



CAMBRIDGE

Unlocking higher-order thinking skills

Exploring systems thinking, analogical problem solving and metacognition in our secondary classrooms

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15 to 16 July 2026

Agenda

This workshop delves into the connections between skills and knowledge in the Cambridge Pathway. We will also:

- explore systems thinking, kind and wicked problem-solving, and metacognitive skills
- discuss best teaching practices and share experiences
- examine the relationship between complex thinking skills and the Cambridge learner attributes
- participate in activities to help learners develop these skills.

Which of the following, if any, do you view as important to learn to be ready for your **next step in education**?
And for your future **after finishing education**?

Values

Thinking and
research
skills

Aesthetic
skills

Physical
skills

Subject
knowledge

Communication
skills

Self-
management
skills

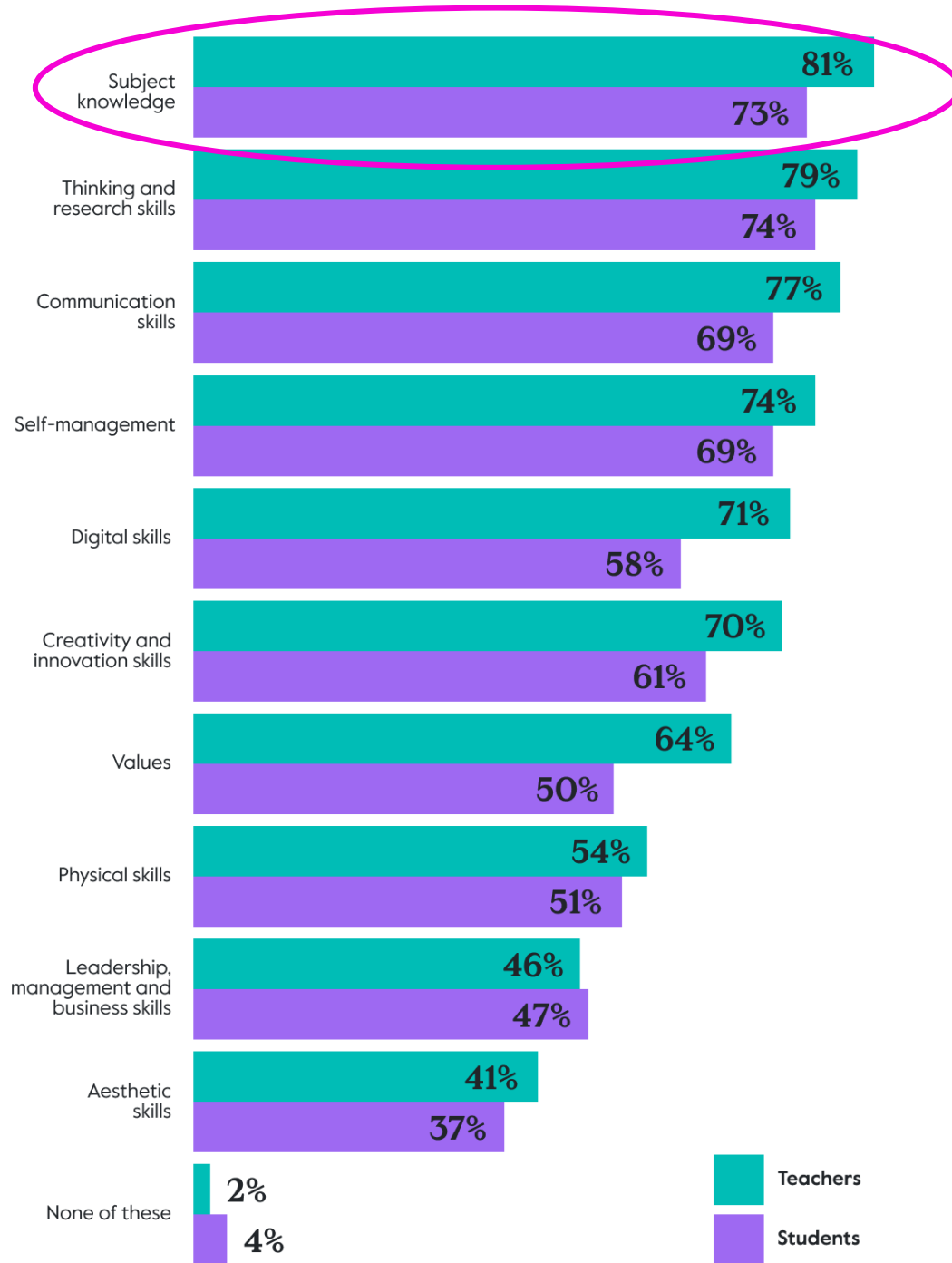
Creativity
and
innovation
skills

Digital skills

Leadership,
management &
business skills

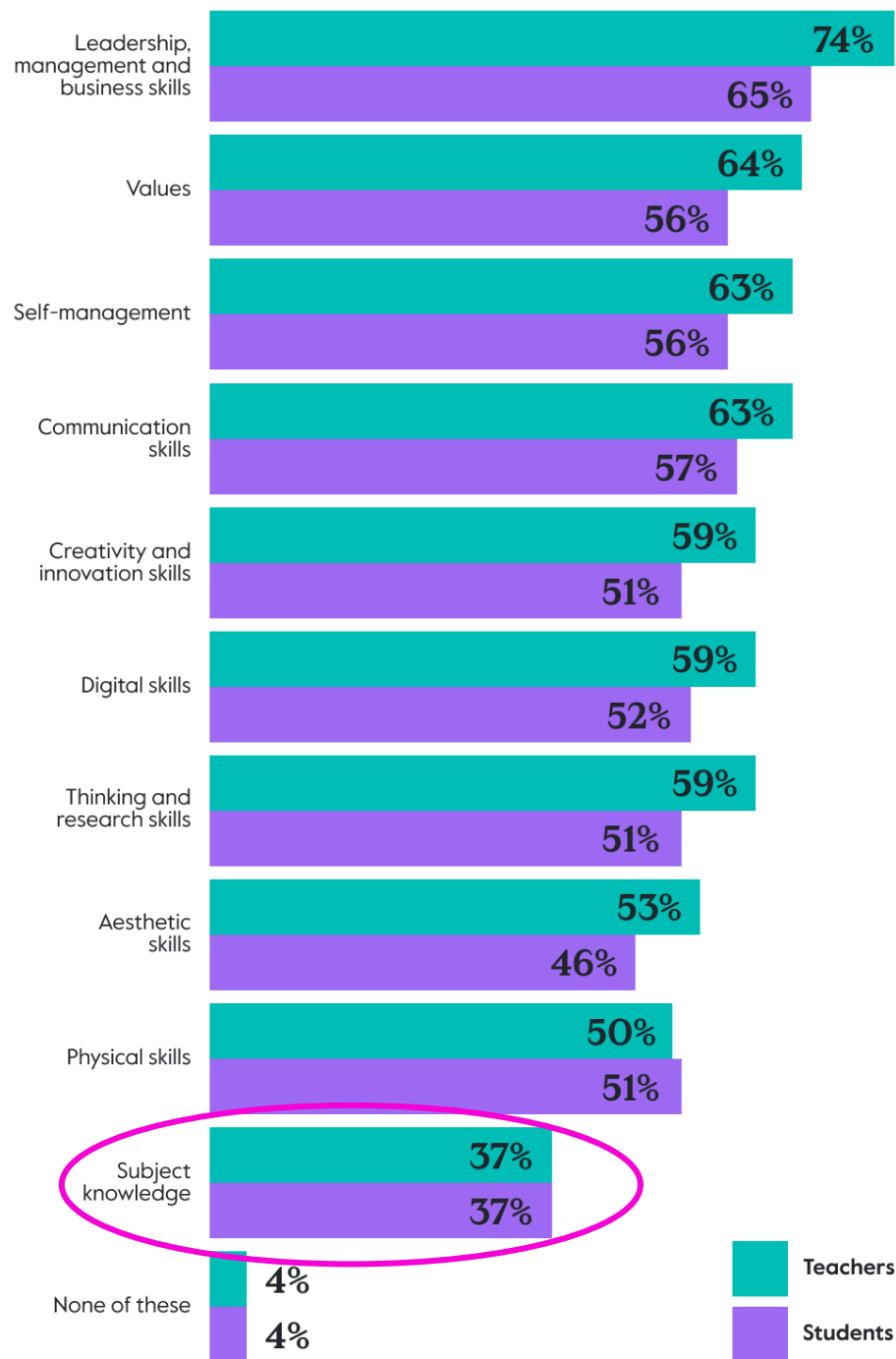


cambridge.org/future-ready-learners



Students and teachers agree that subject knowledge is critical for students' **next step in education**

Question: Which of the following, if any, do you view as important to learn to be ready for your next step in education? Please select all that apply



But are less likely to see it as important for students' **future after finishing education**

Question: Which of the following, if any, do you view as important to learn to be ready for your future after finishing education? Please select all that apply

“As AI gets more popular and more widely available, the need to memorise subject knowledge becomes less important as we can find and implement subject knowledge easily with the help of AI. ”

