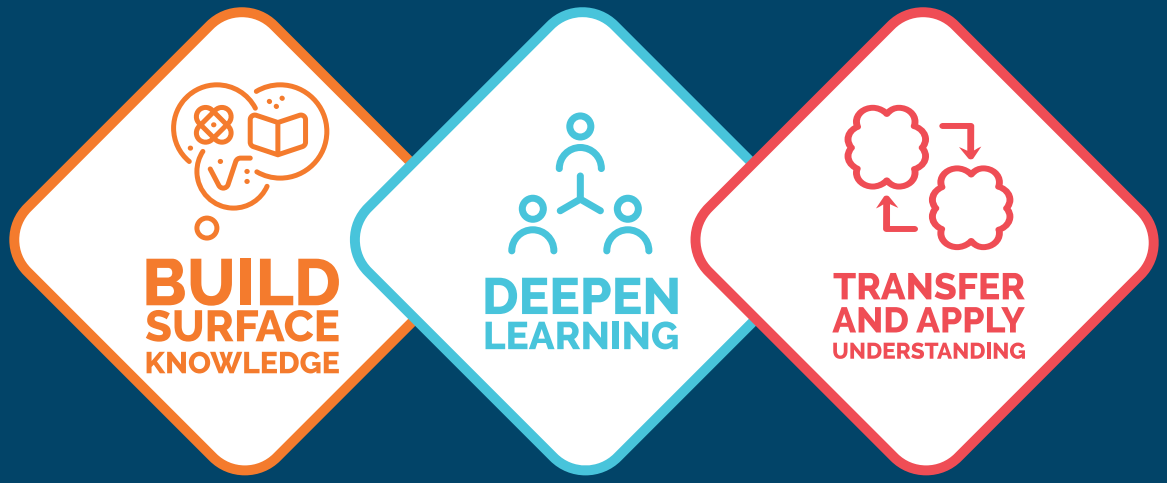
Strategies That Maximise Impact



PRECISION PEDAGOGY

Using the right strategy, at the right time, for the right reason and for the right students:

- provides opportunities for students to acquire and consolidate their learning
- provides opportunities for self assessment and peer feedback
- enables students to develop the skills of self-regulated learners to plan, organise, evaluate and reflect
- builds motivational skills of self-efficacy, goal setting and strategy monitoring.

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Maximising learning

Strategies that maximise impact

Precision Pedagogy

Using the right strategy, at the right time, for the right reason, for the right students

- provides opportunities for students to acquire and consolidate their learning
- provides opportunities for self-assessment and peer feedback
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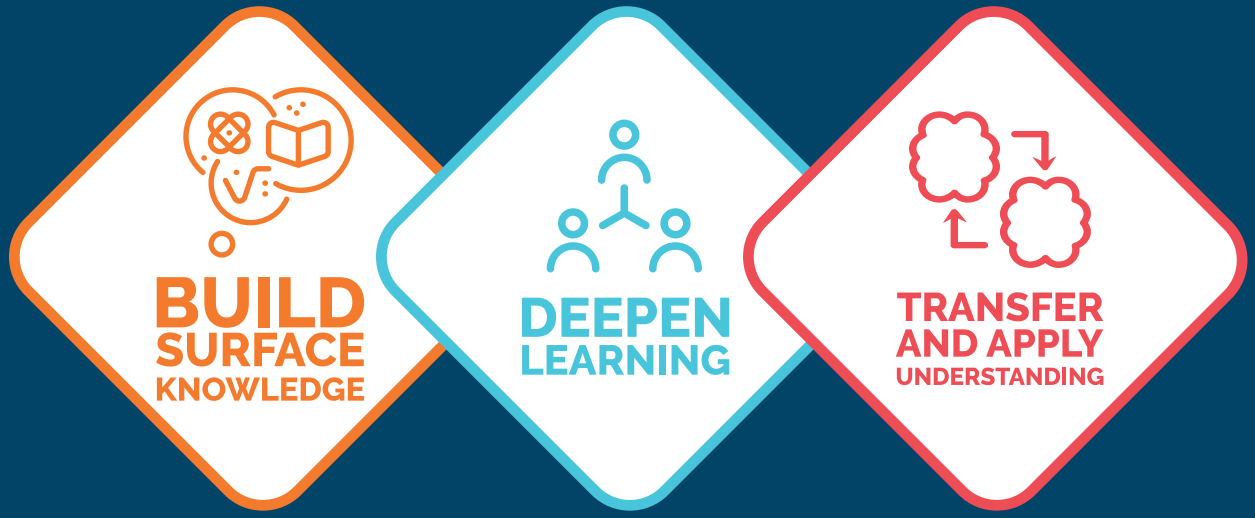
Research identifies which strategies are more effective at a particular stage of learning. Each fact sheet is identified by the highlighting of the appropriate stage. Some strategies are effective in maximising impact across multiple stages and can span all 3 or sometimes 2 stages. In these cases, the symbols are highlighted appropriately.



When we focus our work on maximising learning we focus on the knowledge, skills, dispositions, relevance, understanding and willingness to learn that students bring to their learning and where we want them to be as a result of focused teaching and learning.

What is effect size?

Effect size is a measure of the contribution an education intervention makes to student learning. It allows us to move beyond questions about whether an intervention worked or not, to questions about how well an intervention worked in varying contexts. This evidence supports a more scientific and rigorous approach to building professional knowledge.

On the surface, any practices which result in an effect size greater than zero could be considered as having a positive impact on student learning and therefore worthy of maintaining. However, an effect size of 0.4 is the average or typical effect size likely to be having a visible, positive effect.

Strategies

Each page suggests strategies that are useful in improving student learning and should be implemented in the context of the curriculum areas. These strategies are not exclusive, there are many others as well as variations of the ones suggested.

Tips

Tips are exactly that: tips for teachers to engage successfully with the suggested strategies.

Surface, Deep and Transfer Professional Reading

Three Phases of Learning: Surface, Deep and Transfer

Build Surface Knowledge

In a meta-analysis of various interventions, Hattie et al. found that many learning strategies were highly effective in enhancing surface learning for virtually all students. Surface learning includes subject matter vocabulary, the content of the lesson and knowing much more. Strategies include record keeping, summarisation, underlining and highlighting, note taking, mnemonics, outlining and transforming, organising notes, training working memory, and imagery.

Once a student has begun to develop surface knowing it is then important to encode it in a manner such that it can retrieved at later appropriate moments. This encoding involves two groups of learning strategies: the first develops storage strength (the degree to which a memory is durably established or 'well learned') and the second develops strategies that develop retrieval strength (the degree to which a memory is accessible at a given point in time). 'Encoding' strategies are aimed to develop both, but with a particular emphasis on developing retrieval strength. Both groups of strategies invoke an investment in learning, and this involves 'the tendency to seek out, engage in, enjoy and continuously pursue opportunities for effortful cognitive activity. Although some may not 'enjoy' this phase, it does involve a willingness to practice, to be curious and to explore again, and a willingness to tolerate ambiguity and uncertainty during this investment phase. In turn, this requires sufficient metacognition and a calibrated sense of progress towards the desired learning outcomes. Strategies include practice testing, spaced versus mass practice, teaching test taking, interleaved practice, rehearsal, maximising effort, help seeking, time on task, reviewing records, learning how to receive feedback and deliberate practice (i.e., practice with help of an expert, or receiving feedback during practice).

Adapted from Hattie, J & Donoghue, G. (2016). Learning Strategies: A Synthesis and Conceptual Model. Science of Learning. Doi:10.1038/npjscilearn.2016.13

Deepen Learning

Students who have high levels of awareness, control or strategic choice of multiple strategies are often referred to as 'self-regulated' or having high levels of metacognition. In Visible Learning, Hattie described these self-regulated students as 'becoming like teachers', as they had a repertoire of strategies to apply when their current strategy was not working, and they had clear conceptions of what success on the task looked like. More technically, Pintrich et al. described self-regulation as 'an active, constructive process whereby learners set goals for their learning and then attempt to monitor, regulate and control their cognition, motivation and behaviour, guided and constrained by their goals and the contextual features in the environment'. These students know the what, where, who, when and why of learning, and the how, when and why to use which learning strategies. They know what to do when they do not know what to do. Self-regulation strategies include elaboration and organisation, strategy monitoring, concept mapping, metacognitive strategies, self-regulation and elaborative interrogation.

Once a student has acquired surface and deep learning to the extent that it becomes part of their repertoire of skills and strategies, we may claim that they have 'automatised' such learning—and in many senses this automatisation becomes an 'idea', and so the cycle continues from surface idea to deeper knowing that then becomes a surface idea, and so on. There is a series of learning strategies that develop the learner's proficiency to consolidate deeper thinking and to be more strategic about learning. These include self-verbalisation, self-questioning, self-monitoring, self-explanation, self-verbalising the steps in a problem, seeking help from peers and peer tutoring, collaborative learning, evaluation and reflection, problem solving and critical thinking techniques.

Transfer and Apply Understanding

There are skills involved in transferring knowledge and understanding from one situation to a new situation. Indeed, some have considered that successful transfer could be thought as synonymous with learning. There are many distinctions relating to transfer: near and far transfer, low and high transfer, transfer to new situations and problem-solving transfer, and positive and negative transfer. Transfer is a dynamic, not static, process that requires learners to actively choose and evaluate strategies, consider resources and surface information, and, when available, to receive or seek feedback to enhance these adaptive skills. Reciprocal teaching is one program specifically aiming to teach these skills; for example, Bereiter and Scardamalia have developed programs in the teaching of transfer in writing, where students are taught to identify goals, improve and elaborate existing ideas, strive for idea cohesion, present their ideas to groups and think aloud about how they might proceed.

Similarly, Schoenfeld outlined a problem-solving approach to mathematics that involves the transfer of skills and knowledge from one situation to another. Marton argued that transfer occurs when the learner learns strategies that apply in a certain situation such that they are enabled to do the same thing in another situation when they realise that the second situation resembles (or is perceived to resemble) the first situation. He claimed that not only sameness, similarity, or identity might connect situations to each other, but also small differences might connect them as well. Learning how to detect such differences is critical for the transfer of learning. As Heraclitus claimed, no two experiences are identical; you do not step into the same river twice.

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Teacher Clarity

Teacher clarity maximises the impact on student learning and progress, leads to student success and is fundamental to shifting students' expectation of their ability. The better that teachers know the curriculum intent, the better able they are to define exactly, for themselves and for their students, the surface, deep and conceptual knowledge and understanding that students need to learn. Teacher clarity enables students to take more responsibility for their learning, know where to focus their efforts and to become partners in their learning.

EFFECT SIZE 0.75

Relevance

Focusing on the learning rather than on the context has the advantage of making it more likely that students will be able to transfer their learning from one context to another.

"We need to be careful that, in making activities interesting, relevant, authentic and engaging, this does not lead to busy

Shared clarity in the classroom

A visible learner explains and understands progress - they know where they are at, where they are going and what their next steps are.

