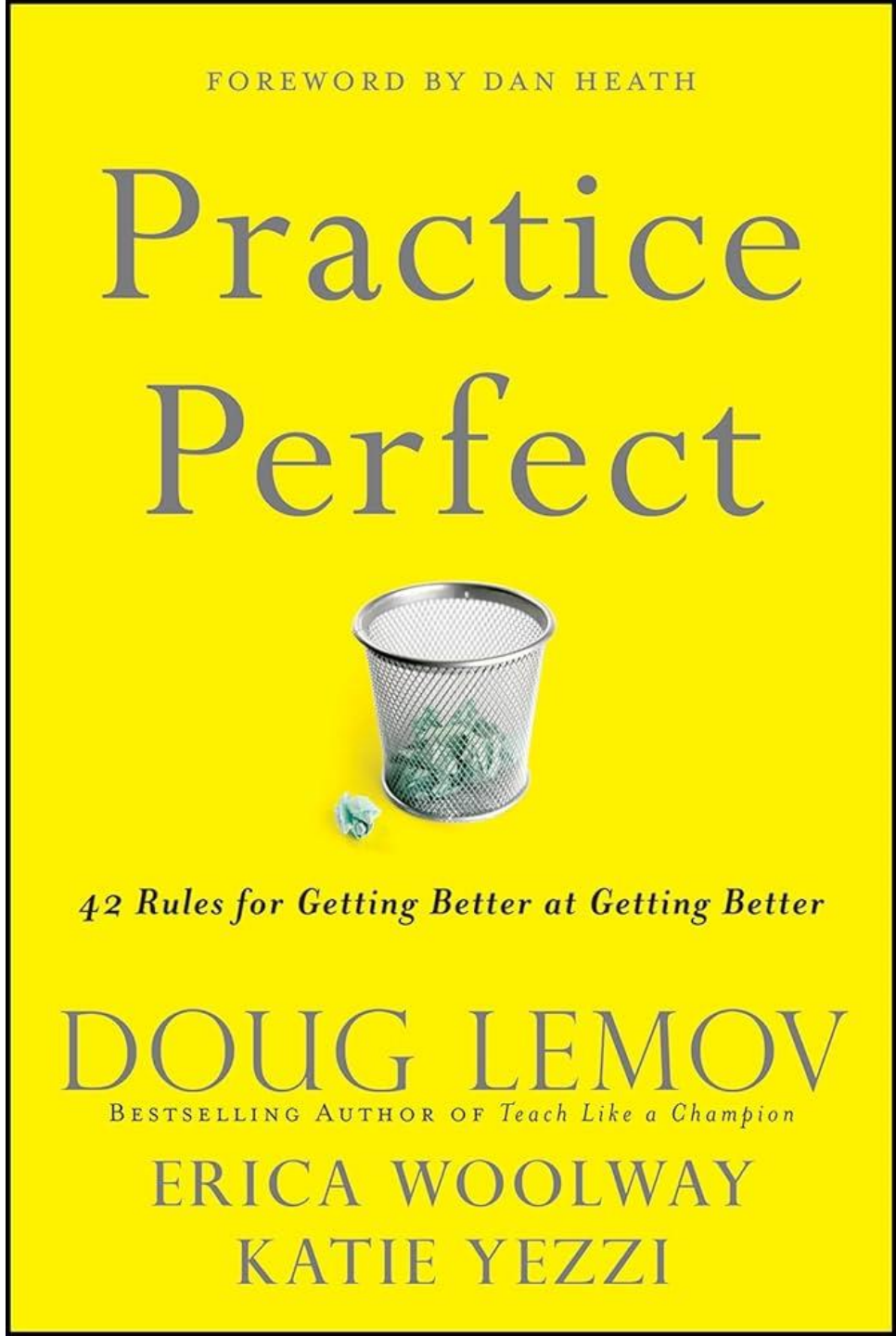
POWER UP

‘Good’ teacher

- 20% LI & SC
- 80% activities

‘Great’ teacher

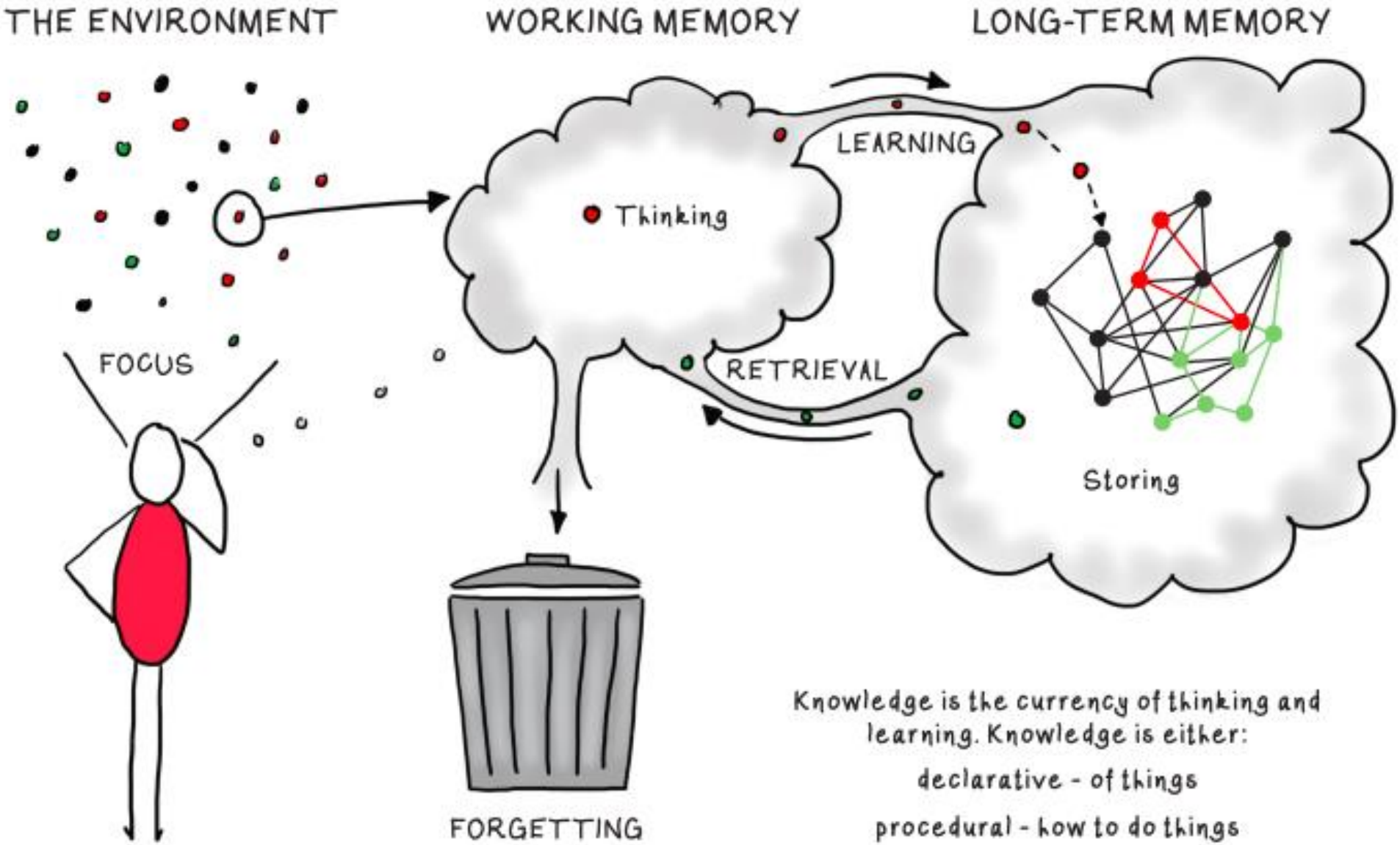
- 80% LI & SC
- 20% activities



POWER UP

1

LEARNING IS THE DEVELOPMENT OF LONG-TERM MEMORY THROUGH THE ACCUMULATION OF KNOWLEDGE.



Knowledge is the currency of thinking and learning. Knowledge is either:

declarative - of things

procedural - how to do things

POWER UP

Key take-away(s)?

POWER UP

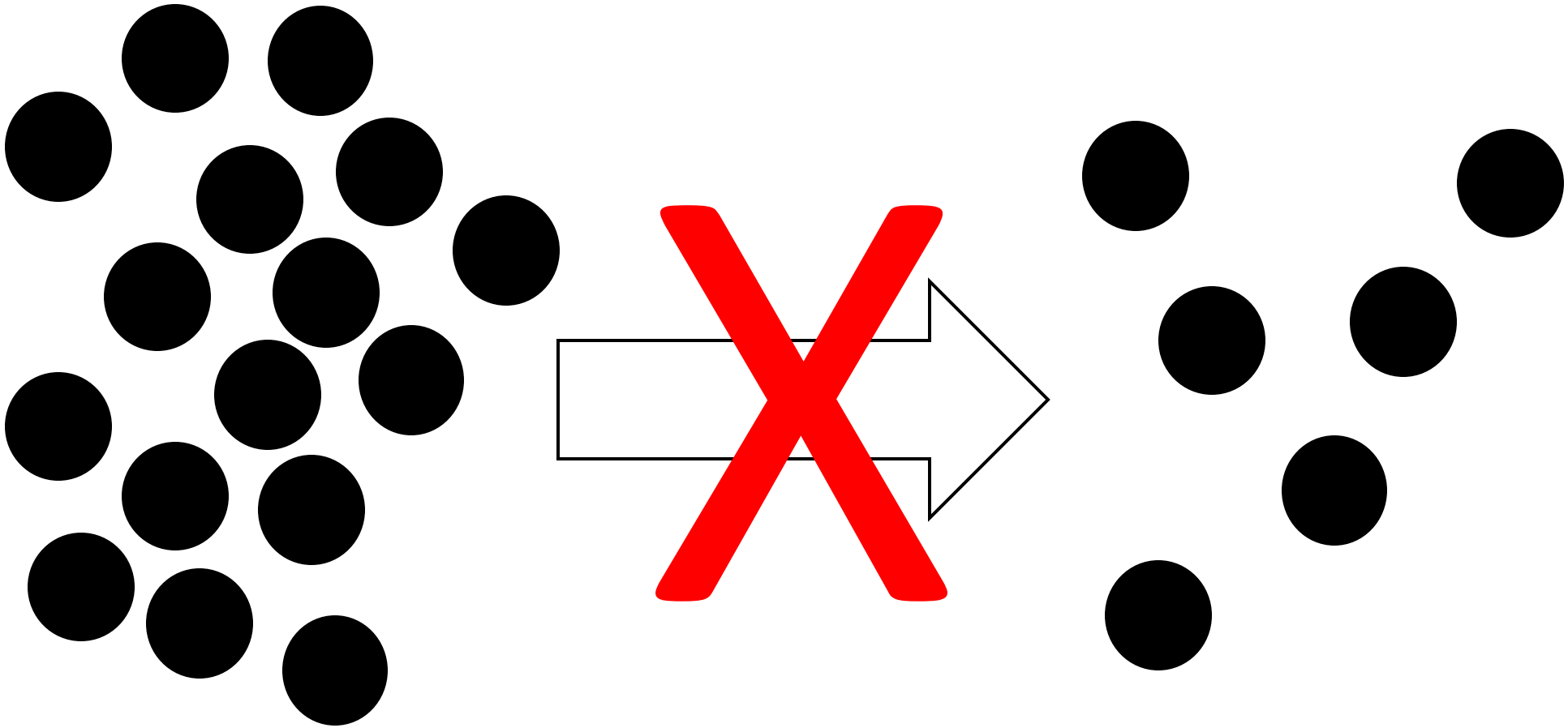
Learning Lesson 2

We learn what we **think about**.

Common Pitfall

Believing that because students have **seen** or **heard** something, they've learned it.

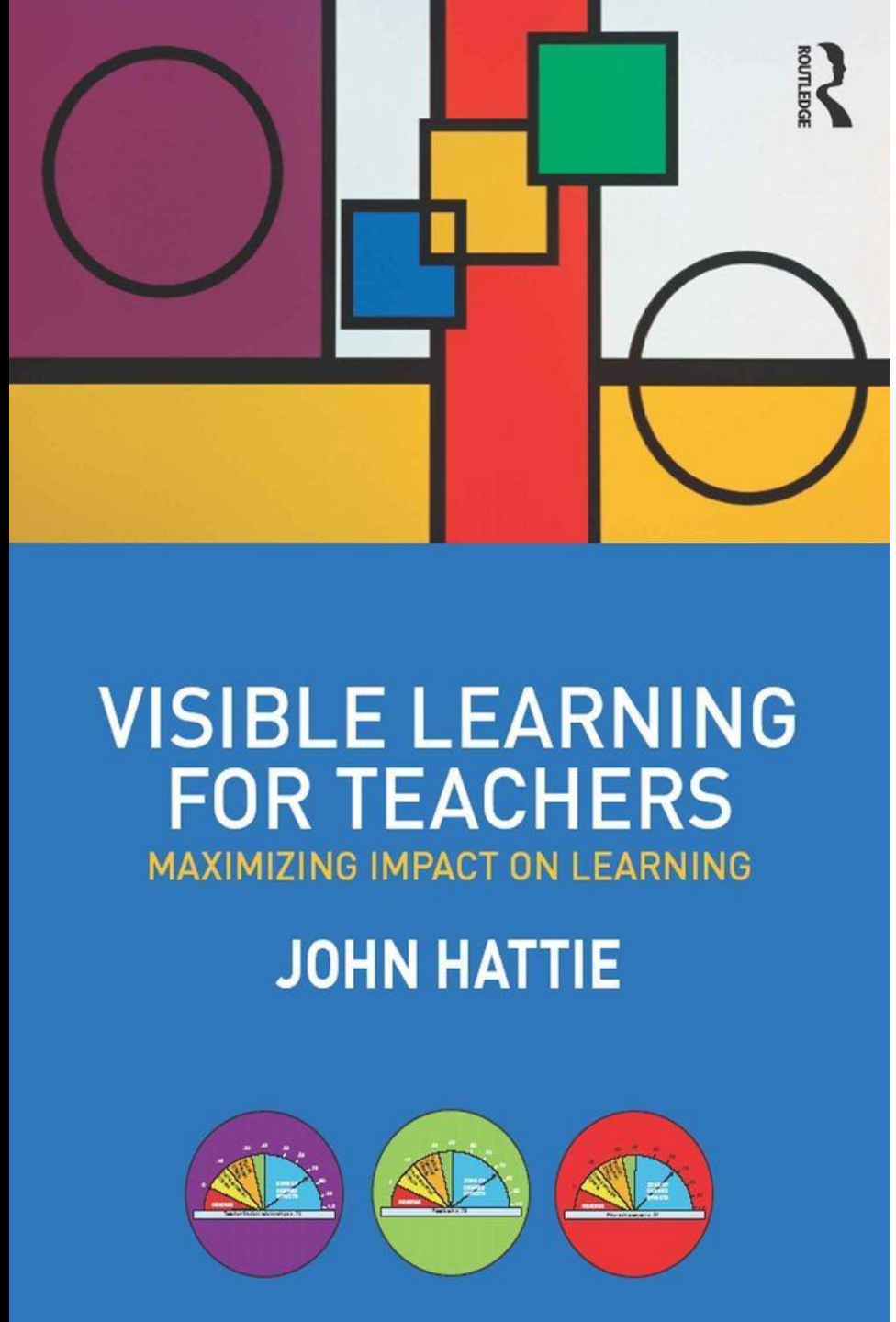
POWER UP



POWER UP

~~Exposure = Learning~~

POWER UP



A *deliberate attempt* to assimilate and accommodate

POWER UP

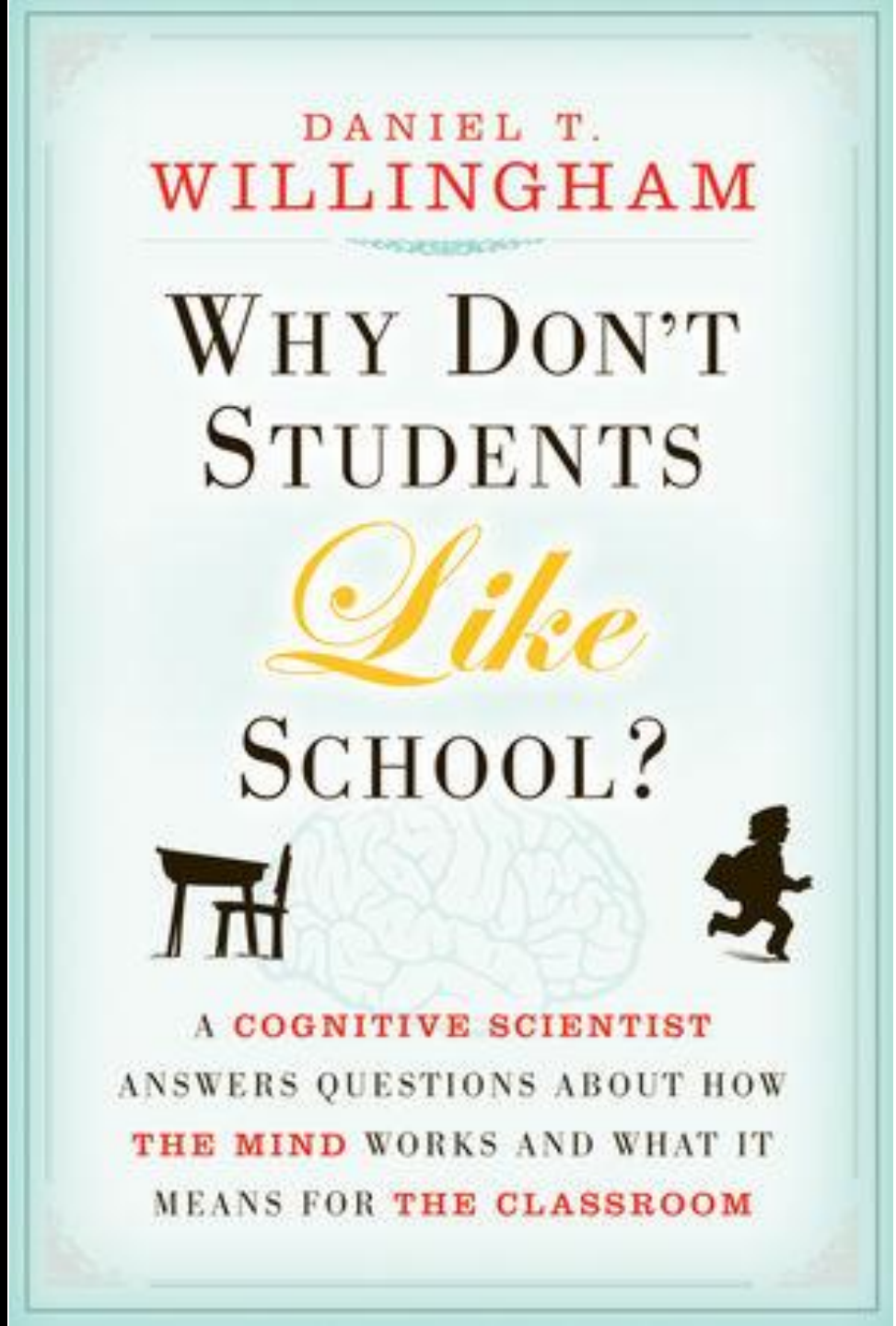
Paying attention is a pre-requisite to learning…

…but there has to be more.

POWER UP

Thinking

POWER UP

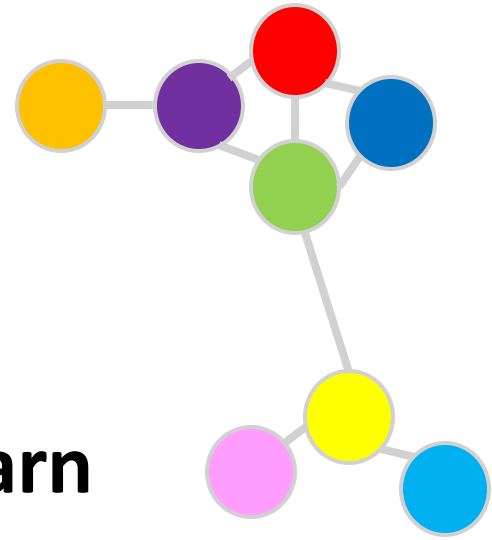


"Memory is the **residue of thought**"

POWER UP

What do we mean by ***thinking***?

Long-term memory



Working memory

Information

Thinking

Learn

Retrieve

Schema

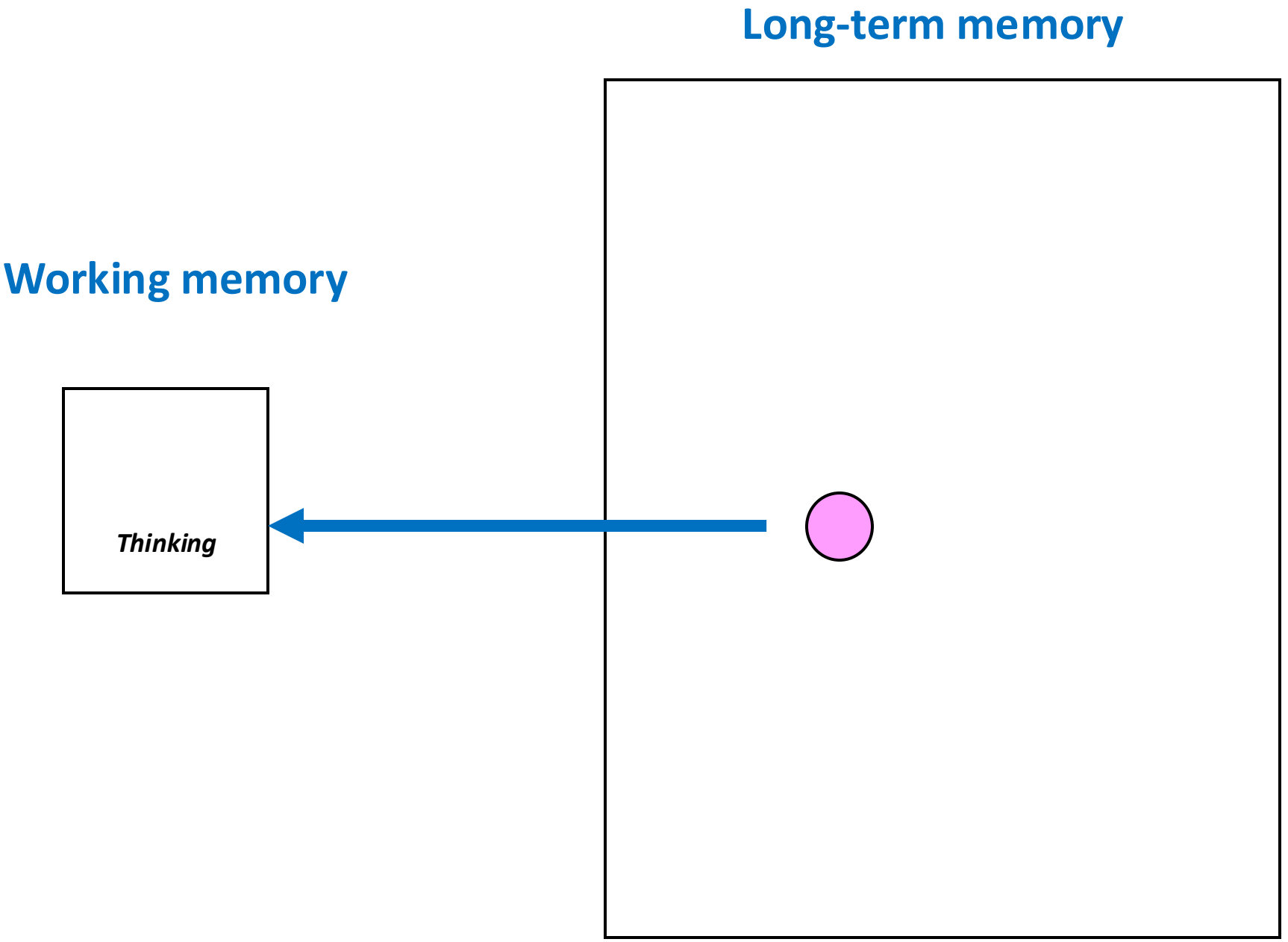
- Declarative knowledge
- Procedural knowledge

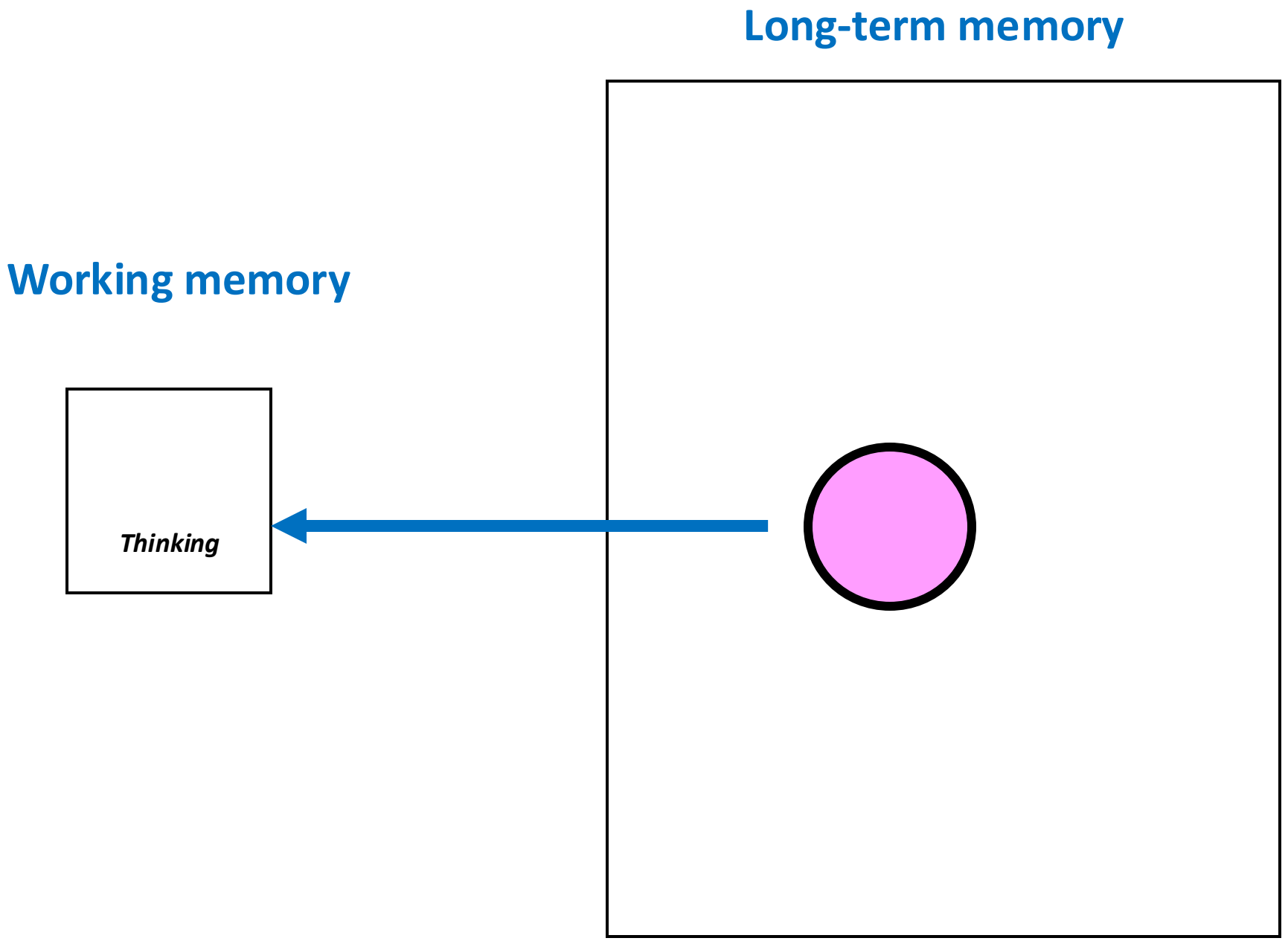
Working memory *in action*

1. Retrieval
2. Combining

‘The Testing Effect’

Retrieval strengthens memory

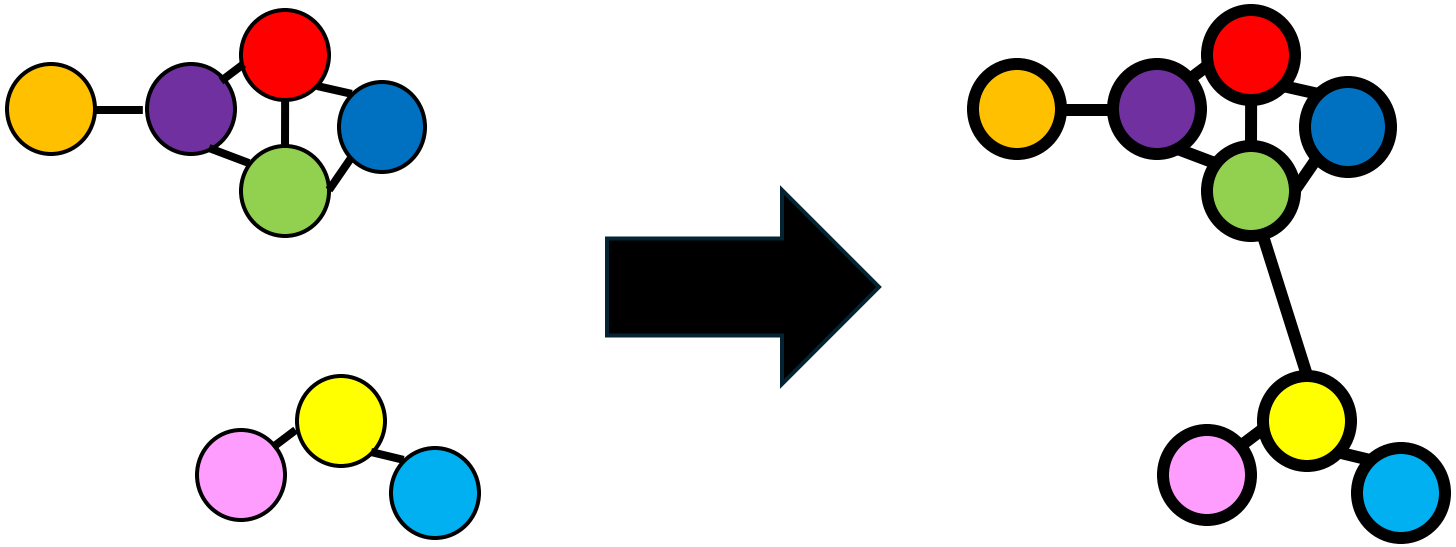

Long-term memory
Working memory
Thinking


Long-term memory
Working memory
Thinking

POWER UP

‘The Generation Effect’

Using knowledge to create something new strengthens memory.



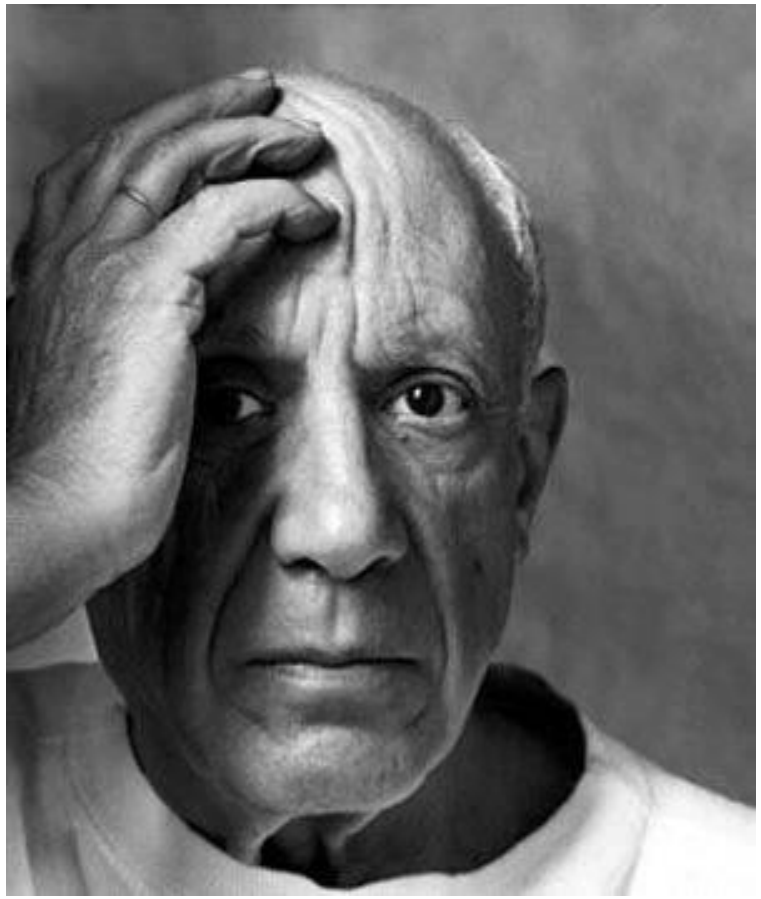
POWER UP

Focus on **thinking**

POWER UP

‘Fun’ and ‘active’

POWER UP



- Students in **groups of four**.
- **Four stations**, each with different information.
- Everyone in each group goes to a **different station** to **read information** and then **report it back** to their group.
- The group **makes a poster** to summarise what they've learned.

POWER UP

Did you enjoy it?

"Not really."

"It was boring."

"Why couldn't the teacher just tell us about Picasso?!"

What did you learn?

"Nothing."

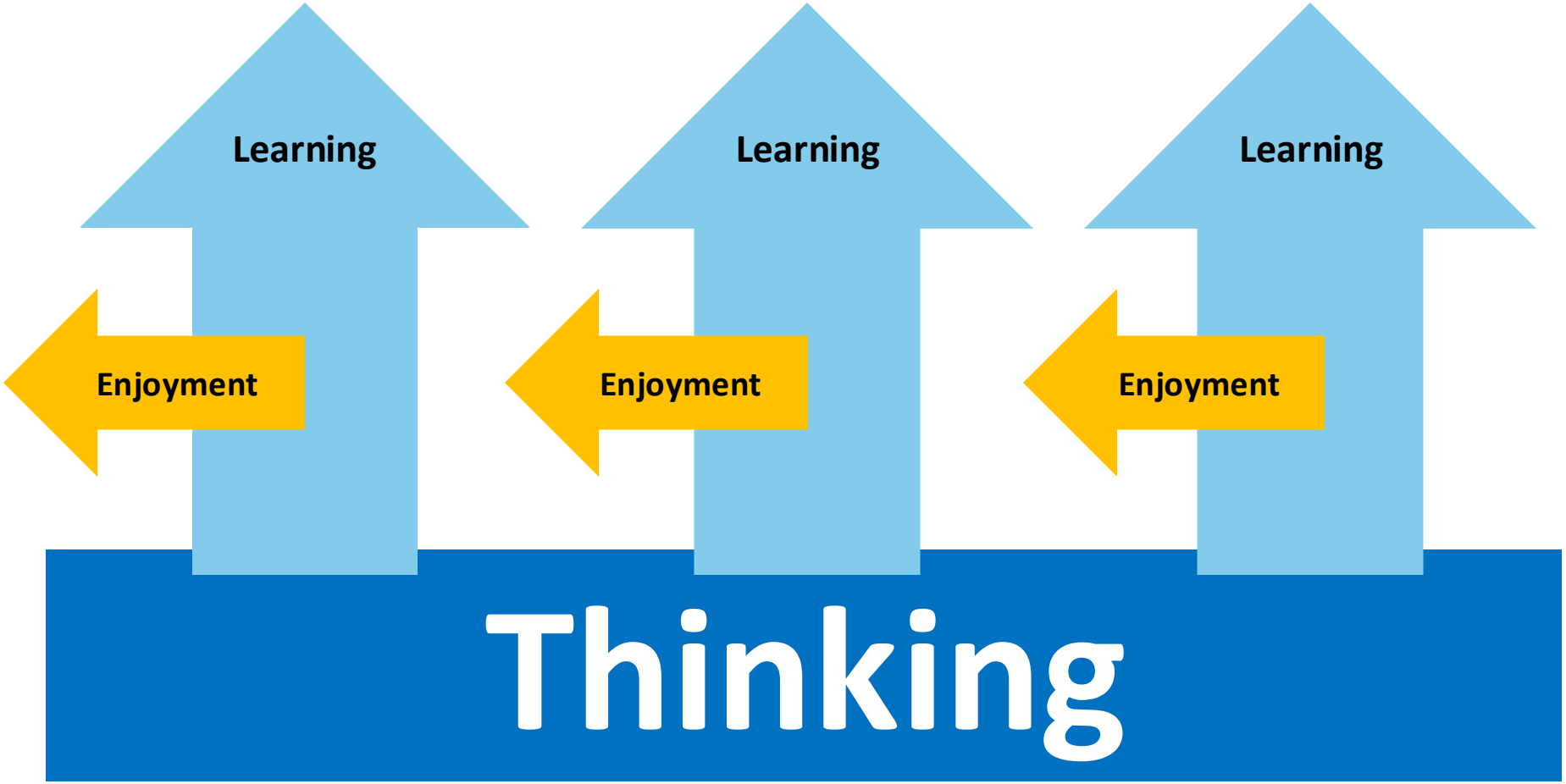
"I can't remember."