Student, India

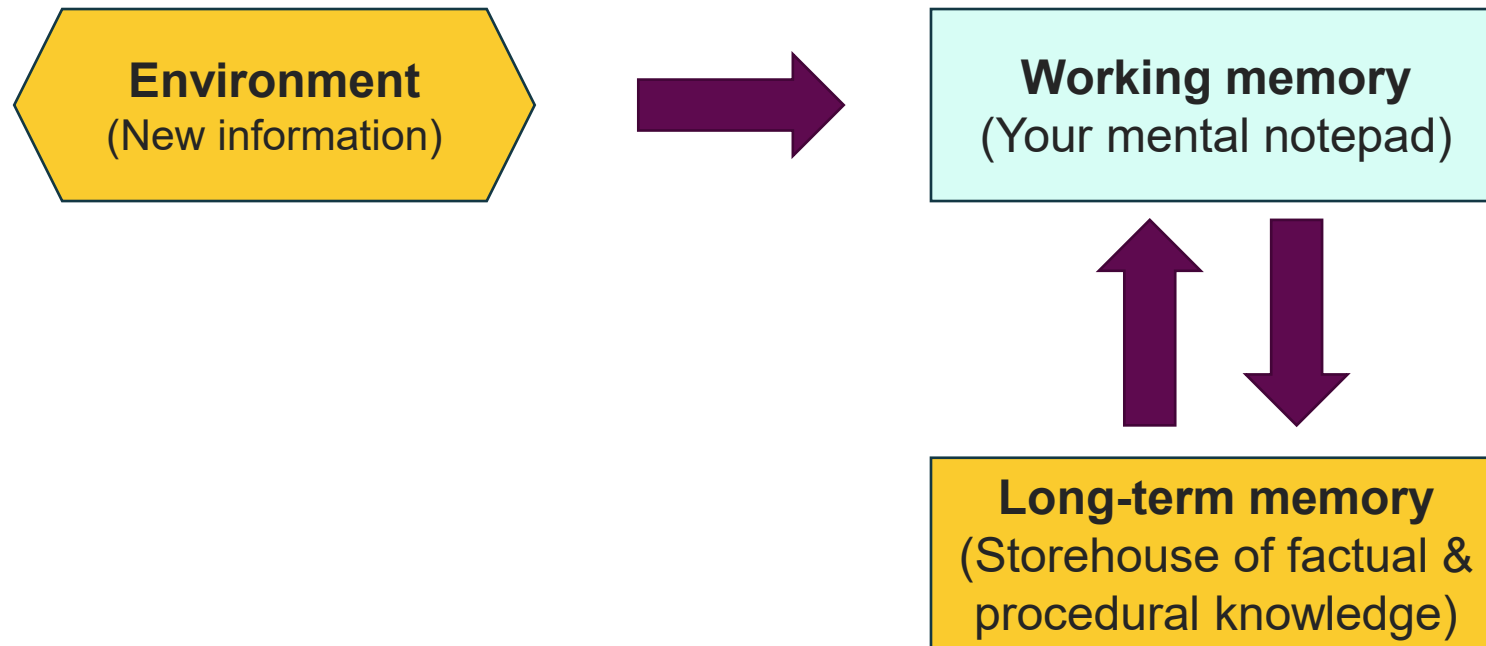
Can't we access all the information we need instantly?



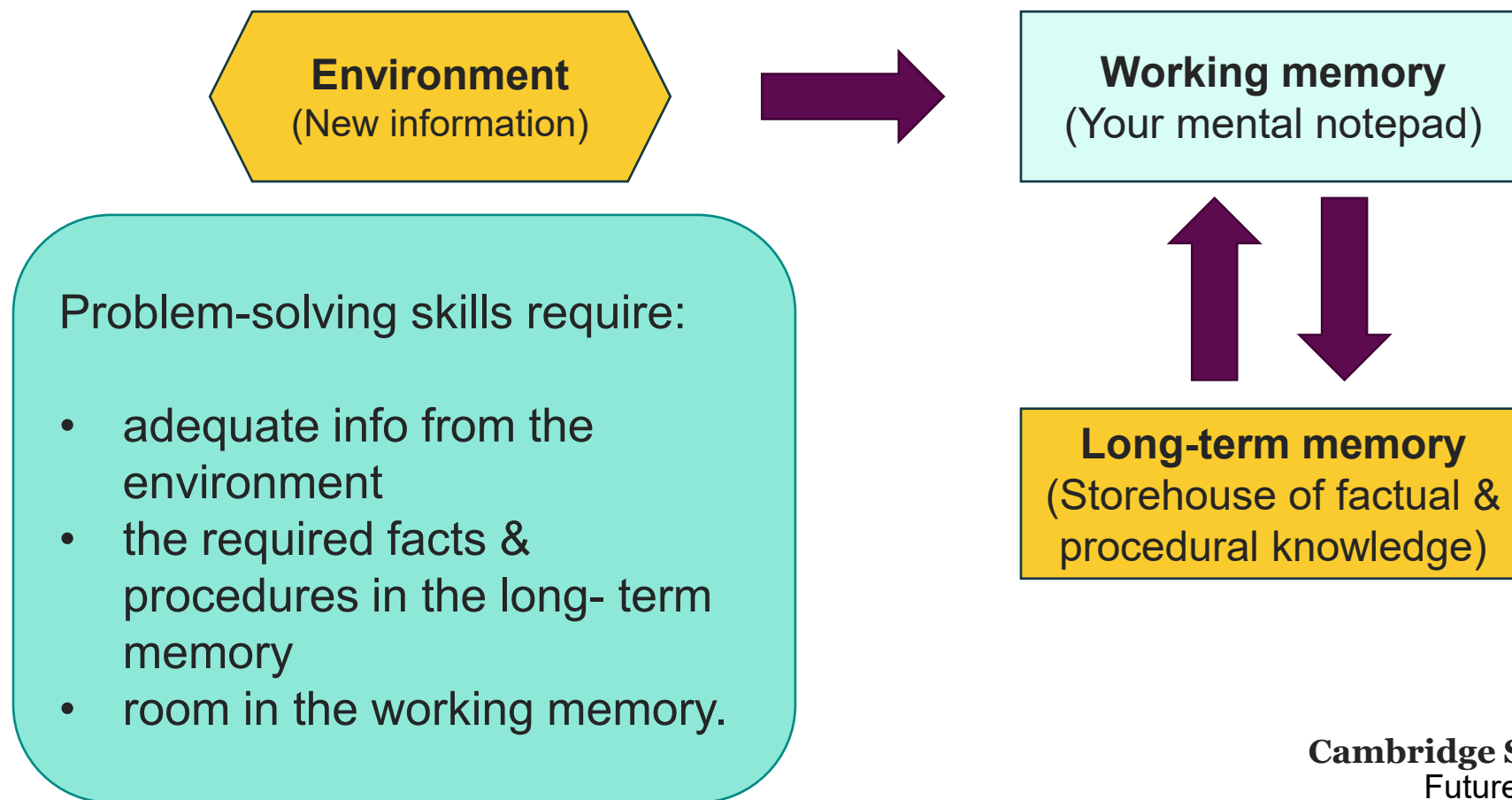
Have knowledge-poor meetings made you frustrated?