Both teacher and students are able to describe:

- what is to be learnt - using learning intentions
- how the learning intention relates to the "big ideas"
- how the learning is relevant
- how students will go about the learning
- how students will know that it has been learnt - using success criteria with reference to exemplars, examples, and modelling.

Examples and modelling

Criteria are best revealed through an experience-socialization process involving such processes as: observation, imitation, dialogue and practice, further explanation, exemplars and quality discussion of the more complex or 'invisible' criteria. *(Rust, Price & Donovan, 2003)*

"In assessing the quality of a student's work or performance, the teacher must possess a concept of quality appropriate to the task, and be able to judge the student's work in relation to that concept." *(Sadler, 1989)*

Success criteria

- They show the students what they are aiming for and how to get there.
- Students can self and peer assess, independently from the teacher. They are not always reliant on teacher judgement.
- Students are clear about what it is they are going to be judged or evaluated on.
- Students have something to refer to when they want to check if they are on track or not.

emphasise depth of conceptual understanding, sophistication of skills and ability to apply essential knowledge	are discussed and agreed with the pupils prior to beginning the learning activity	are used as the basis for teacher feedback
are directly related to the learning intention	**Success Criteria**	describe what successful learning looks like
are informed by the content descriptions	can be co-constructed with students from worked examples	can be a series of dot points or in the form of a rubric
are written in language that students are likely to understand	should be concrete, measurable, observable... and open to negotiation	are used as the basis for peer feedback and self-assessment

How do students know what success looks like?

Students should help define success criteria where possible.

- It involves them in the learning.
- They are being asked to link the learning intention with the criteria - they are making the connections.
- It is a much more challenging experience because they are thinking about the

Getting started

What is the big idea/key concept in this series of lessons?

What do you already know?

What does it remind you of?

How does it fit with what you are already learning in other learning areas?

What is similar or different between learning situations, modes or contexts?

Where does it fit with your life?

Where could you use this?

How relevant is this to us?

Checking for understanding

What do you think?

Why do you know that?

How do you know this?

Can you tell me more?

What questions do you still have?

Engage students in a positive environment for learning

Don't confuse the learning with the task.
Don't confuse the learning with the context.

Essential elements of teacher clarity

Hattie defines teacher clarity as "organization, explanation, examples and guided practice, and assessment of student learning — such that clarity of speech was a prerequisite of teacher clarity." (Hattie 2009, 126)

- ✓ **Learning intentions**
- ✓ **Relevance**
- ✓ **Examples of modelling**
- ✓ **Success criteria**
- ✓ **Checking for understanding**

Tips

- Establish where the students are in their learning
- Identify the learning destination
- Carefully plan a route
- Make regular checks of progress on the way
- Make adjustments to the course as conditions dictate

Learning intentions

"The learning intentions of any lesson need to be a combination of **surface**, **deep**, or **conceptual**, with the exact combination depending on the decision of the teacher, which in turn is based on how the lesson fits into the curriculum." - *John Hattie.*

The aim of any learning intention and success criteria is to **help students learn**, not to help the students complete the activity.

describe what students should know, understand or be able to do by the end of a lesson or series of lessons		inform the teaching and learning activities provided for students
identify new learning and focus on transferable skills	**Learning Intentions**	are used as the focus for teacher questioning
are developed from the achievement standard of the curriculum	can be short term or long term	are made visible to students

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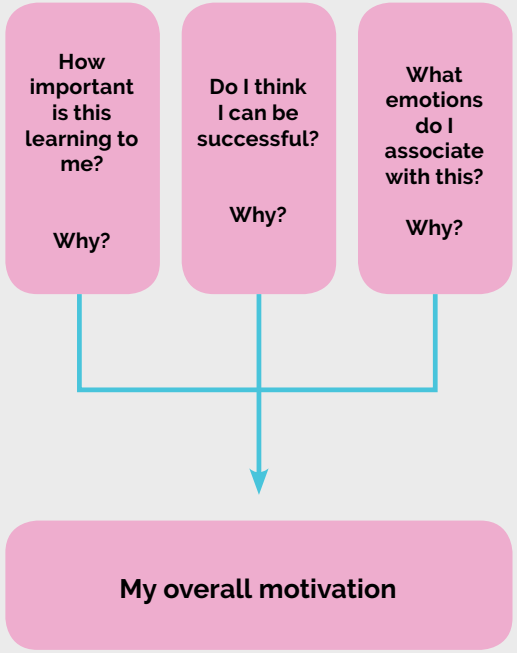
Motivation

The foundation of all learning is the Self-system. This system is comprised of the attitudes, beliefs and feelings that determine an individual student's motivation to learn. The key factors that contribute to motivation are: Importance/relevance, self-efficacy and emotions.

EFFECT SIZE 0.69

Activity self-system



Importance/ Relevance

EFFECT SIZE 0.46

When a student is confronted with learning, one of their first responses is to determine how important and relevant the learning is to them. Students consider whether this is something he/she needs to learn and if the learning will assist in achieving a personal goal.

Tips

- Clearly articulate expectations
- Explain the relevance of the learning– consider student perspective
- Provide opportunities for each student to experience success
- Gain interest – provide a wide variety of activities for students to engage in, utilise auditory, visual and kinaesthetic learning
- Be visible – greeting, monitoring, interacting
- Encourage deep learning
- Give timely feedback – use verbal and non-verbal reinforcement
- Establish a pleasant classroom environment – a safe place for thinking and learning to occur
- Activate intrinsic motivation – students learn for their own self-worth. Eg. "You must be pleased with the thought you put into this piece of work".

Emotions

Feelings that students experience when engaging in a learning experience can have a large impact on motivation. Effective learners use metacognitive skills to help them deal with negative emotional responses and take advantage of positive thinking.

Student self-efficacy

EFFECT SIZE 0.92

Self-efficacy refers to a student's belief about their ability to be a successful learner. Students with a high level of self-efficacy face challenges head-on, believing that they have the resources to achieve success. These students are persistent, able to overcome challenges and become deeply engaged in learning. The most powerful way for students to develop self-efficacy is through experiencing success.

Tips to improve student self-efficacy

- Use peer models
- If the task is too easy it may communicate the feeling that the teacher doubts their abilities; a too-difficult task will reinforce low self-efficacy. The target for difficulty is slightly above the students' current ability level.
- Use moderately difficult tasks
- Students can learn by watching a peer succeed at a task. Peers may be drawn from groups as defined by gender, ethnicity, social circles, interests, achievement level, clothing, or age
- Teach specific learning strategies
- Give students a concrete plan of attack for working on an assignment, rather than simply turning them loose. This may apply to overall study skills, such as preparing for an exam, or to a specific assignment or project
- Capitalise on students' interests
- Tie the course material or concepts to student interests such as sports, pop culture, movies or technology.
- Allow students to make their own choices
- Set up some areas of the course that allow students to make their own decisions, such as with flexible grading, assignment options or self-determined due dates
- Encourage students to try
- Give them consistent, credible and specific encouragement, such as, "You can do this. We've set up an outline for how to write a lab report and a schedule for what to do each week - now follow the plan and you will be successful."
- Give frequent, focused feedback
- Giving praise and encouragement is very important, however it must be credible. When giving feedback on student performance, compare to past performances by the same student, don't make comparisons between students
- Encourage accurate attributions: students need to understand they don't fail because they are dumb, they fail because they didn't spend enough time on the task or didn't follow instructions

(Adapted from Margolis and McCabe, 2006)

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Explicit Teaching

When teachers adopt explicit teaching practices they clearly show students what to do and how to do it. Students are not left to construct this information for themselves. The teacher decides on learning intentions and success criteria, makes them transparent to students, and demonstrates them by modelling. In addition, the teacher checks for understanding, and at the end of each lesson revists what the lesson has covered and ties it all together. (Hattie 2009).

EFFECT SIZE 0.59

Be clear about the learning intention:

- What will the students be able to know, understand and do as a result of my teaching?

Teacher clarity - Learning intentions

Be clear about successful learning:

- What success criteria will be expected?
- How will these be made clear to students?
- How will students be accountable for their learning?

Teacher clarity - Success Criteria - Co-Constructed

Build commitment and engagement in the learning task:

- How will the student be introduced to the learning such that they commit to the intention and their own success?

Motivation

Provide opportunity for guided practice:

- Carefully designed guided practice, with support gradually withdrawn as the pupil becomes proficient, can allow pupils to develop skills and strategies before applying them in independent practice.
- How will opportunities for students to demonstrate their grasp of new learning be provided?
- How will eachers provide feedback and scaffolding as needed for each student?

Scaffolded tasks

- Scaffolded tasks, like worked examples, allow pupils to develop their metacognitive and cognitive skills without placing too many demands on their mental resources.

Provide opportunity for independent practice:

- How will independent practice follow first mastery of content in a new context?

Develop guides for how the learning will be presented:

- How will input, modelling, checking for understanding be presented?

Modelling - think alouds

- Teachers should verbalise their metacognitive thinking ("What do I know about problems like this? What ways of solving them have I used before?") as they approach and work through a task.
- Plan in advance, provide visual cues
- Use I language
- Modelling by the teacher is a cornerstone of effective teaching; revealing the thought processes of an expert learner helps to develop pupils' metacognitive skills.

Ensure the learning has closure:

- What actions or statements cue students that they have arrived at the important part of the learning?
- How will this help students for a coherent view of their learning to consolidate, eliminate confusion and reinforce major points in learning intentions?

Checking for understanding

- journal entry
- exit pass
- 3-2-1
- think pair share
- thumbs up/thumbs down
- KWL
- 3 W's
  What (did we learn today?)
  So **what** (relevence, importance, usefuless)
  Now **what**
- Summaries key takeways

Explicit Teaching = deliberate teaching and learning

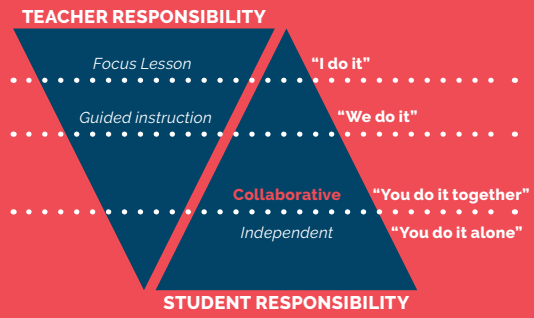
Explicit instruction in cognitive and metacognitive strategies can improve pupils' learning

A series of steps

- A series of steps - beginning with activating prior knowledge and learning to independent practice before ending in structured reflection - can be applied to different subjects, ages and contents.

A Model for Success for All Students

- Dialogue needs to be purposeful, with teachers guiding and supporting the conversation to ensure it is challenging and builds on prior subject knowledge.
- As well as explicit instruction and modelling, classroom dialgoue can be used to develop metacognitive skills.