"Picasso was a painter."

~~Activity-based | fun-orientated~~

POWER UP

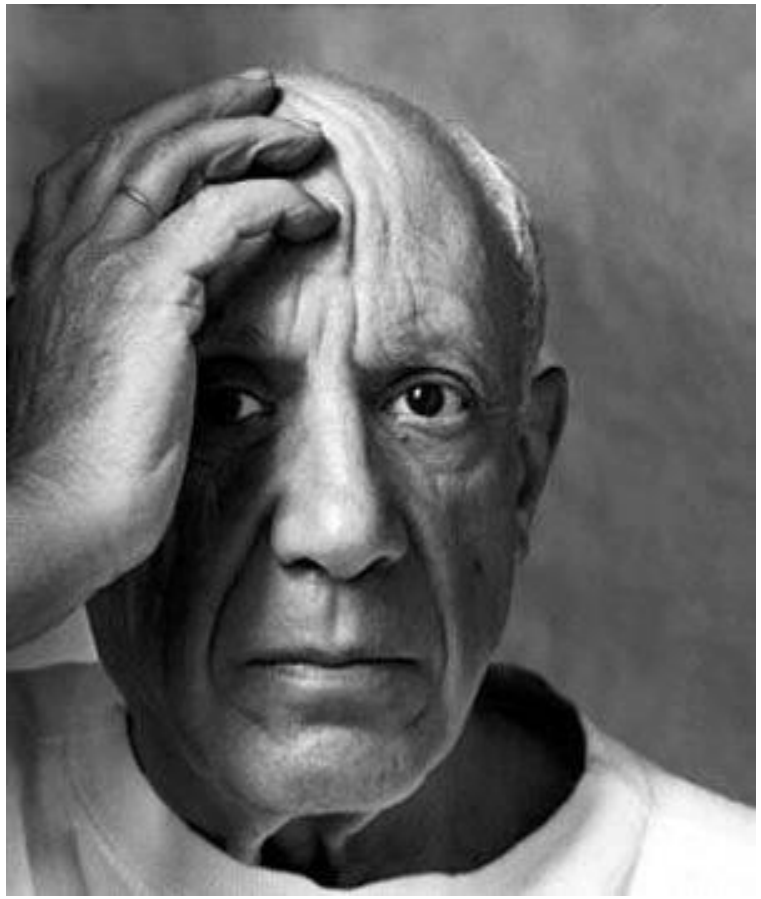
Thinking-based | learning-orientated



POWER UP

POWER UP

POWER UP



Better teaching approaches?

(We'll come back to that.)

POWER UP

Key take-away(s)?

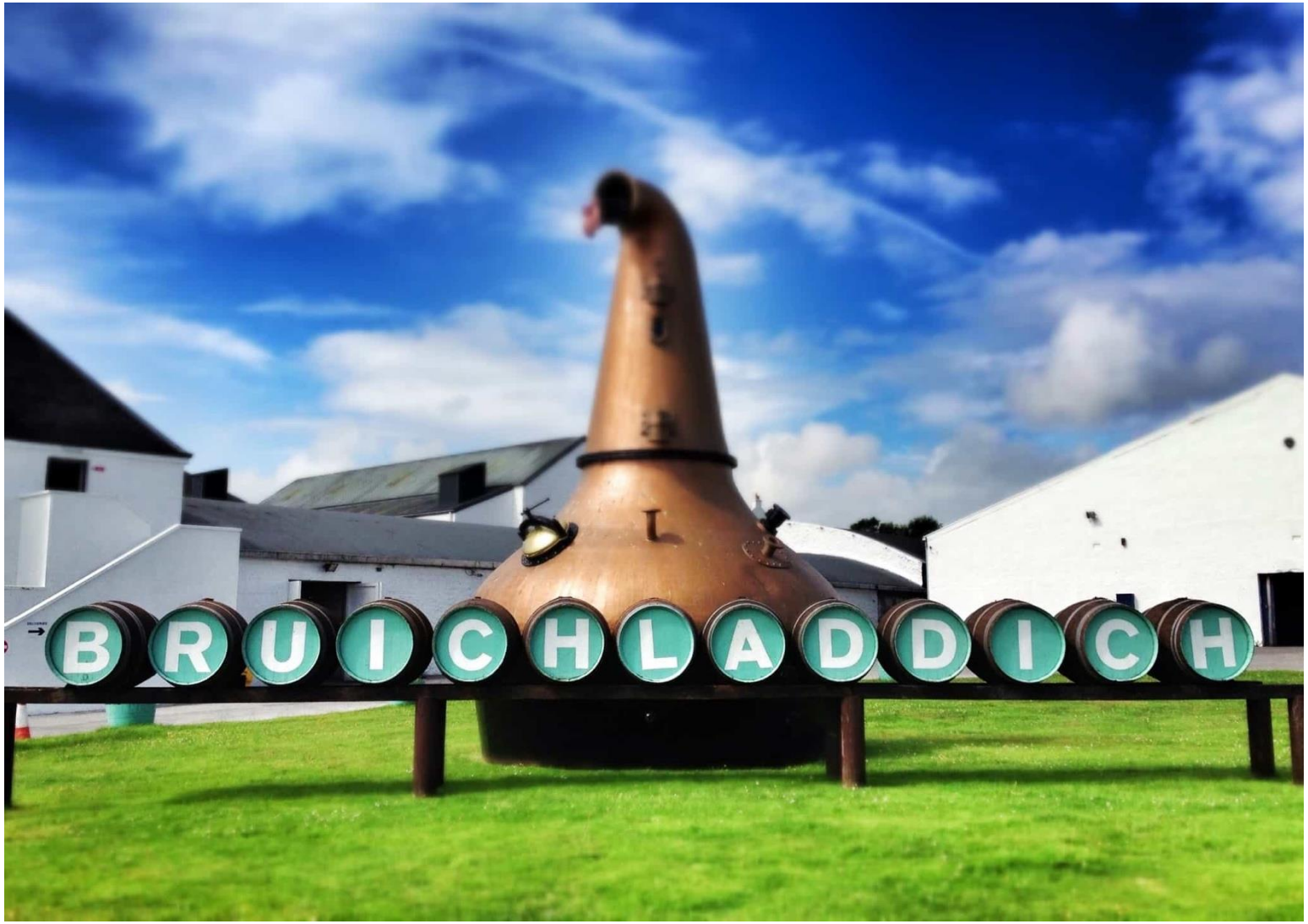
POWER UP

Learning Lesson 3

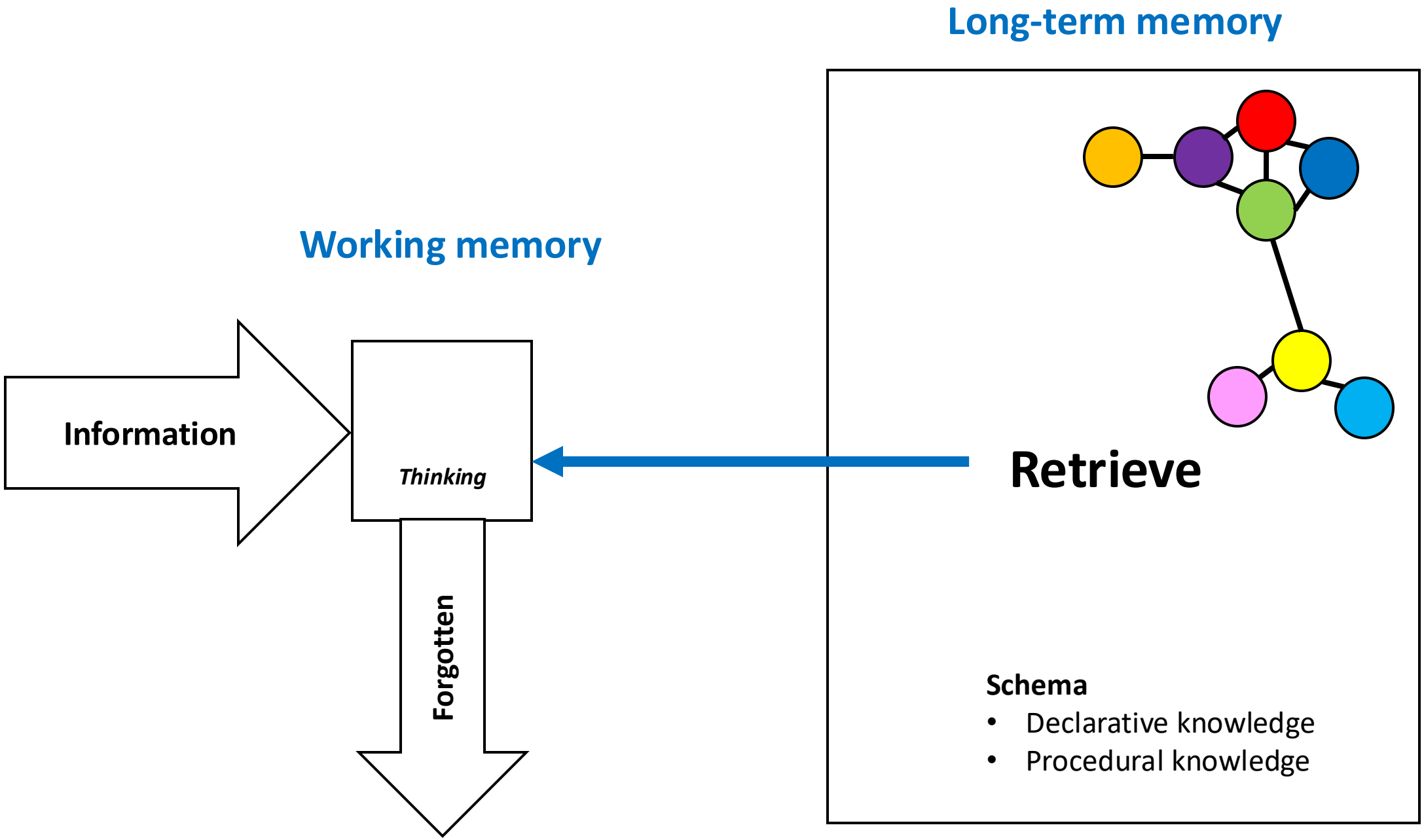
Novices and **experts** think and learn differently**.**

POWER UP

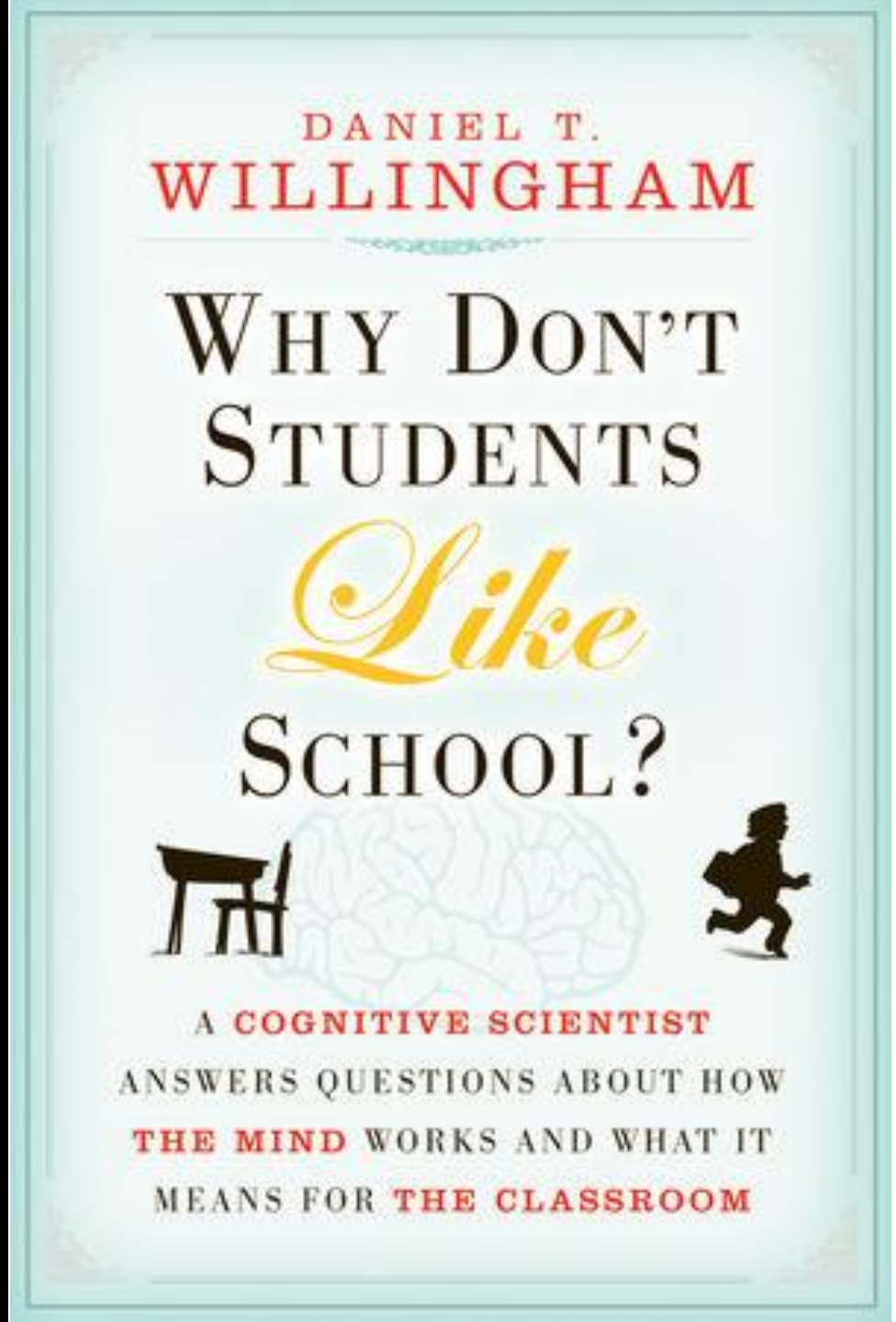
?



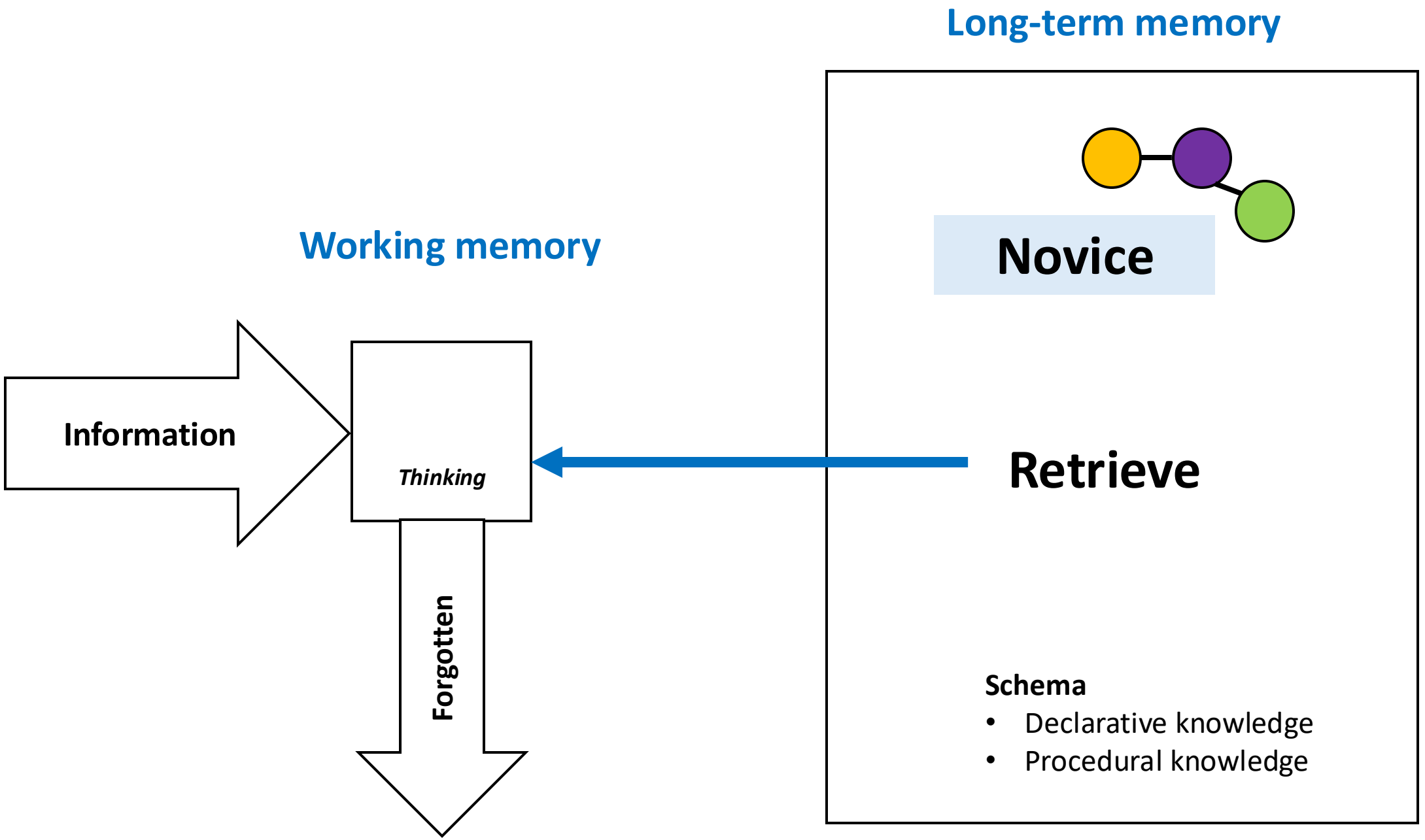
What do you see?

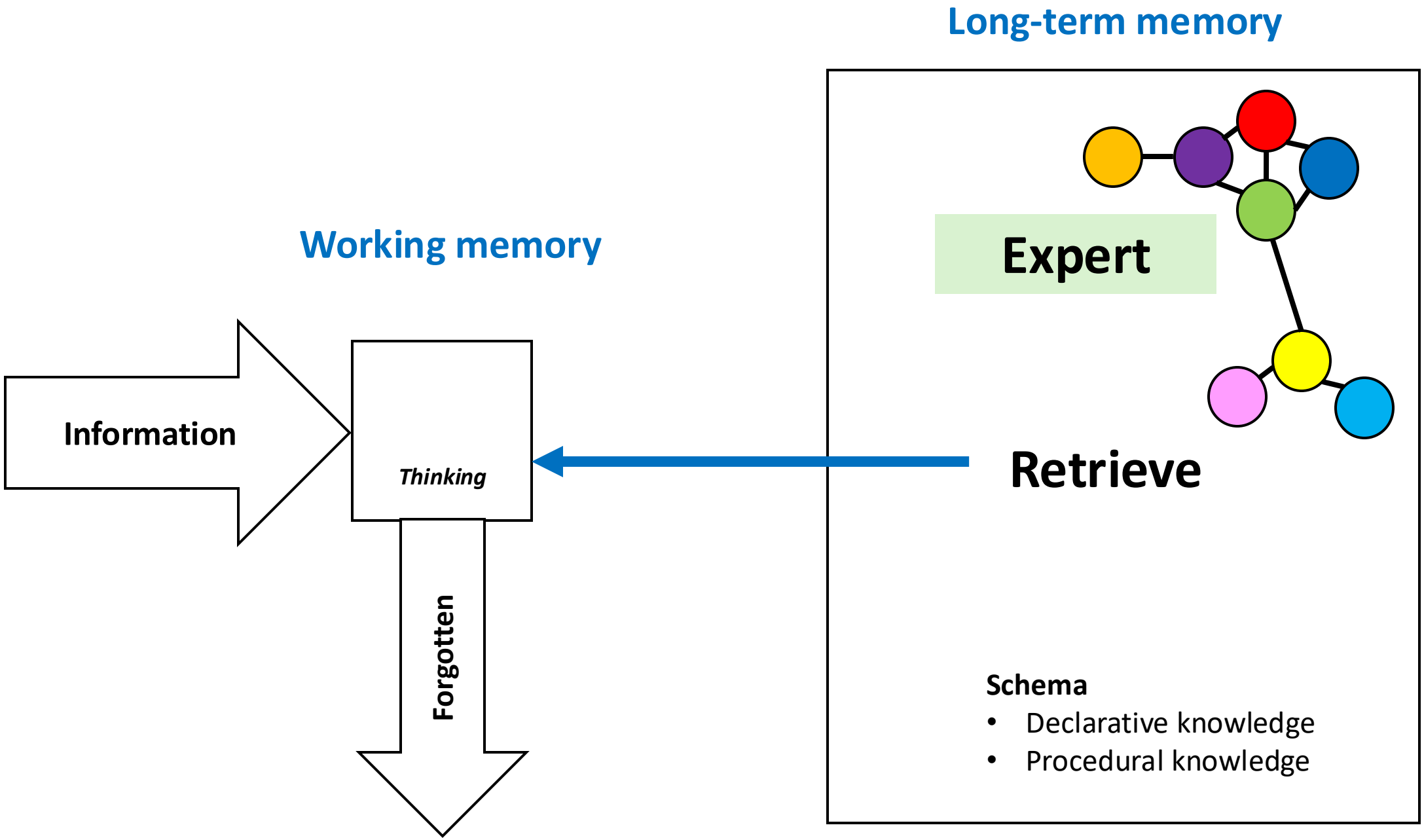

Long-term memory
Working memory
Information
Thinking
Forgotten
Retrieve
Schema
• Declarative knowledge
• Procedural knowledge

POWER UP



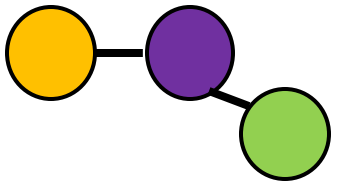
"Understanding is **remembering in disguise**"


Long-term memory
Working memory
Novice
Information
Thinking
Retrieve
Forgotten
Schema
• Declarative knowledge
• Procedural knowledge

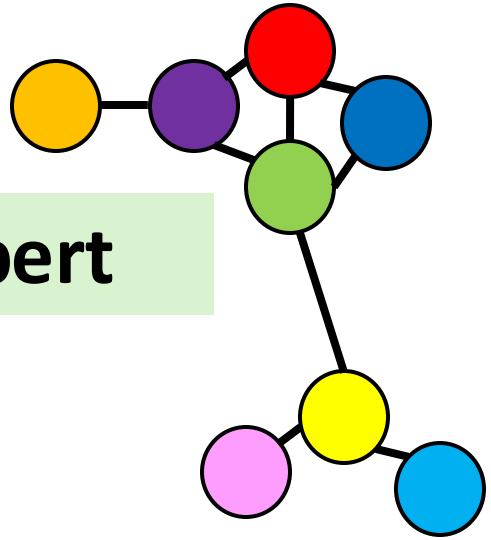

Long-term memory
Working memory
Expert
Information
Thinking
Retrieve
Forgotten
Schema
• Declarative knowledge
• Procedural knowledge

POWER UP

Novice



Expert



Differences in schema…

→ Novices ***think differently*** to experts.

→ Novices should be ***taught differently*** to experts.

POWER UP

Teacher-led pedagogy

Student-led pedagogy

POWER UP

‘Drill and kill’

‘Chalk and talk’

‘Rote memorisation’

‘Experiential learning’

‘Discovery learning’

‘Project-based learning’

POWER UP

‘The past half century of empirical research has provided overwhelming and unambiguous evidence that, **for everyone but experts, partial guidance during instruction is significantly less effective and efficient than full guidance**.’

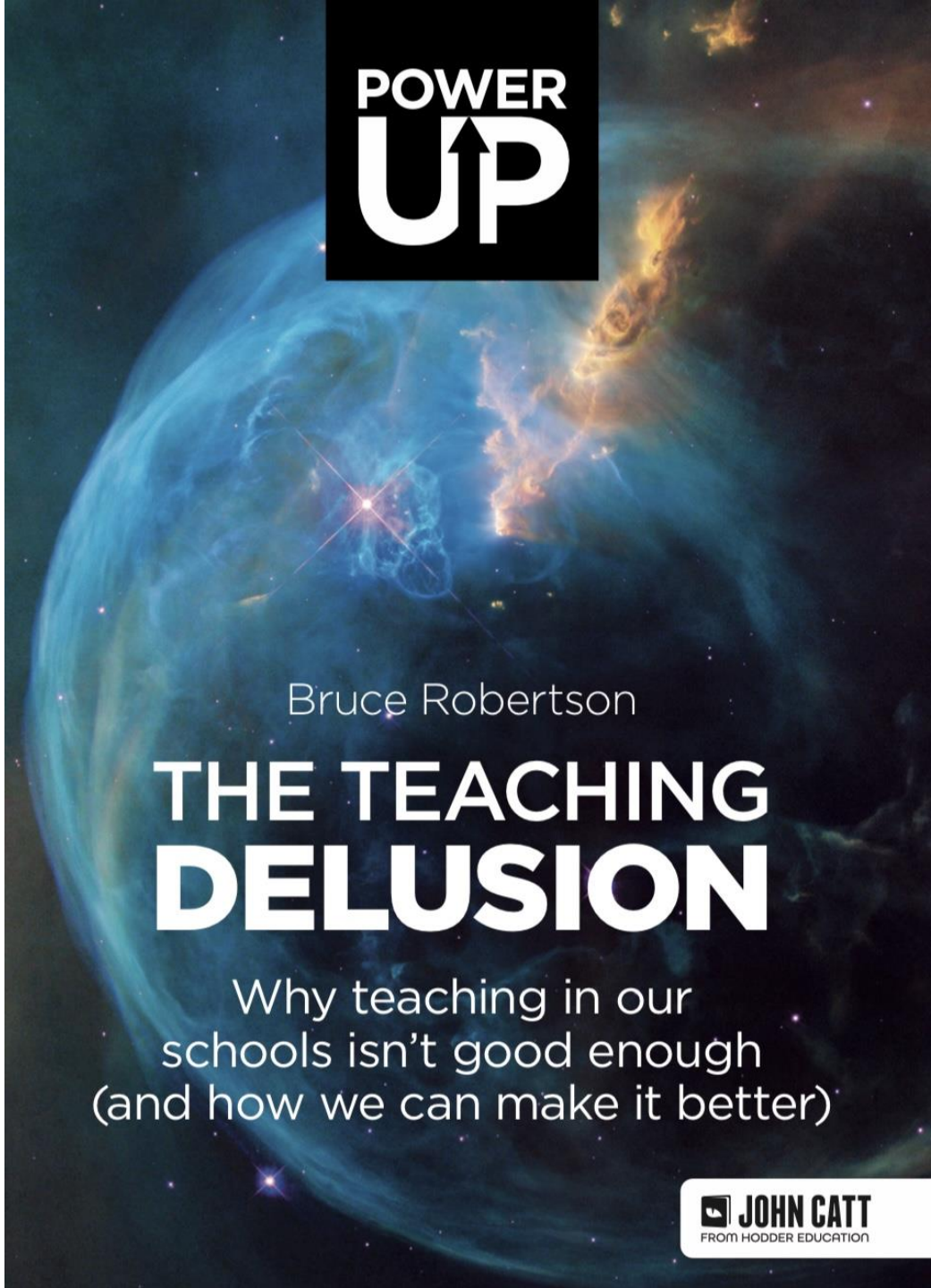
Clark, R.E. et al. (2012) ‘Putting Students on the Path to Learning’

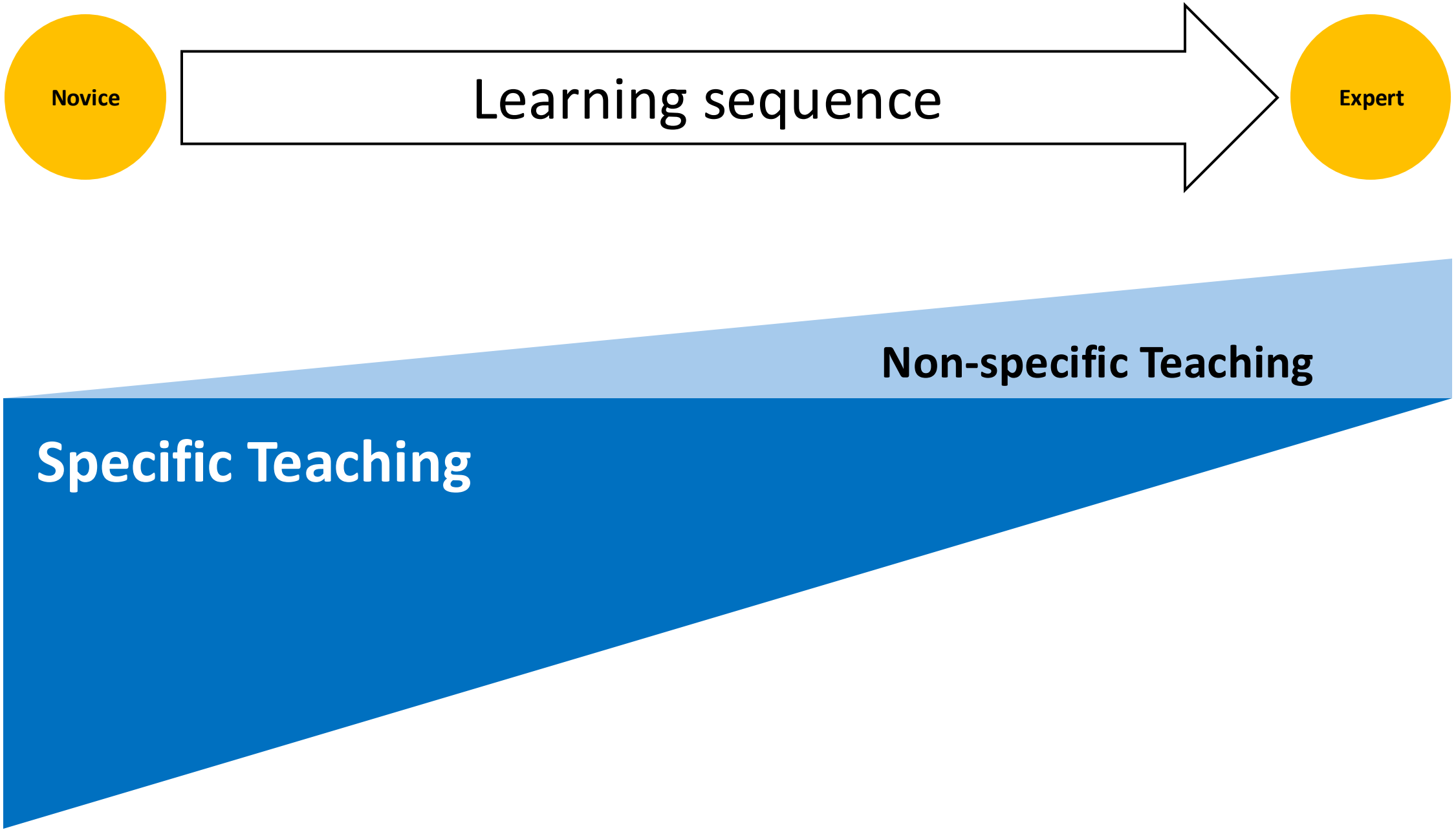
Specific Teaching

- Direct-interactive instruction
- Formative assessment

Non-specific Teaching

- Open-ended application and extension
- Choice




Novice
Learning sequence
Expert
Non-specific Teaching
Specific Teaching

Example 1

Students are learning about the different ways electricity is generated. This includes nuclear power stations and wind turbines. They are taught this using **Specific Teaching** pedagogies (direct-interactive instruction and formative assessment) before being asked to debate each type. The debate is **Non-specific Teaching**. Students must apply their learning, which helps evidence and consolidate it.

Example 2

Students are being taught how to create 3D images using a computer program. The teacher has created a pre-recorded video that students can watch themselves, at their own pace. Although they aren't interacting with the class in real time, the teacher is still leading the learning. The teacher circulates the room, offering specific feedback. Periodically, they pause the class to give whole-class feedback messages. This is **Specific Teaching**.

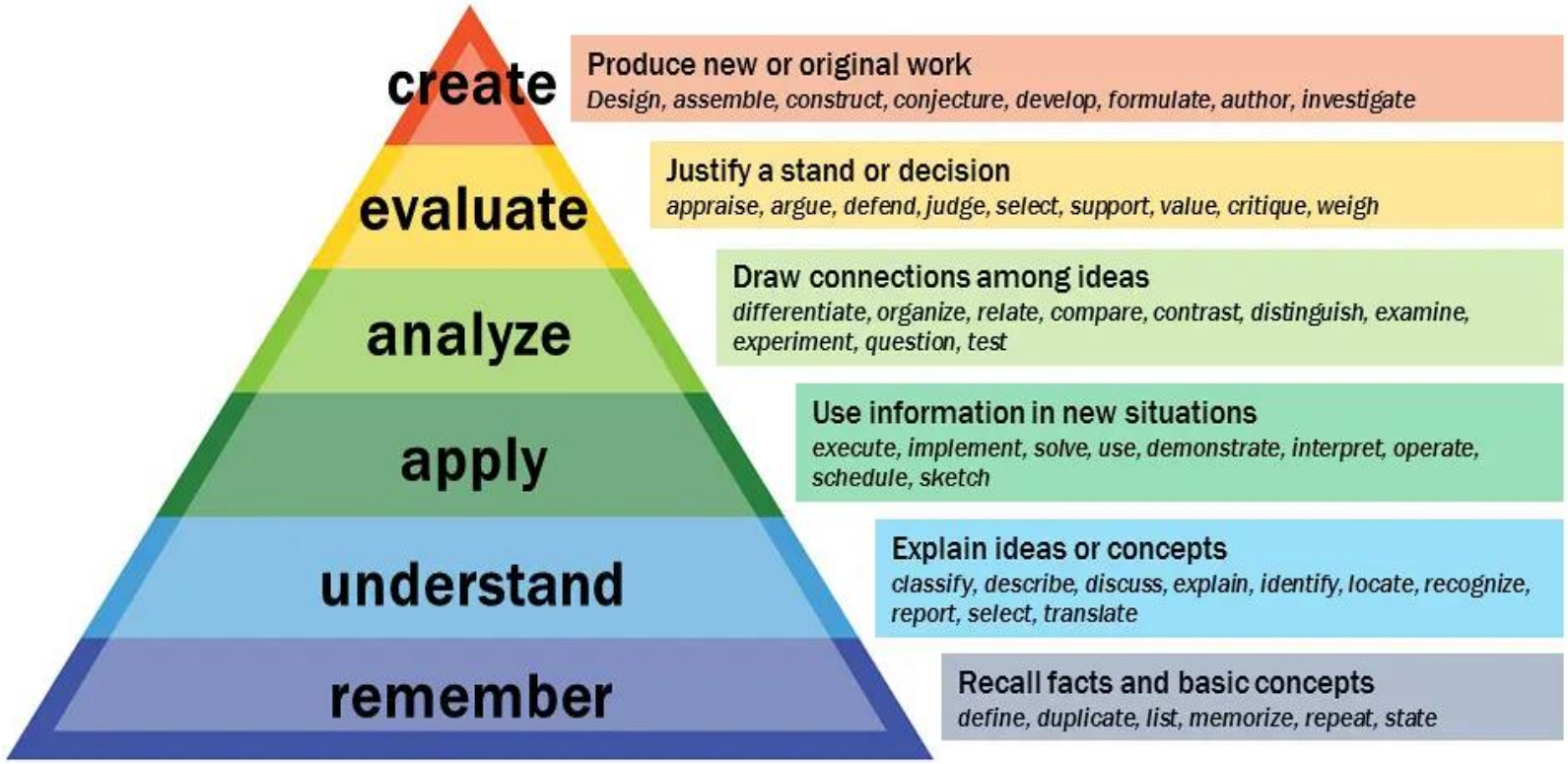
Once students have completed this, they are asked to create their own shape, but this time without looking at the video. This is an opportunity for them to enrich, consolidate and extend their learning. It is **Non-specific Teaching**. This can't happen without a secure knowledge base to draw on.