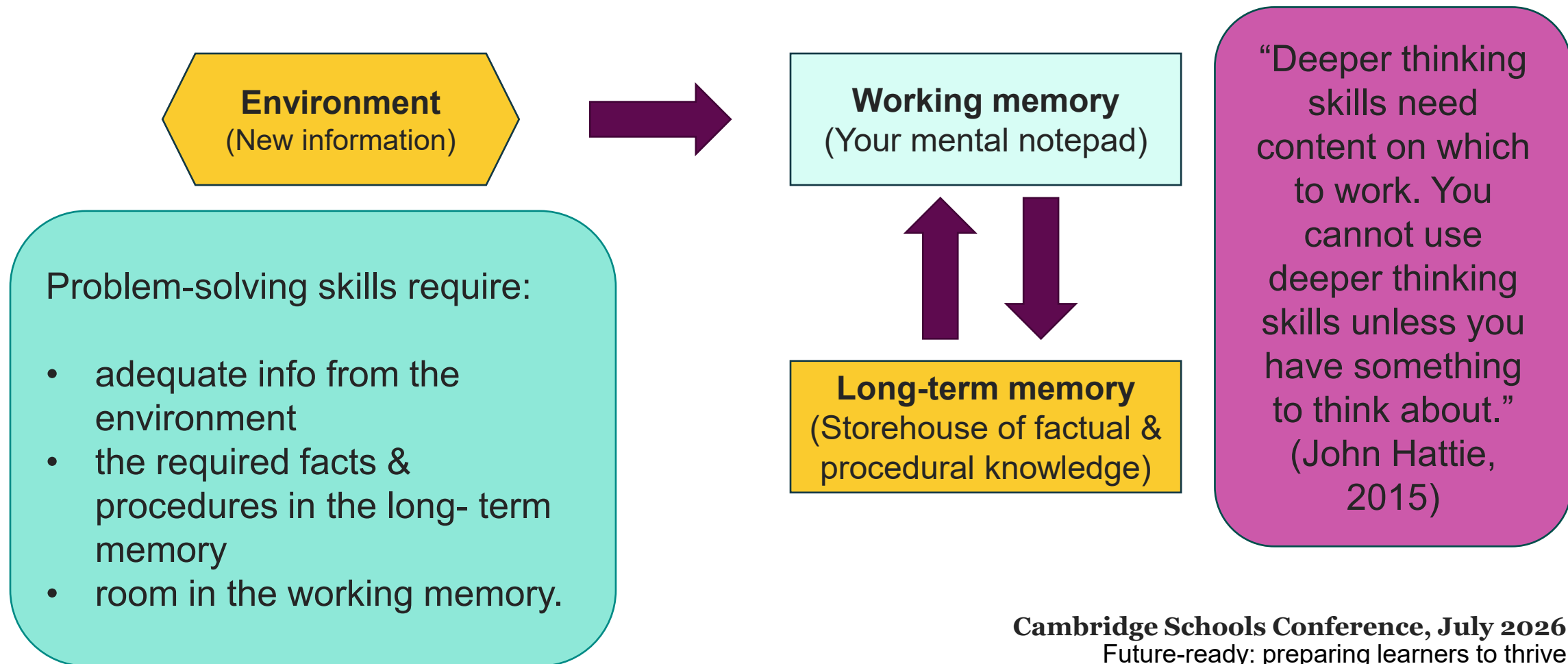
Just about the simplest model of the mind possible