Explicit teaching is not:

- Didactic teaching
- Direct Instruction (capital D and I)
- Following a script
- A set of rules

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Leverage Prior Knowledge

BUILD SURFACE KNOWLEDGE | DEEPEN LEARNING | TRANSFER AND APPLY UNDERSTANDING

Prior knowledge is the unique set of knowledge each individual student brings to the learning experiences. It is a combination of the student's attitudes, experiences and knowledge. Knowledge is what the student already knows about the learning process, vocabulary knowledge, topic knowledge and concept knowledge. Activating prior knowledge is most effective when acquiring surface knowledge. It involves using this knowledge base to build and extend knowledge and understanding.

EFFECT SIZE 0.65

How does activating prior knowledge support learning?

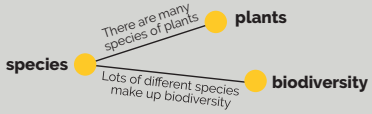
By activating their prior knowledge, students are able to connect with what they already know. This gives them a base on which to build further knowledge. It is important to help students to make these links. "Meaning is intertwined with the meaning you bring to it" (Zimmerman & Hutchins, 2003, p45).

Language we can use when activating prior knowledge

- What do I already know about this (author, topic, etc.)?
- What have I read that seems similar to this text?
- What type of text/genre is this text - article, narrative, letter, poem?
- What sort of language features would I expect to find in this text?
- Based on my prior knowledge of _, my question/s is/are __.
- When I hear the word (or phrase) _, it makes me think about __ .
- The words and pictures remind me of something else that I have read/seen/experienced __.
- The illustrations tell me __about the text.

Dot-to-dot connections

The teacher identifies 6-8 meaningful words from the upcoming learning. Students record these words next to a dot, spacing them apart on the paper. Students predict connections between the words by drawing a connecting line between the dots and writing the connections on the line. Remember to review these predictions after learning.



Tips

While some learners may have useful prior knowledge, they often need encouragement to express and harness it as a means of making connections with, and understanding, the current text. It is important to help readers make those links.

For struggling learners, it is especially important to spend time building prior knowledge to support them with comprehending the text. See the Gradual Release of Responsibility strategy "Familiarisation" for supporting information.

Drawing on peers is an effective way of building each others' background knowledge. For example, a peer may have visited or come from a country a story is set in; a peer may have participated in the activity being described in the text; a peer may have carried out the task before in a different context etc.

Seesaw strategy

In pairs, students take turns giving answers to questions posed by a teacher or peer. Students may seesaw after reading or viewing texts to recall facts, observations and opinions.

KWL

Begin the lesson with a three-column organiser: What I Know, What I Want to know or What I Wonder, What I Learned. Have students fill in the first two columns in advance of the lesson. Return to the last column as a summarising strategy for the lesson.

What we think we know:	What we want to find out OR wonder:	What we have learned:

Hot potato brainstorming

Write a question or statement about the upcoming learning at the top of a piece of chart paper and place around the room. Repeat this process on chart paper for a number of different questions and statements. Ask small groups of students (3-4) to begin by responding to one chart paper topic. After a short period of time, student groups will move on to the next piece of chart paper, read what has been written about that topic and add to or respond to it. These charts and responses can be used to activate a lesson, representing the prior knowledge and current understandings of the group.

Anticipation guide

The teacher provides students with 5-10 statements about the topic of at the end of the lesson. Students respond in the "Before" column, basing their answers on their prior knowledge or predictions about the statement. They then return to the Anticipation Guide, recording their response in the "After" column together with a reflection as the summarising strategy for the lesson.

Statement	Before		After		Reflection/Evidence
	Agree	Disagree	Agree	Disagree	
Example: The hypotenuse of a right-angled triangle is always the longest side					

Checking for understanding

Activating prior knowledge through teacher questioning that requires students to explain and justify their thinking enables a teacher to determine what the learner knows and doesn't know. Moreover, it helps teachers identify any misconceptions that students have that could get in the way of understanding. Information gleaned affects what a student is able to do next and can be utilised to modify future teacher instruction.

Adapted from Zimmerman, S. (2003); Cameron, S. (2009) and First Steps Reading resource book (2013).

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Note Taking

BUILD SURFACE KNOWLEDGE | DEEPEN LEARNING | TRANSFER AND APPLY UNDERSTANDING

Taking notes enhances comprehension and retention of the information from a text. Students build on their prior knowledge as they transform the information they are reading into notes that suit their individual needs. Note taking is most effective when acquiring surface knowledge.

EFFECT SIZE 0.59

Tips

- record the date at the top of each page of notes
- don't try to record every word
- record examples and non-examples
- record any new vocabulary and subject matter
- write down any questions you have
- utilise symbols and abbreviations.

Highlighting and Underlining

Annotating a text
Underlining and highlighting keywords or sections of a text and using post-it notes assists students to annotate a text. Students learn to focus on the meaning of what is being read whilst identifying key words and passages from a text.

Outlining
Students record an author's main ideas, supporting ideas and evidence in point form. As a useful record of reading, students may also incorporate a drawn diagram/map of the contents of the text.

Charting

Charting is a great note taking technique for reading texts where information can be grouped into categories. Charting is effective as students identify categories, consider similarities and differences, and recognise patterns. During reading, students record key details in the appropriate column. This technique is also effective for transforming and rewriting notes when revisiting and reviewing.

Category 1	Category 2	Category 3	Category 4

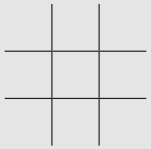
About/point chart

Students record what the text is about and the supporting details in dot points. This may be completed individually or with a partner, to be shared in small groups with the class. Use of this chart is most effective when teachers model thinking about reading first with think-alouds.

The text is ABOUT:	
The Author's POINTS are:	

Tic Tac Toe

Taking notes in a Tic Tac Toe grid provides a simple structure to record key headings and relevant information from a text. Teachers may also provide the headings for each square to guide note taking.



How does note taking support learning?

When taking notes, interacting with notes and reflecting on notes, students:

- learn how to read and listen for important information
- learn to paraphrase information in their own words and therefore make meaning
- learn to review and revise content of their notes
- make connections between content and prior experiences
- collaborate with peers to check for understanding
- learn from their notes.

Rule-Based

The Rule-Based technique helps students to eliminate any information that is not necessary for understanding. It can be completed alone or with a partner.

1. Draw a line through unimportant or irrelevant information.
2. Delete words that repeat information.
3. Replace lists of things with one word that describes them (categorise).
4. Find a sentence that summarises the meaning of the text, or write a summary.

Cornell Approach

Students divide their page into two columns for keywords and notes, with a horizontal space for a summary at the bottom. The Cornell approach emphasises the 5 Rs of note taking:

- **record** ideas in the notes column while reading the text
- **reduce** notes into keywords
- cover the notes column and attempt to **recite**
- **reflect** on information and make connections
- **review** and revise notes.

CORNELL TWO-COLUMN NOTES

Keywords:	Notes:
	Types of Matter
Solids	I. Solids A. Have a definite shape B. Have a definite volume
Liquids	II. Liquids A. Do not have a definite shape B. Have a definite volume
	III. Gases A. Do not have a definite shape B. Do not have a definite volume

Summary:
(Insert summary of lecture after class)

Reviewing and Rereading notes

Revisiting and reviewing notes taken after some time has passed (spaced practice) increases a student's capacity to embed learning into their long-term memory

LESSON | BREAK | REVIEW

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Summarising

BUILD SURFACE KNOWLEDGE | DEEPEN LEARNING | TRANSFER AND APPLY UNDERSTANDING

Summarising is the ability to reduce a larger piece of text so the focus is on the most important elements. It is closely linked to the strategy of determining importance. A summary is a shortened version of the original text that captures the main focus through the inclusion of all the main ideas, important details and key words from the original text. A summary often uses the same text structure as the original text, e.g. cause and effect, orientation to setting followed by a character introduction etc.
Summarising is most effective when acquiring surface knowledge.

EFFECT SIZE 0.63

Students need to be explicitly taught to:

- identify the key idea/s
- consider how the key ideas work together to create meaning
- identify and use key information - words, facts and phrases
- take notes
- think critically about the text's perspective and their own interpretations

in order to become proficient at summarising.

Tips

Summarising is a complex strategy to master, and consequently, effective teaching of summarising requires multiple modelling sessions and many opportunities for students to practise. When asked to summarise, students initially tend to copy out whole sections of text and include all the details.

Paraphrasing

Summarising is closely linked to paraphrasing in that they both involve identifying the key ideas and putting these into the students' own words. Paraphrasing is the re-stating or re-writing of a text into other words, but there is no expectation that key words, phrases or facts be replicated and there is also no expectation that the structure of the original text be maintained. When paraphrasing, a student may choose to paraphrase one statement, a group of statements, or an entire passage. This is quite different from summarising, which requires a reader to gain a global picture of the complete text.

Retelling

Summarising is closely linked to re-telling in that they both involve identifying the key ideas and putting these in the students' own words. A re-telling does not only focus on key ideas, it provides more detailed information and elaborations on the text's content and interpretations of the content. For example, characteristics of good re-telling of a narrative might include: using character names, describing the setting, explaining the events or plot, discussing the problem a character is having, and describing how the problem is or isn't resolved.

3, 2, 1

3 3 things I learnt...

2 2 things I found interesting...

1 1 question I still have...

Think, pair, share

THINK about the question or problem

PAIR with a partner to share the answer or solution

SHARE with the class or group

Retrieval chart

Students locate specific information from texts, recording it in the grid.

	Who?	Where?	When?	What?	Interesting fact
Text 1					
Text 2					

Using a summary as an exit pass can be a powerful tool for formative assessment.

Fishbowl (circle within a circle)

Students sit in two circles, one circle inside the other. Students in the inner circle discuss what they have discovered about a specific topic.
Students in the outer circle take notes from the discussion. They then ask the inner group questions before contributing to the discussion. The process can then be repeated with another topic and the two groups swap roles.

How does summarising support learning?

In order to summarise, the students must attend closely to the text and be able to include information that gives the essence of the text. Summarising also plays a part in the ability to synthesise. If the students are able to articulate the main points and ideas of a text, they are more readily able to synthesise. Summarising enables students to reduce ideas in a text to key points and to then consider the text's and their own perspectives.

Jigsaw

EFFECT SIZE 1.20

Teachers arrange a class in groups.

Each group member is assigned a different piece of information in which to identify the most important ideas.

Group members then join with members of other groups assigned the same piece of information, to share ideas that were identified.

Eventually, students return to their original groups to try to "piece together" a clear picture of the topic at hand.

The language of summarising

- The most important thing to know about _is _.
- Some important facts included in the text are _.
- The key point the author is making is _.
- In my own words, the text is about _.
- Another name for this text could be _.
- Who? When? Where? What? How?
- The whole point of this text is _.
- Key words used in the text are _.
- So far I have learned _.
- The text is mostly about _.

Adapted from Zimmerman, S. (2003); Cameron, S. (2009) and First Steps Reading resource book (2013).