Example 3

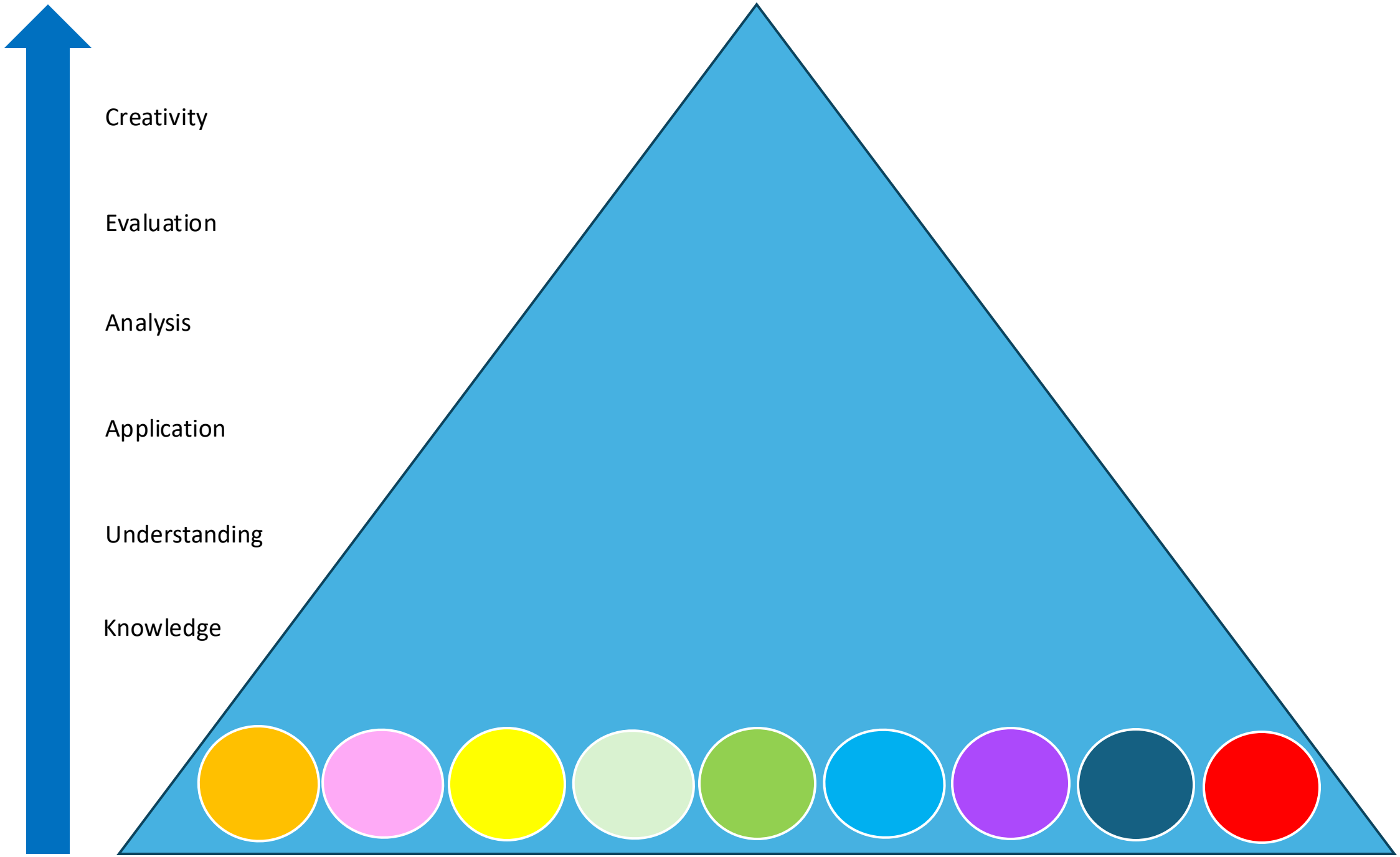
A series of lessons has been used to teach students the principles of quantum mechanics, using **Specific Teaching** pedagogies. Over the next two lessons, they are asked to work in groups to design a game, the rules of which must follow quantum mechanics principles. This is **Non-specific Teaching**. It both consolidates and enriches learning. By drawing on a secure knowledge base, students are able to be creative in a meaningful way, not a tokenistic one. The teacher is blown away by the quality and ingenuity of what students produce.

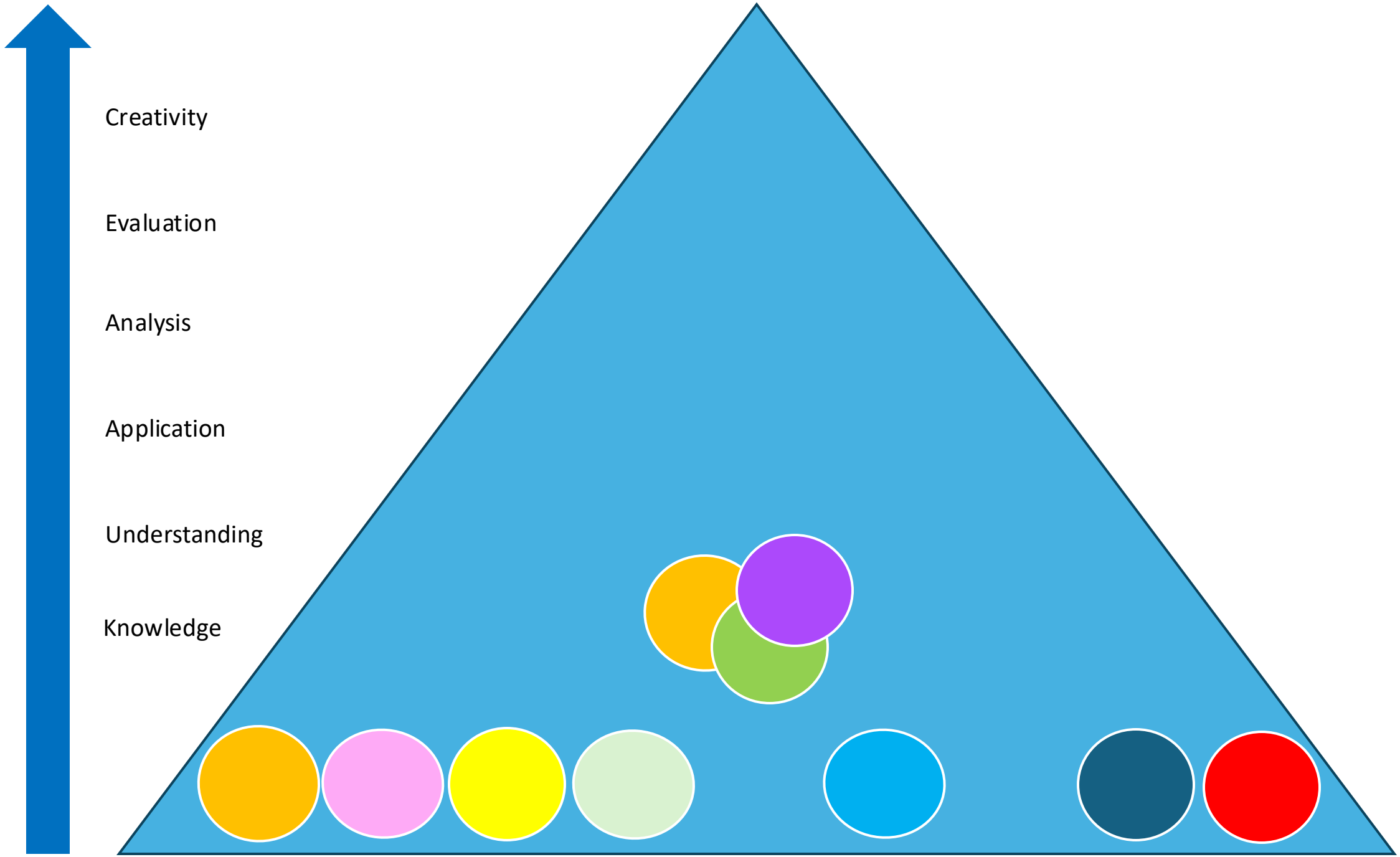
POWER UP

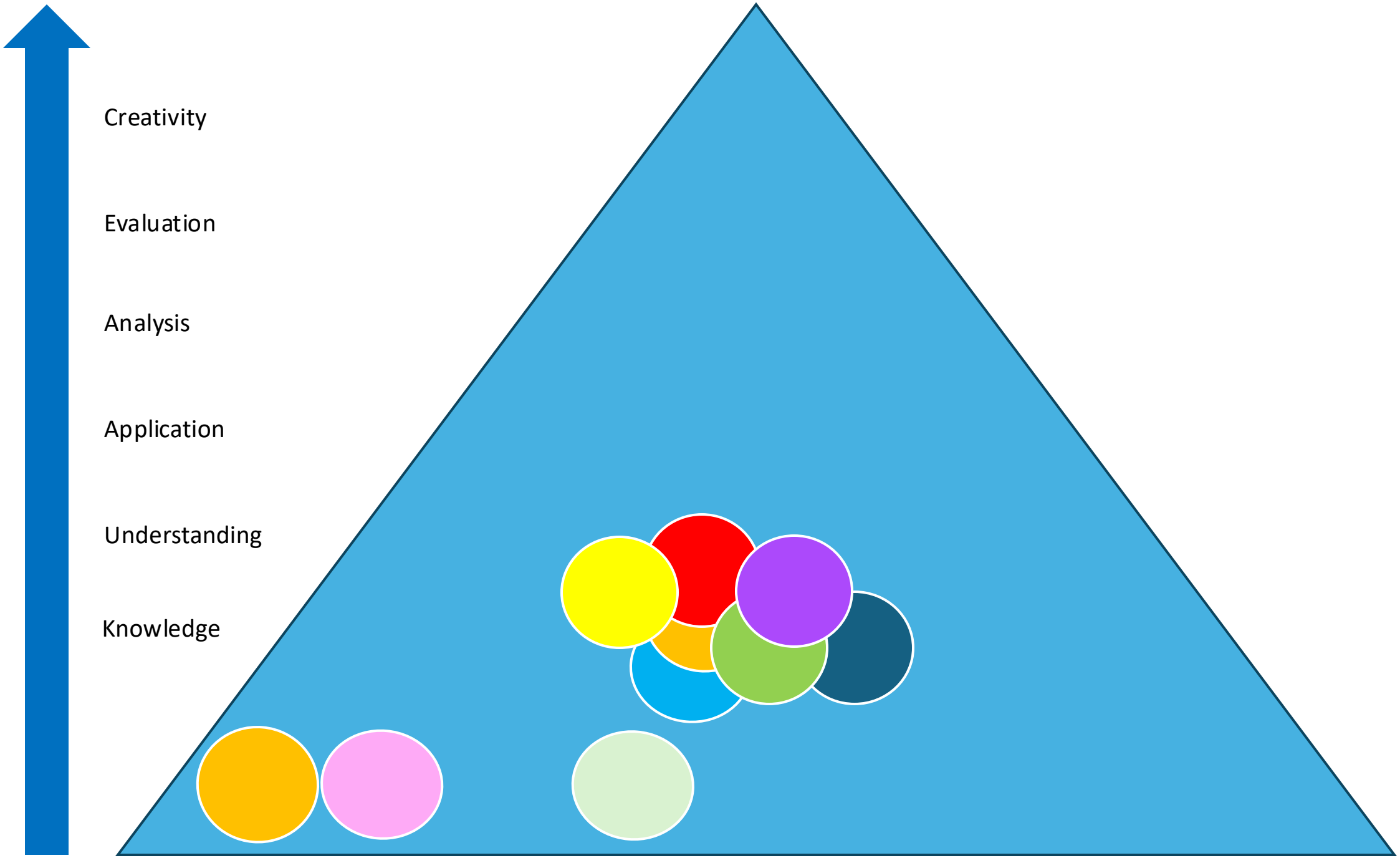
?

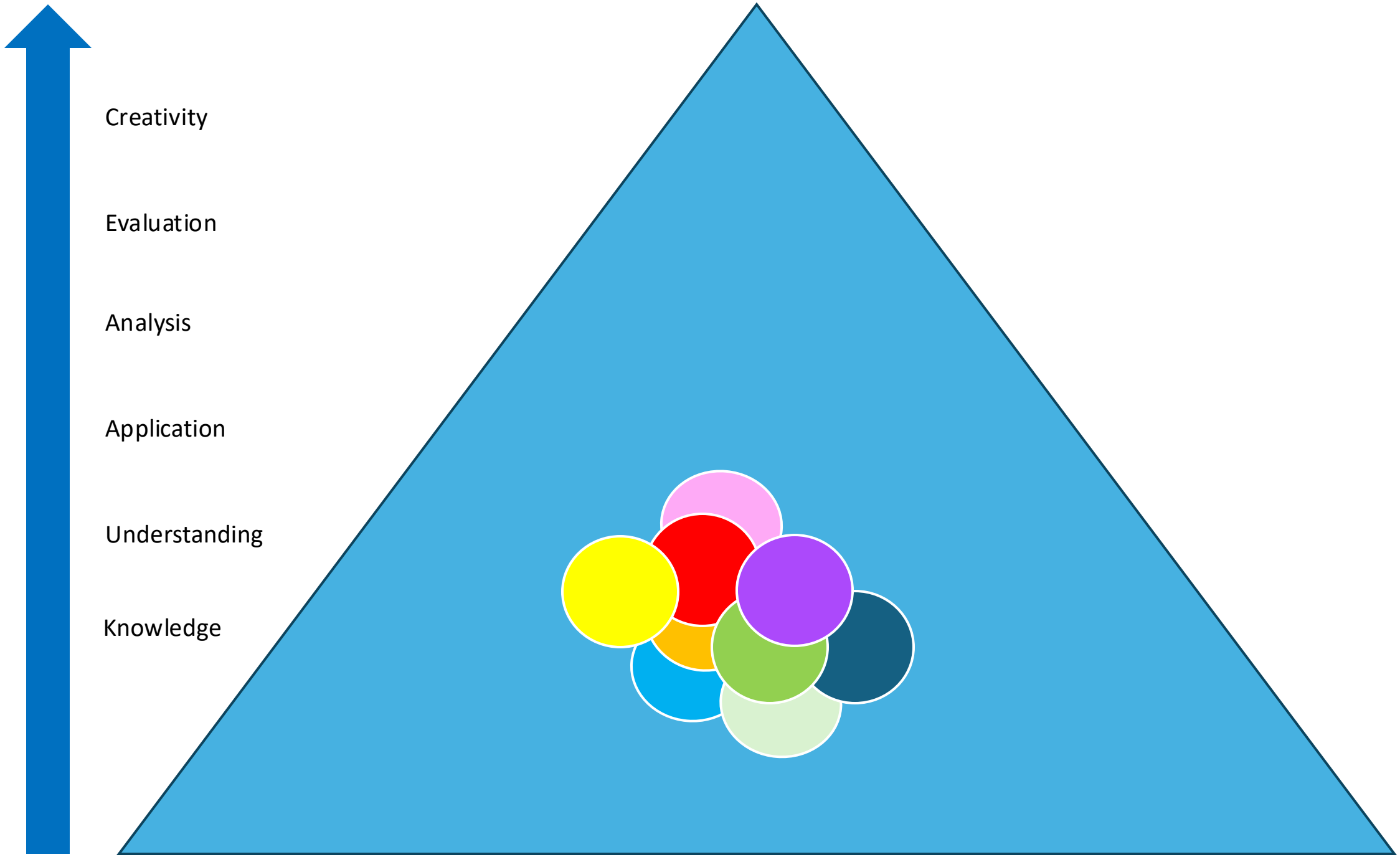


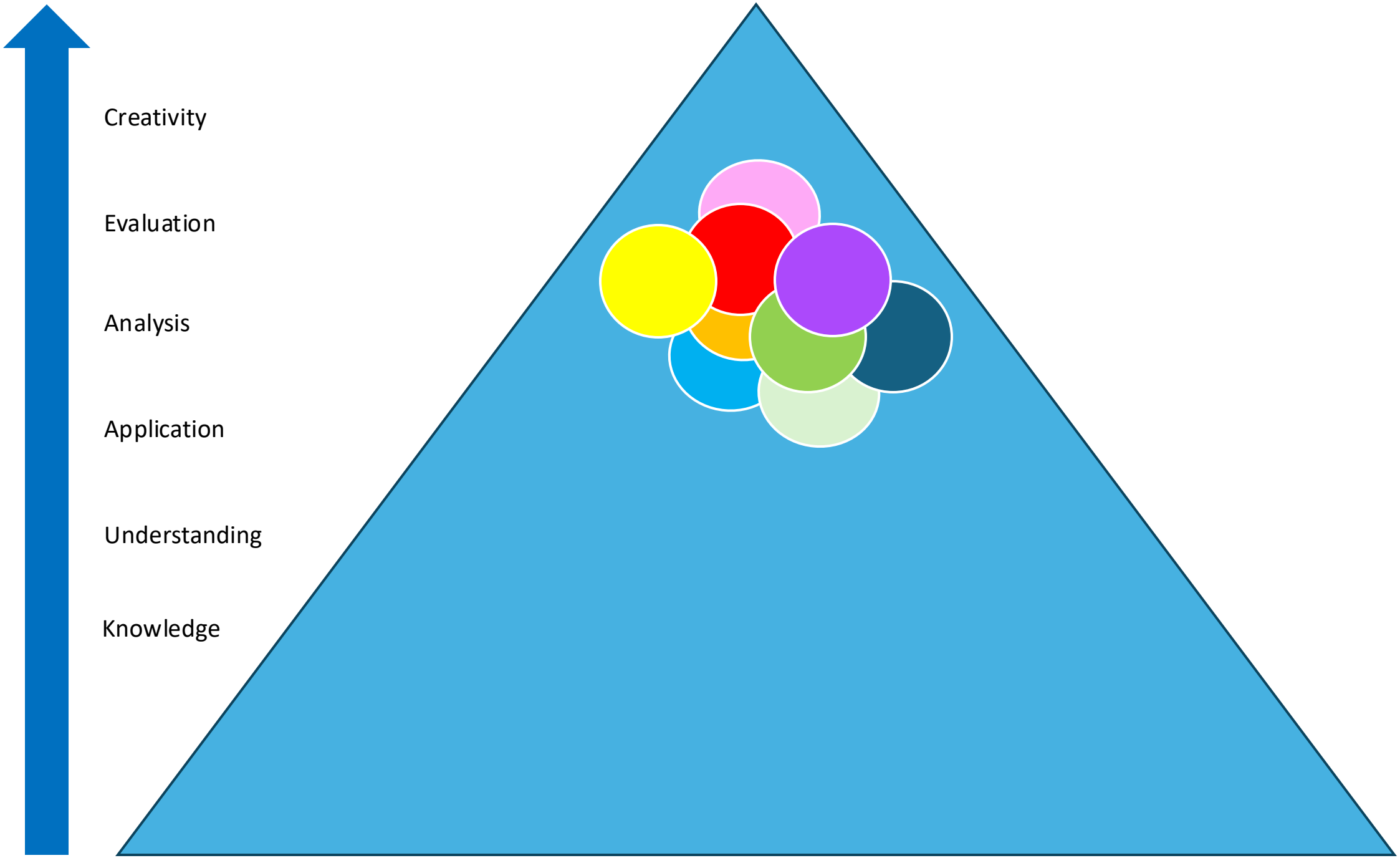
What do you see?


Creativity
Evaluation
Analysis
Application
Understanding
Knowledge


Creativity
Evaluation
Analysis
Application
Understanding
Knowledge

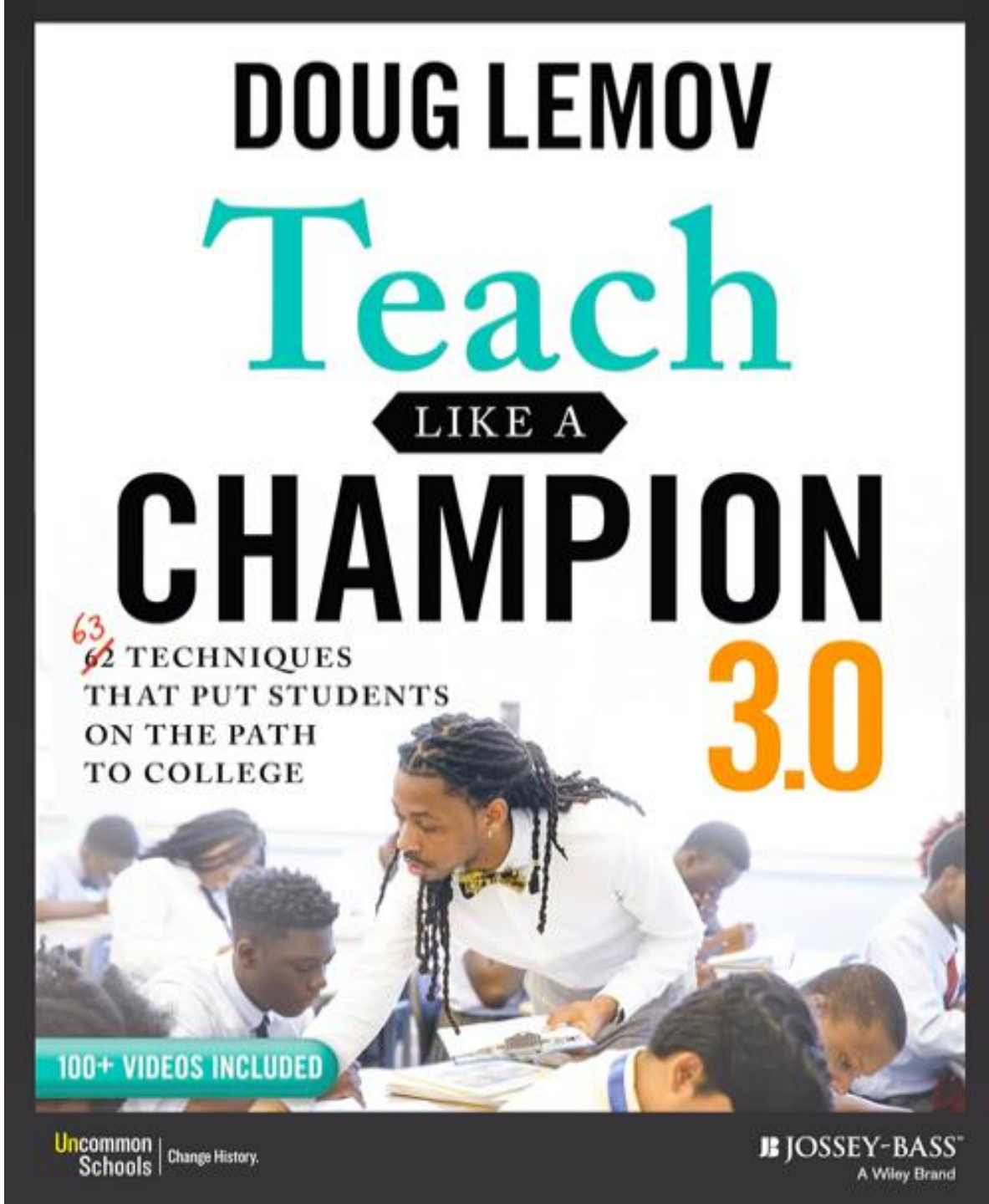

Creativity
Evaluation
Analysis
Application
Understanding
Knowledge


Creativity
Evaluation
Analysis
Application
Understanding
Knowledge


Creativity
Evaluation
Analysis
Application
Understanding
Knowledge

POWER UP

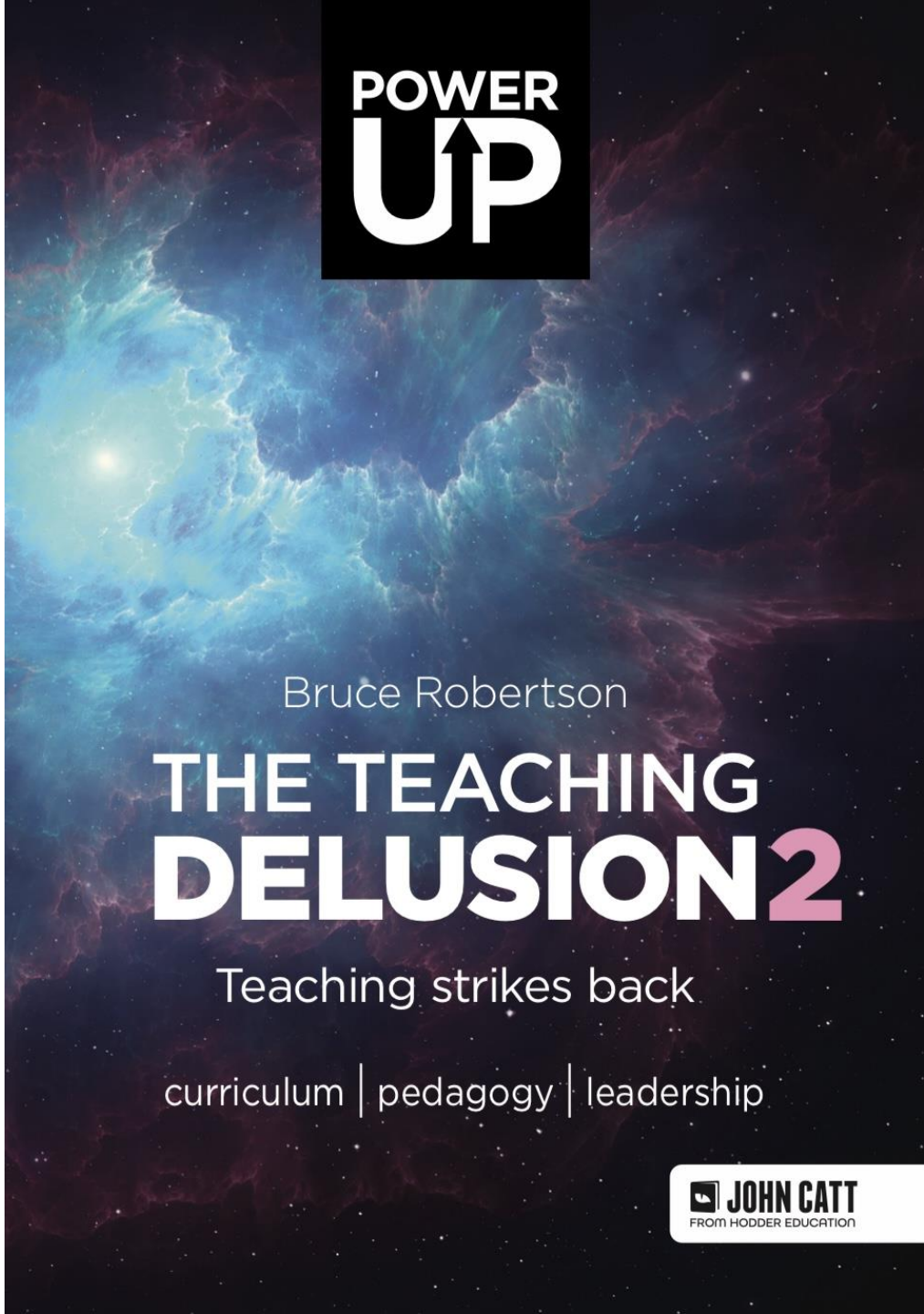
"You can think deeply only about things you know something about – the more you know, the more deeply and creatively."



POWER UP

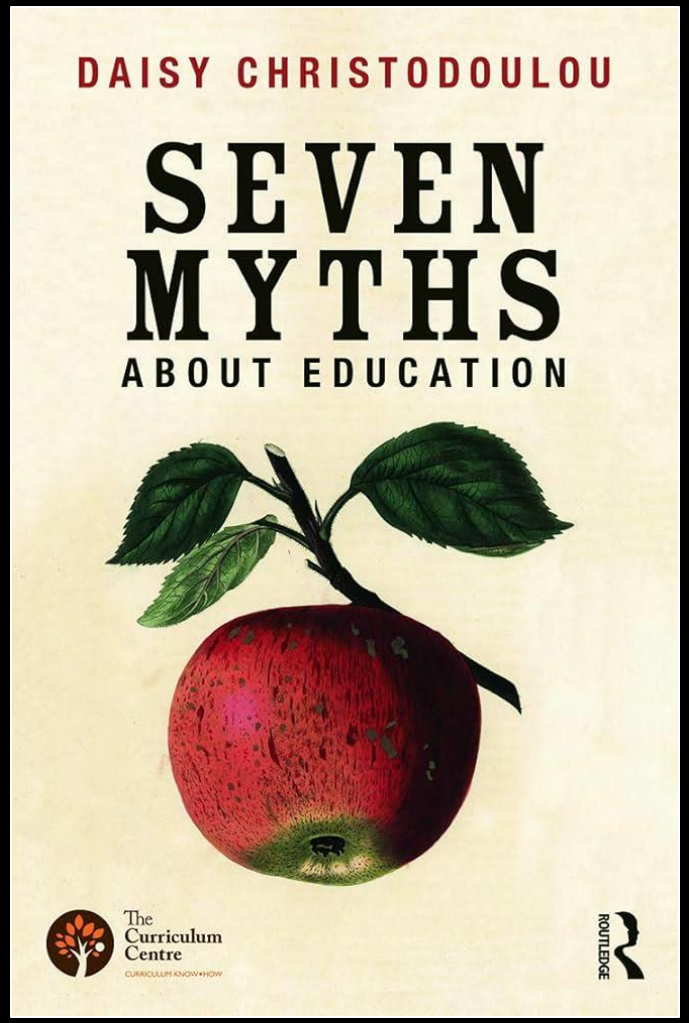
"Teaching students a **broad, deep body of knowledge** is the key to developing problem-solving, critical thinking and creativity.

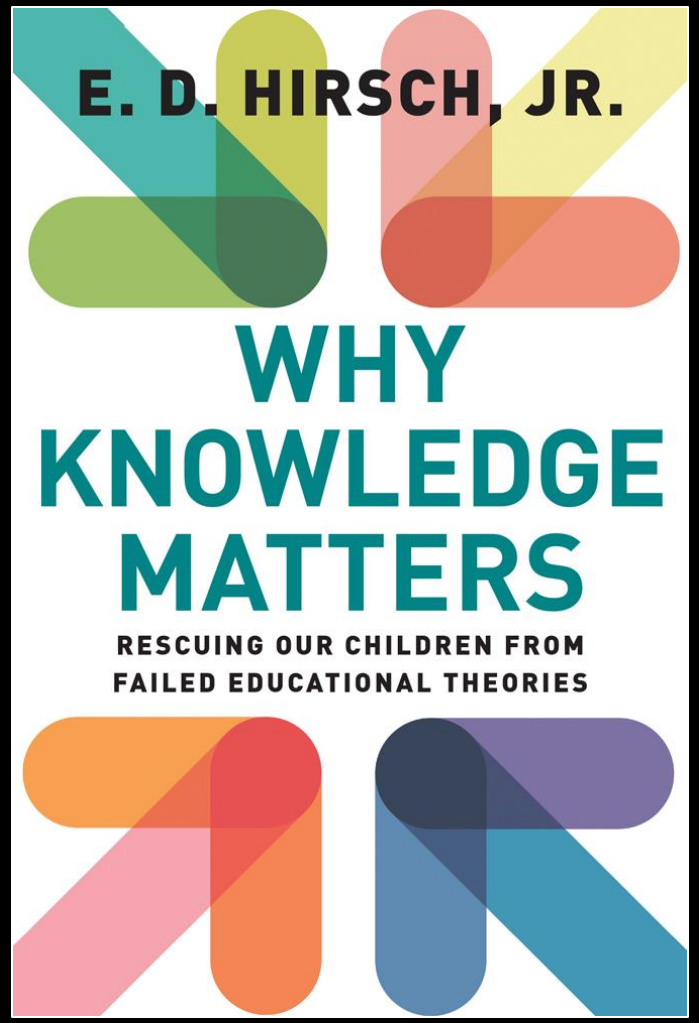
Teach students more and they will be able to do more."

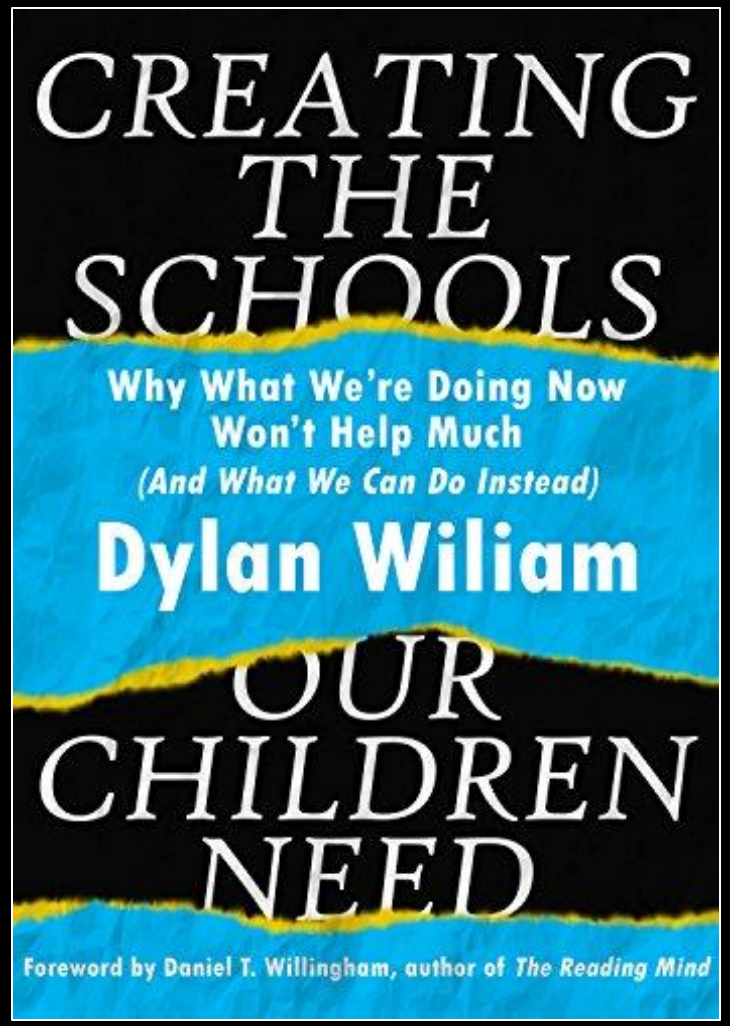


POWER UP

Further reading







POWER UP

Key take-away(s)?

POWER UP

Learning Lesson 4

Being busy and **learning** are not the same thing.

POWER UP

Being busy activities

VS

Learning activities

Common ‘being busy activities’

- Cutting things out.
- Colouring things in.
- Completing a word search.
- Copying from the board.
- Answering questions when the answer can just be copied from somewhere.

Common ‘being busy activities’

- Talking to a partner about something when neither student knows much about what they are talking about.
- Moving around the room for no reason other than to be out of their seat, such as to get information from different stations.
- Researching something on the internet when students don’t really know what they’re looking for, or where to find it.
- Creating something for no other reason than it seems like a fun thing to do.