Just about the simplest model of the mind possible

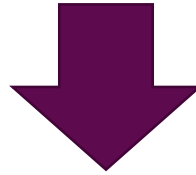


Just about the simplest model of the mind possible



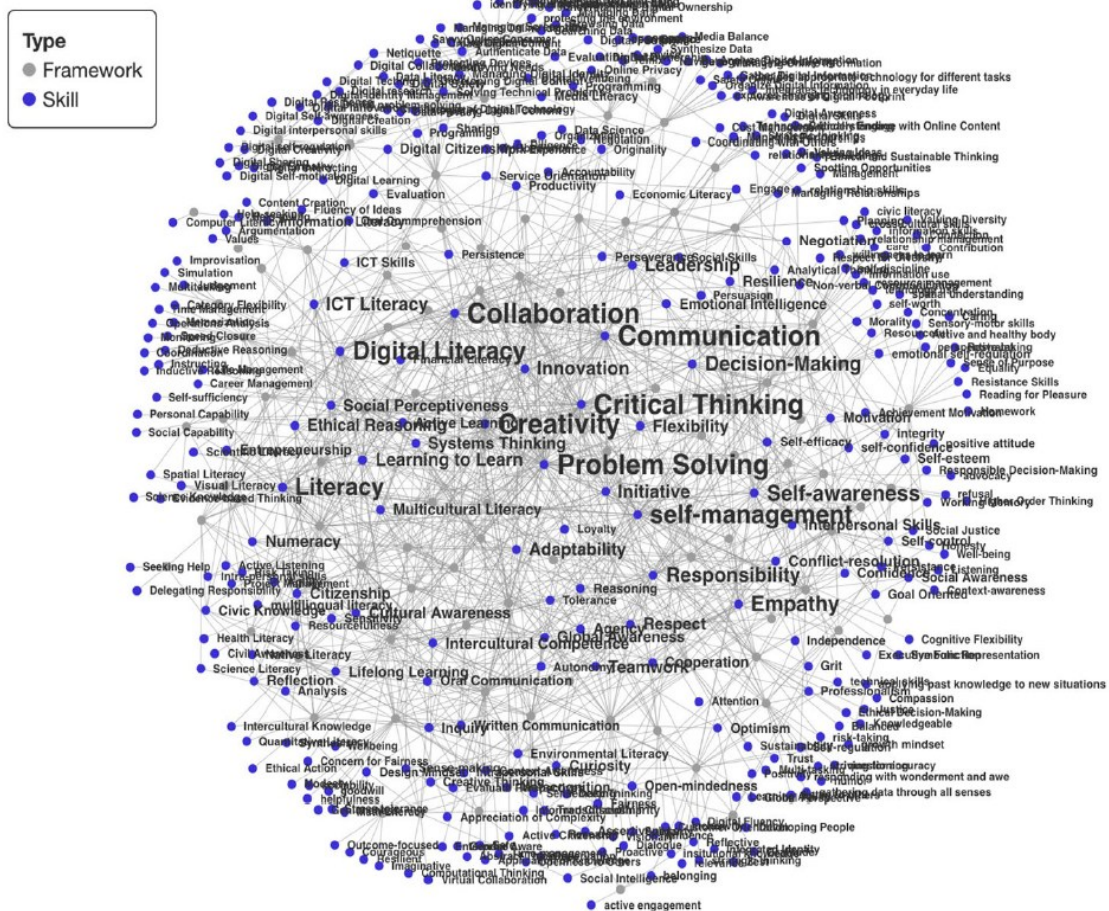
The good news

Skills and knowledge are deeply intertwined.



Curricula can be both knowledge-rich AND skills-rich.

There are hundreds of skills...



- Researchers in the Digital Education Futures Initiative (DEFI) within the University of Cambridge reviewed 99 skills frameworks.
- The frameworks covered 341 different skills!
- The analysis generated this figure.

Figure 3. Two Mode Network Diagram of Frameworks and Skills.

(Kotsiou et al., 2022)

Cambridge Schools Conference, July 2026
Future-ready: preparing learners to thrive