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Visualising

BUILD SURFACE KNOWLEDGE | DEEPEN LEARNING | TRANSFER AND APPLY UNDERSTANDING

Visualising occurs throughout the learning process as students use all of their senses, along with their prior knowledge and experiences, to create images of what is happening in a text, problem or idea. Visualising is sometimes referred to as creating images or a movie in your mind. While images are typically mental, they may be visual, auditory, olfactory, kinaesthetic or emotional. Visualising is most effective when acquiring surface knowledge.

EFFECT SIZE 0.45

Students need to be explicitly taught to:

- create an internal representation that can be drawn on as the student works through an idea or problem
- identify a useful image or representation of an idea that helps the student describe the structure of an idea or problem
- compare different images to identify what is the same or different
- make connections by remembering underpinning structures and understandings rather than images
- share a personal visualisation with an audience, to explain or clarify their thinking.

Tips

It is important that students understand that everyone creates their own unique mental images in their head. They should be given the opportunity to share their images and to talk about how creating images helps to gain a better understanding of the text or problem. Images can be shared orally, as drawings, as jottings, or through drama. Students need to be aware that while there are no right or wrong images, information (clues) must be drawn upon to support the creation of the images. It is essential to support students to create visual images that contain lots of detail and that have drawn upon both literal and inferential information from the text or problem. Students should also be supported to revise their images when new information is gained.

How does visualising support learning?

Using all five senses to create visual images helps the text to come to life and supports the reader to connect with and become part of the text. Visualising also supports comprehension, as when students create their own mental images they tend to pick up on finer details and understand the text more deeply.
Visualising supports students to monitor meaning as if the mental images are difficult to create, the student is likely to re-read and look more closely for clues in the text. Sensory images created by readers also support them to draw conclusions, make predictions, interpret information and remember details.

Visualising during learning

- Creating a physical representation and a mental image of a situation helps to make sense of a problem or idea, model options and think ahead.
- Visualising occurs in the depths of problem solving, supporting the development of ideas and enabling the clear communication of understandings.
- Students are encouraged to describe their visualisations whilst exploring several possibilities and problem posing, "What would happen if…?"
- Students identify the key components of the problem and the relationships that exist between them through visualisation.
- Students may use a range of recording systems. For example, story boards may be used as representations of visualisations during problem solving.

Language of visualising

- In my mind I can see _.
- I can imagine _.
- The movie in my mind shows _.
- The image I see in my head is _.
- I can just taste/feel/hear/smell the _ and remember details.

Start up a conversation!

Through short conversations about what a student is visualising, teachers gain a deeper understanding of a student's comprehension of a text. Teacher prompting questions:

- Tell me about what you saw in your mind.
- What were you visualising while you were listening to the text?
- How are you imagining this in "your mind's eye"?
- Tell me a little about the picture you have visualised.

Story Map

Students draw a graphical representation as a record of the important events and elements in a story. Story maps can be used to assist students to retell a story in written or oral form.

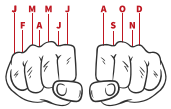
Sketch to Stretch

Students create a visual sketch of the main ideas presented in a text. Students use their sketches to begin a discussion with others, sharing and explaining their thinking and understandings.

Children who use concrete materials in learning tend to have better visualising ability

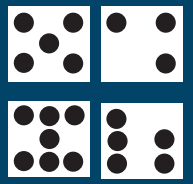
Mnemonic

Used to remember the number of days in the months.
30 days hath September, April, June and November,
all the rest have 31,
except for February alone,
which hath 28 days clear, and 29 in each leap year.



Subitising

Recognising the number of objects in a visual array or group without needing to count.



R.I.D.E.R

Students engage in the following steps during reading:

Read
Imagine
Describe
Evaluate
Read on.

Teachers model this thinking for students when reading aloud.

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Graphic Outlines

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Graphic outlines help students to develop thinking skills and improve their comprehension of texts. Students are engaged in active meaning-making as they organise and construct their understandings. The graphic outline that is chosen for the task should be the most suitable for the thinking that is required. Graphic outlines are most effective when building surface knowledge.

EFFECT SIZE 0.42

Tips

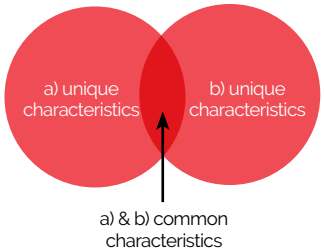
- Explain the purpose of the graphic outline.
- Introduce a graphic outline by providing the class with a completed example based on an important part of a text that uses subheadings and diagrams. Ask students to refer to the graphic outline as they discuss the text with their peers.
- Students should then be given time to reflect on the value of the graphic outline and possible applications.
- Encourage students to draw up their own graphic outlines

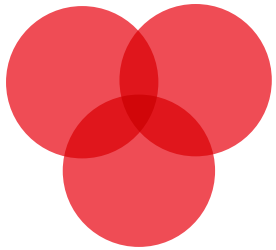
Y-Chart

Purpose: A three-part chart to help organise what the student knows about the topic, what it looks like, feels like and sounds like. The students use their senses of sight, hearing and touch and record their writing or drawing in the Y-Chart.

Venn diagram

Purpose: A diagram that is made up of two or three overlapping circles. Venn diagrams help students to visualise the relationship between 2 or 3 subjects by comparing and contrasting the similarities and differences.



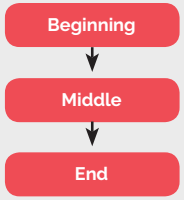


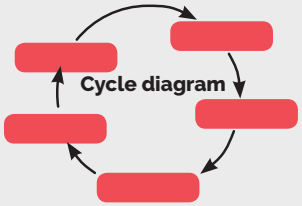
Continuum diagram

Purpose: A graphic representation of a continuum of data that occur chronologically or sequentially. For example, a timeline of milestones in a person's life.

Chain diagram

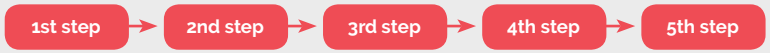
Purpose: To examine and describe the stages or steps in a sequence of events or a process. For example: a chain diagram can be used for linear processes, analysing the plot of a story, to identify and analyse the cause and effect of a process or to document the stages in the lifecycle of an animal.





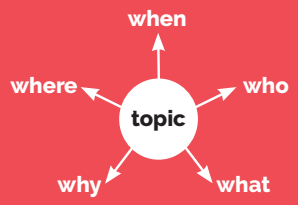
Cause and effect diagram

Flow chart



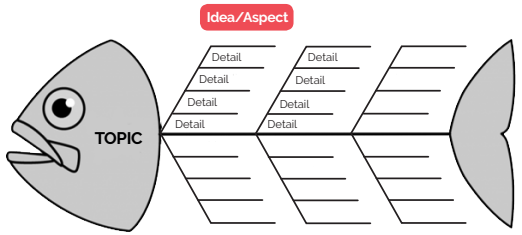
Cluster diagram

Purpose: A non-linear diagram that helps to brainstorm and generate a list of as many ideas, facts or attributes as possible, associated with a subject. For example: a cluster diagram can be used to create a graphic display about a topic like pollution, or a story star can be used to describe key events in a story by noting the 5 W's; who, when, where, what and why.



Fishbone

Purpose: A diagram that is used to explore many aspects of a topic, or to consider cause-and-effect, helping the student to clearly organise complex thoughts in a visual way. A fishbone diagram can also be used to prepare for writing as the student lists the main ideas concerning a topic and elaborates on the attributes, functions or effects associated with each idea.



T-Chart

Purpose: To analyse or compare two aspects of a subject. For example: Pros and Cons Chart associated with a decision, or Fact vs. Opinions Chart about what is presented in a newspaper article.

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Spaced Practice

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Spaced practice is the distribution or chunking of learning over time. This powerful practice improves retention of information and builds fluency. Spaced practice is effective because students get the opportunity to utilise and practice skills between learning episodes, student engagement is increased, learner fatigue is reduced and multiple retrieval routes are activated, aiding remembering. Spaced practice is most effective when consolidating surface knowledge.

EFFECT SIZE 0.71

A-B-C-D Response Cards

A variation of four corners, and effective for reviewing learning. Each student has a set of A, B, C, or D cards. Students hold up their answer card corresponding with the answer they would choose. Individuals and groups share their reasoning. Students are given the opportunity to change their answer after hearing the reasoning of their peers.

Four Corners

Four Corners allows students to get up and move, and engage in meaningful conversations with their peers:

Begin with a statement or a question related to what is being learned. Create four different opinions related to the statement/question, e.g. Strongly agree, agree, disagree and strongly disagree. Place these on chart paper in four different areas of your classroom.

1. Read the statement/question to the class and allow time for students to independently think about an answer. You may ask students to write down their answer and provide reasoning for their choice.
2. Ask students to commit to an opinion and move to the corresponding corner of the room. Allow two or three minutes for peer discussion about their reasoning. Each group then presents the key points to the class.

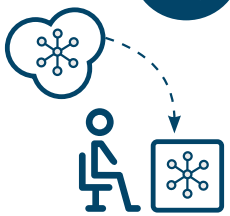
Interleaving Practice

Reviewing ideas/concepts, with short breaks in between learning episodes, helps strengthen understandings and learning. Vary the types of activities that the students are doing and avoid spending too long on one topic or activity. This enables important comparisons and connections to be made between these ideas/concepts.

Retrieval Practice

EFFECT SIZE 0.73

Also referred to as practice testing, retrieval practice involves frequent low-stakes testing/ quizzing over time to encourage recalling information from memory. This practice enables teachers to check for understanding. Over time, retrieval practice enhances a student's ability to recall information and to apply it in new ways. Students should be encouraged to create their own quizzes and share them with their peers for retrieval practice.



Self and Peer Assessment

Self and peer assessment is a reflective practice that can help students acquire a range of transferable skills such as self-reflection, time management, organisational and team skills.

Reviewing new learning is most effective after some time has passed.

Tips

- Spaced practice requires careful planning and time management.
- Visual representations can assist students to develop automaticity in recalling information they have learned. Encourage students to draw infographics, diagrams, timelines, graphic organisers and comic strips to represent information they are trying to learn.

Flash cards

Practice rehearsing and recalling the information on them, and go beyond definitions by thinking of links between ideas

Spaced vs. Massed Practice

Spaced practice is effective for managing the cognitive load of learning on students. Concepts to be learned are presented in shorter sessions, repeated and distributed over time. Compared to mass practice (also referred to as cramming), spaced practice assists students to retain and recall information.

Elevator Pitch

A short, pre-prepared persuasive speech that explains an idea clearly and succinctly. It can be used to spark interest in an idea whilst conveying the important information.

Rehearsal and Memorisation

Students benefit from regular rehearsal of what they have learned. This practice consolidates learning so that students are able to access information as they deepen their understandings of a concept.
E.g. Before writing, students may engage in an oral rehearsal of their writing before they begin. They use graphic organisers to plan what they intend to say and write.