POWER UP

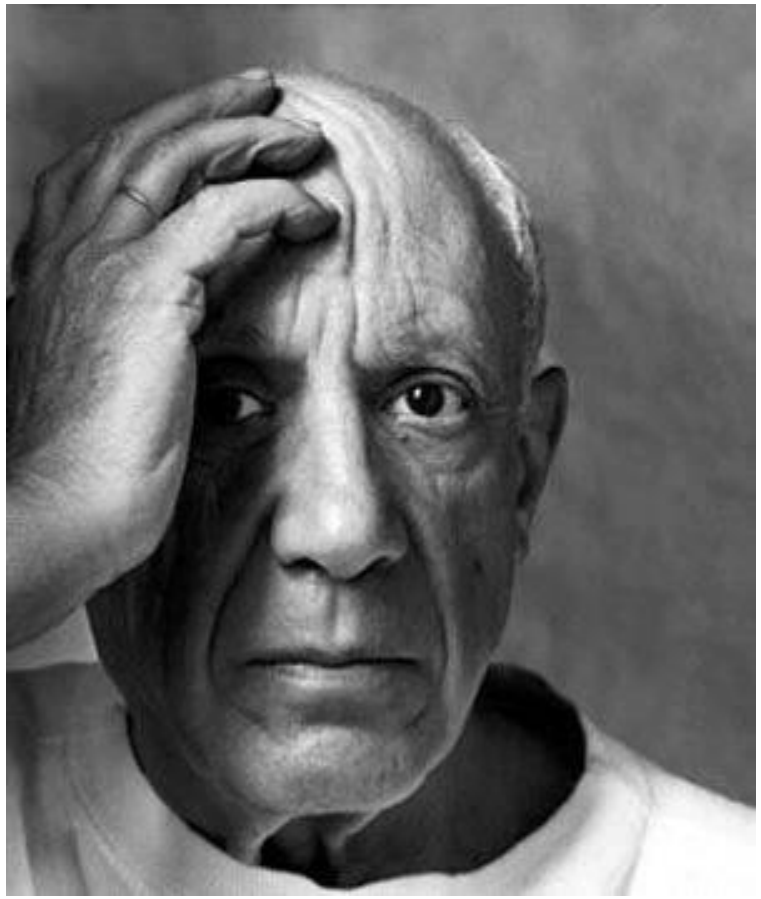
Minimise

POWER UP

Learning activities

Get students to **think** about **specific content**

POWER UP

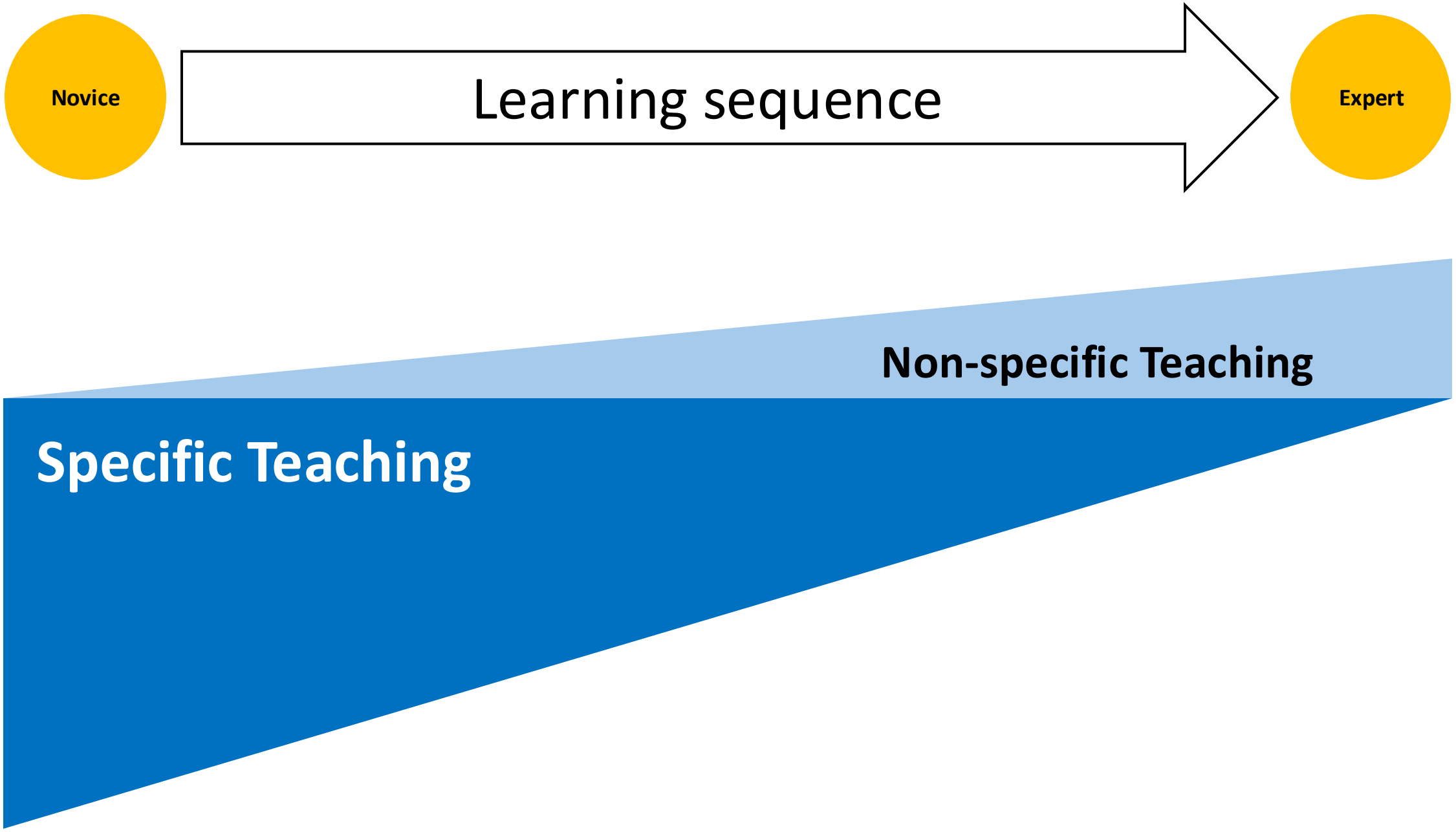


Better teaching approaches…

- An *interactive* teacher presentation
- Reading, *questioning and discussion*
- Video, *questioning and discussion*

POWER UP

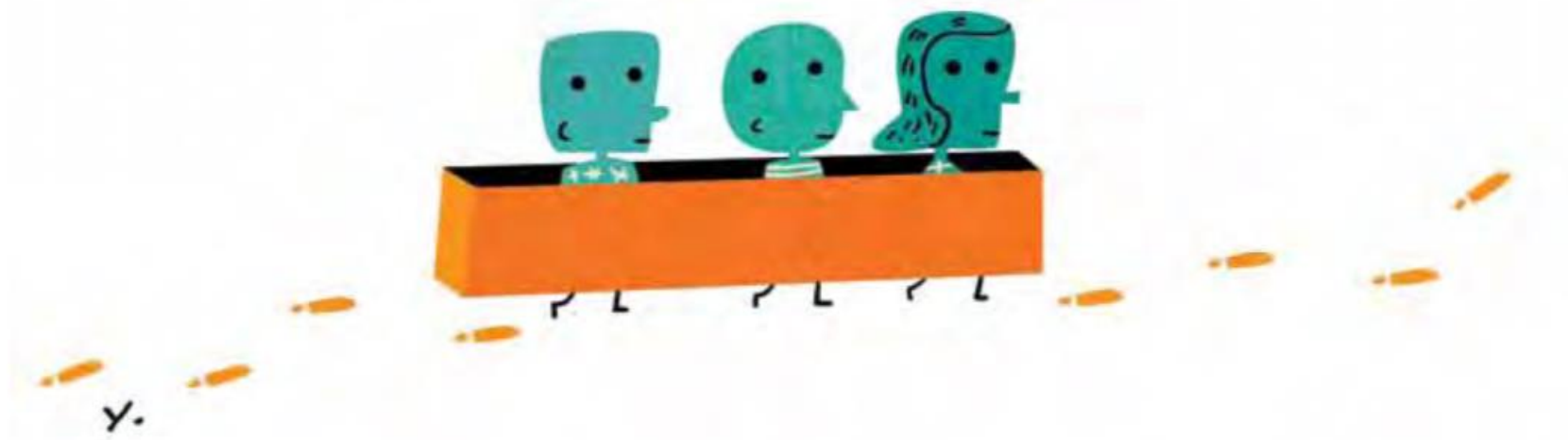
Specific example to avoid


Novice
Learning sequence
Expert
Non-specific Teaching
Specific Teaching

POWER UP

Principles of Instruction

Research-Based Strategies That All Teachers Should Know



By Barak Rosenshine

This article presents 10 research-based principles of instruction, along with suggestions for classroom practice. These principles come from three sources: (a) research in cognitive science, (b) research on master teachers, and (c) research on cognitive supports. Each is briefly explained below.

A: Research in cognitive science: This research focuses on how our brains acquire and use information. This cognitive research also provides suggestions on how we might overcome the limitations of our working memory (i.e., the mental "space" in which

Even though these are three very different bodies of research, there is *no conflict at all* between the instructional suggestions that come from each of these three sources. In other words, these three sources supplement and complement each other. The fact that the instructional ideas from three different sources supplement and complement each other gives us faith in the validity of these findings.

Education involves helping a novice develop strong, readily accessible background knowledge. It's important that background knowledge be readily accessible, and this occurs when knowledge is well rehearsed and tied to other knowledge. The most effective teachers ensured that their students efficiently acquired,

POWER UP

Principles of Instruction

Research-Based Strategies That All Teachers Should Know

By Barak Rosenshine

This article presents 10 research-based principles of instruction, along with suggestions for classroom practice. These principles come from three sources: (a) research in cognitive science, (b) research on master teachers, and (c) research on cognitive supports. Each is briefly explained below.

A: Research in cognitive science: This research focuses on how our brains acquire and use information. This cognitive research also provides suggestions on how we might overcome the limitations of our working memory (i.e., the mental "space" in which

Even though these are three very different bodies of research, there is *no conflict at all* between the instructional suggestions that come from each of these three sources. In other words, these three sources supplement and complement each other. The fact that the instructional ideas from three different sources supplement and complement each other gives us faith in the validity of these findings.

Education involves helping a novice develop strong, readily accessible background knowledge. It's important that background knowledge be readily accessible, and this occurs when knowledge is well rehearsed and tied to other knowledge. The most effective teachers ensured that their students efficiently acquired,

1. Begin a lesson with a short review of previous learning.
2. Present new material in small steps with student practice after each step.
3. Limit the amount of material students receive at one time.
4. Give clear and detailed instructions and explanations.
5. Ask a large number of questions and check for understanding.
6. Provide a high level of active practice for all students.

POWER UP

Principles of Instruction

Research-Based Strategies That All Teachers Should Know

BY BARAK ROSENSHINE

This article presents 10 research-based principles of instruction, along with suggestions for classroom practice. These principles come from three sources: (a) research in cognitive science, (b) research on master teachers, and (c) research on cognitive supports. Each is briefly explained below.

A: Research in cognitive science: This research focuses on how our brains acquire and use information. This cognitive research also provides suggestions on how we might overcome the limitations of our working memory (i.e., the mental "space" in which

Even though these are three very different bodies of research, there is *no conflict at all* between the instructional suggestions that come from each of these three sources. In other words, these three sources supplement and complement each other. The fact that the instructional ideas from three different sources supplement and complement each other gives us faith in the validity of these findings.

Education involves helping a novice develop strong, readily accessible background knowledge. It's important that background knowledge be readily accessible, and this occurs when knowledge is well rehearsed and tied to other knowledge. The most effective teachers ensured that their students efficiently acquired,

7. Guide students as they begin to practise.
8. Think aloud and model steps.
9. Provide models of worked-out problems.
10. Ask students to explain what they have learned.
11. Check the responses of all students.
12. Provide systematic feedback and corrections.

POWER UP

Principles of Instruction

Research-Based Strategies That All Teachers Should Know

By Barak Rosenshine

This article presents 10 research-based principles of instruction, along with suggestions for classroom practice. These principles come from three sources: (a) research in cognitive science, (b) research on master teachers, and (c) research on cognitive supports. Each is briefly explained below.

A: Research in cognitive science: This research focuses on how our brains acquire and use information. This cognitive research also provides suggestions on how we might overcome the limitations of our working memory (i.e., the mental "space" in which

Even though these are three very different bodies of research, there is *no conflict at all* between the instructional suggestions that come from each of these three sources. In other words, these three sources supplement and complement each other. The fact that the instructional ideas from three different sources supplement and complement each other gives us faith in the validity of these findings.

Education involves helping a novice develop strong, readily accessible background knowledge. It's important that background knowledge be readily accessible, and this occurs when knowledge is well rehearsed and tied to other knowledge. The most effective teachers ensured that their students efficiently acquired,

13. Use more time to provide explanations.
14. Provide many examples.
15. Reteach material when necessary.
16. Prepare students for independent practice.
17. Monitor students when they begin independent practice.

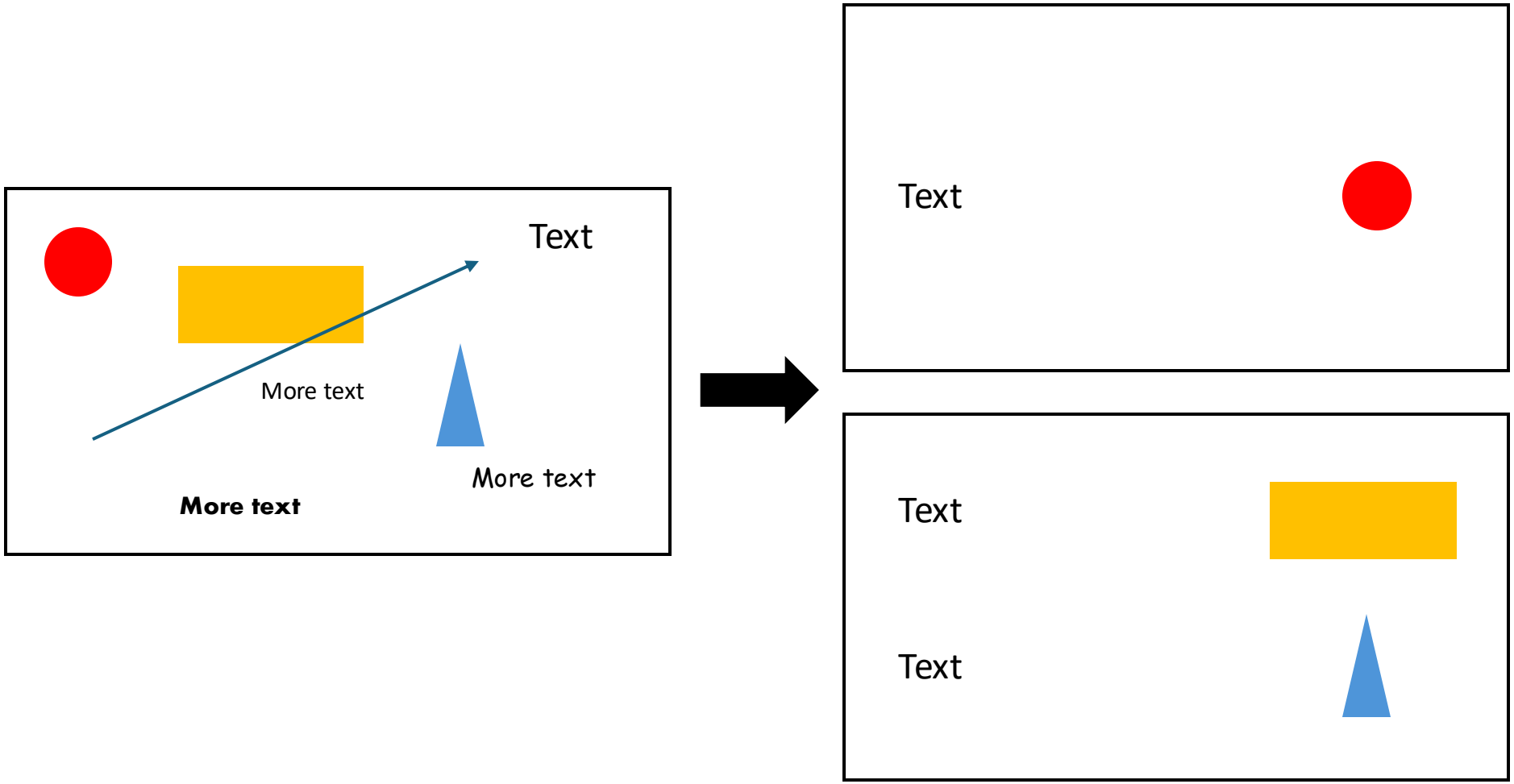
POWER UP

TRUSTED TECHNIQUES

POWER UP

TRUSTED TECHNIQUE

Stripped-Back Slides



OBJECTIVE SETTING AND SUCCESS CRITERIA

Learning Objective:

- To identify opportunities for using learning intentions and success criteria in our own classroom.
- To be able to identify and frame learning intentions and success criteria; and

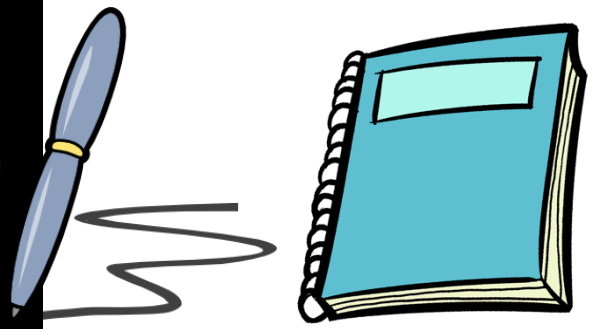
- To understand what learning intentions and success criteria are;
- be able to identify and frame learning intentions and success criteria; and

Learning Outcomes:

By the end of this session, we will have:

3. **understood the terms & the differences between them**
4. **achieved greater consistency in lesson planning through sharing learning objectives, learning outcomes & success criteria**
5. **improved lesson planning & clarity for pupils about:**
   - **what they are learning and why,**
   - **what is expected of them as an end product for assessment, &**
   - **what the success criteria are – what will get good marks.**

POWER UP



Welcome Year 8

Sit in your allocated seat, get out your equipment and write the title and date, and begin the starter.

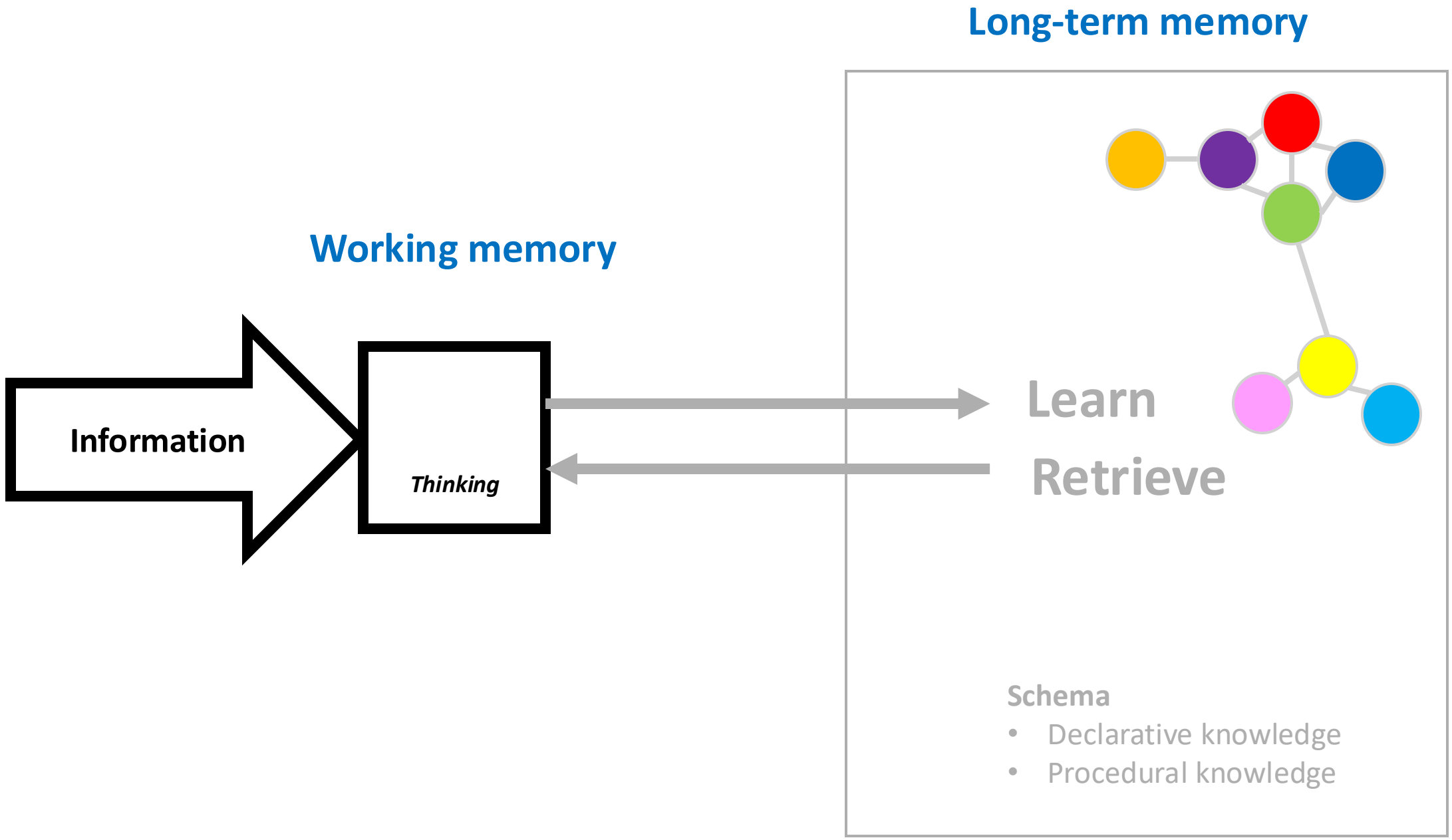
01 July 2025

Title: Vertebrates and Invertebrates

Starter: 5 MINS

In full sentences, answer the following questions:

1) What is the difference between vertebrates and invertebrates.
2) List as many examples of each as you can.


Long-term memory
Working memory
Information
Thinking
Learn
Retrieve
Schema
• Declarative knowledge
• Procedural knowledge

POWER UP

And you will read this last

You will read this first

And then you will read this

Then this one

POWER UP

The Redundancy Effect

When the *same information* is communicated in *written* and *spoken* forms *at the same time*, one of the forms is redundant.

Rather than have a neutral effect, this actually affects learning negatively.

Trying to ‘filter out’ the redundant form causes unnecessary cognitive load. Avoid reading out too much text on your PowerPoint slides.

POWER UP

The Redundancy Effect

The Transient Information Effect

POWER UP

Key take-away(s)?

POWER UP

Why do we ask students **questions**?

1.
2.
3.
4.

POWER UP

Thinking

Spotlight

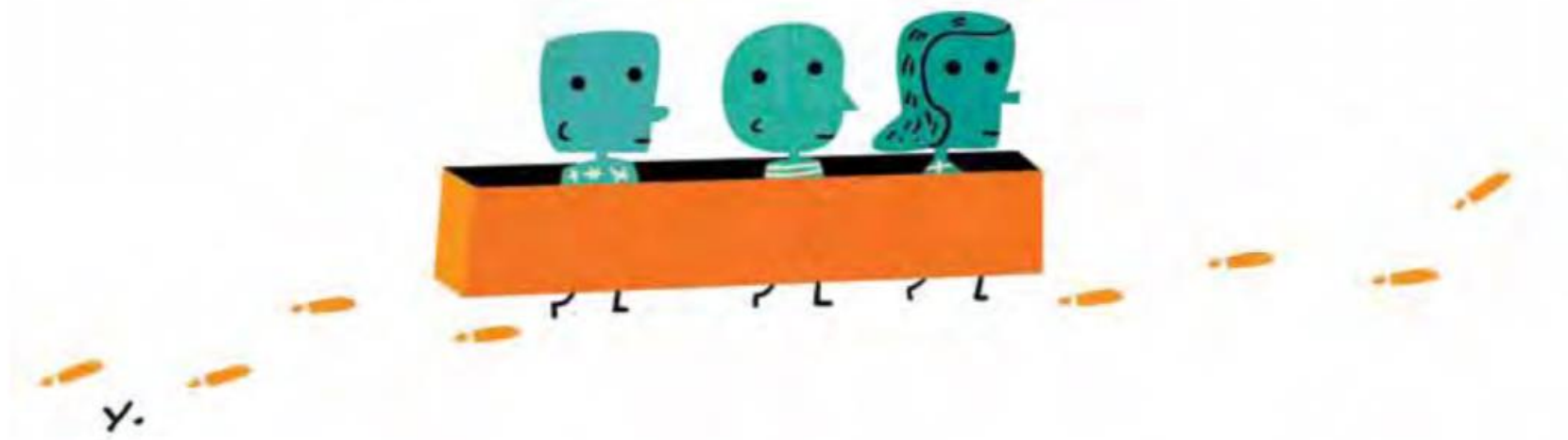
Attention

Responding

POWER UP

Principles of Instruction

Research-Based Strategies That All Teachers Should Know



By Barak Rosenshine

This article presents 10 research-based principles of instruction, along with suggestions for classroom practice. These principles come from three sources: (a) research in cognitive science, (b) research on master teachers, and (c) research on cognitive supports. Each is briefly explained below.

A: Research in cognitive science: This research focuses on how our brains acquire and use information. This cognitive research also provides suggestions on how we might overcome the limitations of our working memory (i.e., the mental "space" in which

Even though these are three very different bodies of research, there is *no conflict at all* between the instructional suggestions that come from each of these three sources. In other words, these three sources supplement and complement each other. The fact that the instructional ideas from three different sources supplement and complement each other gives us faith in the validity of these findings.

Education involves helping a novice develop strong, readily accessible background knowledge. It's important that background knowledge be readily accessible, and this occurs when knowledge is well rehearsed and tied to other knowledge. The most effective teachers ensured that their students efficiently acquired,

POWER UP

Students need to practice new material. The teacher's questions and student discussion are **a major way of providing this necessary practice**.

The most successful teachers [spend] more than half of the class time lecturing, demonstrating, and asking questions… Questions allow a teacher to determine how well the material has been learned and whether there is a need for additional instruction.

The most effective teachers also ask students to explain the process they used to answer the question, to explain how the answer was found. Less successful teachers ask fewer questions and almost no process questions.

POWER UP

Lessons as lectures don’t provide sufficient opportunity for practice.

POWER UP

"The lesson was **too teacher-led**."

"Students should be allowed **to lead their learning more**."

POWER UP

"Devote more time to **interaction**."

"Devote more time to **practice**."

"Let **evidence of learning** guide the teaching."

5

PRESENTING CONTENT

INTERACTIVE TEACHER PRESENTATIONS - we want students to be actively engaged, not just to appear like they're listening or busy but not learning.

Illusion of learning

Passive

Illusion of learning

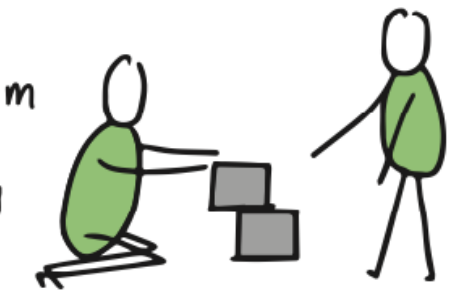
'Active'

Sweet spot

INTERACTIVE TEACHER PRESENTATIONS

'Listening' for extended periods of time, watching a presentation or film with no purpose or task

Unstructured learning with little input from the teacher, e.g. discovery learning



POWER UP

How good is your questioning?

POWER UP

How good is your questioning?

1. **Quantity** and **frequency**
2. **Quality**
3. **Technique**

Common Pitfall

Talking for extended periods without asking a question.

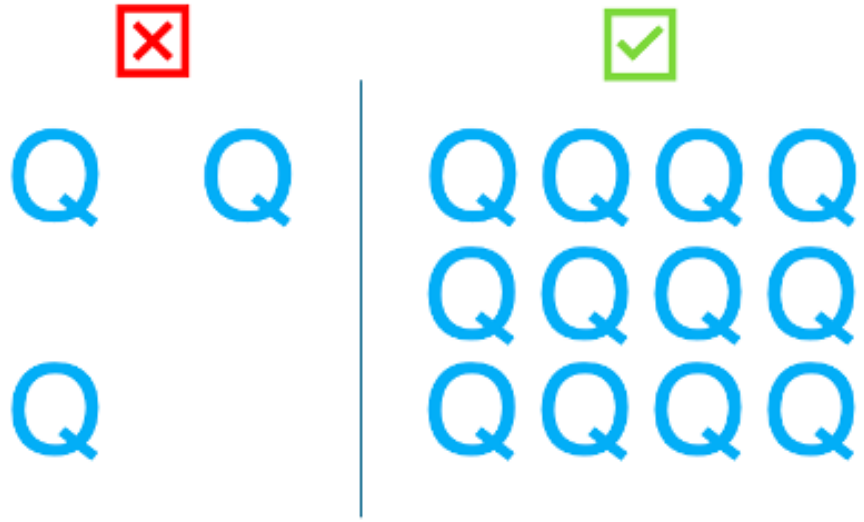
POWER UP

TRUSTED TECHNIQUES

POWER UP

TRUSTED TECHNIQUE

More Questions, More Often



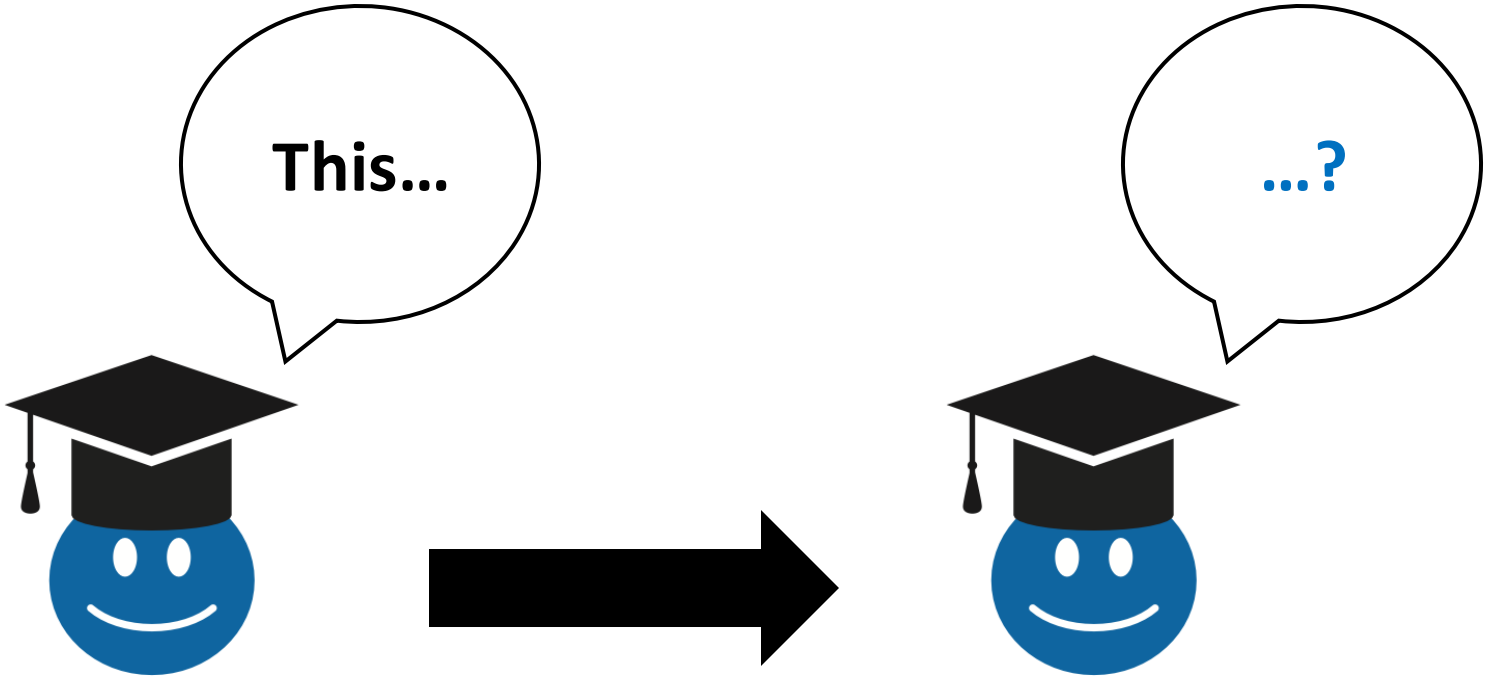
Rather than ask questions *sporadically*, ask them **frequently**.

As a rule of thumb, for every minute* of teacher exposition, aim to ask *at least* one question.