Skills can be grouped into five large areas

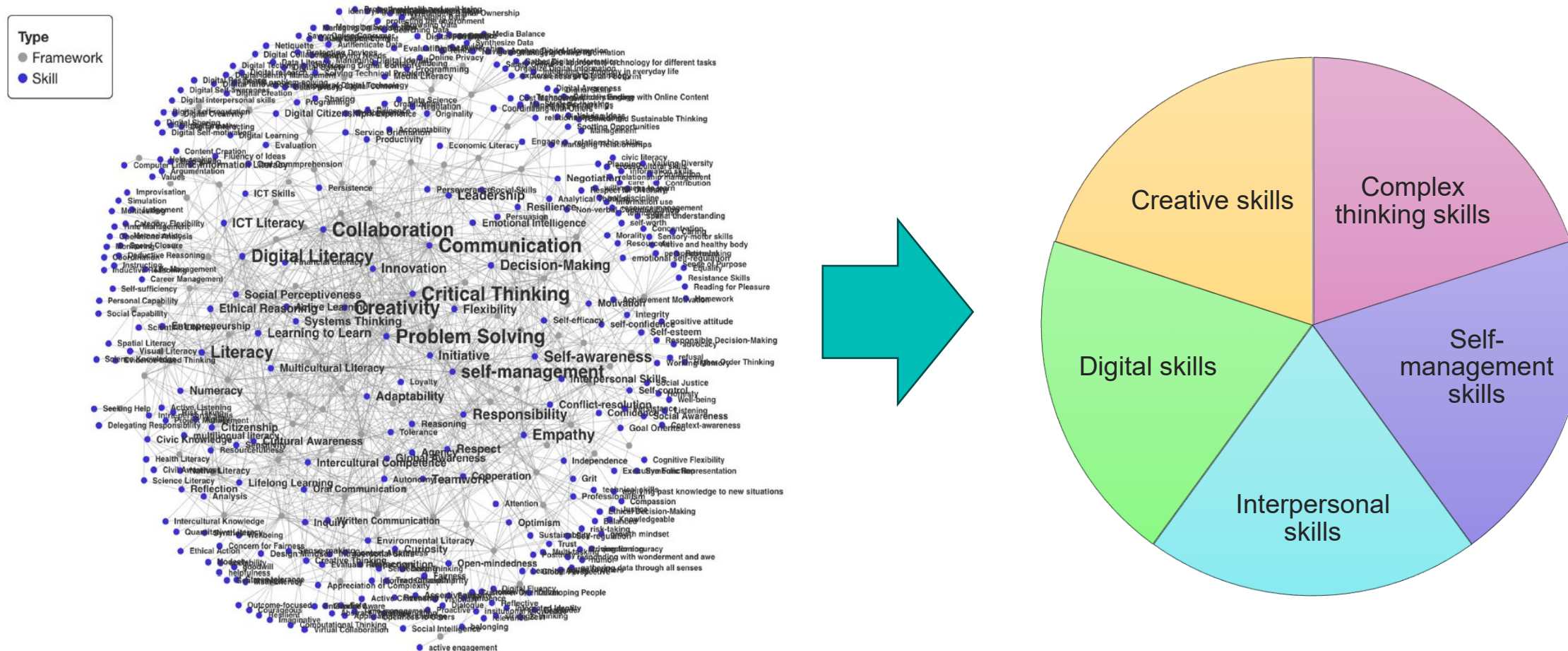
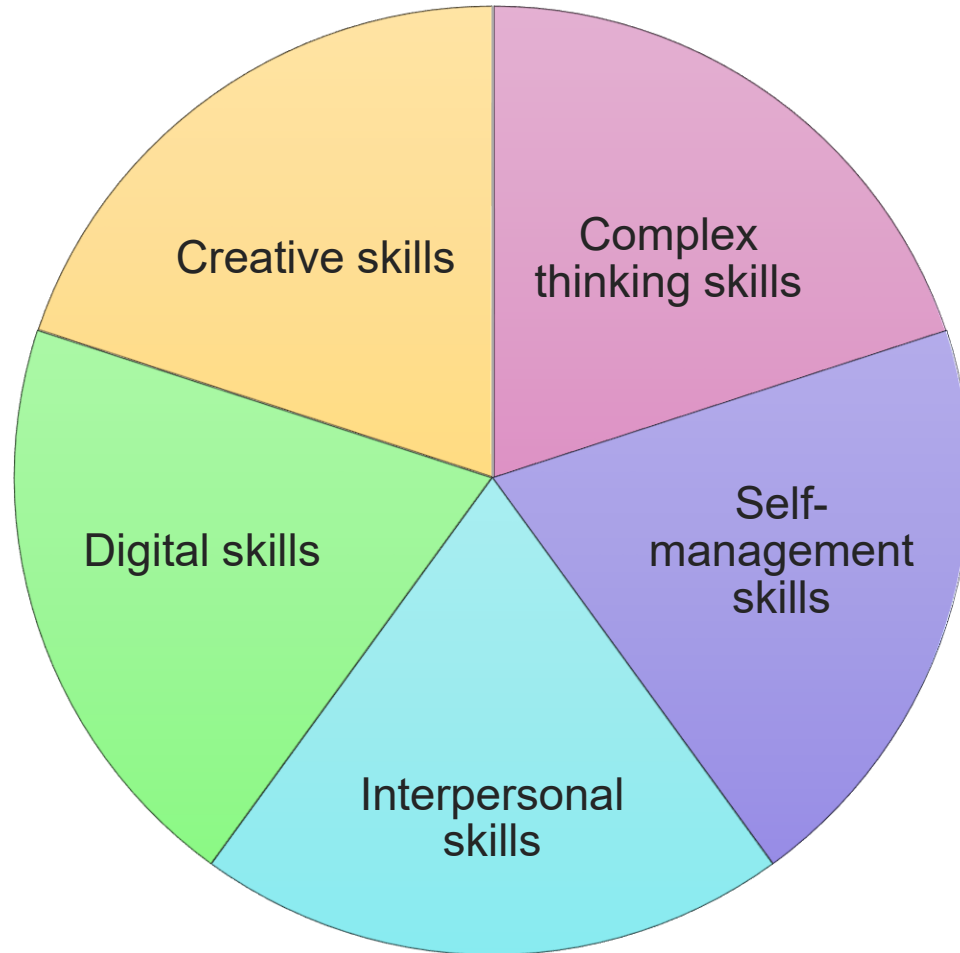


Figure 3. Two Mode Network Diagram of Frameworks and Skills.

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Five large areas of skills



Enable you to understand ideas deeply, apply knowledge in new ways, and make informed judgements.

Sometimes known as higher order thinking skills.

Include **systems thinking** and **problem-solving** skills

Systems thinking skills

- About examining relationships and dynamics within systems that are often complex, enabling informed decisions that account for broader contexts and long-term consequences of actions.
- Arguably, some of the most pressing global issues, such as war, famine, poverty, and climate change, are fundamentally the result of systemic failures.



