

# Breaking down content and concepts

## Overview

How we introduce new learning is crucial for managing cognitive load and facilitating schema development. Schemas (also called mental models) 'are structures that organise knowledge in the mind' (EEF 2021:31).

Chunking is the practice of breaking down complex content, concepts and skills into smaller, more manageable components, so they can be introduced sequentially.

Teachers use checking for understanding of each smaller component to determine when to introduce the next chunk of learning. They allow time for students to think about, process and practise chunks of learning to help manage the limitations of working memory, supporting students to build more accurate and complex schemas (AERO 2024).

### Key considerations:

- Experiencing success in mastering smaller chunks increases student motivation.
- Breaking down content into smaller components allows for clear and concise communication of the key knowledge and skills.
- Subject matter expertise is crucial for specific, fine-grained chunking and sequencing
- Student understanding and complexity of the material guides how learning is segmented and how learning is chunked.

## Classroom application

### Early Stage 1 Science example:

**Syllabus Outcome: STE-SCI-01** identifies and describes characteristics of living things, properties of materials, and movement.

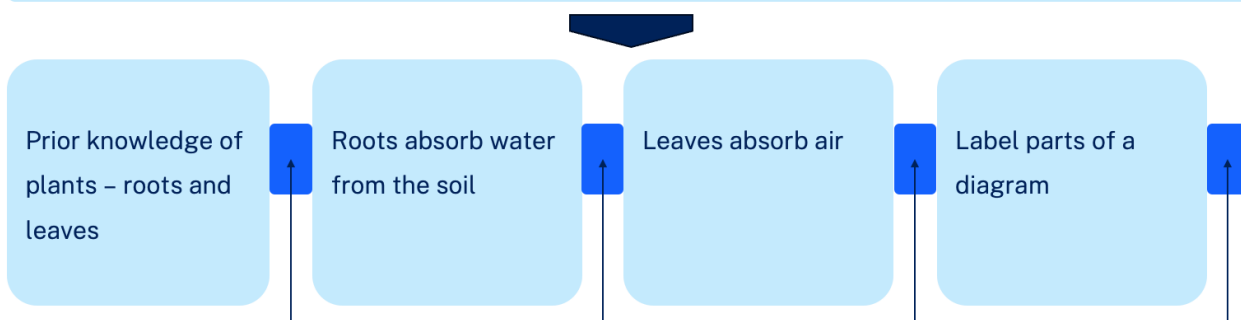
**Content:** Describe how living things get air, water and energy to survive in their environment.

For example, an early Stage 1 class is learning about how living things get air, water and energy to survive in their environment.

In this lesson, the chunks are:

- existing schema of plants, including the roots and leaves
- how plants get water
- how plants get air
- labelling a diagram.

### The function of plant parts



### Check for understanding

Concepts become more complex, building on

The existing schema of plants takes up only one space in the working memory, leaving space for new pieces of information – facts and procedures. Without explicit teaching, students would not consolidate each new chunk (one at a time) into their existing schema of plants, and this could overload their working memory.