POWER UP

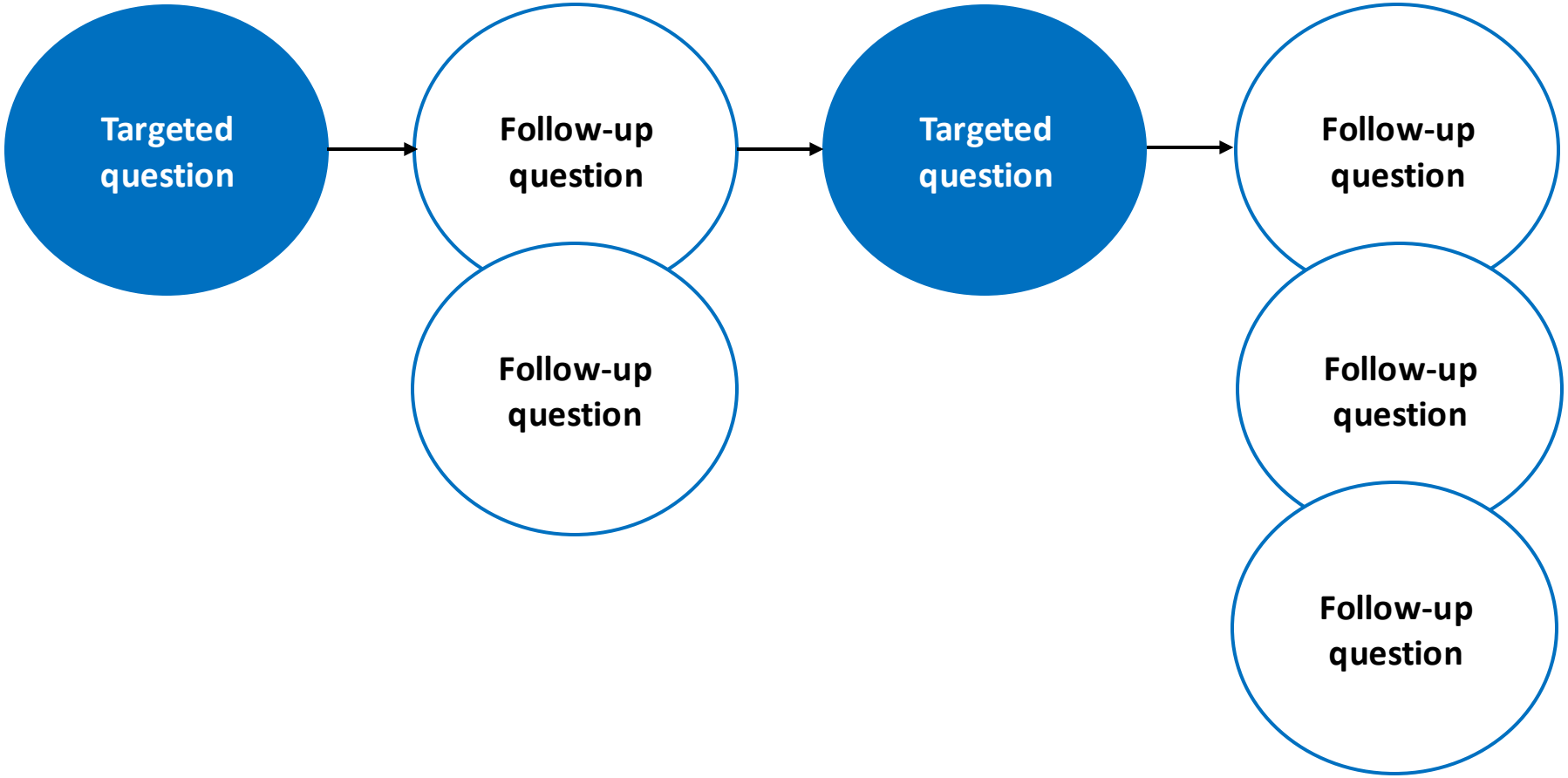
TRUSTED TECHNIQUE

Statements into Questions



First, we do this…	→	***What*** **should we do first?**
We do this because…	→	***Why*** **do you think we do this?**
This is important…	→	***Why*** **do you think this is important?**

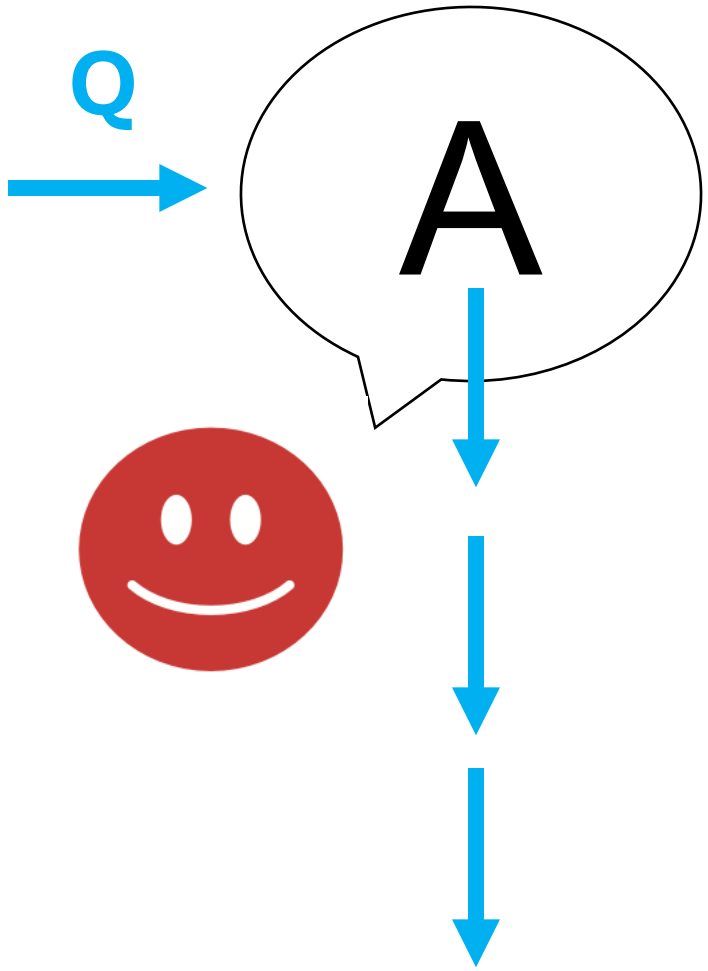
POWER UP


Targeted question
Follow-up question
Follow-up question
Targeted question
Follow-up question
Follow-up question
Follow-up question

POWER UP

TRUSTED TECHNIQUE

Drill Down



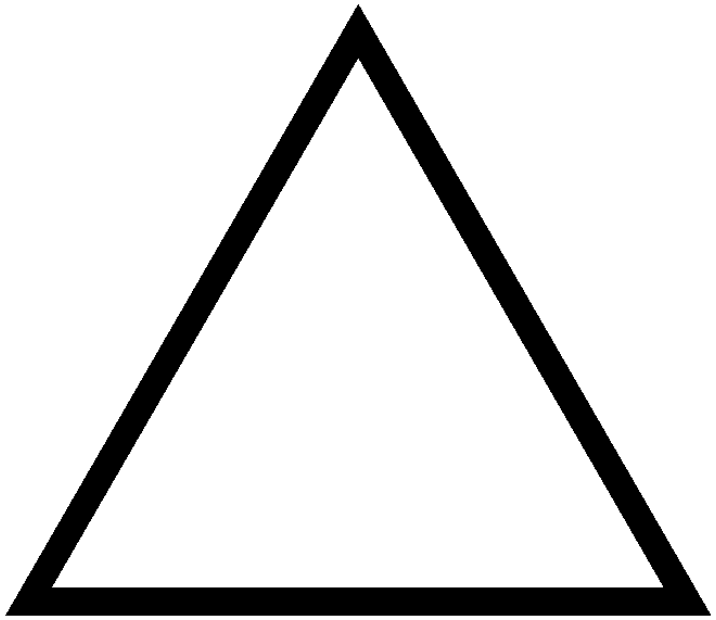
A student's (correct or incorrect) answer to a question is followed-up with *at least one **open question*** to explore their thinking.

For example:

- 'Why do you think that?'
- 'What makes you so sure of that?'
- 'What do you do to help remember that?'

Example

Q: “What type of triangle is this?”



A: “Equilateral.”

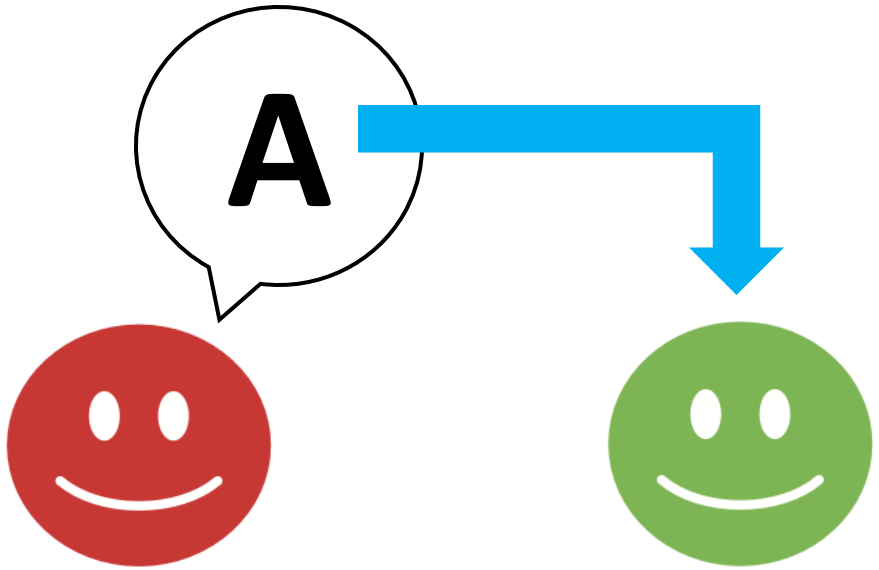
Q: “Why do you think that?”

A: “Because it doesn’t have any right angles.”

POWER UP

TRUSTED TECHNIQUE

Bounce



‘Do you agree... [name student]?’

‘Who would like to comment on that?’

‘Please build on what was just said... [name student].’

Current practice?	Introduce or refine?	Key features?	Pitfalls?

POWER UP

TRUSTED TECHNIQUE

More Questions, More Often

☒ Q Q

☑ QQQQ QQQQ QQQQ

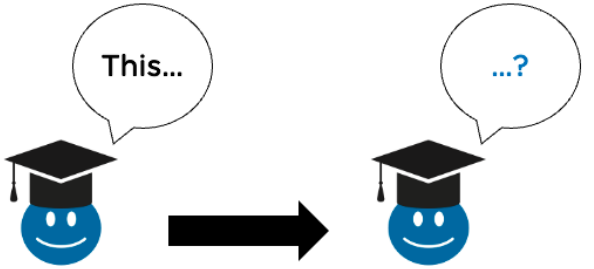
Rather than ask questions *sporadically*, ask them **frequently**.

As a rule of thumb, for every minute of teacher exposition, aim to ask *at least* one question.

POWER UP

TRUSTED TECHNIQUE

Statements into Questions



First, we do this... → *What* should we do first?

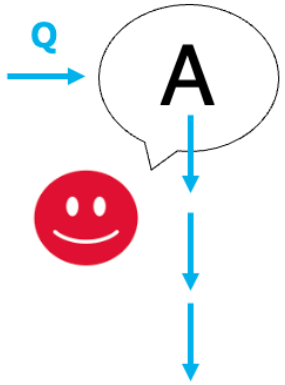
We do this because... → *Why* do you think we do this?

This is important... → *Why* do you think this is important?

POWER UP

TRUSTED TECHNIQUE

Drill Down



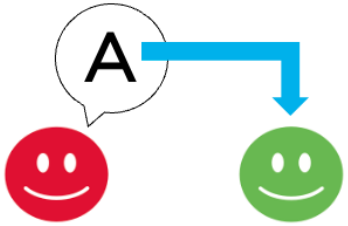
A student's (correct or incorrect) answer to a question is followed-up with *at least one* ***open question*** to explore their thinking.

For example:
- 'Why do you think that?'
- 'What makes you so sure of that?'
- 'What do you do to help remember that?'

POWER UP

TRUSTED TECHNIQUE

Bounce



'Do you agree... [name student]?'

'Who would like to comment on that?'

'Please build on what was just said... [name student].'

POWER UP

Common Pitfall

Asking ‘**throwaway questions**’.

Examples…

Plenary in a geography lesson to 12-year-olds on the Greenhouse Effect…

True or false: we have been learning about ‘the Bluehouse Effect’.

Checking prior knowledge of CVs in a business management lesson to 15-year-olds …

What does CV stand for?

A. Communication Vibes
B. Curriculum Vitae
C. Current Ventures
D. Creative Vocabulary

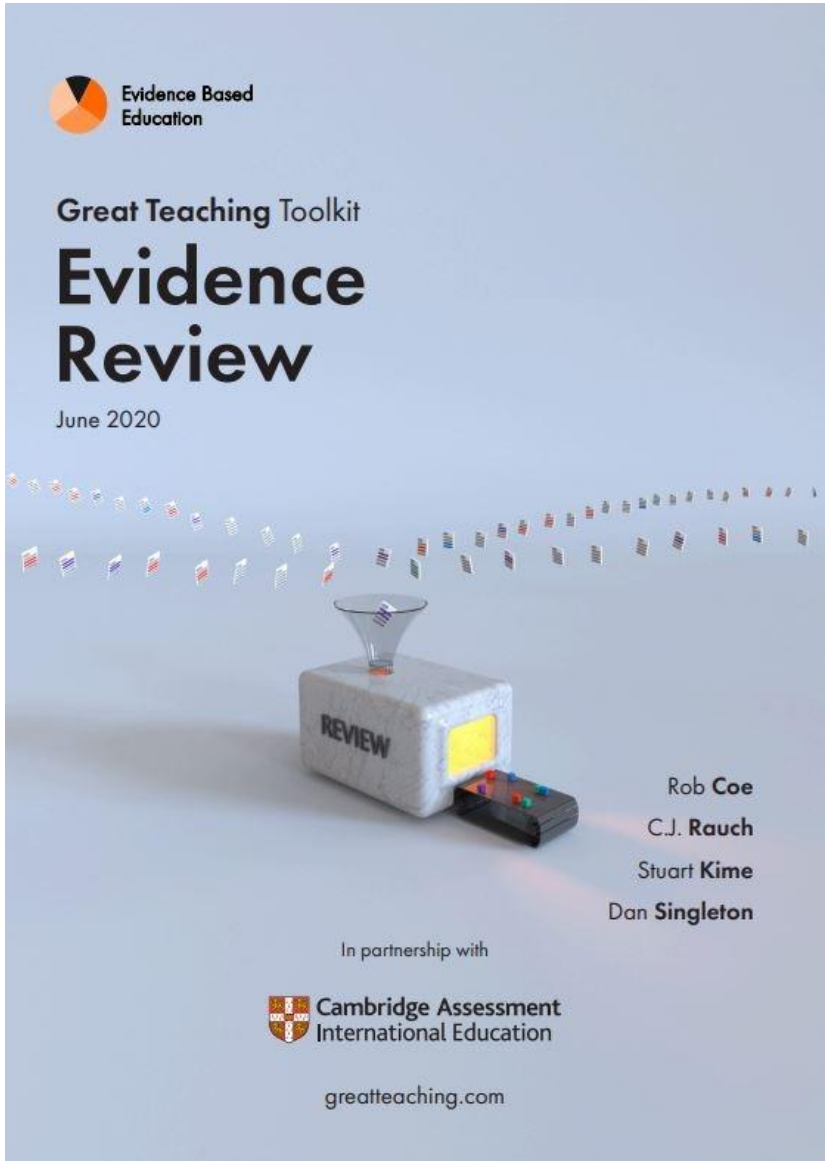
POWER UP

Don’t promote ‘***desirable* thinking**’

- *Specific* content
- Appropriately *challenging*

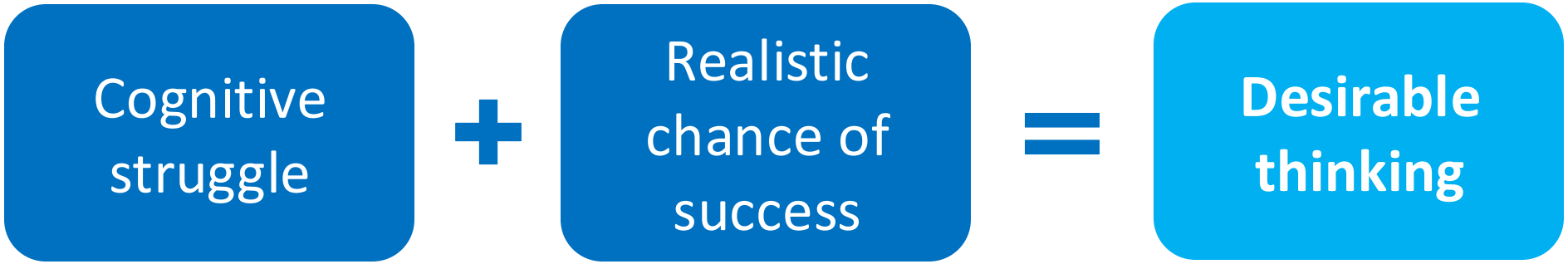
POWER UP

POWER UP



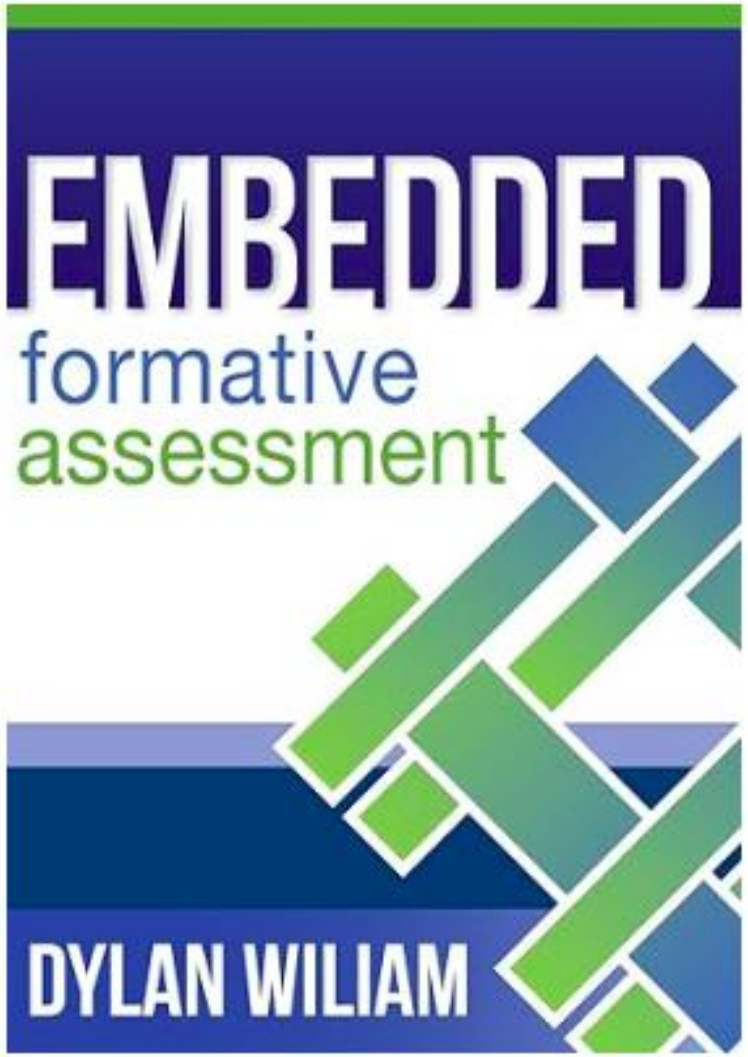
Learning is most likely to happen when students **think (appropriately) *hard***.

POWER UP


Cognitive struggle
+
Realistic chance of success
=
Desirable thinking

A lot of value in planning ‘desirable thinking’ questions in advance of lessons.

POWER UP



"**Sharing high-quality questions** (between teachers and schools) may be **the most significant thing we can do** to improve the quality of student learning."

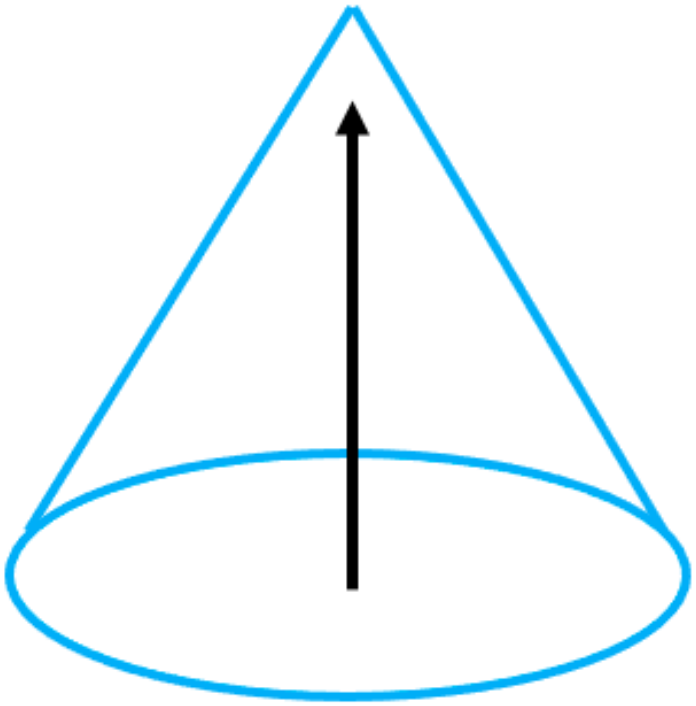
POWER UP

TRUSTED TECHNIQUES

POWER UP

TRUSTED TECHNIQUE

Spotlight Assessment Activities



Questions and tasks designed to get students to ***think*** **appropriately hard** about particular content.

Focus on **misconceptions** that otherwise would have remained hidden and uncorrected.

POWER UP

TRUSTED TECHNIQUE

True or False

- The moon orbits the Earth once per day.
- Astronauts weigh less on the moon than they did on Earth.
- ‘I like ice-cream’ is an example of a simile.
- 80% as a decimal is 0.8

POWER UP

Individual

Pairs

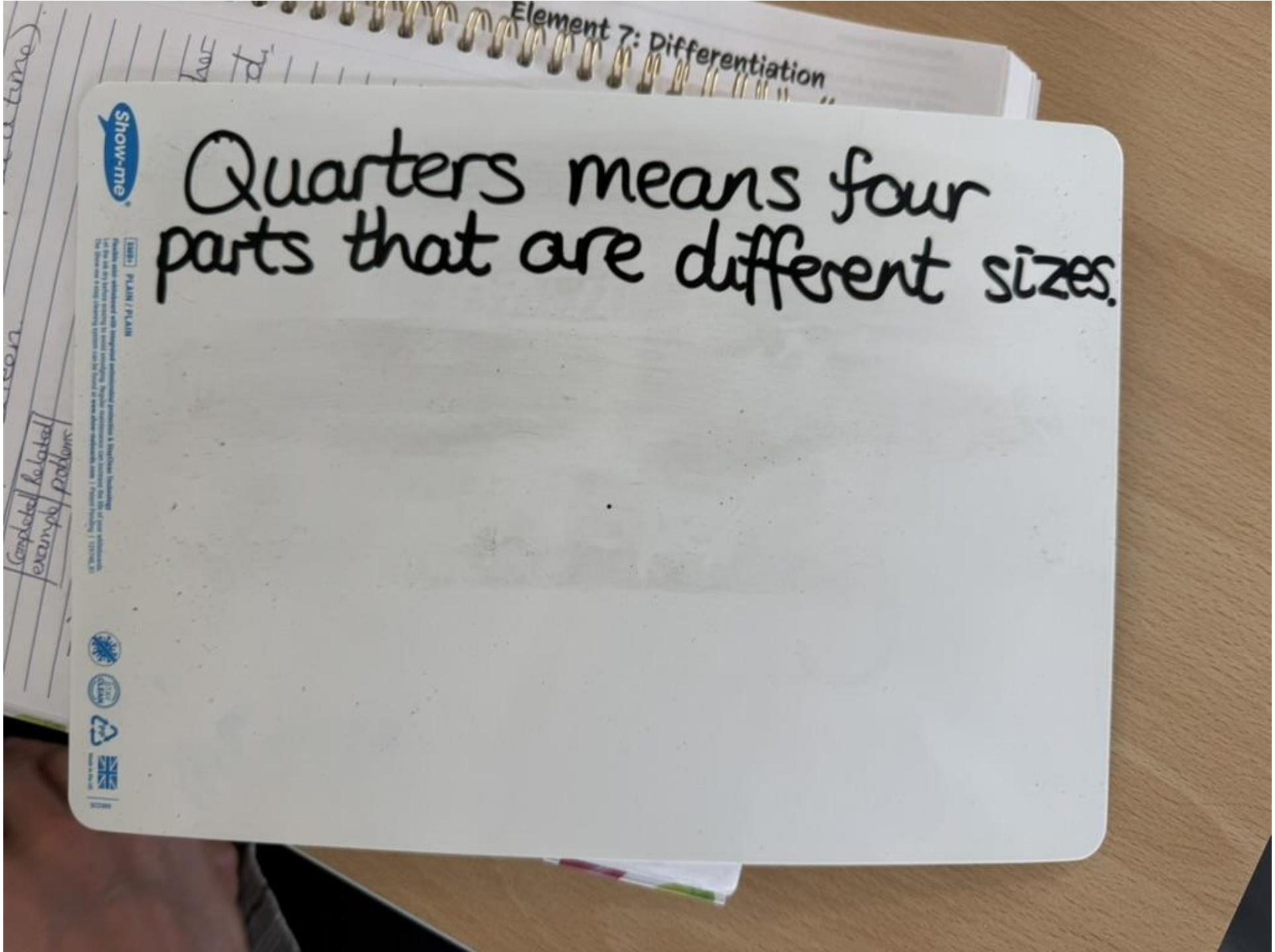
Whole-class

Verbal

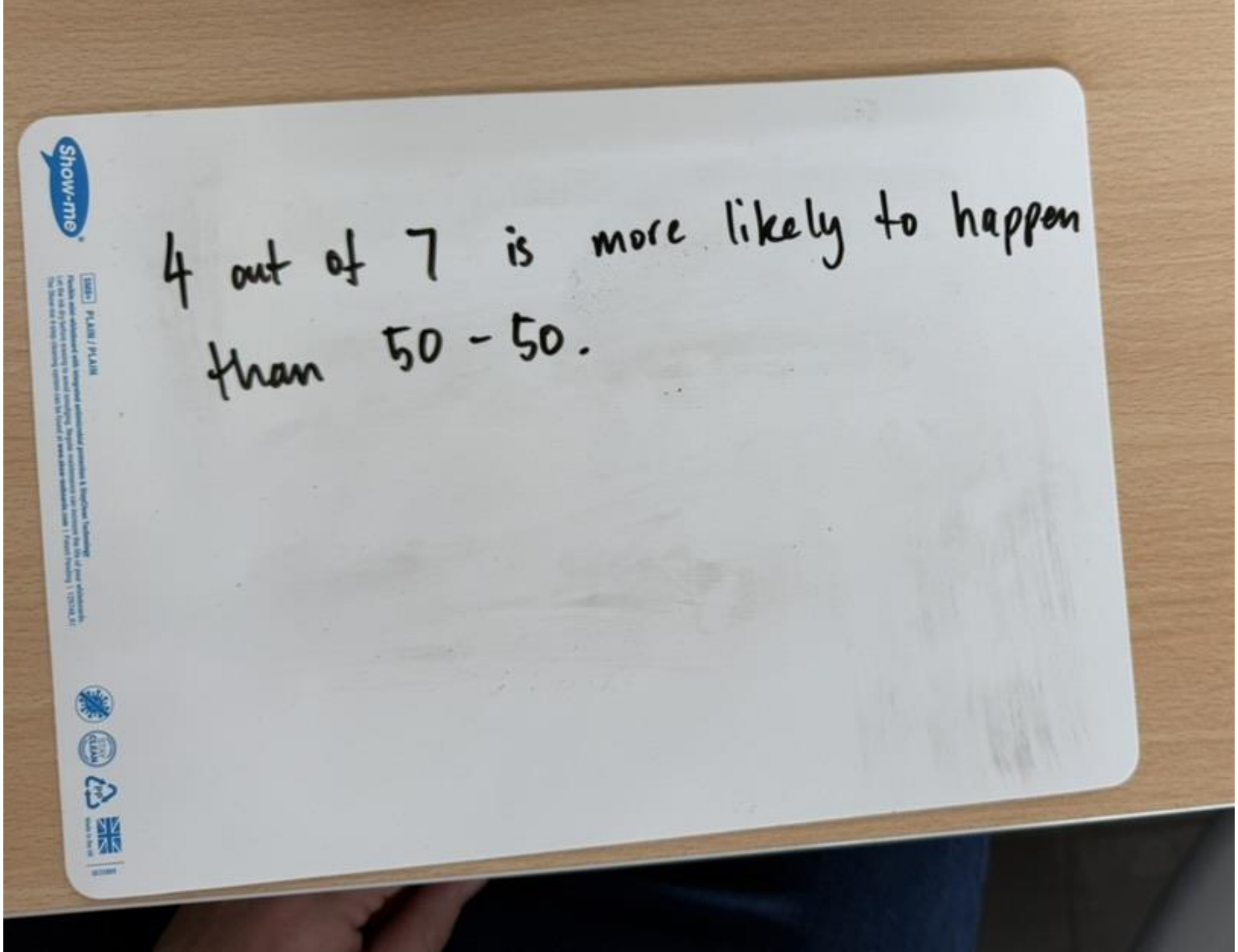
Written

Card sort

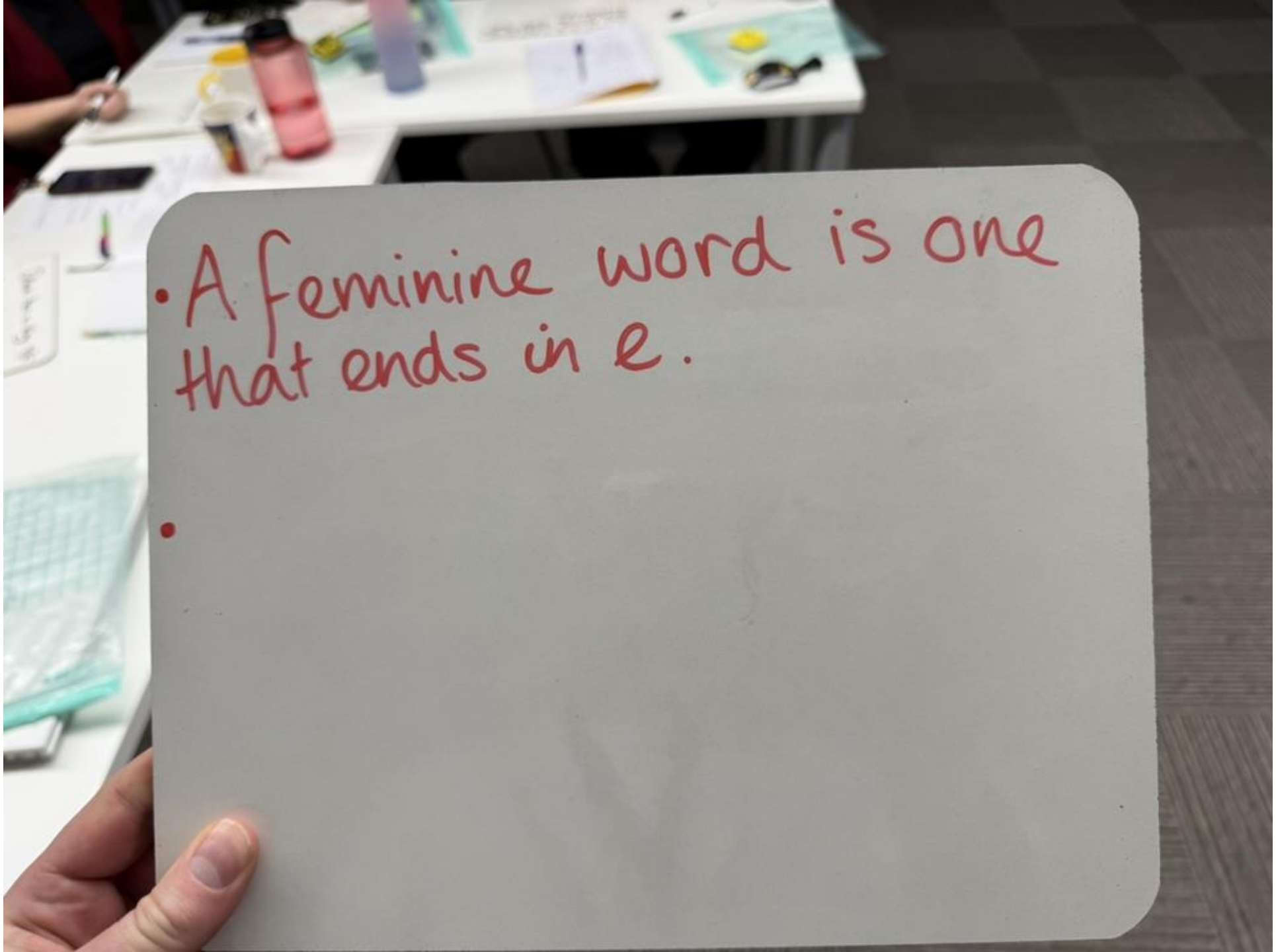
POWER UP


Element 7: Differentiation
Quarters means four parts that are different sizes.
Show-me

POWER UP



POWER UP



POWER UP

TRUSTED TECHNIQUE

Deliberate Mistakes

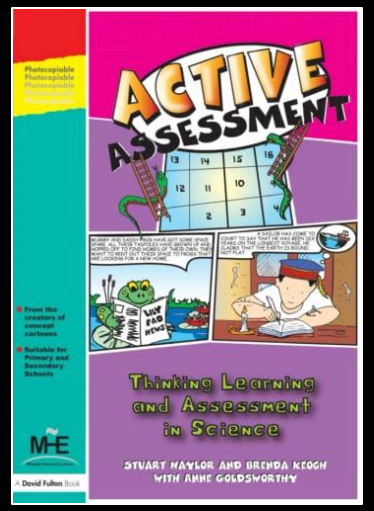
English	Jim wasnt happy with Jill's response to the questions he was asking her.
Geography	To find out how far east or west a place is, lines of latitude are used. These lines run parallel to the Equator.
Science	The chemical formula for carbon dioxide is CO2.

POWER UP

"If I had to reduce all of educational psychology to just one principle, I would say this: **the most important single factor influencing learning is what the learner already knows**. Ascertain this and teach him [or her] accordingly."