Problem-solving skills

Analogical thinking, which identifies similarities across different contexts, is often critical.

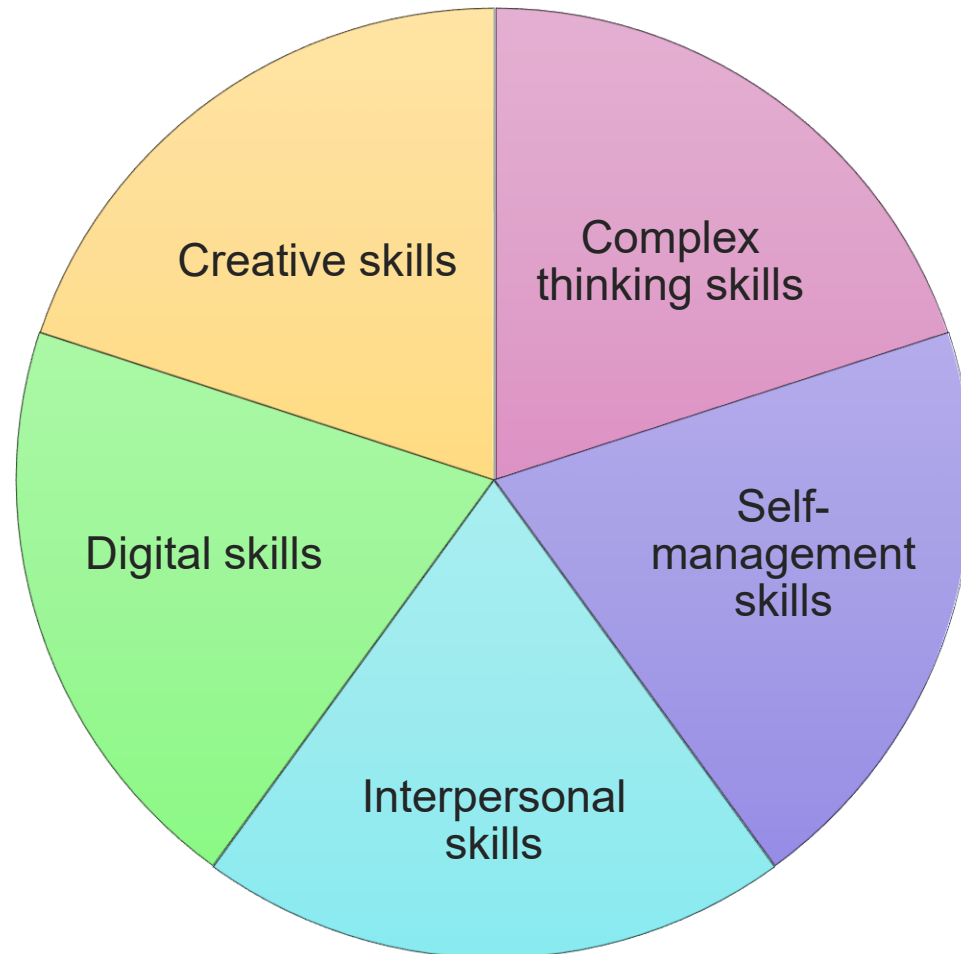


Kind problems are well-defined with clear goals, established rules, reliable feedback, and predictable solutions.



Wicked problems are poorly-defined, multi-faceted, ever-evolving challenges. Information is often incomplete or contradictory.

Five large areas of skills



Enable you to recognise and manage your thoughts, feelings and actions. They help you to understand yourself and make positive choices.

Include **metacognitive** skills

Metacognitive skills

- Thinking about one's own thinking
- This involves planning, monitoring, evaluating, changing, and reflecting on one's own learning behaviours

Metacognitive knowledge:

(e.g. I have trouble remembering dates.)

Metacognitive regulation:

(e.g. This problem-solving strategy isn't working so I should try something else.)



Where do these skills feature in Cambridge subjects?

Activity (in pairs)

- We have collated some specimen questions from different Cambridge International AS & A level subjects (English Language, Geography, Physics and Psychology).
- Using the definitions of the future skills we have highlighted, consider whether tackling these questions would help learners to develop these skills.
- Discuss with a partner.



Systems
thinking skills?

Problem-solving
skills?

Metacognitive
skills?

Other future
skills?

Feedback

- How did you find the task?
- What can we do to help learners understand the skills they are developing through studying subject disciplines?



Nurturing skills nurtures the Cambridge Learner attributes

Cambridge learners	Cambridge teachers
Confident in working with information and ideas – their own and those of others	Confident in teaching their subject and engaging each student in learning
Responsible for themselves, responsive to and respectful of others	Responsible for themselves, responsive to and respectful of others
Reflective as learners, developing their ability to learn	Reflective as learners themselves, developing their practice
Innovative and equipped for new and future challenges	Innovative and equipped for new and future challenges
Engaged intellectually and socially, ready to make a difference	Engaged intellectually, professionally, and socially, ready to make a difference

How can the learner attributes be taught and fostered?