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Concept Mapping

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Concept mapping is creating a graphical representation of the conceptual structure of content. Concept maps make links between old and new learning and are most effective when developed collaboratively. Generally they begin with a main idea or theme and are expanded through creative use of images, colour, and logic to show patterns and connections. Concept mapping is most effective when acquiring deep and surface knowledge.

EFFECT SIZE 0.60

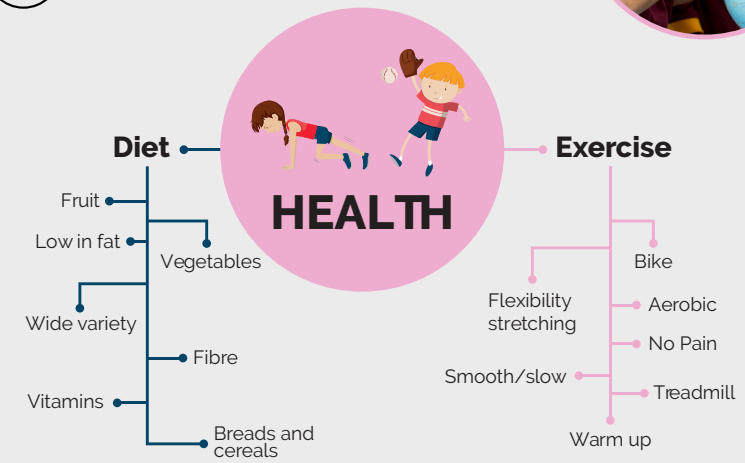
What needs to be explicitly taught:

Teacher models a simple map associated with the current learning – What does this mean? What words are most important? How are the words grouped? How are these words linked/connected? What are the implications?
Students contribute to class concept maps - brainstorm ideas together and invite students to group or link words.
Give students time to develop their own concept maps and make connections in their own way.
Students reflect on their concept maps – encourage students to articulate their understandings and justification for the map.

Mind mapping

The terms mind map and concept map are sometimes used interchangeably. A mind map is a way to record information and organise ideas. They can be a way of a student brainstorming and organising ideas and knowledge before writing.

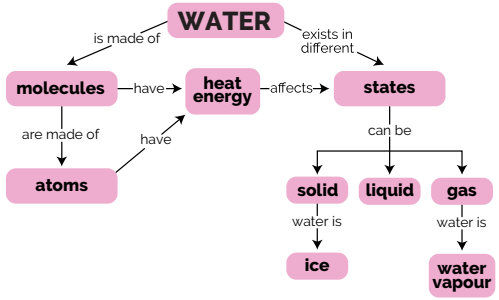
Example mind map



Teacher prompting questions

Which key words/concepts are most important?
How could these words/concepts be grouped differently?
What links/connections/patterns can we see?
What are the implications?

Example concept map

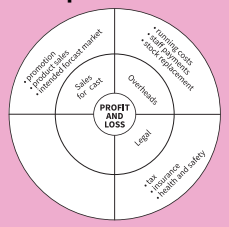


Concept Spiral

The concept spiral is a tool to develop conceptual knowledge and make connections. It combines both written and symbolic text. The spiral consists of three concentric circles fixed with a split pin. Each circle is divided into an equal number of segments. The information is then recorded on the cards and concepts aligned.

Example 1:
This tool could be used to develop confidence and vocabulary in writing about characters. The names could be written in the centre circle. The next circle could be words and phrases to describe each character. The outer circle could be a small image of the character.

Example 2:



Tips

Collaborative construction is the key to effective concept maps, building energy and interest in a topic. The discussion, debate and generation of ideas can build knowledge and understanding. The use of concept mapping can surface what is known, not known or what is misunderstood. Further into the learning, concept maps bring together various aspects of understanding. Concept maps can be re-visited throughout the learning so that students can illustrate their new understandings.

Concept Pyramid

Drawing a concept pyramid is a way of brainstorming concepts and arranging them in a negotiated sequence or hierarchical order.

When and Why

- can be used across a broad range of disciplines and skills can be transferred from one learning area to another
- can be used to identify relationships and draw links between concepts within a topic area or within and across learning areas
- can be used to gauge initial ideas of students and progressively built up during a period of time to illustrate overall understanding.
- can be taught to students of all ages
- has been found to increase student's ability to organise and represent thoughts

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Critical and Creative Thinking

"Critical thinking is at the core of most intellectual activity that involves students learning to recognise or develop an argument, use evidence in support of that argument, draw reasoned conclusions, and use information to solve problems. Examples of critical thinking processes are interpreting, analysing, evaluating, explaining, sequencing, reasoning, comparing, questioning, inferring, hypothesising, appraising, testing and generalising". (ACARA, 2010). When these skills are consistently practiced, students develop the capacity to think complex thoughts which enables them to approach and solve problems confidently as they are presented in learning and real-life situations. Critical thinking is most effective when consolidating deep knowledge.

EFFECT SIZE 0.48

Inferring

Making an educated guess using clues from an observation or from text.
Language of Inferring:
- What meaning is being conveyed here?
- What does…tell us about…?
- What clues can we use to predict what will happen next? What are the clues to the answer?
- What can you conclude about…and what evidence do you have to support your conclusion?

Tips for the process of inferring - ask yourself:
- What did I observe/What information was I given?
- What do I already know?
- How can my knowledge explain what I observed/ the information I was given?
- What conclusion can I draw about my observation or the information I was given.
- If required, can I make a prediction about what will happen in the future?

Evaluating

Generating and applying criteria to judge the quality of something.
Language of Evaluating- questions that could be asked:
- Which is the better idea and why?
- Which one is more important and why?
- How valid is this argument?
- How effective is this process?
- Which is the best choice and why do you think so?
- What are the advantages and disadvantages of this decision?
- How well do these features satisfy the criteria?

Tips for the process of evaluating - ask yourself
- What are the criteria…
- Do I need to order the criteria from most important to least important?
- How does the item that I want to evaluate satisfy the criteria?

Comparing

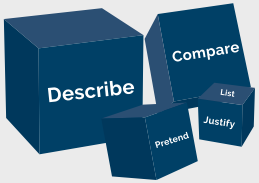
Looking at both similarities and differences.
Language of Comparing - questions that could be asked:
- How are these items similar?
- How are these items different?
- What are the similarities and differences between…?
- What do these have in common?
- Compare your observations with … and identify how they are similar and different.

Tips for the process of comparing - ask yourself
- What items do I want to compare?
- What features of these items do I want to compare?
- How are these features similar and different?

Tips

Encourage critical thinking in the classroom by:
- allowing students thinking time before stepping in to help
- brainstorming what students think they will be learning or reading about before engaging in a text
- asking students to sort and categorise concepts being learned
- allowing time for students to consider the significance of a concept and make comparisons
- modelling making connections between learning and real-life situations through the use of think-alouds
- provide multiple opportunities for peer collaboration and cooperative learning

Cubing



Student develop critical thinking skills as they examine ideas, think and question multiple different points of view.
Students start with an idea that can be viewed from multiple perspectives. Teachers or students generate a question related to each perspective. Questions that have no right or wrong answer are most effective. Create a cube or die to roll with six different perspectives, one on each face. Cubing can be adapted to use in a variety of learning areas across year levels.

Analysing

Examine something methodically and in detail, typically in order to explain and interpret it.
Language of analysing - questions that could be asked:
- Exactly what do you want to find out?
- What are the facts of the situation?
- What are the different parts of the subject matter?
- Is there a relationship between the different parts?
- If there is a pattern, what would happen if one of the parts/variables changed?

Tips for the process of analysing - ask yourself:
What are the parts of this subject matter?
Which parts are relevant/not relevant for the analysis?
How are the parts connected, is there a pattern or relationship between the parts?
What would be the effect of changing one of the parts, how would the other parts or the whole of the subject matter be affected?

Generalising

Language of generalising:
- What is the key idea/principle of…?
- What is the underlining theme of …?
- What general rule can be applied to…?
- What are the essential features of this …?
- What statement can be used to describe the essential elements of…?

Tips for the process of generalising: ask yourself:
- What is the key knowledge presented here?
- What is a more general way of saying this?
- Which information can I leave out?
- Do I recognise this pattern somewhere else?

Socratic Seminar

A Socratic Seminar is a powerful technique that encourages students to think critically whilst co-constructing a deeper understanding of a text or issue.
A seminar begins with a teacher or student posing an open-ended question. e.g. What is the meaning of this film?
Time is provided for students to prepare their ideas before contributing to the seminar. In conjunction with the teacher, students prepare a list of ground rules for the discussion. e.g. Don't interrupt others, don't put down your peers' ideas, etc.
Students then engage in a discussion, responding to the question, explaining their thinking, justifying their ideas and sharing their point of view.
Sometimes Socratic Seminars may be organised with students forming an outside circle, making observations and taking notes on the seminar that is taking place in the inner circle.

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Questioning

Questions are posed before, during and after learning. Often these questions are formed spontaneously, with one question leading to the next. Questions may relate to the content, structure, key ideas, events or an attempt to clarify meaning. Questioning is most effective when acquiring deep knowledge.

EFFECT SIZE 0.48

Tips

Set up a classroom where questioning is encouraged. Students who generate their own questions tend to show greater levels of comprehension; therefore, it is essential to explicitly teach students how to become aware of and value the questions they ask naturally as they engage with a text.
Students also need to be aware that answers to all questions may not always be in the text. Use follow-up probes that encourage clarification, extension or elaboration of a response. Allow wait time after posing a question for students to build their thoughts and consider their response. Encourage student dialogue by redirecting student responses or comments back to peers, e.g. Would any one like to respond to that idea? Model self-talk and self-questioning to students.

How does questioning support learning?

Effective readers continually pose questions before, during and after reading to assist them to comprehend a text. Self-formulated questions provide a framework for active reading, as they create a purpose for reading and engage students in the text as they go in search of the answer/s. Questioning also plays an important part in the process of self-monitoring, as students ask themselves: "Does this make sense?" This connection with the text before, during and after reading helps to deepen comprehension.

Hot seat interview

Students take turns in the "hot seat", answering questions posed by other students. There are many possible variations to the activity. For example, the chosen student is 'in role' as a character in a story, or as a survivor of a Tsunami. Students are encouraged to ask a variety of different types of questions relating to the text.

A questioning friendly classroom is where students are:

- encouraged to contribute diverse responses
- building on each other's responses and ideas
- comfortable to ask a question that challenges a point of view
- prepared to seek clarification about a response
- encouraged to share ideas and opinions
- confident to generate questions for discussions.

Allow wait time

Use affirmative non-verbal signals, such as a nod and eye contact, to show interest and encourage students to contribute to the discussion. Allow comfortable silences in the classroom to enable students extended thinking time.
Wait 3 seconds after asking a question and 3 seconds after a question is answered.

Question-Answer relationships

This identifies four question types: Right There, Think and Search, Author and You and On My Own.