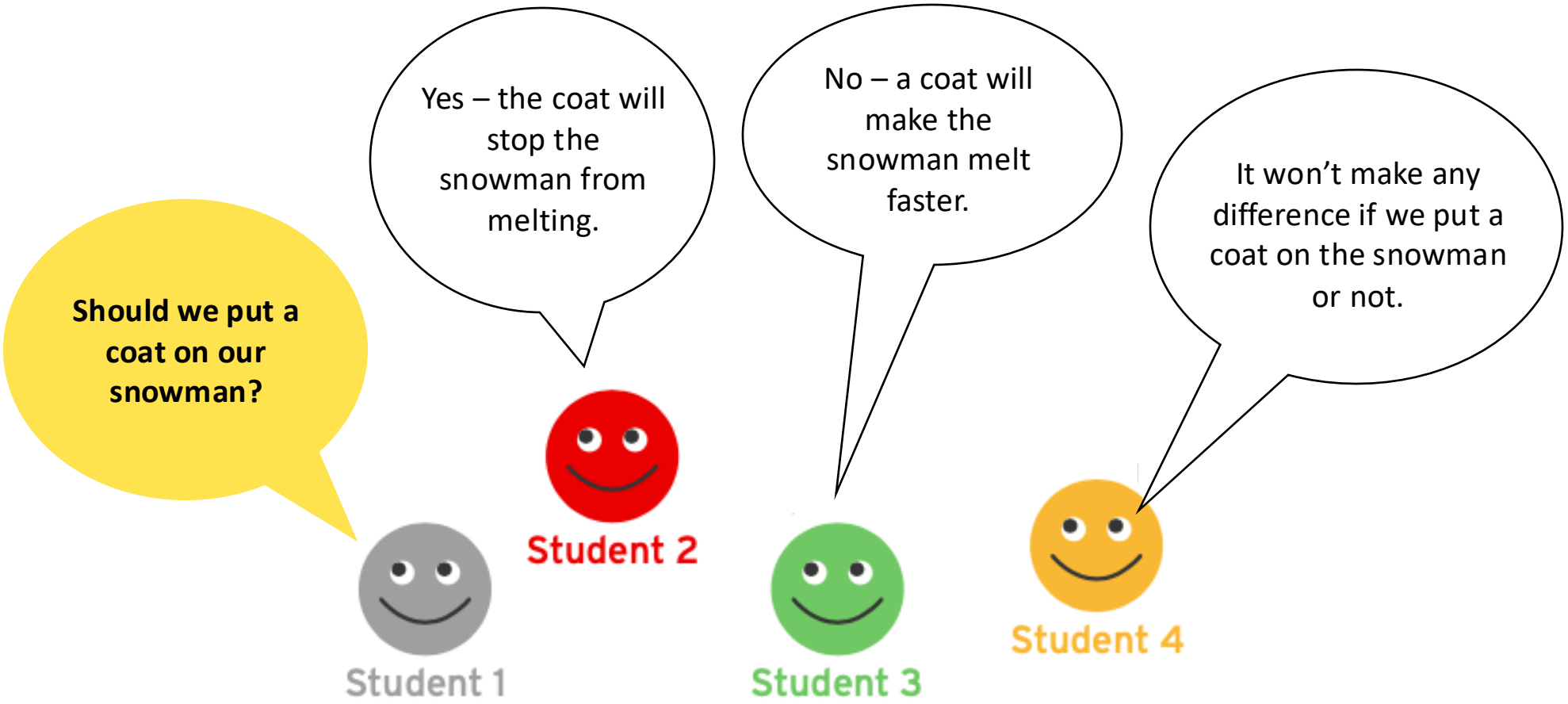
- David Ausubel, American Psychologist

POWER UP

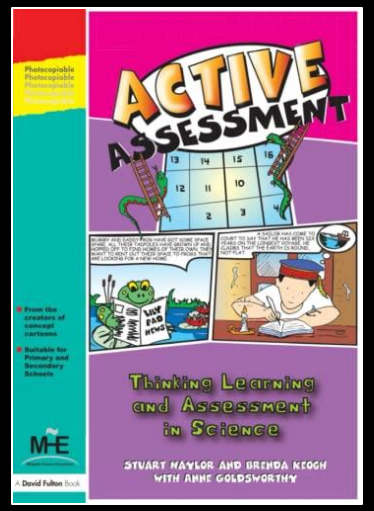


SPOTLIGHT ASSESSMENT ACTIVITIES:

Concept Cartoons

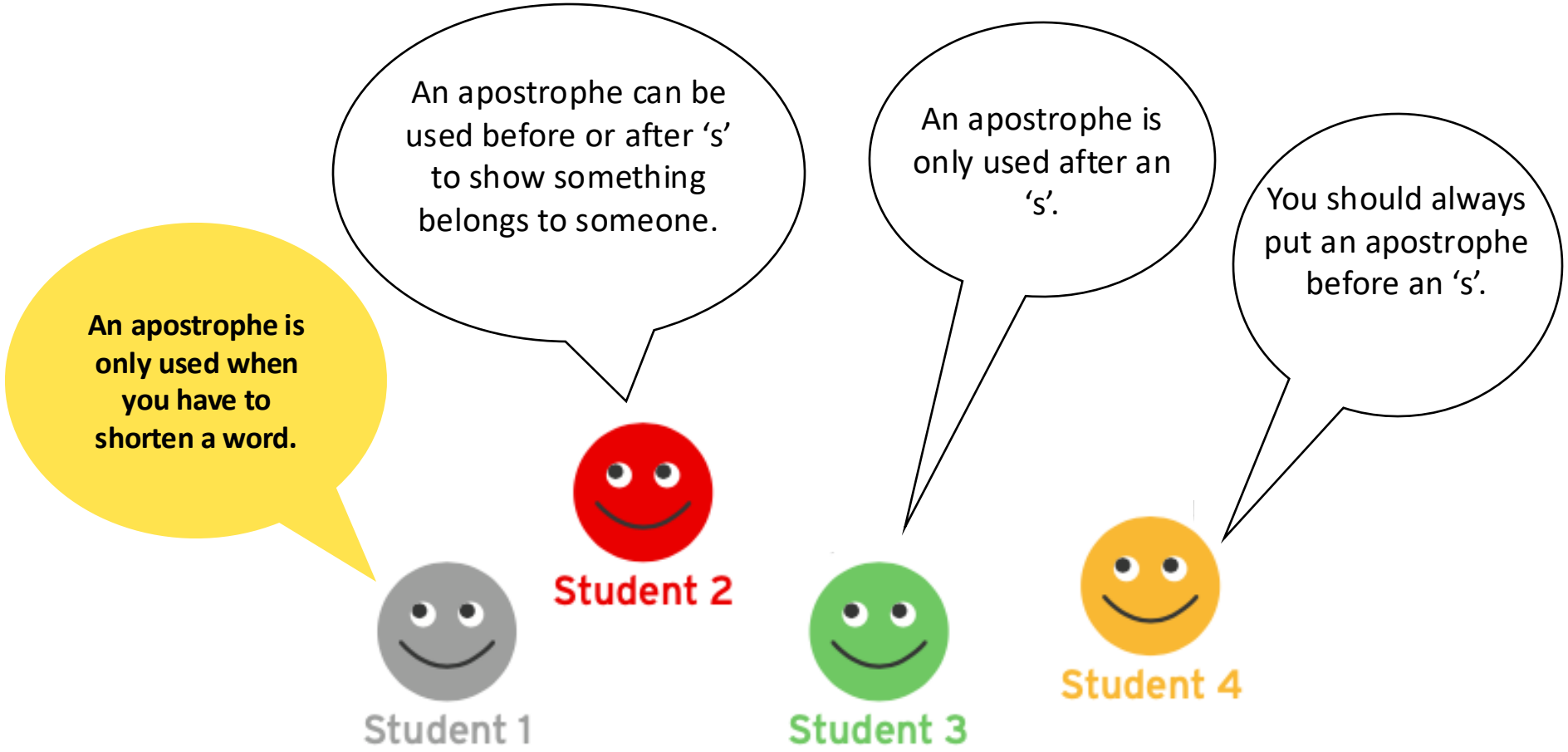


POWER UP

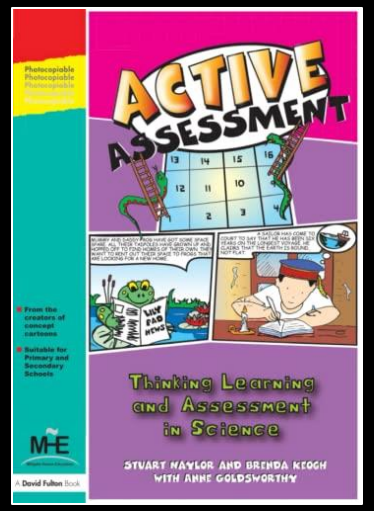


SPOTLIGHT ASSESSMENT ACTIVITIES:

Concept Cartoons

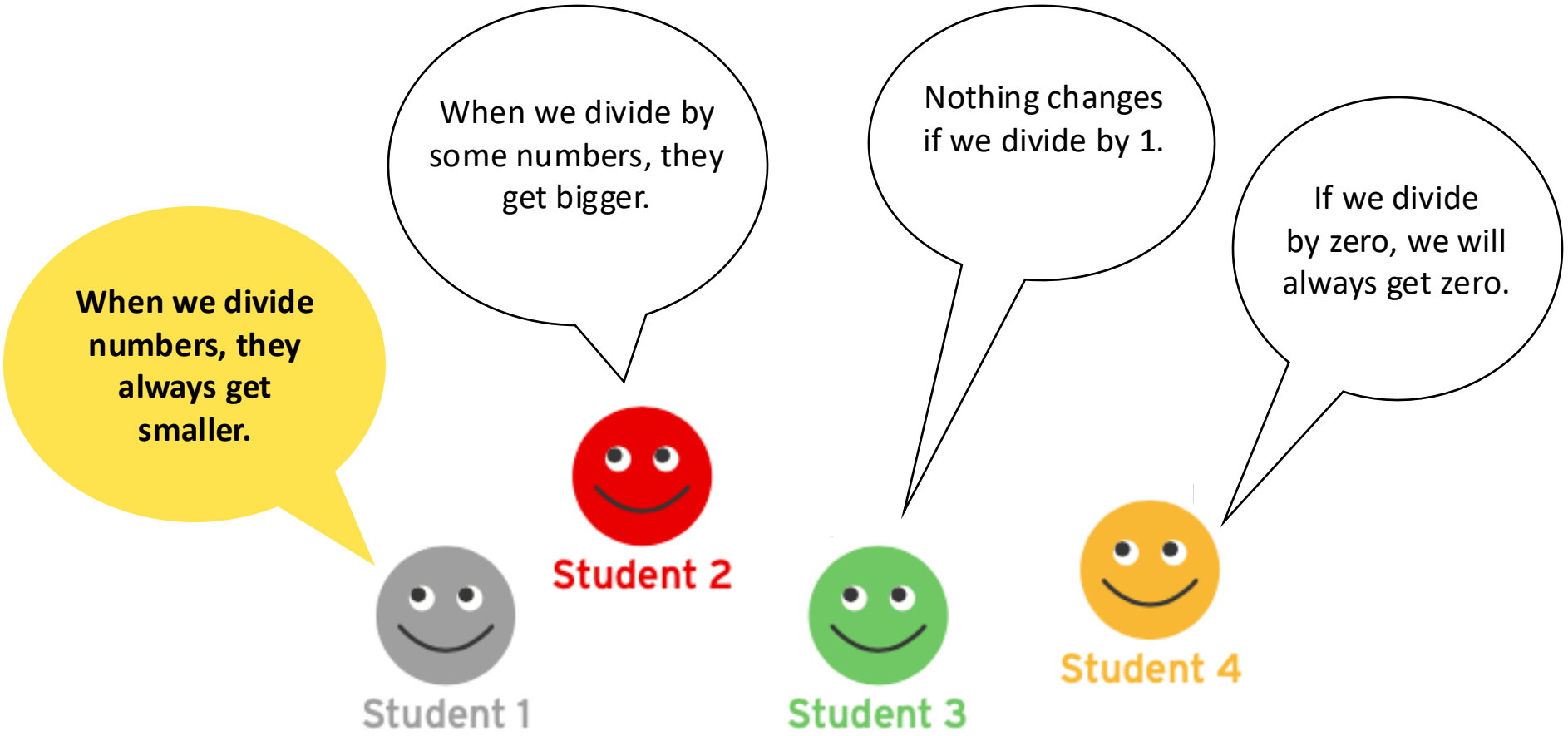


POWER UP

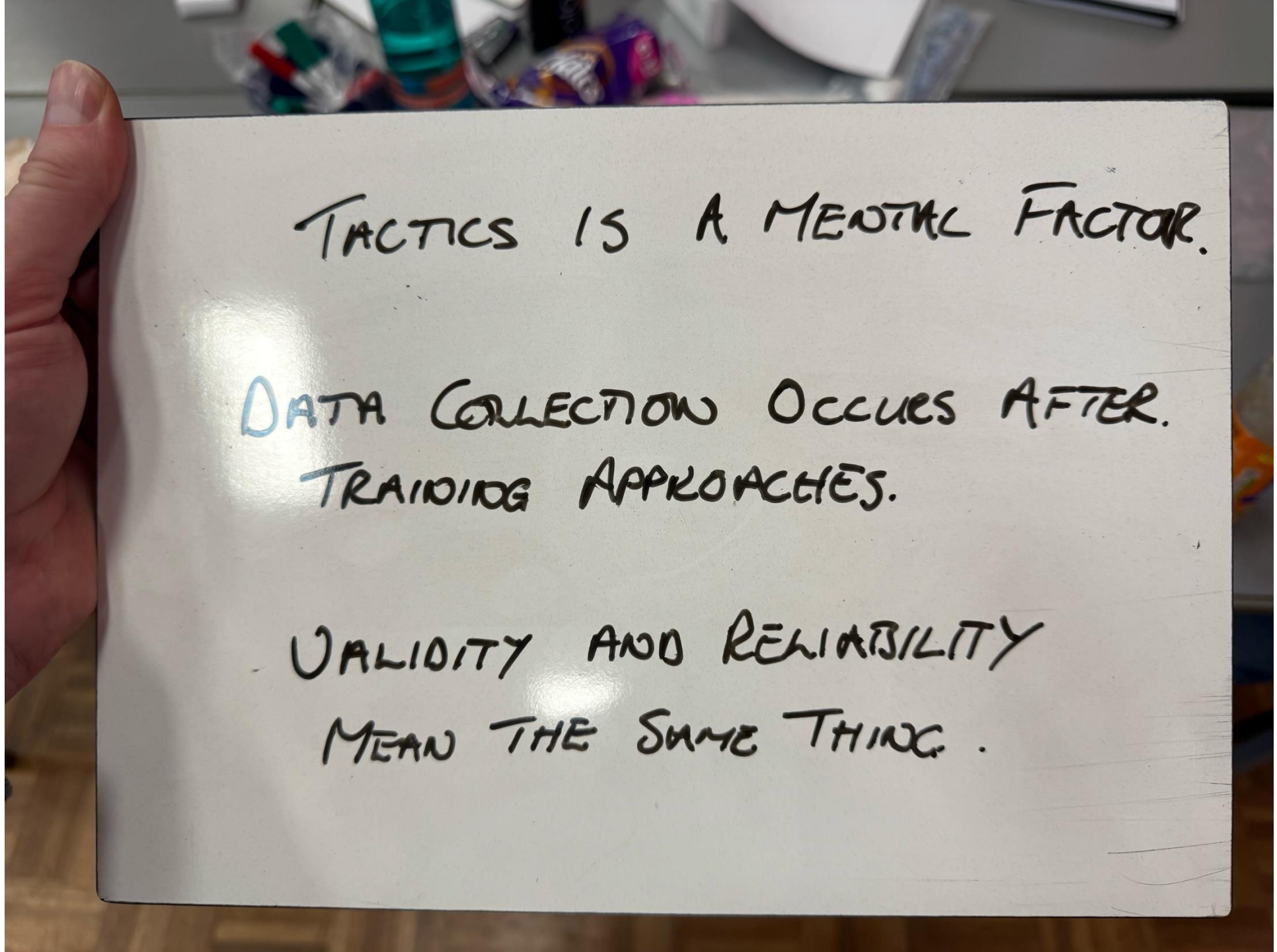


SPOTLIGHT ASSESSMENT ACTIVITIES:

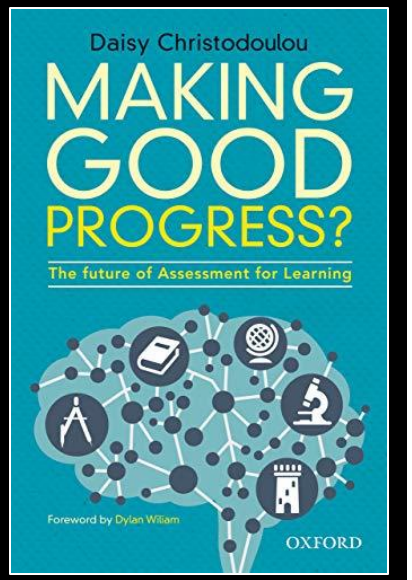
Concept Cartoons



POWER UP


TACTICS IS A MEDICAL FACTOR.
DATA COLLECTION OCCURS AFTER TRAINING APPROACHES.
VALIDITY AND RELIABILITY MEAN THE SAME THING.

POWER UP



SPOTLIGHT ASSESSMENT ACTIVITIES:

Multiple Choice

What is 20% of 300?

A. 30

B. 60

C. 15

D. 6000

A

B

C

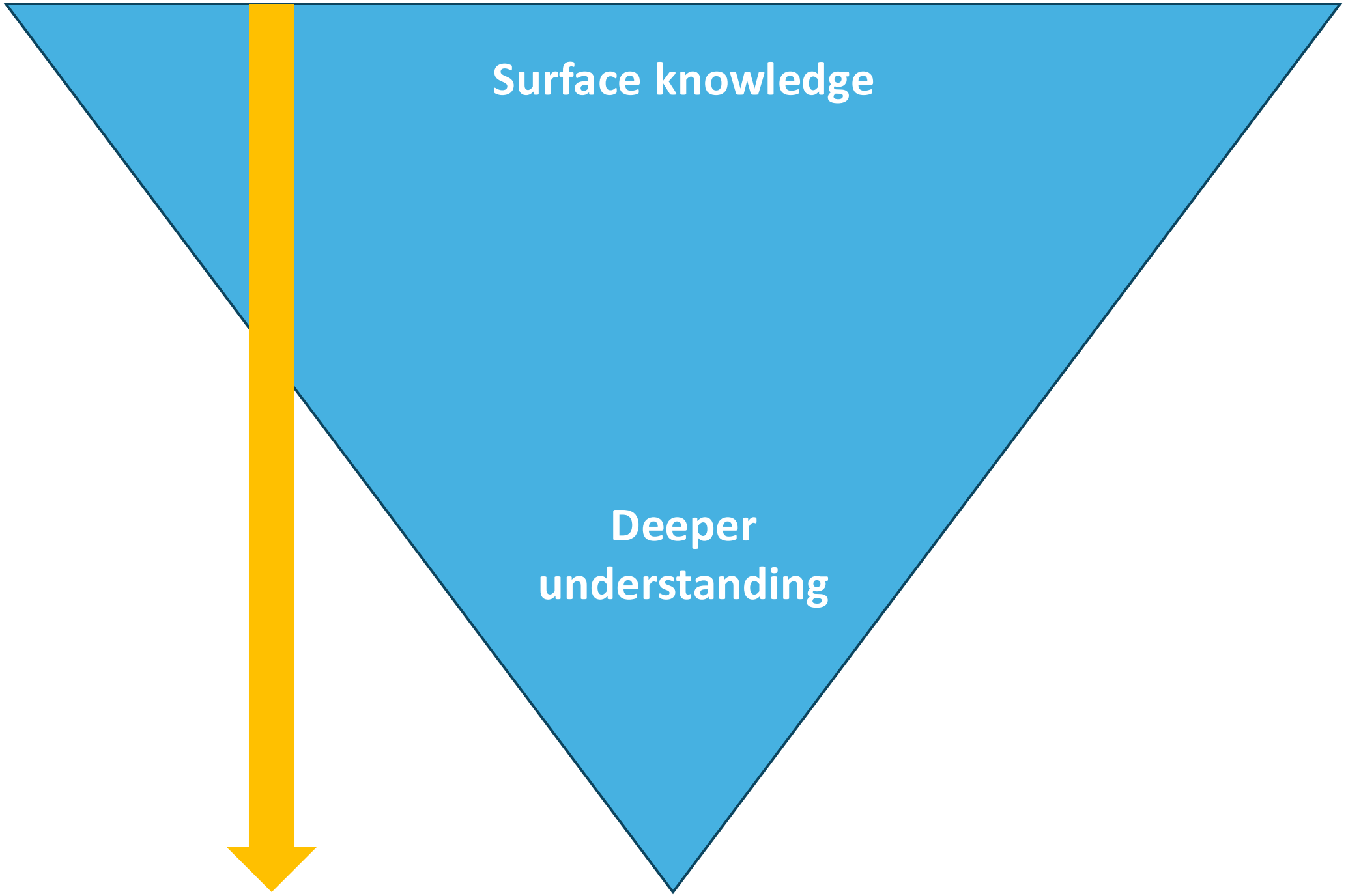
D

C. Confusing percentages with division

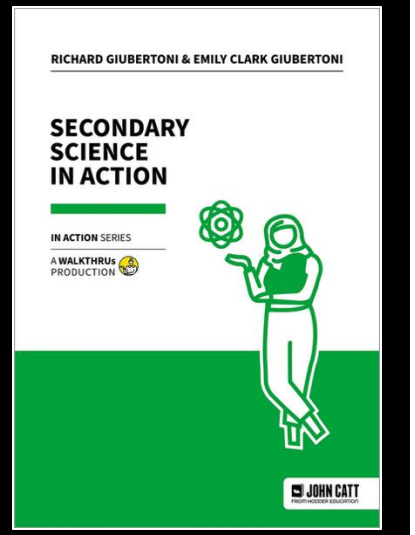
A. Good at calculating 10% but unsure how to calculate 20%

D. Confused percentages with multiplication

POWER UP



POWER UP



SPOTLIGHT ASSESSMENT ACTIVITIES:

Multiple Choice

When a bar of chocolate melts, which statement best describes what is happening?

A. The chocolate surrounding the particles melts.

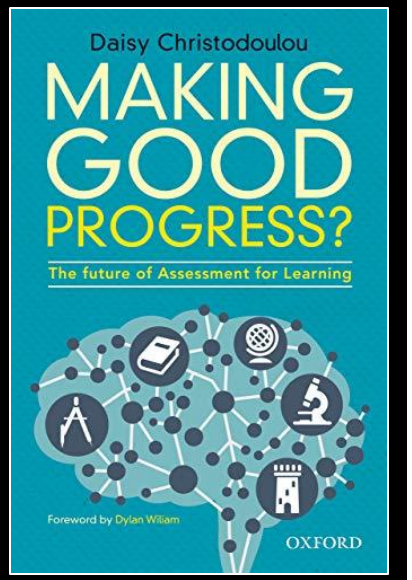
B. The particles move apart and keep moving apart.

C. Solid particles change to liquid particles.

D. The particles move about, keeping close together.

E. Hard particles change to runny particles.

POWER UP



SPOTLIGHT ASSESSMENT ACTIVITIES:

Multiple Choice

Liberal ideology…

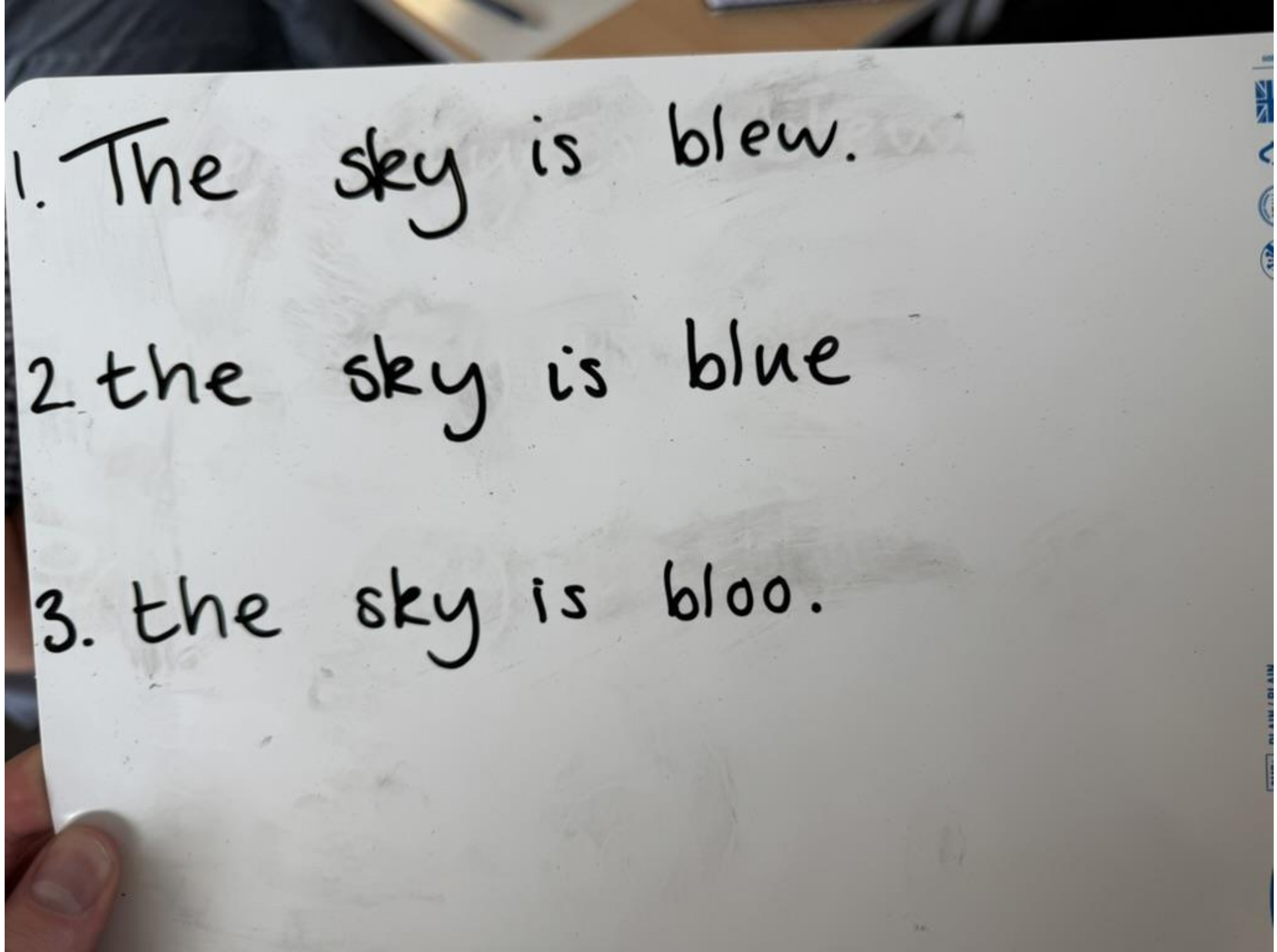
A. Was invented in the eighteenth century to serve the interests of the British Liberal Party.

B. Developed as a hostile response to the emergence of industrial capitalism.

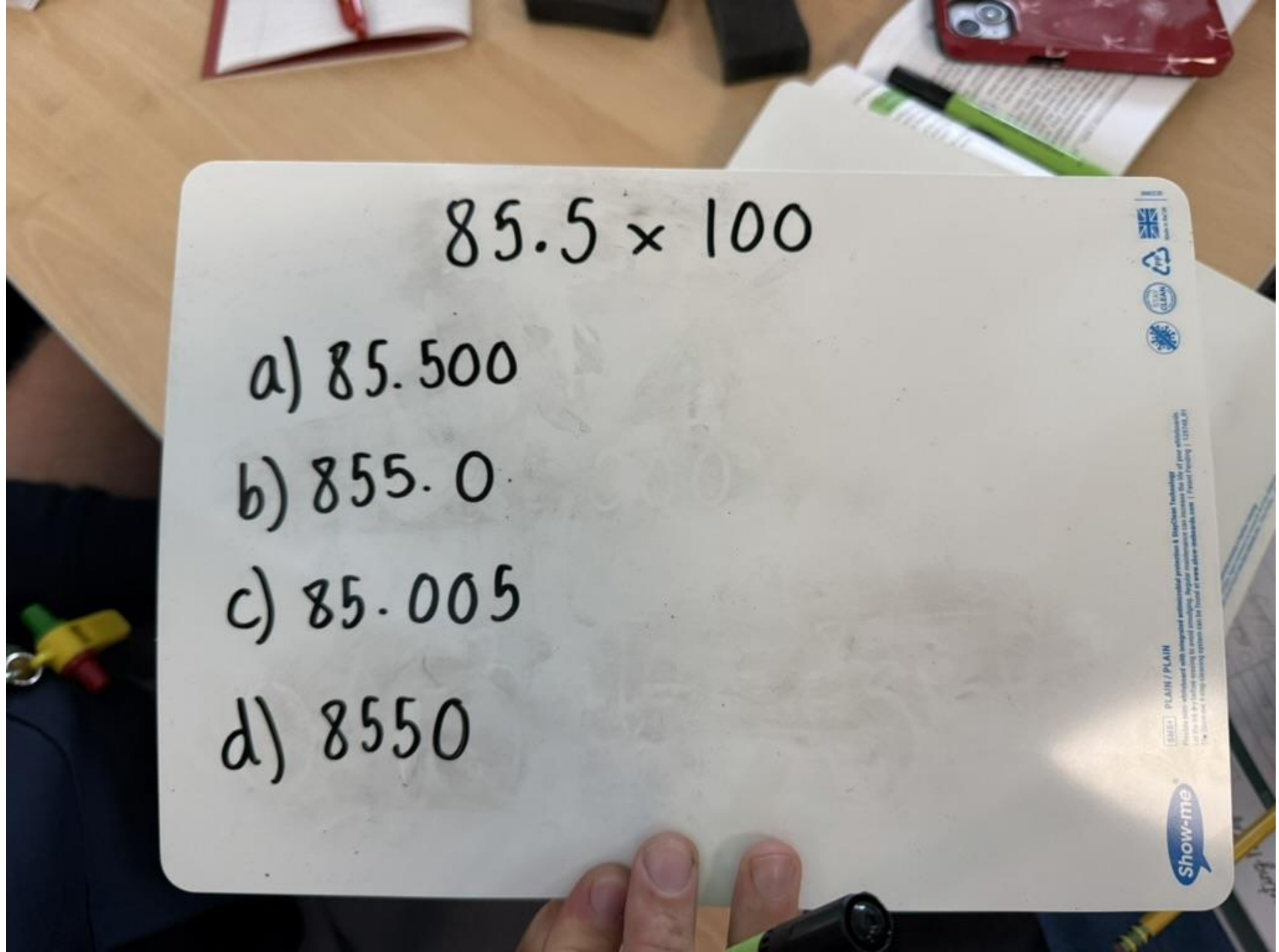
C. Is a compromise between socialism and conservatism.

D. Is a long-established creed which focuses on individual freedom.

POWER UP



POWER UP



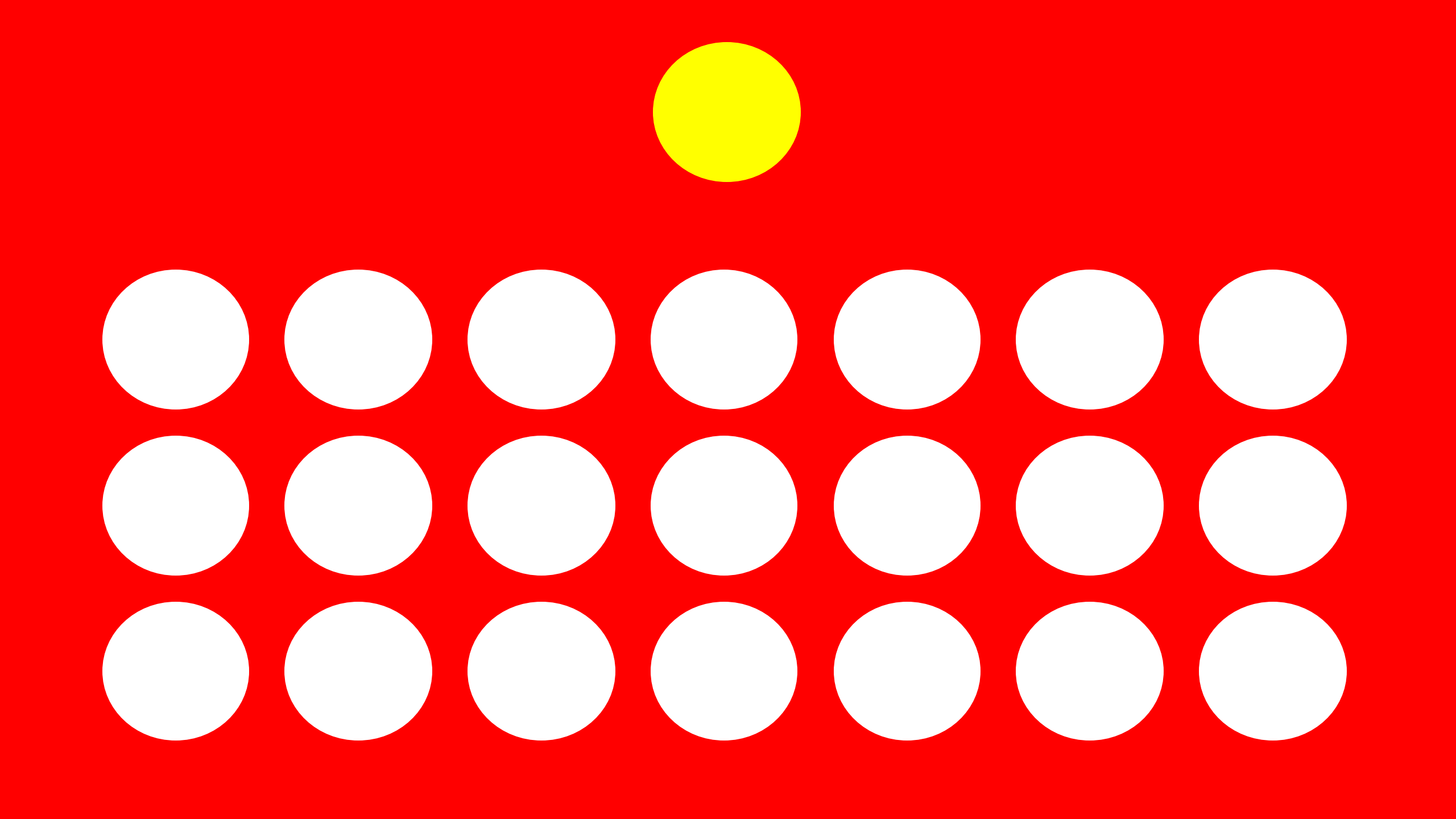
POWER UP

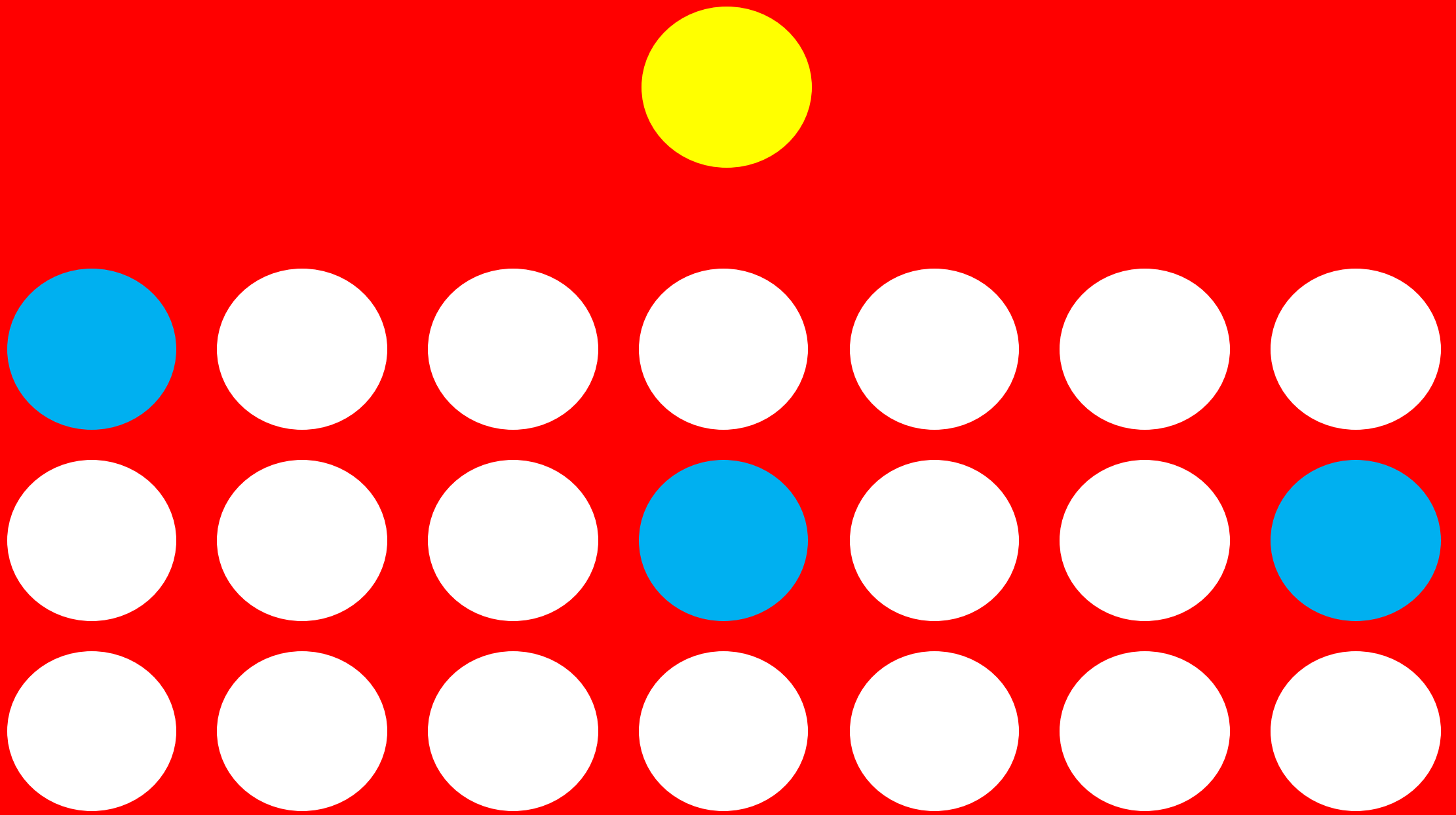
Key take-away(s)?