- Focus primarily upon actively teaching the underpinning skills and values.
 - Also, explicitly discuss the meaning of the attributes, sharing concrete examples
- ➡ • When learners become well-practised in exercising and demonstrating these skills and values, they can be understood to have strengthened the relevant attribute in that specific learning and cultural context.
- ➡ • In this way, skills and values give rise to the learner attributes, and learners demonstrate different attributes in different contexts.

Simple examples

Cambridge Learner Attribute	Skills	Simple explanation
Engaged	Analysis and evaluation	When exercising skills in analysis and evaluation, learners become active meaning-makers rather than passive recipients of information. Engagement emerges as learners encounter intellectual challenge which absorbs them.
Confident	Communication and collaboration	Through communication and collaboration, learners articulate and test ideas, experience shared intellectual risk and receive affirmation through dialogue. These experiences develop confidence by reinforcing learners' beliefs in their abilities to contribute, reason, and engage purposefully with others.

Higher-order thinking skills in published resources

How can we support students with these skills?

Systems thinking

Cambridge International AS & A Level Global Perspectives – analysis and evaluation of different healthcare systems:

Some other countries, for example the USA, have a healthcare system based on private health insurance. There are no limits on the range of treatments available, no compromises on the standard of care and no significant waiting lists – provided you have the ability to pay or your insurers agree to pay. If your financial resources are more limited, you will receive considerably less or perhaps no medical treatment at all, however ill you are. Yet when former President Obama introduced a system in the USA with more publicly controlled elements and the requirement for everyone to have the option of reasonably priced health insurance, he met fierce political opposition.

DISCUSSION POINT

- What is the fairest system of healthcare? Is this the same as the most effective one?
- Does government healthcare place unacceptable limits on our ability to choose our own medical treatments?
- What about countries where little or no modern healthcare is available – public or private?
- What about healthcare in your own country? How does it compare with these alternatives?



Systems thinking



Cambridge International AS & A Level Biology – maintaining the health of astronauts on a mission to Mars with reference to homeostatic systems:

Question for discussion

The weightlessness experienced by astronauts during space travel has significant effects on the normal working of their bodies.

There are plans for astronauts to travel long distances into space. For example, it takes spacecraft about seven months to reach Mars from Earth. Discuss the problems involved in maintaining the health of astronauts on a manned mission to Mars and suggest some solutions to the problems you identify.

Problem solving skills

2 The price of a product falls from \$5 to \$4. As a result, its supply in a given time period falls from 800 units to 700 units.

What is the PES?

- A 0.71
- B 0.625
- C 1.6
- D 0.5

3 A firm supplies 10 units of a product at \$48 per unit.

If the PES is 4, how many units will the firm supply at a price of \$60 per unit?

- A 10
- B 20
- C 40

Cambridge International AS & A Level Economics – **Kind problem solving**. Students must make calculations using the standard PES formula.

Cambridge International AS & A Level Global Perspectives – **Wicked problem solving**. Students must identify a complex problem and propose solutions.



ACTIVITY 7.6

Consider the problem you have been working on with your team, or another issue that relates to one of the syllabus topics and is also relevant to your local area. Write some short notes that cover:

- why it is a problem
- why it is relevant to your local area and how it relates to other parts of the world
- possible sources of evidence you could use to show this and any specific pieces of evidence you have already found

some ideas on how these pieces of evidence support one another

a possible solution to the problem

the pieces of evidence you have found that would be most effective in justifying that solution.

Metacognitive skills

Cambridge International AS & A Level Chemistry – Self-assessment checklists at the end of each chapter.

SELF-ASSESSMENT CHECKLIST

Let's revisit the Knowledge focus and Exam skills focus for this chapter.

Decide how confident you are with each statement.

Now I can:	Show it	Needs more work	Almost there	Confident to move on
define <i>unified atomic mass unit</i> as one-twelfth of the mass of a carbon-12 atom	Write a definition for this term in your own words.			
define and use the terms <i>relative atomic mass</i> , <i>isotopic mass</i> and <i>formula mass</i> in terms of unified atomic mass unit	Write definitions for these terms in your own words.			
define and use the term <i>mole</i> in terms of the Avogadro constant	Recall the value of the Avogadro constant and use it to calculate numbers of particles.			

Metacognitive skills



Cambridge
International AS & A
Level History –
Students reflect on
and clarify their
understanding
through discussion.

Reflection

Discuss your response to the Ems Telegram with another student. Did you reach similar conclusions about Bismarck's conduct? Would you change your mind about him in the light of your discussion?

Your views on teaching skills



Loading...

Should we make it clearer in our textbooks when students are developing skills?



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Waiting for participants

Should we make it clearer in our textbooks when students are developing skills?



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Resource creation activity

- **Objective:** Create a resource that promotes higher-order thinking.
- **Activity:** In groups, create an idea for a new educational resource (e.g. a worksheet, project or assessment) designed to develop higher-order thinking skills.
- You could focus on **systems thinking**, **kind/wicked problem solving** or **metacognitive skills**.
- It could be subject-specific or cross-curricula.



**Ready
for the
world**

Feedback

- Report back to the whole group about the activity that you created in your group.



Conclusion

Feedback



Any questions?

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Thank you!

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Get in touch!

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