Right There: The answer is in the text, and if we pointed at it we'd say, "it's right there!" These are typically literal questions.

Think and Search: The answer is in the text, but you might have to look in several different parts of the text and put the information together to make meaning. It requires a grasp of multiple ideas across paragraphs or pages.

Author and You: The answer is not in the text, but you still need information that the author has given you, combined with what you already know, in order to respond to this type of question. These are typically inferential questions.

On My Own: While the question is related to an aspect of the text, the answer is not in the text. You are required to draw on background/prior knowledge to answer the question.

Adapted from Zimmerman, S. (2003); Cameron, S. (2009) and First Steps Reading resource book (2013).

Extension and creativity

How can I best approach this next step/challenge/frustration?
What thinking tool is most appropriate to help me here?
What have I done when I have been here before?
What have others tried before me?
How do I need to change my plan?
How can we build on this idea?
Who has another perspective?

Questions that encourage deep thinking

Clarifying and elaborating

Why do you think that?
Can you tell us more about that idea?
Can you explain that in a different way?
Can you provide some evidence to support your view?
What does this really mean?
What are the implied or suggested meanings?
What is an example of...?
How could we prove this?

Comparing and organising

Do these two ideas agree?
How is that different from what was said?
What is ... similar to or connected with?
What is ... different or distinct from?
What evidence is there to believe ...?
How reliable is that evidence?
How could we sort or organise ...?

Reasoning

Why do you think/say that?
How do you know that?
What reasons support that thinking/idea? Why?
What are the reasons against this thinking/idea?
What conclusions can you draw from...?
Do those reasons lead to that conclusion?
What are some possible explanations/causes?

Alternatives and consequences

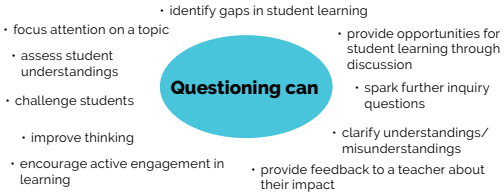
What would be a different view?
What would the consequences/implications be?
What might it mean if certain conditions and circumstances changed?
What else needs to be taken into consideration?
We might be making a mistake thinking ... because ...
If ... is true, what would this tell us?

Thinking progress

What did we do well?
What could we improve?
Where have we moved forward?
What do you understand more?
What have you discovered or learned?
What do we need to work on next?
I now understand ... because...
I am more confused about ... because...

Encouraging student dialogue

Would anyone like to respond to that idea?
Does anyone have a different opinion?
What can you add to that response?
How consistent is that response with what you think?
What is a different idea about ...?
How else could we think about ...?



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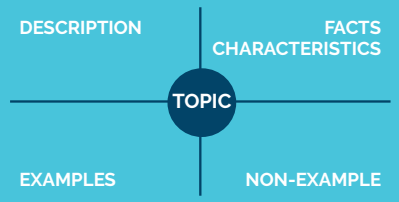
Elaboration and Organisation

Elaboration and organisation helps students expand upon key ideas and concepts that are to be learned. The student expands the key ideas and concepts by relating and making connections to other information. Using elaboration and organisation techniques can be a powerful tool for students, as connecting information can support the learning of new information. Elaboration and organisation is most effective when acquiring deep knowledge.

EFFECT SIZE 0.75

Frayer model

Students begin with a key word, phrase or point of view that is being explored. Through engagement with learning area texts and their peers, students record a definition/illustration, the characteristics, examples and non-examples. For example, utilising the Frayer Model is an effective way to expand a student's vocabulary and subject matter when reading and writing in the learning areas.



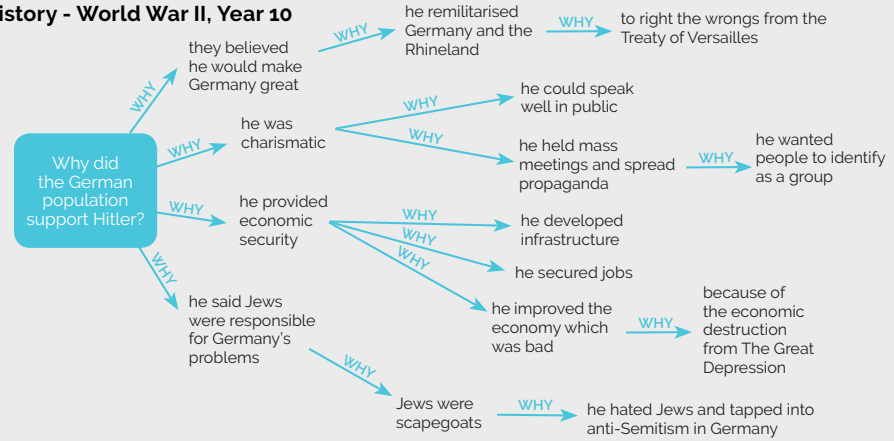
SWOT analysis

A SWOT (Strengths, Weaknesses, Opportunities and Threats) Analysis is a problem solving approach to learning that inspires critical thinking. Students and teachers engage in a discussion to brainstorm relevant characteristics into the four categories of the diagram.

5 Whys

An interrogative technique to explore cause-and-effect relationships underlying a particular problem.
Define a problem and develop a shared understanding of the problem with the group.
Write a statement about the problem and ask the group why it occurs.
Record answers to the right of the problem statement as short phrases.
Ask "why" four more times and record your answers in succession.
5 Whys also allows for multiple lines of inquiry, when there are more than two possibilities/ reasons as answers.

E.g. History - World War II, Year 10



How can elaboration strategies help your students?

Elaboration strategies connect information to be learned with information that students already know. These connections create efficiency of learning and assist with retrieval of information and working memory.

Students need to be taught to:

- explain and describe ideas/concepts with many details
- relate ideas and concepts to their prior knowledge
- make connections between ideas/concepts to explain how they work together
- think of ways ideas/concepts are similar or different.

Elaborative Interrogation

EFFECT SIZE 0.42

A technique that encourages learning through the use of the question "why". Students generate "why" questions and try to generate possible answers and reasoning to explain a cause-and-effect relationship. Engaging in elaborative interrogation helps students to integrate and relate new ideas and concepts with their prior knowledge and experiences.
Questions to prompt students:

- Why is this true?
- Why does this make sense?
- Why is ... true, but ... is false?

Tips

- Consider the ideas/concepts together with the prior learning and abilities of your learners.
- Provide worked examples of elaborations.
- Encourage student ideas and discussion to help students articulate connections between ideas/concepts.
- Provide effective feedback to students about their ability to elaborate, ensuring the way students explain and describe an idea is accurate.

Lotus blossom technique

This creative thinking technique helps to manage and categorise large amounts of information related to a particular idea/concept. It involves starting with a central idea/concept and working outwards by recording related ideas on the petals. Related ideas may become central ideas/ concepts themselves, and so forth.

1. Write the central idea/concept in the diagram's centre.
2. Think of related ideas and write them in the surrounding petals/circles.
3. Try to think of eight new central ideas/concepts, and write them in the surrounding flowers. Generate as many related ideas as you can.
4. Continue the process until you've completed as much of the diagram as you can.
5. Evaluate your ideas.

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Class Discussion

Engaging students in discussions allows them to construct meaning whilst simultaneously fostering social and communication skills. In classroom discussions, students are empowered to ask for clarification, share details, defend ideas, make connections and analyse concepts. Collaborative discussions, student led and student centred conversations can be used with large classes and small groups across all learning areas where teachers want students to develop critical thinking and communication skills whilst learning. Classroom discussions are most effective when consolidating deep knowledge.

EFFECT SIZE 0.74

Tips

- Discussions help contextualise the learning through the examples that are shared during the conversation.
- The learning becomes more relevant to the students.
- There is a reciprocal relationship between discussing the learning and language acquisition.

Gallery Walk

A Gallery Walk gets students out of their chairs to actively engage in discussions with their peers about learning.

1. Place questions or prompts to stimulate student discussion on chart paper around the classroom.
2. In groups of 4-5 students, each group begins the discussion at a different chart.
3. The group reads the first question and records their responses on the chart paper.
4. After 5 minutes, groups rotate to the next chart, read and discuss the previous group's responses and add their own responses until they have discussed each chart.
5. Groups can return to their first chart to read and reflect on the other responses that have been added to the chart paper.

Naming students in roles as leader, reporter, monitor and recorder may help to add structure to the groups. Using Gallery Walks promotes the development of thinking skills including analysis, evaluation and synthesis, together with effective communication and team building skills.

Harkness Discussion

Student controlled conversations can invigorate the learning experience as students pose questions, seek clarification, make connections and evaluate ideas.

1. Provide an engaging stimulus as a focus for the discussion. The stimulus may be an event, video, song, performance or text etc.
2. Students generate questions that they do not know answers to.
3. Students sit in a circle.
4. Students discuss the questions.

The teacher observes and takes anecdotal notes.
In large groups, consider a fishbowl approach, to break the class group into more manageable groups (with the inside circle using the Harkness Discussion Method and the outside circle making peer observations).

Summarising

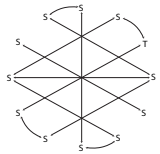
Classroom discussion structures

In a **student centred discussion**, students:

- engage with each other
- all contribute different ideas
- aim to get an outcome
- may progress their discussion to a debate.

In an **inquiry community,** students:

- engage with student ideas
- make connections, evaluate and build on ideas
- make progress through a rigorous inquiry.



Elbow Partners

Students have the opportunity to work with their peers which helps to create a classroom community of trust and further develops relationships.

Academic Controversy

Academic Controversy is learning in the form of a debate in which students consider alternative sides of an issue before reaching a consensus. All students are engaged in a co-operative discussion, speaking, listening and thinking about an issue.

- Form two teams (**A** and **B**).
- Provide a stimulus statement.
- **A** team takes the positive position, **B** takes the negative position.
- Each team has 5-10 minutes to construct an argument for their position.
- **A** presents their argument, followed by **B**. Each team listens but may not interrupt or question.
- Each team then adopts the opposing position and has a set time to prepare new arguments for that position.
- **A** presents as before, followed by **B**.
- Working together, both teams review the arguments and achieve a consensus position in relation to the topic.

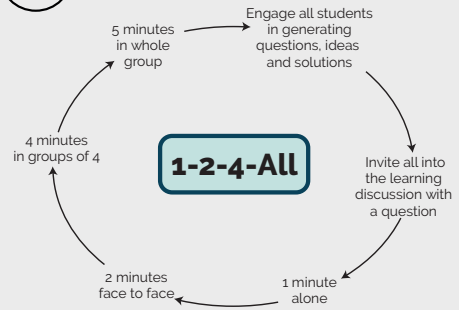
The Issue:	
Facts:	
Arguments FOR	**Arguments AGAINST**
List of possible solutions:	

Corners

1. The teacher names each corner of the classroom to represent a view ("For," "Against," "Undecided") or choice ("Which character do you identify with the most?" or "Which problem was the easiest / most difficult?")
2. Students are then given thinking time to make a choice. (Encourage students to record their answer and reasons for that decision.)
3. Students move to the corner that represents that viewpoint.
4. Students in each corner discuss their opinion or respond to a question/comment in each corner. (This may be done in pairs first).
5. Groups summarise their discussion and share with the whole class.