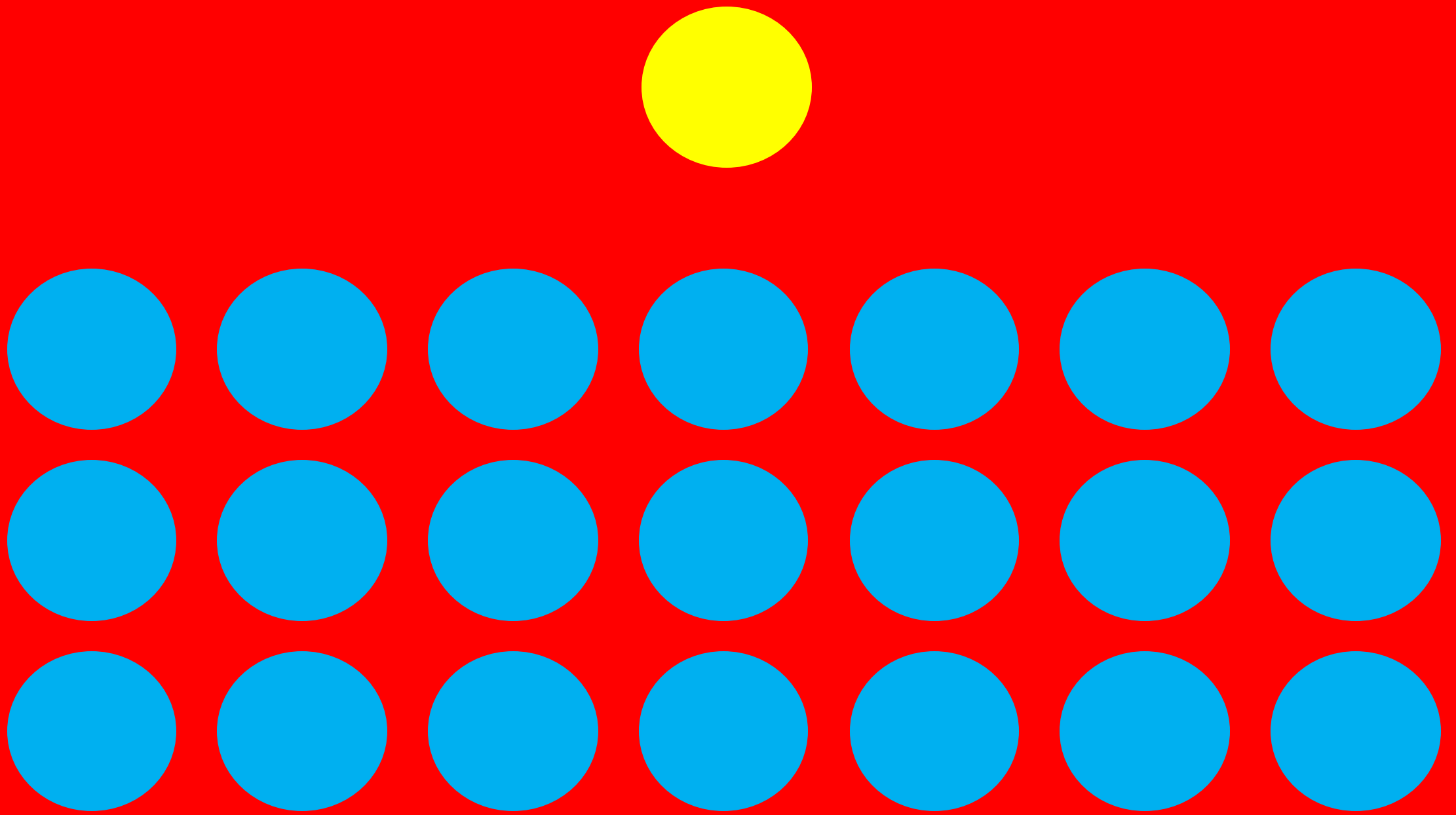
POWER UP

Common Pitfall

Asking the first (or second) student to put up their hand to answer.







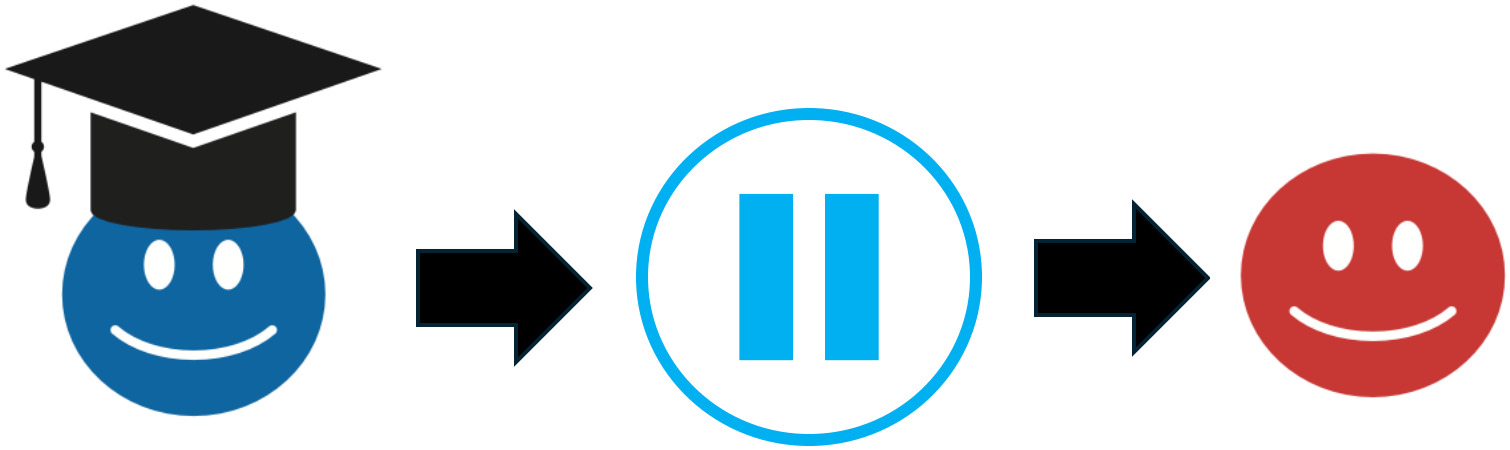
POWER UP

TRUSTED TECHNIQUES

POWER UP

TRUSTED TECHNIQUE

Pause



- “Everyone think about that.”
- “Take 10 seconds to think.”

Alternatively, simply remain silent.

POWER UP

TRUSTED TECHNIQUE

Patient Hands

- “I’d like to see a few more hands, please.”
- “I can see a few hands up, but I’d like everyone to be thinking about this. I’m going to wait for a few more.”

POWER UP

TRUSTED TECHNIQUE

Cold Call

You choose a student to answer a question, **regardless of whether their hand is up or not**.

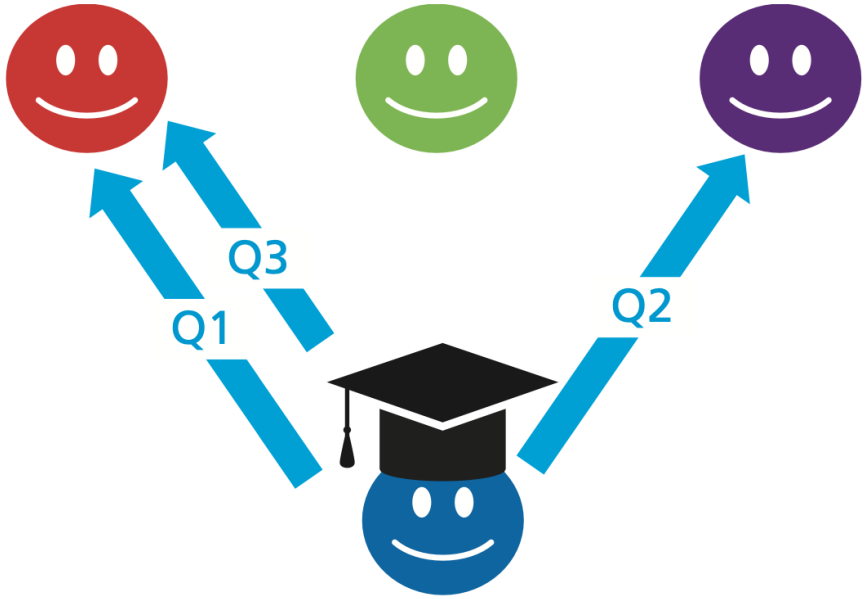
Question… pause… name student

For example:
‘What is the name of this chord… [pause] …Logan?’

POWER UP

TRUSTED TECHNIQUE

On The Hook



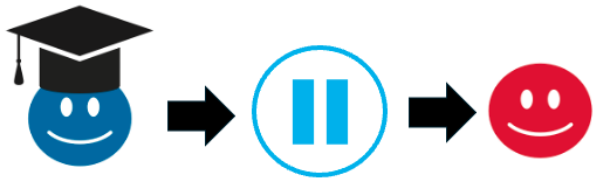
A student who has recently answered a question is **asked another a relatively short time afterwards** (as opposed to being 'ticked off as done' and not asked again for an extended period).

Current practice?	Introduce or refine?	Key features?	Pitfalls?

POWER UP

TRUSTED TECHNIQUE

Pause



- "Everyone think about that."
- "Take 10 seconds to think."

Alternatively, simply remain silent.

POWER UP

TRUSTED TECHNIQUE

Patient Hands

- "I'd like to see a few more hands, please."
- "I can see a few hands up, but I'd like everyone to be thinking about this. I'm going to wait for a few more."

POWER UP

TRUSTED TECHNIQUE

Cold Call

You choose a student to answer a question, **regardless of whether their hand is up or not.**

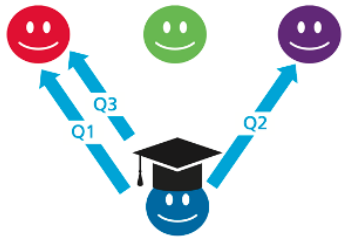
Question... **pause...** name student

For example:
'What is nine multiplied by three... [pause] ...Logan?'

POWER UP

TRUSTED TECHNIQUE

On The Hook



A student who has recently answered a question is **asked another a relatively short time afterwards** (as opposed to being 'ticked off as done' and not asked again for an extended period).

POWER UP

Common Pitfall

Using the answers from a small number of students as a proxy for the learning of everyone.

POWER UP

“What is the capital of Australia…

…Marnie?”

POWER UP

“Canberra”

“Well done”

POWER UP

TRUSTED TECHNIQUE

Show-Me Boards

All students write (or draw) a response on mini-whiteboards, holding these up for you to see when told.

Canberra	Sydney	Sydney	Sydney	Sydney
Sydney	Sydney	Sydney	Sydney	Sydney
Sydney	Sydney	Sydney	Sydney	Sydney
Sydney	Sydney	Sydney	Sydney	Sydney
Sydney	Sydney	Sydney	Sydney	Sydney

Canberra	Sydney	Canberra	Canberra	Sydney
Sydney	Canberra	Sydney	Sydney	Canberra
Sydney	Canberra	Sydney	Sydney	Canberra
Melbourne	Sydney	Canberra	Sydney	Sydney
Canberra	Sydney	Sydney	Canberra	Sydney

POWER UP

Your best friend

POWER UP

1. Make **all** students **think**.

2. Give **all** students **time to think**.

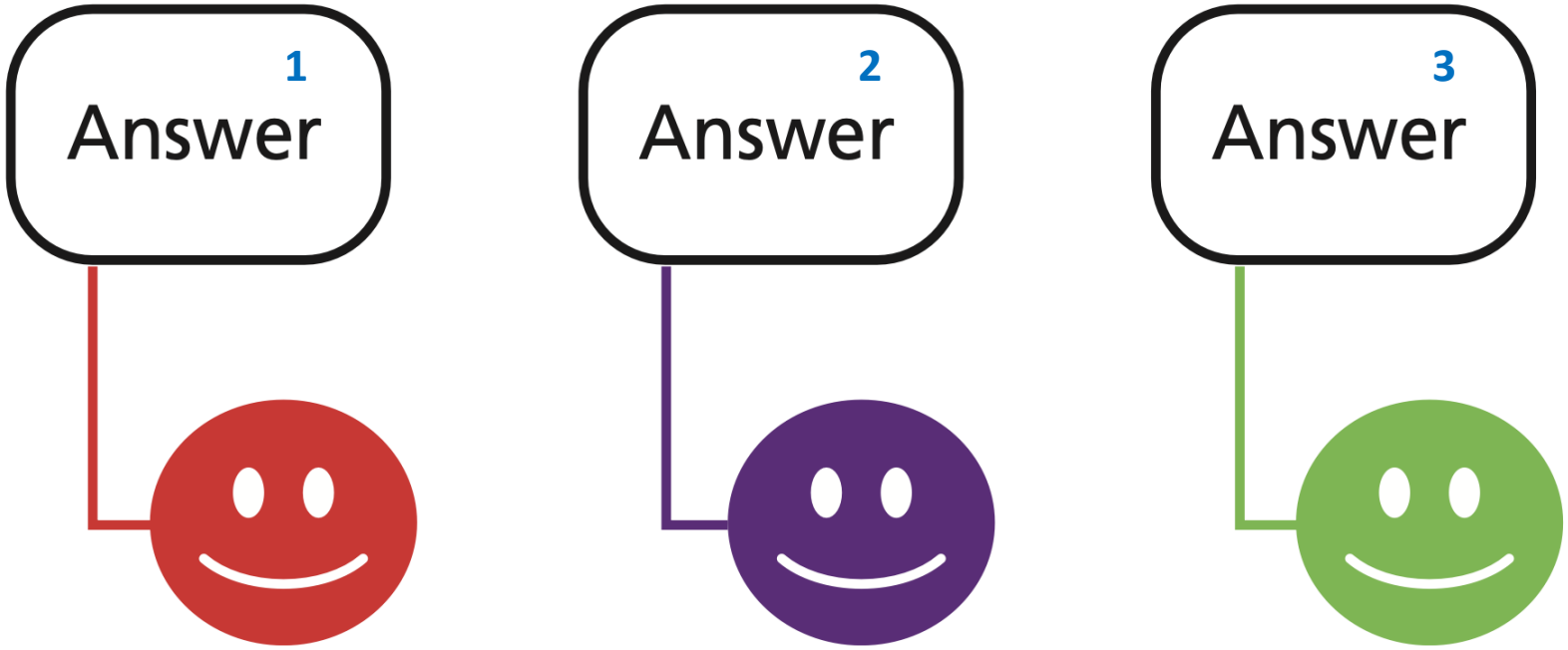
3. Make **all** students **commit to a specific answer**.

4. Make **all** students' **thinking visible to you**.

POWER UP

TRUSTED TECHNIQUE

Confidence Measures



- Encourage participation
- Formatively useful to teacher

POWER UP

TRUSTED TECHNIQUE

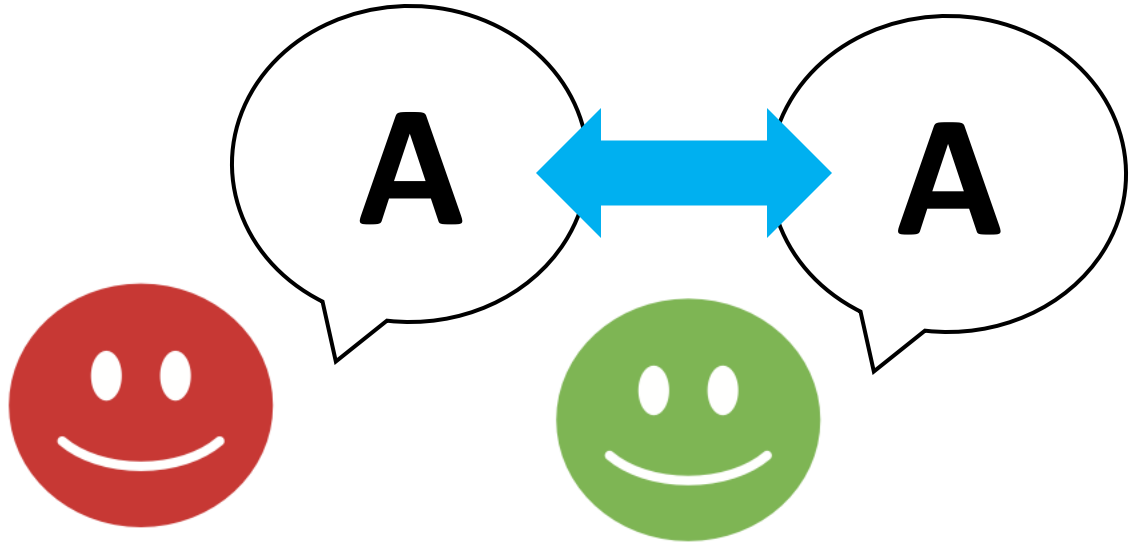
Choral Response

You ask a question that **all students** are expected to answer verbally **at the same time**.

POWER UP

TRUSTED TECHNIQUE

Chat To A Partner



You ask a question and **give students time to talk to a peer** about what they are thinking.

Particularly useful technique when a question is relatively difficult or complex.

Current practice?	Introduce or refine?	Key features?	Pitfalls?

POWER UP

TRUSTED TECHNIQUE

Show-Me Boards

All students write (or draw) a response on mini-whiteboards, holding these up for you to see when told.

POWER UP

TRUSTED TECHNIQUE

Confidence Measures

- Encourage participation
- Formatively useful to teacher

POWER UP

TRUSTED TECHNIQUE

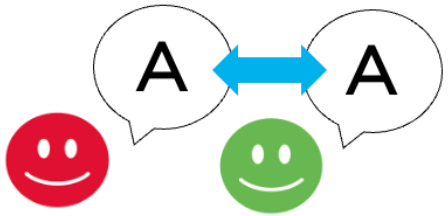
Choral Response

You ask a question that **all students** are expected to answer verbally **at the same time**.

POWER UP

TRUSTED TECHNIQUE

Chat To A Partner



You ask a question and **give students time to talk to a peer** about what they are thinking.

Particularly useful technique when a question is relatively difficult or complex.

POWER UP

?

Have you understood the **key messages** in this presentation to this point?

POWER UP

What does the **STAR** acronym stand for?

S …

T …

A …

R …

POWER UP

Learning Lesson 5

Familiarity and **learning** are not the same thing.

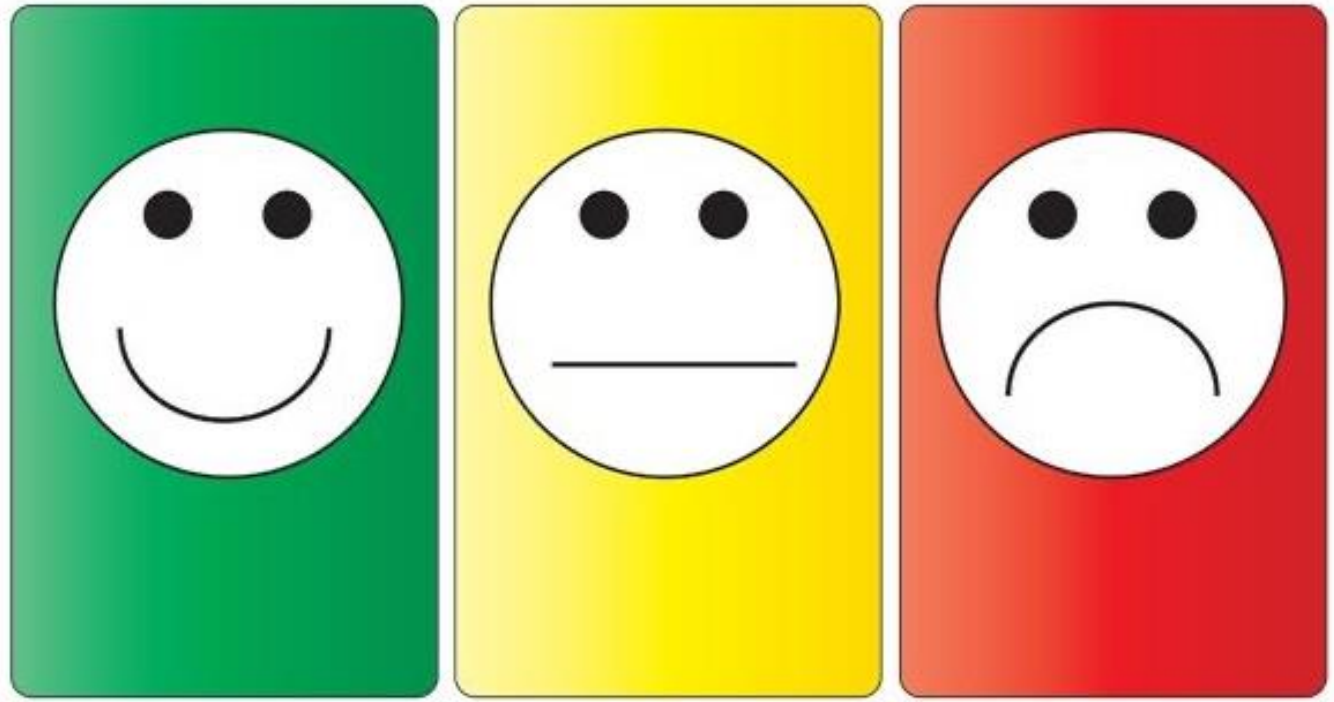
POWER UP

Common Pitfall

Confusing **confidence measures** with **evidence measures**.

POWER UP

POWER UP



POWER UP

Prove it!

POWER UP

			
I can…			
I can…			
I can…			

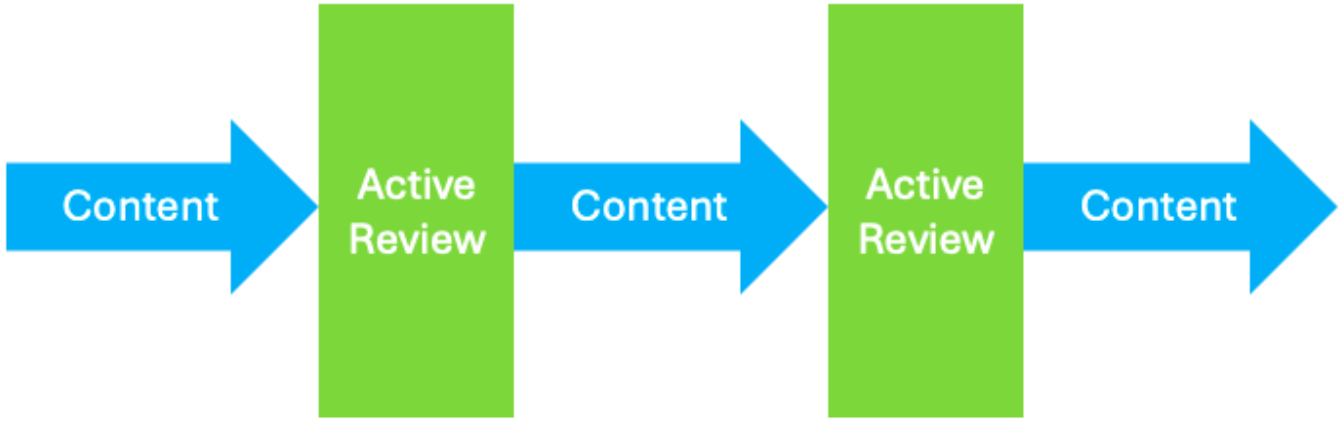
POWER UP

TRUSTED TECHNIQUES

POWER UP

TRUSTED TECHNIQUE

Chunk It

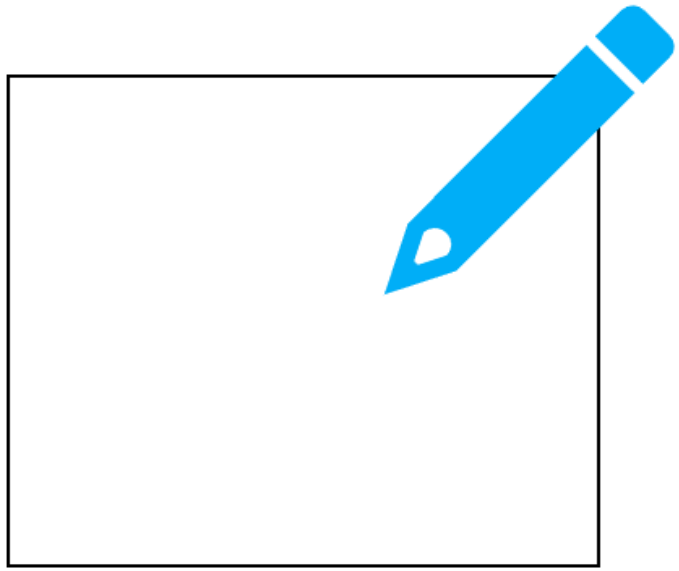


Part-way through or at the end of a period of teacher exposition, you **pause to *actively* review** the content covered to that point, using specific, preplanned questions.

POWER UP

TRUSTED TECHNIQUE

Quick Summary



As you are presenting, you **pause periodically** (e.g. every 15 minutes) and ask students to…

- Write down everything you've understood about…
- Write down everything you've understood from the last 15 minutes.

POWER UP

TRUSTED TECHNIQUE

Success Criterion Check-in

POWER UP

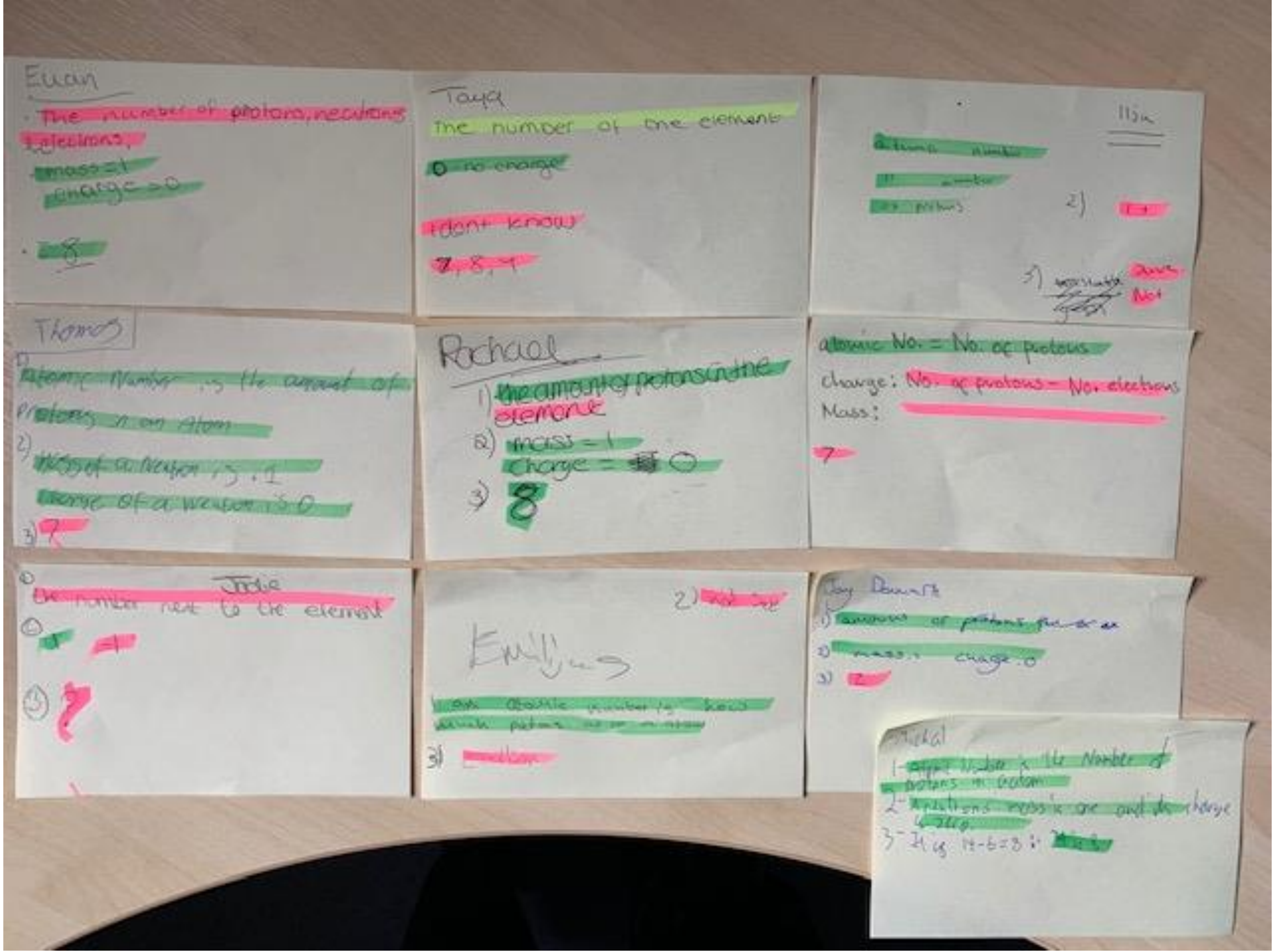
- I can **suggest reasons why the Greeks created Myths and Legends.**
- I can **outline the key events** in the story of Atlantis
- I can show the **sequence** of the destruction of Crete using a diagram to help.

POWER UP

TRUSTED TECHNIQUE

Exit Tickets

POWER UP

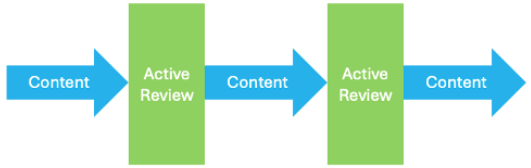


Euan
The number of protons, neutrons
electrons,
mass = 1
charge = 0
8
Taya
The number of the element
0 no charge
I dont know
Thomas
1) Atomic Number is the amount of protons in an atom
2) Mass of a Neutron is 1
Charge of a Neutron is 0
3) 7
Rachael
1) the amount of protons in the element
2) mass = 1
Charge = 0
3) 8
atomic No. = No. of protons
charge: No. of protons − No. electrons
Mass:
7
Jodie
the number next to the element

Current practice?	Introduce or refine?	Key features?	Pitfalls?

POWER UP

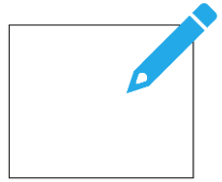
TRUSTED TECHNIQUE
Chunk It



Part-way through or at the end of a period of teacher exposition, you pause to *actively* review the content covered to that point, using specific, preplanned questions.

POWER UP

TRUSTED TECHNIQUE
Quick Summary



As you are presenting, you **pause periodically** (at least every 15 minutes) and ask students to...

- Write down everything you've understood about...
- Write down everything you've understood from the last 15 minutes.
- Chat to a partner about what you think the key points were.

POWER UP

TRUSTED TECHNIQUE
Success Criterion Check-in

POWER UP

TRUSTED TECHNIQUE
Exit Tickets

In the final few minutes of a lesson, you ask students to answer a question or a short set of questions designed to **generate evidence of their understanding** (*short-term learning)* from the lesson.

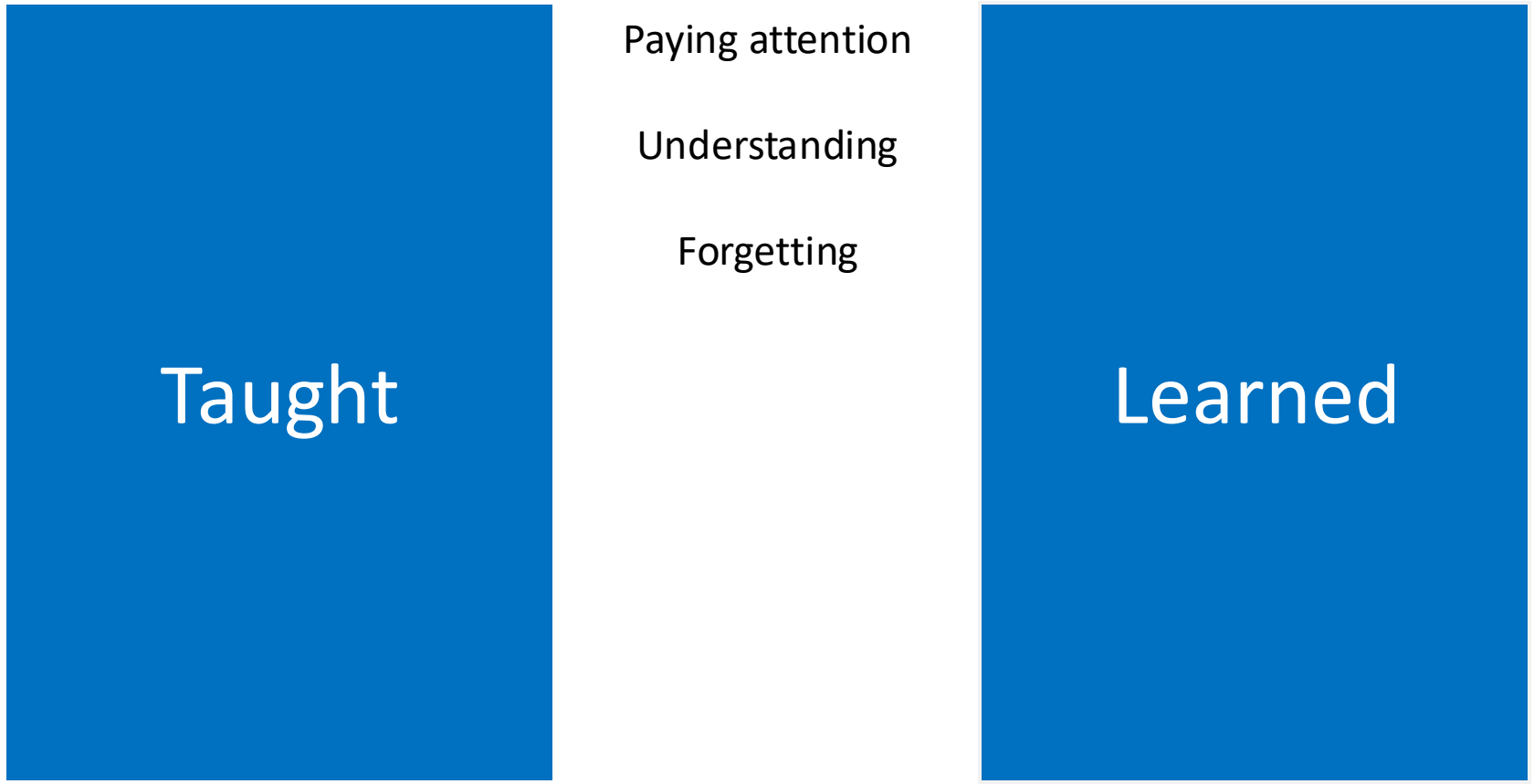
You review these ahead of the next lesson, adapting your lesson planning accordingly.