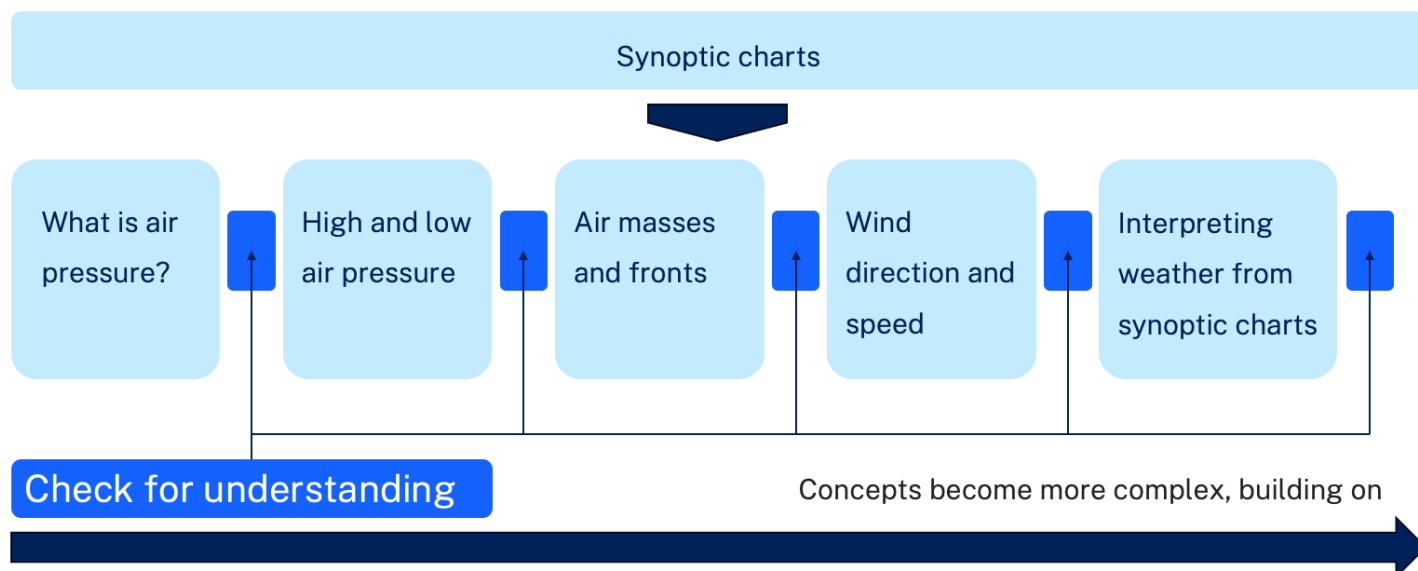
## Classroom application

### Stage 4 Geography example:

**Syllabus Outcome: GE4-TAP-01** selects and uses geographical tools to acquire and process geographical information.

**Content:** Interpret weather maps to gather information about wind direction and speed, pressure patterns, fronts and rainfall

A Year 8 Geography class is learning to find air pressure on a synoptic chart. The teacher breaks down this skill into 5 components.



With these small chunks, the teacher plans the lesson to check for understanding of the whole class between each chunk. By using these regular checks for understanding the teacher can correct misunderstandings as they occur, and the students can consolidate the new learning into their schema before the next chunk is introduced (Archer and Hughes 2011; Sherrington 2019).

“Teachers need to invest time in analysing their curriculum material to see how it can be broken down”

(Sherrington 2019:15).

“When chunks are taught in a logical sequence of small steps, it helps students build on what they already know, understand and can do, and retain what they’re learning for future use”

(AERO 2024:3).

## Chunking and sequencing resources



<https://edu.nsw.link/explicit-teaching-chunking-and-sequencing-learning>

## More resources

AERO – Explicit instruction

<https://www.edresearch.edu.au/summaries-explainers/explainers/explicit-instruction>

Explicit teaching – checking for understanding

<https://education.nsw.gov.au/teaching-and-learning/curriculum/explicit-teaching/explicit-teaching-strategies/checking-for-understanding>

Explicit teaching – connecting learning

<https://education.nsw.gov.au/teaching-and-learning/curriculum/explicit-teaching/explicit-teaching-strategies/connecting-learning>

Explicit teaching – gradual release of responsibility

<https://education.nsw.gov.au/teaching-and-learning/curriculum/explicit-teaching/explicit-teaching-strategies/gradual-release-of-responsibility>

Inclusive Practice Hub

<https://education.nsw.gov.au/inside-the-department/directory-a-z/inclusive-practice/search-results?q=scaffolding&adjustments=adjustment-617>

Multicultural education – Planning for teaching

<https://education.nsw.gov.au/teaching-and-learning/multicultural-education/english-as-an-additional-language-or-dialect/teaching-and-learning/planning-for-teaching>

## References

Archer A and Hughes C (2011) *Explicit instruction: effective and efficient teaching*, Guilford Press.

AERO (Australian Education Research Organisation) (2024) *How students learn best: an overview of the learning process and the most effective teaching practices*, AERO, accessed 31 October 2024.

<https://www.edresearch.edu.au/research/research-reports/how-students-learn-best-overview-evidence>

EFF (Education Endowment Foundation) (2021) *Cognitive science approaches in the classroom: a review of the evidence*, EFF.

<https://educationendowmentfoundation.org.uk/education-evidence/evidence-reviews/cognitive-science-approaches-in-the-classroom>

NESA (NSW Education Standards Authority) (2024) *Geography 7–10 Syllabus*, NESA.

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Sherrington T (2019) *Rosenshine's Principles in action*, John Catt Educational Limited.