Variation: Students are selected from each corner to go to another corner to share their corner's viewpoint.

1-2-4-All



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Reciprocal Teaching

Reciprocal Teaching is a reading practice based on the foundational skills introduced through guided reading in addition to the use of scaffolded talk between a teacher and a group member or group members with each other to develop and support comprehension. Students who participate in this practice are encouraged to read, talk and think their way through the text. Scaffolded talk about the text is guided by four comprehension strategies: predicting, clarifying, questioning and summarising. (Palincsar and Brown, 1985; Palincsar, 2003.) Talk is promoted by the use of specific roles based on these strategies. Each group member undertakes a role and through discussion, jointly constructs the meaning of the text. Reciprocal Teaching is most effective when acquiring deep knowledge.

EFFECT SIZE 0.74

Reciproical Teaching

Reciprocal Teaching uses 4 roles to foster good discussions about a text.

Predictor
- hypothesising what the author will discuss next in the text
- linking new ideas to prior knowledge
- confirming or modifying thoughts and opinions
- using text structure
- monitoring own understandings

How
- stop at different points in the text
- provide predictions of what will happen next, or how the author will discuss...
- use headings, sub-headings
- confirm or reject predictions

Questioner
- formulating and answering questions
- demonstrating deeper engagement with the text
- developing skills to think critically

How
- ask questions before, during and after reading
- use literal, inferential and evaluative questions
- provide question-type support charts, for example: Did the author say it? Did the author mean it? Would the author agree?

Roles

Clarifier
- focusing on the meaning of a text
- be alert to unfamiliar vocabulary, phrases and complicated concepts
- restoring meaning through the use of context, known words, references, re-reading and asking for help

How
- look for unfamiliar vocabulary
- examine the layout of the text
- identify complex concepts
- use the grammar of the text
- use a dictionary or thesaurus
- re-read

Summariser
- organising and integrating the information from the text
- showing understanding of the main idea, information and purpose of the text
- reviewing what has been read

How
- locate key words in the text and use in the summary
- summarise the main idea of a paragraph
- summarise key points relating to headings and sub-headings
- synthesise the main ideas into a concise paragraph

Text selection

The teacher selects an appropriately levelled text. The teacher identifies the supports and challenges in the text and selects the teaching focus based on student learning needs. Each student works with an individual copy of the text. It will usually be a text that students have not read before. As Reciprocal Teaching emphasises research-based dialogue, short non-fiction text types are particularly suitable. However, a text may be read over several sessions if it contains chapters or challenging vocabulary or contexts.

Adapted from Reciprocal Teaching Resource, www.education.vic.gov.au

Modelling the roles within Reciprocal Teaching

Teachers as leaders

Initially, the teacher will model the procedure for Reciprocal Teaching sessions. The teacher acts as the leader of the discussion - modelling, discussing and explaining the use of the four strategies. The four roles/strategies are dealt with separately for learning purposes, including:

- **Predictor:** predicting from what is already known, from the text structure or from the text features.
- **Clarifier:** clarifying "unfamiliar vocabulary, challenging concepts awkward structure, unclear referent words, idiomatic expressions" (Palinscar, 2003, p. 370).
- **Questioner:** asking questions about the text that cover the three levels; literal, inferential and evaluative.
- **Summariser:** summing up the main ideas or gist of the text.

Efficient readers synthesise these strategies when reading. However, to make them explicit to students it is desirable that each one is modelled and scaffolded separately until they can be competently integrated. At this point in the process the teacher takes on a secondary role, providing encouragement, feedback and support as required. Teachers have the opportunity to observe their students using the strategies as they jointly construct meaning.
During observations, the teacher annotates the level of student participation and their strategy competence. These annotated observations form the basis of future planning and teaching. It is envisaged that when students can competently use the strategies developed during Reciprocal Teaching they will be integrated, internalised and transferred to their independent reading.

Students as leaders

As students become adept at using the strategies and verbalising their thought processes, the teacher will gradually transfer responsibility to the students for leading the discussion. Role cards can act as successful prompts for students as they begin to work independently on a strategy. Initially each student may lead one of the four parts of the discussion. Once the students are familiar with the procedure of Reciprocal Teaching and are competent at using the four strategies, they are ready to take over the role of group leader. Group leaders take on the responsibility for leading discussion, modelling the strategies and calling on others for contributions.

Tips

Reciprocal Teaching may be used with fluent readers to develop their comprehension skills during a small group reading session. Teachers may choose to use components of Reciprocal Teaching as a variation of a guided reading session. This practice requires students to read more independently than in a structured guided reading session, as it involves a lower level of teacher involvement and a higher level of student independence.

Reciprocal Teaching is a supported teaching practice because it:

- supports students to develop comprehension strategies
- makes explicit what readers do - predict, clarify, question and summarise
- develops students' content knowledge and topic vocabulary
- fosters meaningful dialogue among students including extended talk about texts
- helps students to develop skills in locating, recording and organising information in preparation for writing.

Theory into practice

First modelled and lead by the teacher, over time students are gradually scaffolded to talk, think and share their way independently through more complex texts. (Palincsar and Brown, 1985; Palincsar, 2003.) In line with Vygotsky's (1978) Zone of Proximal Development and Bruner's (1986) notion of scaffolding, the strategies within this teaching practice allow students to develop confidence in their comprehension at the word, sentence and text level. This practice also provides opportunities for students to apply these strategies in an authentic literacy experience (students support each other to predict, question, clarify and summarise texts). Teacher support during these sessions can be adjusted according to the needs of groups or individual students.
Research by Palincsar and Brown (1984) identified a discrepancy between student decoding levels and comprehension levels. They identified the importance of dialogue in promoting comprehension, using the word 'reciprocal' to mean 'backwards and forwards' through discussion. Dialogue is an important element of socially mediated instruction, as it is the vehicle through which the more 'knowing other' (i.e. teacher) scaffolds the learning of the novice (i.e. student) (Bruner, 1986; Palincsar, 2003; Vygotsky, 1978).

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Close Reading

Close reading involves a critical analysis of a text that focusses on significant details or patterns to develop an understanding and make meaning of a text. It involves re-reading, annotating important and/or confusing parts of a text, discussing a text with others and responding to text dependent questions. Close reading should provoke deep thinking, beyond the text, therefore it is most effective when acquiring deep knowledge.

EFFECT SIZE 0.63

What happens:

- Students read and re-read a complex, short text. The text can be read to the students if necessary as the focus is on vocabulary and comprehension, not decoding instruction.
- Students recount the text in their own words. Reciprocal Teaching is an effective strategy to scaffold this text recount.
- Students examine meaning thoroughly. They annotate and highlight the text to mark their thinking. Students collaborate to deepen understanding.
- Students' attention is directed to central ideas and key supporting details. The teacher asks questions to deepen students' understanding and analysis.
- Students reflect on vocabulary, text structure or features and look for patterns in the work.
- Students interpret the text and draw conclusions from it. They may compare the text with other sources to establish similarities and differences.

Literature Circles

Literature circles are a collaborative response to literature that the students have chosen to study from a range of options. Circles are formed of 4-6 students. Reading and discussion goals are planned. Students may take on roles for the discussion and sharing within the circle.

Roles

- Discussion Director: asks questions and leads discussion.
- Literary Luminary: finds good examples of language use.
- Vocabulary Extender: finds new vocabulary.
- Connector: makes connections with other texts and life experiences.
- Summariser: summarises the ideas or events of the text.
- Record Keeper: encourages all members of the literature circle to contribute.

Selecting an appropriate text

When selecting an appropriately complex text, consider:

- Vocabulary – including academic terms and complex words used in a range of contexts
- Ideas and information that focusses on the topic
- Text structures
- Text features

The text needs to be challenging, add to what the students need to know and engaging as they will study it for a few lessons. It needs to be short, if it is a longer text, select a significant section for the close reading.

Questions to consider when selecting a text:

- Does this text offer information to further student understanding of the subject?
- How is the text structured (sentence structures, word choices etc.)?
- Is the level of readability suitable for the students in the group?
- How can I scaffold to ensure their success with this text?
- How much prior knowledge do my students have about this subject?
- What may be difficult for my students when they are reading this text?

Close Reading steps

Steps	Examples of text dependent questions
First read - Participate in a Think-Pair-Share of the key ideas and details of the text, checking for understanding.	What are the key ideas in the text? What key details help support the author's main idea? Who, what, where, when, how questions. What have you learned from this text? What can we infer about...? What important messages has the author shared? Summarise the text. What supporting details has the author cited? Explain connections between two or more events, ideas and concepts in the text based on supporting details provided by the author.
Second Read – Re-read a chunk of text, focusing on one text dependent question about how the text works. Students highlight and annotate parts of the text to cite as evidence. This will then be used in a discussion with a small or whole group.	What do the words and phrases used in this text mean? What kind of text is this? How do you know? How have specific word choices shaped the meaning or tone of the text? Which words call our attention and illuminate the author's point of view on the topic? How do the sentences and paragraphs fit together to provide structure and cohesion to the text? Explain the structure the author has used in this text. How has the purpose and author's point of view shaped the text? How did pictures, graphics and words help you to make meaning from the text? How does your point of view compare to the author's point of view?
Third Read - Re-read the selected chunk of text focusing on what the text means to the reader and how it connects to other experiences. Students encouraged to highlight and annotate parts of the text to cite as evidence. Students discuss in small and whole group and journal with text dependent question.	How do the graphics, illustrations, words and multimedia elements help convey the important ideas of the text? How did the author use graphics, illustrations, words and multimedia elements to engage the reader in the text? What text features did the author include to help the reader (headings, sign posts etc.)? Identify the reasons that the author gives to support the key ideas in the text. Explain how the author uses reasons and evidence to support key ideas. Explain cause and effect relationships in the text. What is the author's point of view on the topic? What evidence in the text makes you think that? Describe the connections in the text between sentences and paragraphs. Analyse how two or more texts address similar ideas or topics and identify similarities and differences between the texts.

Tips

- Allow time – deep comprehension may take a few lessons because it is cognitively demanding.
- Use short texts that have sufficient complexity to be challenging.
- Read slowly for depth of understanding; not volume.
- Teacher questions are important as they deepen student discussion and analysis. Students must move from literal to structural and inferential levels of analysis.
- Allow time for deep discussion and analysis. Collaboration is important for this to occur.
- Expose students to different genres of texts including literacy and informational texts. Some primary source materials should also be studied.
- Explain to students tricks that authors use to influence the reader.