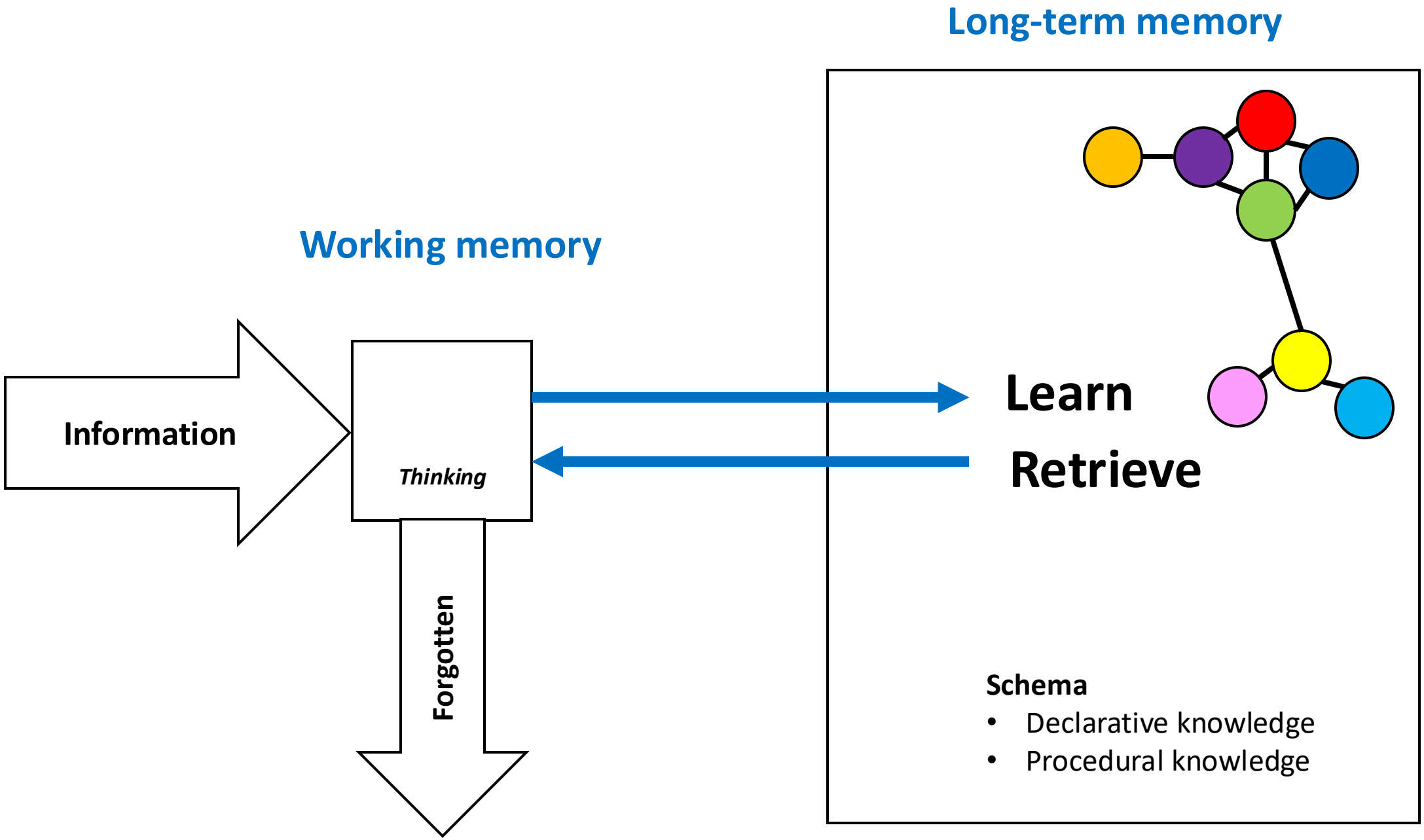
POWER UP

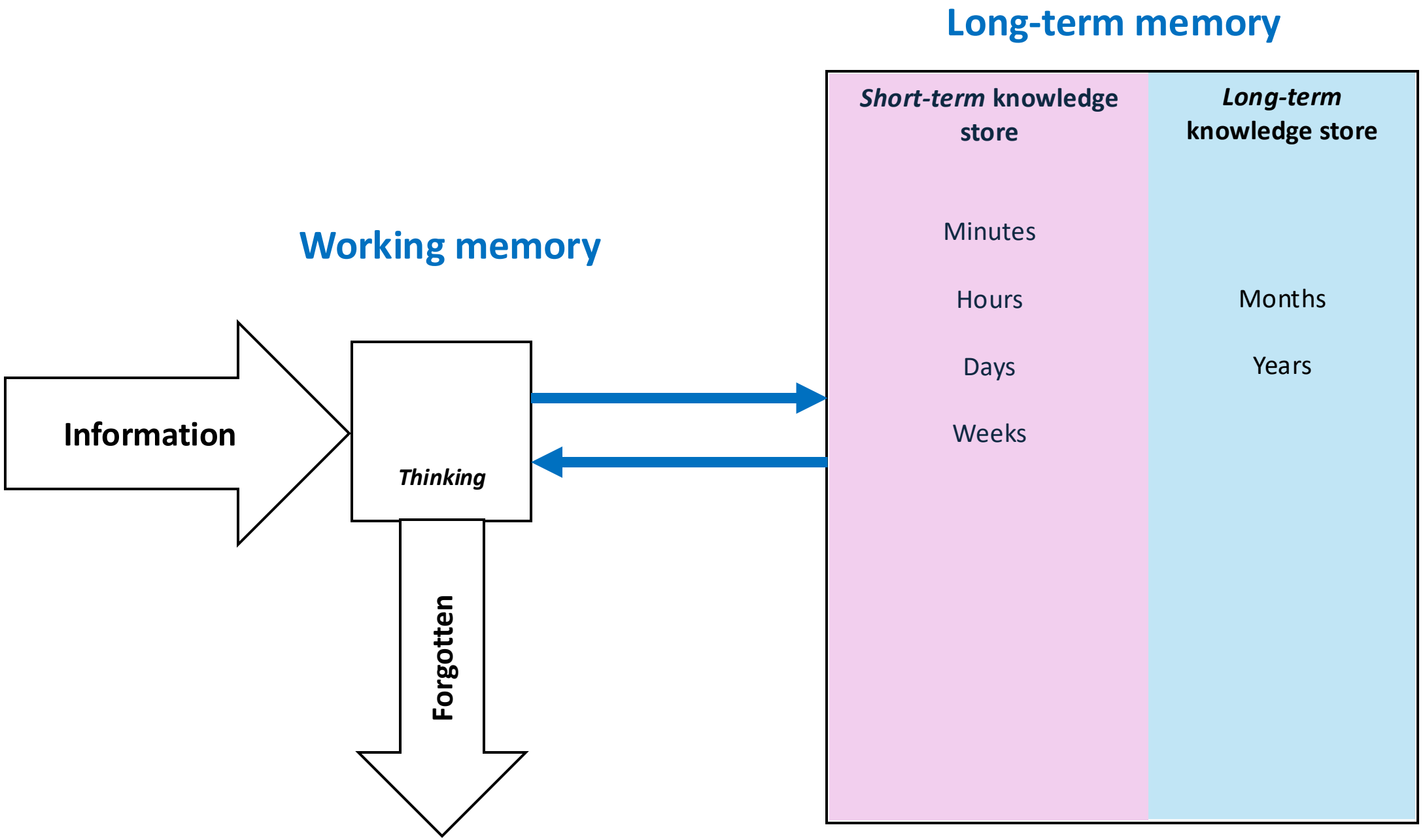
Learning Lesson 6

Spaced retrieval is the best way to prevent forgetting.

The Teaching-Learning Gap




Long-term memory
Working memory
Information
Thinking
Forgotten
Learn
Retrieve
Schema
• Declarative knowledge
• Procedural knowledge


Long-term memory
Short-term knowledge store
Long-term knowledge store
Working memory
Minutes
Hours
Days
Weeks
Months
Years
Information
Thinking
Forgotten

POWER UP

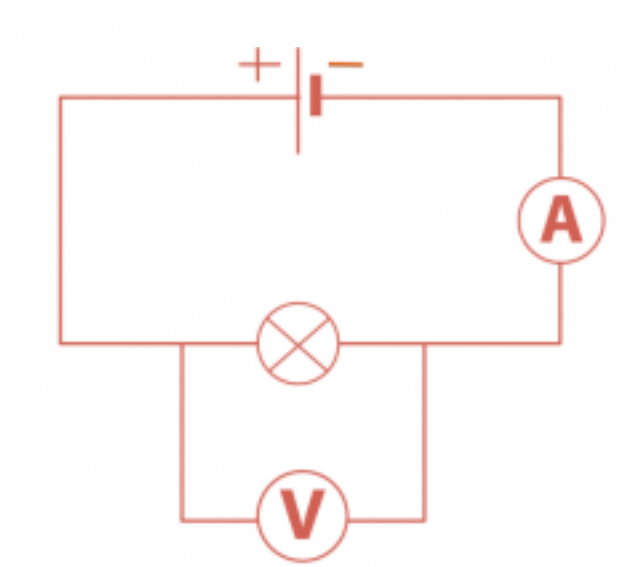
Common Pitfall

Believing that because something was ***understood*** **in the previous lesson**, it will be ***remembered*** **in the next lesson**.

POWER UP

Example

Draw a graph based on table of results from an experiment in the previous lesson.



“What was this experiment about?”

Everyone was asked to think about this, and *everyone* was asked to write it down.

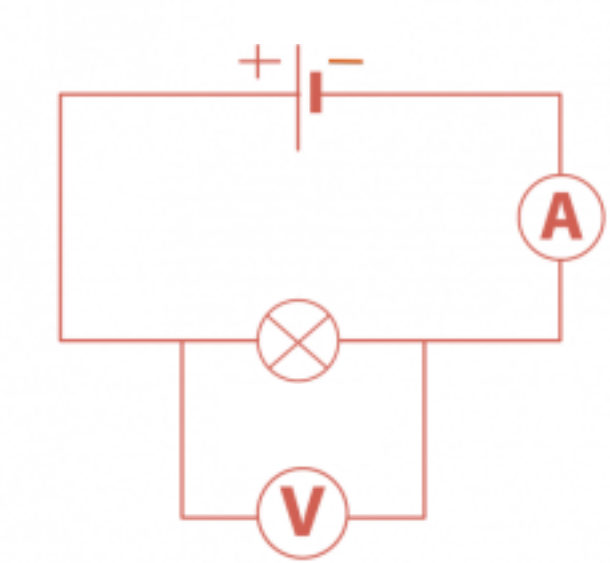
POWER UP

What students said…

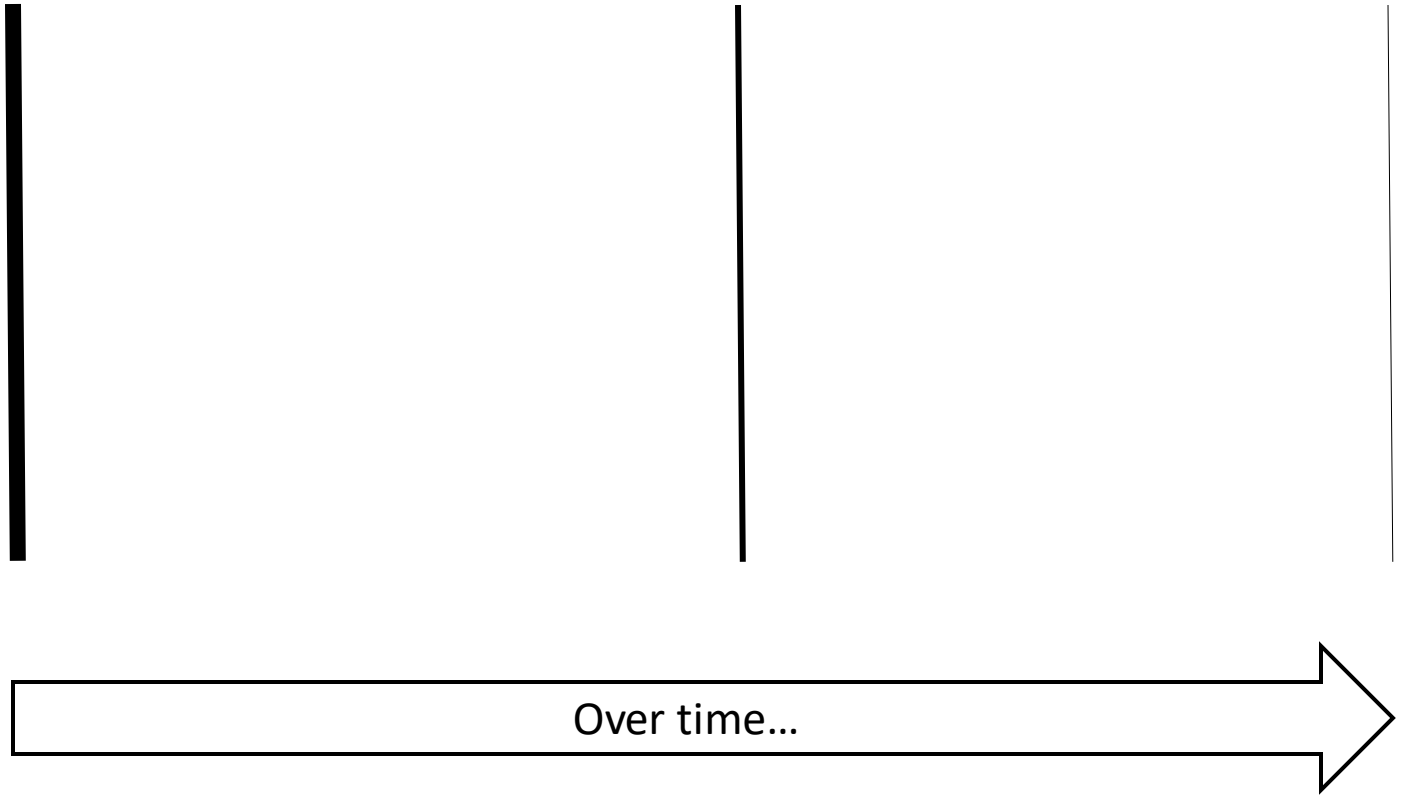
“To find out how much voltage was in the bulb.”

“To find out how much voltage you can get from a bulb when the brightness changes.”

“To find out if increasing or decreasing the voltage impacts on the brightness of a bulb.”

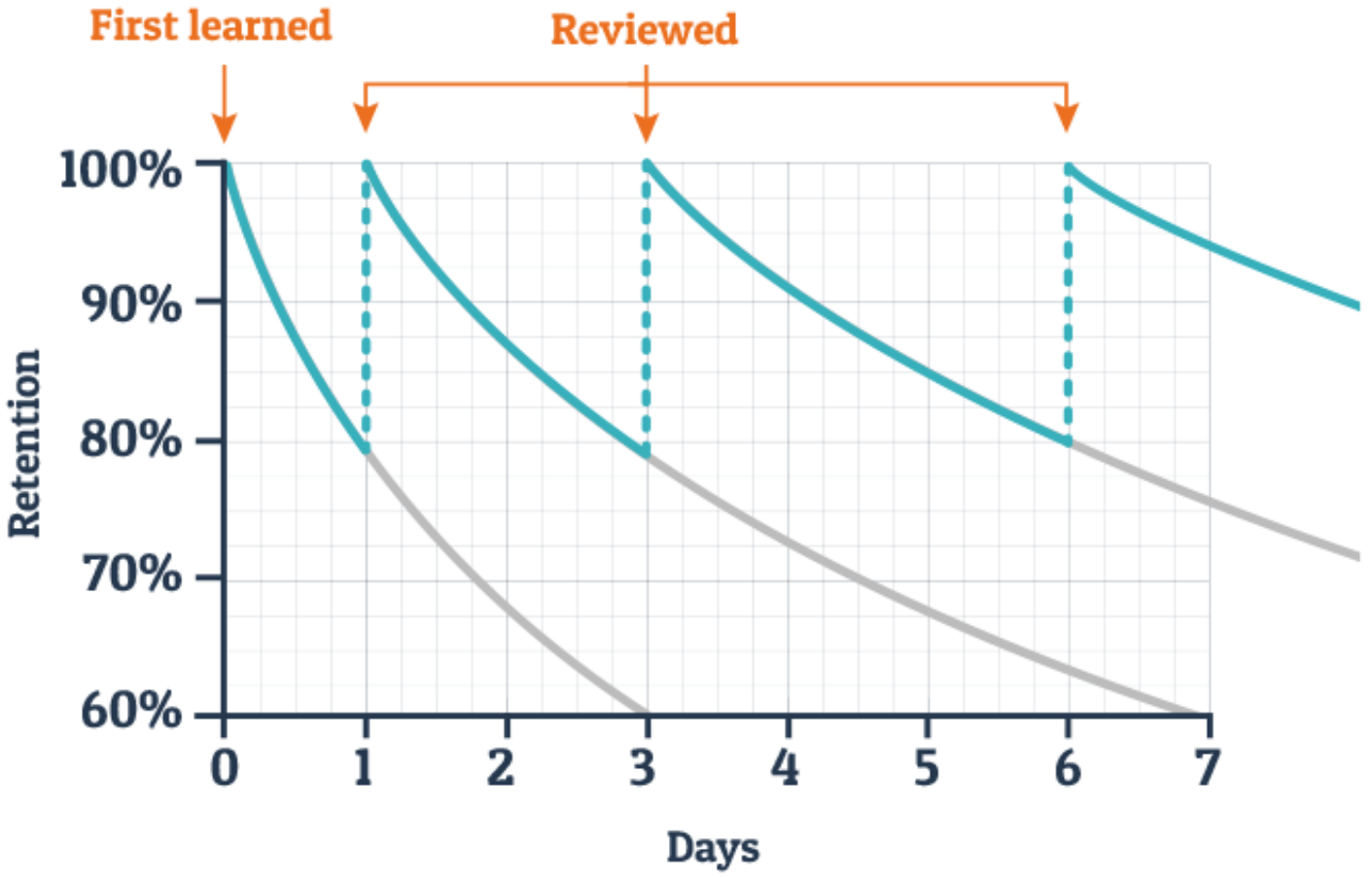


Fading

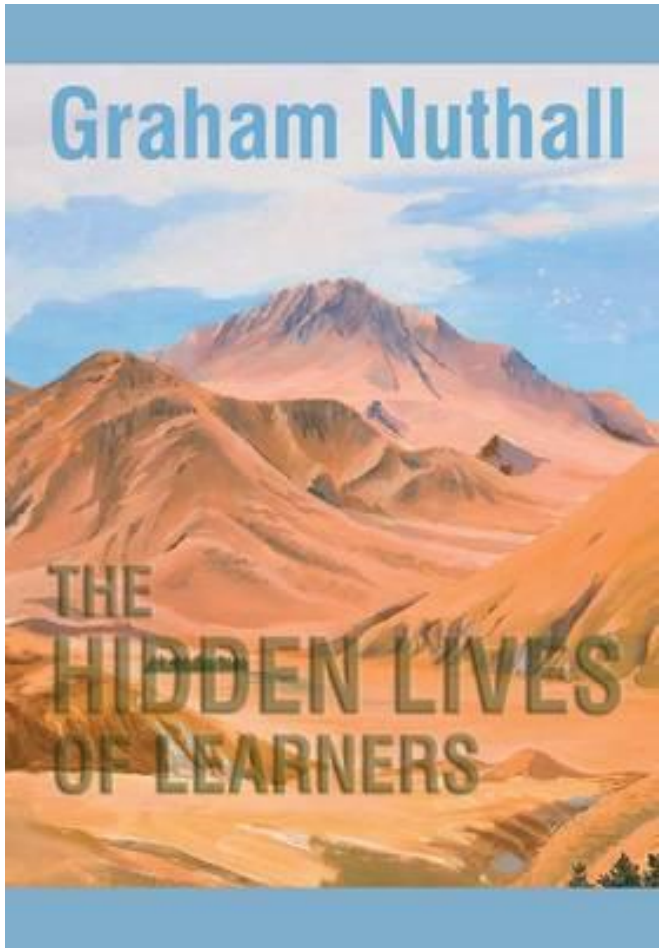


POWER UP

Ebbinghaus' Forgetting Curve



POWER UP

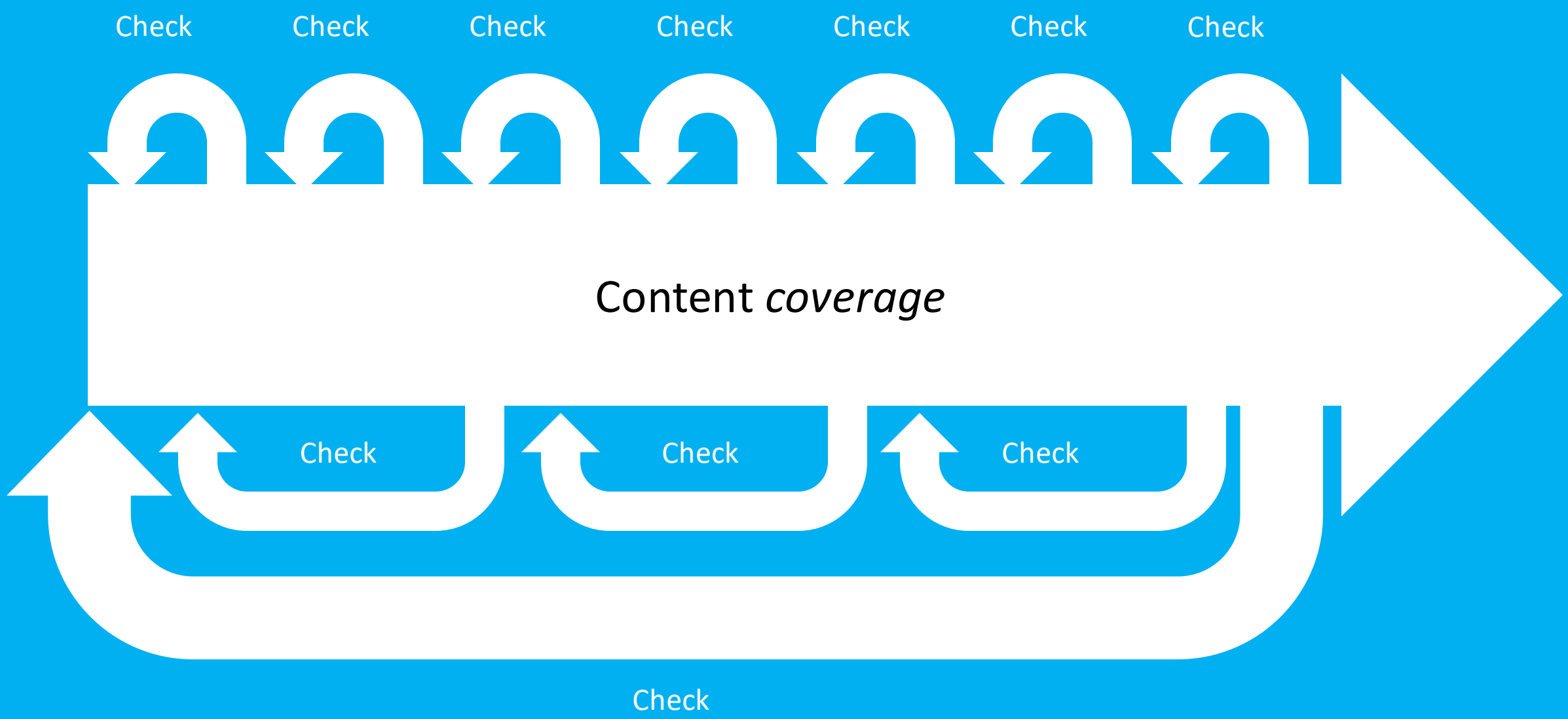


3

Students need to think about ‘a concept’ on ***at least*** **3 separate occasions** before it is likely to be learned.

~~Revisiting is important~~

***Active* revisiting is essential**


Check
Check
Check
Check
Check
Check
Check
Content *coverage*
Check
Check
Check
Check

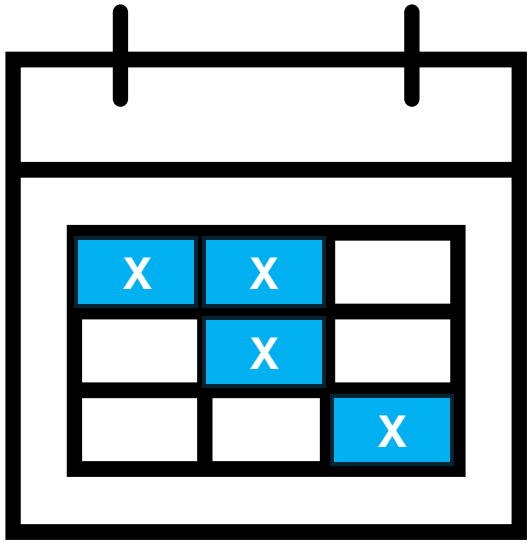
POWER UP

TRUSTED TECHNIQUES

POWER UP

TRUSTED TECHNIQUE

Repeated Revisits



You plan for students practise something in a lesson…

…then **again** in another lesson soon after…

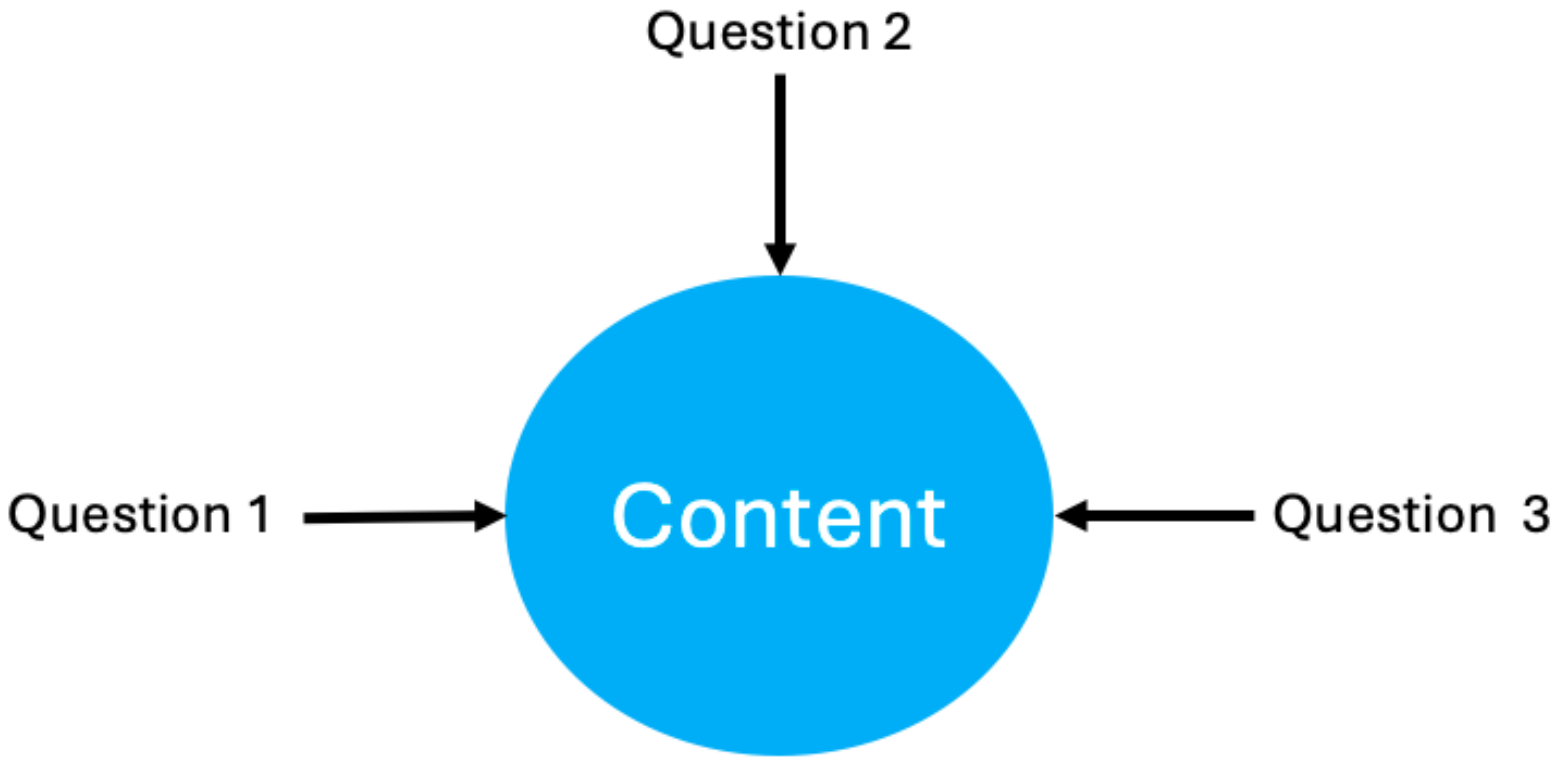
…then **again** – in a lesson or in homework – once more time has passed…

…and **again**, after even more time has passed…

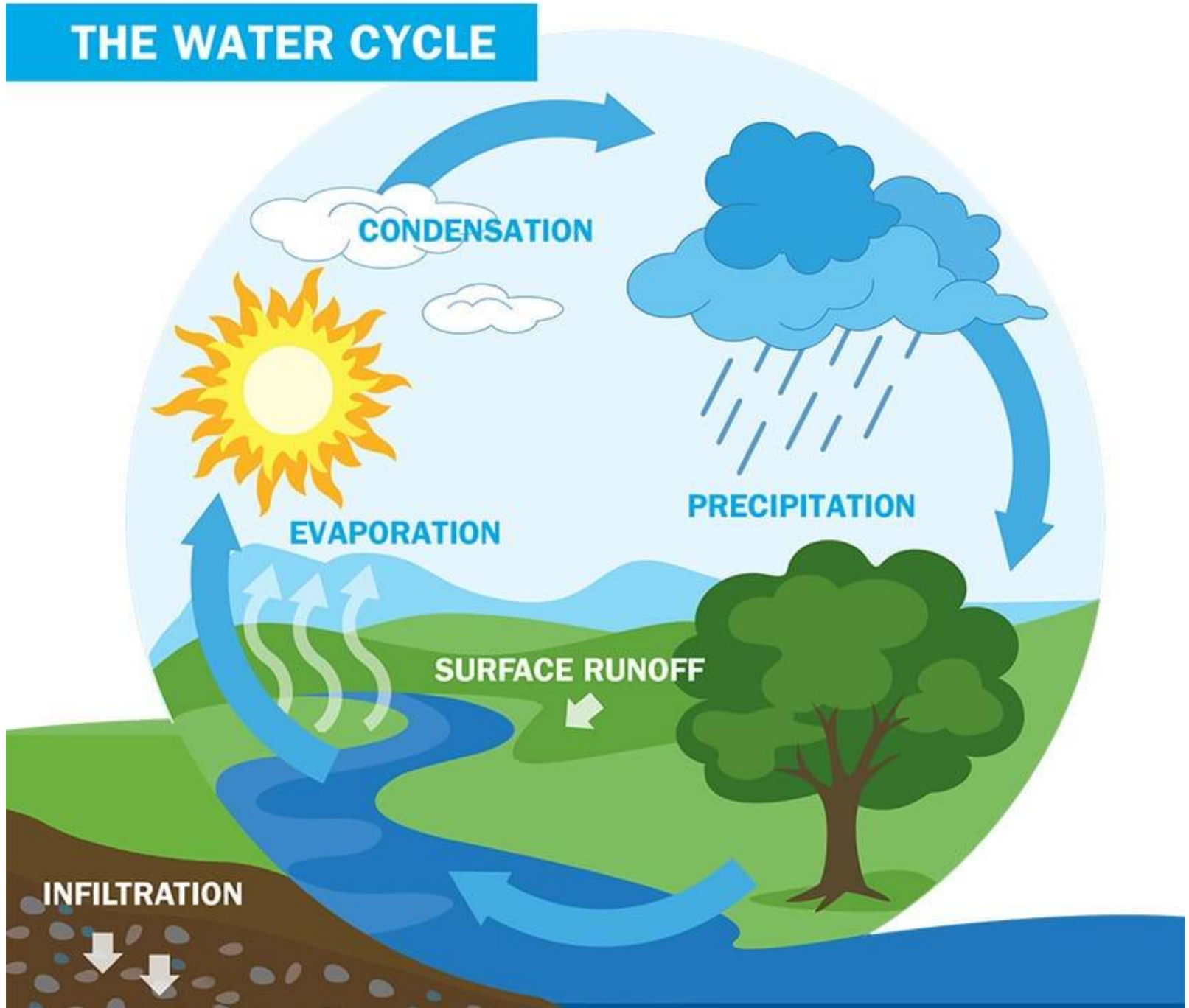
POWER UP

TRUSTED TECHNIQUE

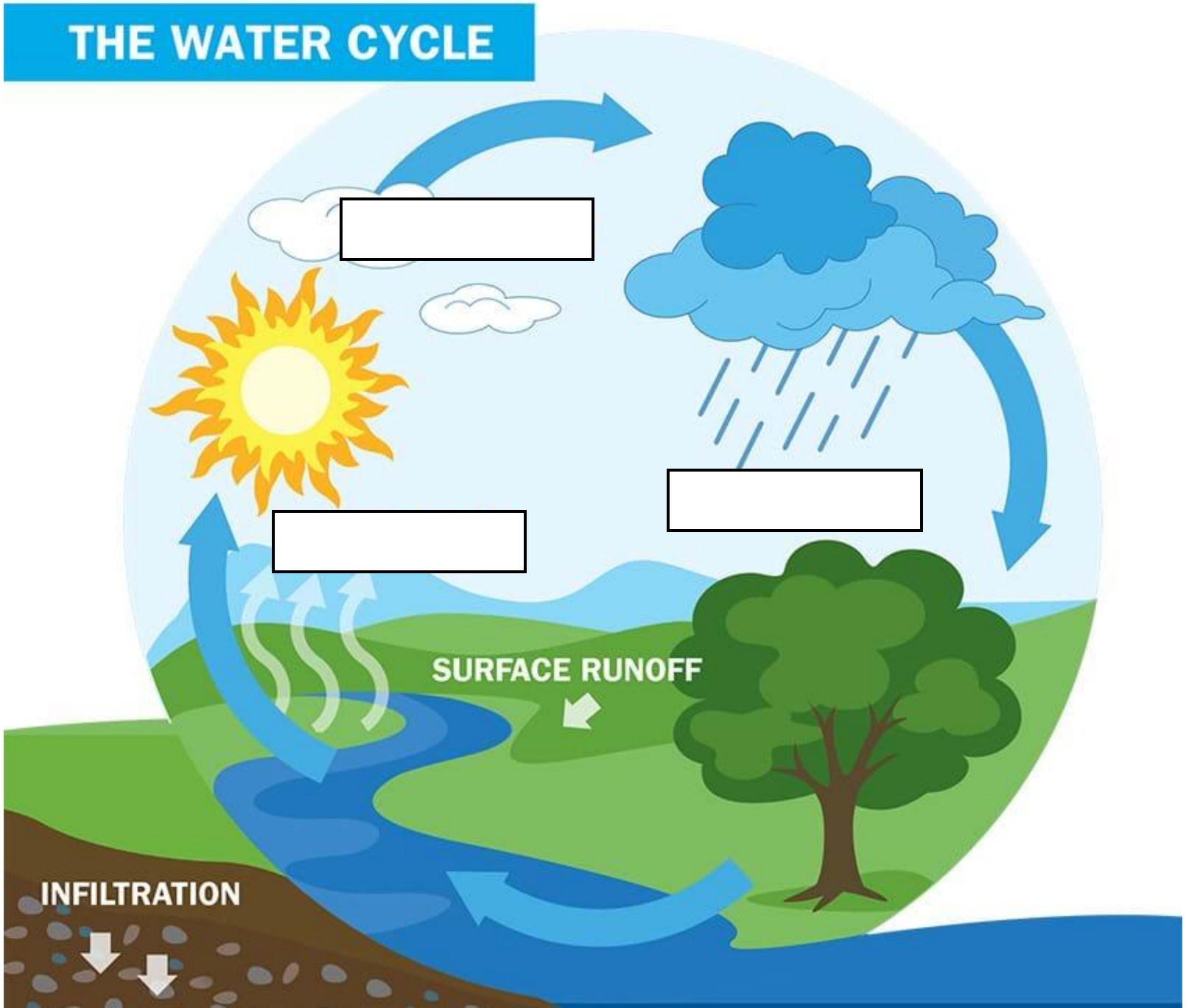
Different Angles



POWER UP


THE WATER CYCLE
CONDENSATION
PRECIPITATION
EVAPORATION
SURFACE RUNOFF
INFILTRATION

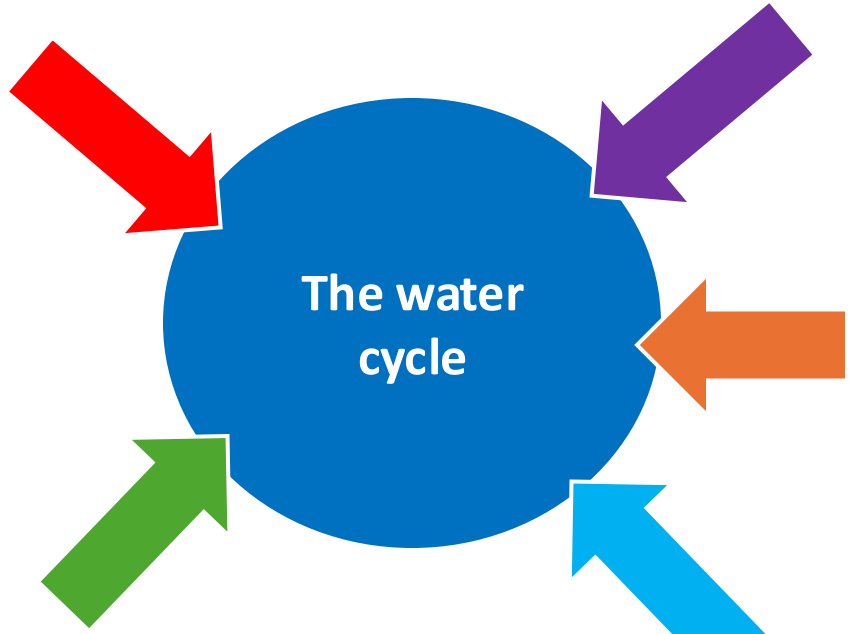
POWER UP



Different angles…

Label blank diagram

Draw the cycle from memory



Explain it to a partner

Spot the deliberate mistakes in an alternative version

True or false statements

POWER UP

Aim

To develop your understanding of key messages from **cognitive science** and **educational research** about ***principles*** that underpin high-quality pedagogy, with a focus on how these can be **applied in the classroom**.

POWER UP

Make you think – *extended learning sessions*

Challenge and consolidate

Spark your interest

Support you to make your teaching *even better* than it is already

POWER UP Your Pedagogy

Bruce Robertson

St Andrew's High School, Kirkcaldy, 25th and 26th June 2025

NEXT LEVEL EDUCATIONAL

NextLevelEducational.com

bruce@nextleveleducational.com | @BruceNextLevel