Supporting students to read complex texts through the Gradual Release of Responsibility

While the aim is to have students read independently, most students will need scaffolding to achieve this. Depending on the ability of the students, teachers can model their thinking with Think-Alouds and as students' skills improve, move to shared and guided practice before students try an independent close reading. Even for independent readers, the realization that their depth of knowledge of the text is likely to be improved through class discussions about meaning and the author's intent is an important part of their understanding. This process is an important part of metacognition. Close reading can be scaffolded through: Shared Reading and Writing, Focus Lessons on Comprehension, Literature Circles, Reciprocal Teaching, Jigsaw Discussions etc.

Jigsaw

Teachers arrange a class in groups and each member is assigned a different text in which to identify the most important ideas. Group members then join with members of other groups assigned the same piece of information, to share ideas that were identified. Students then return to their original groups to "piece together" the topic.

Questions to develop depth of understanding

- What does the author want me to understand?
- Who is the audience for the text?
- What is important? Why?
- What does the author mean by .....? How do I know this?
- What is missing from the text (gaps/silences)? Why has this been left out? How does it impact the meaning?

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Self-Regulation

BUILD SURFACE KNOWLEDGE | DEEPEN LEARNING | TRANSFER AND APPLY UNDERSTANDING

Self-regulation strategies enable in-depth, consistent and independent learning. Students who are self-regulated must learn to continually ask themselves, "does this strategy work for me in this situation?" A successful self-regulated learner sets specific learning goals, uses a variety of learning strategies, self-monitors more often, and adapts their efforts more systematically. It is important that students learn to use multiple self-regulatory learning skills rather than single strategies. Teachers can help students learn self-regulation by shifting the responsibility for learning to the students, demonstrating self-regulatory techniques.

EFFECT SIZE 0.52

Successful self-regulated learners

Students need guidance through the learning process to enable them to become more metacognitively aware and self-regulated.

Strategies

1. Guide student motivation, self-belief, goal setting and expectations
   - help students receive new information and feedback
   - provide specific cues for using self-regulatory strategies
2. Promote reflective dialogue
   - teacher modelling of reflective practices through think-alouds
   - student practice with reflective dialogue
   - engage students in group discussions and collaborative learning
3. Provide feedback
   - success criteria must be clear and perceived as attainable
   - provide task, process and self-regulation level feedback
4. Help learners make connections between abstract concepts
   - use hands-on learning activities
   - help students learn to identify relevant from irrelevant information (i.e. help them know where and how to focus their attention)
5. Help learners link new experiences to prior learning
   - use experiential learning activities
   - focus on application of knowledge in broader contexts
   - integrate real-life examples with classroom information

EFFECT SIZE 0.61

Metacognition

Metacognition involves critical awareness of oneself as a thinker and a learner. It refers to the processes used to plan, monitor and evaluate one's own understanding and performance. Various metacognitive strategies should be explicitly taught within learning area contexts. Learning and controlling these strategies increases students' abilities to transfer their learning to new contexts. Strategies that develop metacognitive awareness are most effective when taught and used with small groups of students, when acquiring deep knowledge.

Self-regulating strategies need to be learned and controlled

Self-regulation involves controlling behaviour, motivational beliefs, and cognitive strategies for learning. According to Barry Zimmerman (1989), self-regulated learning involves the regulation of three general aspects of learning.

First...

Self-regulation of behaviour involves the active control of the various resources students have available to them, such as their time, environment (e.g. the place in which they study), peers and teachers. These strategies involve seeking assistance and structuring of the physical study environment.

1. Seeking information (library, Internet)
   a. library resources
   b. Internet resources
   c. re-reading records, tests, textbooks

2. Environmental structuring
   a. selecting or arranging the physical setting
   b. eliminating and minimising distractions
   c. break up study periods and spread them over time

3. Seeking social assistance
   a. from peers
   b. from teachers or other adults
   c. seek exemplars or models

Second...

Self-regulation of motivation involves controlling and changing motivational beliefs such as self-efficacy and mindset, so that students can adapt to the requirements of the learning area and improve their learning. These strategies involve actions that the student takes.

1. Self-evaluating (checking quality or progress)
   a. task analysis (What does the teacher want me to do? What do I want out of it?)
   b. self-instructions; expectations
   c. attentiveness

2. Reward for completion
   a. motivation to achieve your own goals
   b. meaningful and enjoyable incentives

Third...

Self-regulation of cognition involves the control of various cognitive learning strategies. These strategies usually involve how a student organizes and interprets information and can include:

1. Organizing and transforming information
   a. outlining
   b. summarising
   c. highlighting
   d. flashcards/index cards
   e. draw pictures, diagrams, charts
   f. webs/mapping

2. Goal setting and planning
   a. sequencing, timing, completing
   b. time management

3. Monitoring learning
   a. note-taking
   b. lists of errors made
   c. record of marks
   d. portfolio, keeping all drafts of assignments

4. Rehearsing and memorising (written or verbal; overt or covert)
   a. mnemonic devices
   b. teaching someone else the material
   c. making sample questions
   d. using mental imagery
   e. using repetition

Students need supported opportunities to monitor and regulate their own learning

"The goal of deep learning is to foster self-regulation and self-talk." (Hattie, Fisher & Frey, 2016). When acquiring deep knowledge, students learn to plan, organise, elaborate and reflect. As they deepen understandings, students experience cognitive dissonance by wrestling with ideas and concepts and integrating new knowledge with their prior understandings. Students develop the ability to think critically, investigate and reason to examine issues.

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Self-Questioning, Self-Explanation, Self-Verbalising

BUILD SURFACE KNOWLEDGE | DEEPEN LEARNING | TRANSFER AND APPLY UNDERSTANDING

Successful learners engage in and practice self-questioning, self-explanation and self-verbalising strategies automatically when thinking and learning. Students "consolidate deep knowledge through self-talk and self-questioning… both of which are necessary to become increasingly aware of their own metacognition" (Hattie, Fisher & Frey, 2016). Using these metacognitive strategies increases engagement and understanding of concepts being learned.

EFFECT SIZE 0.64

Tips

Monitoring and reflecting on our learning selves is essential to develop metacognitive awareness. When reflecting, learners actively consider ways to seek deeper understandings. It involves students in activities such as: looking back, pulling ideas apart, drawing conclusions, considering alternative perspectives, making connections, reasoning, making judgements and setting goals. (Smart Thinking: Developing Reflection and Metacognition, Wilson & Jan, 2008)

EFFECT SIZE 0.61

Metacognition

Metacognition involves critical awareness of oneself as a thinker and a learner. It refers to the processes used to plan, monitor and evaluate one's own understanding and performance. Various metacognitive strategies should be explicitly taught within learning area contexts. Learning and controlling these strategies increases students' abilities to transfer their learning to new contexts. Strategies that develop metacognitive awareness are most effective when taught and used with small groups of students, when acquiring deep knowledge.

Self-Assessment

Self-assessment enables students to set learning goals and monitor their own progress. Students develop strategies for working towards achieving their learning goals. Assessment as learning helps students take responsibility for their own learning, becoming more metacognitively aware and self-regulated.

Student self-assessment involves teachers:

- ensuring that students understand the learning intention
- co-constructing the success criteria with students
- explicitly teaching students how to apply those criteria to their work
- providing students with feedback to help them improve
- helping students to set learning goals to achieve improvement.

Students who engage with self-assessment experience increased motivation, self-esteem and improvement in their learning because they know how they learn rather than just what they learn. Teachers who engage students in self-assessment see the responsibility for learning shifting from them to the students, see an increase in student motivation and are able to use the feedback from their students about how they learn to shape future teaching and learning.

I do not **yet** understand. I need coaching.	I am starting to understand. I need coaching but want to try some on my own
I understand! I make a few mistakes, so I'm working through those.	I understand **very** well. I can explain this to others without telling them the answers.

Self-Questioning

When engaging in reading we are continually trying to make sense of the text. Students need to be taught how to monitor their comprehension and what to do when they encounter difficulty making meaning. During consolidating knowledge, students develop the ability to be strategic in their thinking, planning and learning.

Embedding questions within discussions for students, such as, "Tell me what you understand so far," enables teachers to evaluate their impact and decide upon their next instructional steps.

Students need to also be encouraged to generate their own questions for themselves. Self-questioning is essential to recognise when they have lost the meaning of the text. Posing questions to monitor their understandings such as, "does this make sense?" and "what do I need to do to further my understanding?"

Cue Card for Students' Self-Questions

- **Right There** - Literal Questions (who, when, where)
- **Think and Search** - Interpretive Questions (draw conclusions, analyse, predict)
- **On My Own** - Evaluative Questions (imagine, speculate, hypothesize, believe)
- **Author and You** - Thinking Beyond Questions (interact, connect, associate)

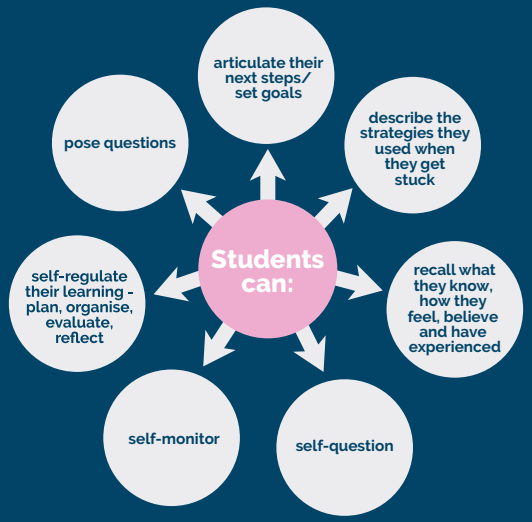
WOOP (Wish, Outcome, Obstacle, Plan)

An active, cognitive strategy for promoting goal-directed behaviours, visualising success, tackling obstacles and generating a concise plan for moving forward.

1. Articulate a wish that presents a challenge.
2. Visualise the outcome you will experience when you achieve your wish.
3. Think about the internal obstacles that may stand in your way.
4. Generate an action plan to assist in overcoming obstacles and achieving success.

Growth Journal

Students identify and record their learning goals, strengths and weaknesses in their Growth Journal. Teachers may prompt students by posing reflective questions following episodes of learning. Throughout their learning journey, students re-evaluate their goals based on their progress and record their next steps to moving forward. Journaling for growth effectively helps students develop metacognitive skills.



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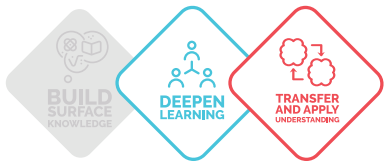
Cooperative Learning



Cooperative learning is a specific kind of collaborative learning where students work together in small groups on a structured activity. They are individually accountable for their work, and the work of the group as a whole is also assessed. Cooperative groups work face-to-face and learn to work as a team. In small groups, students can share strengths and also develop their weaker skills. They develop their interpersonal skills and learn to deal with conflict. Cooperative learning is most effective when deepening understandings and transferring and applying knowledge.

EFFECT SIZE 0.41

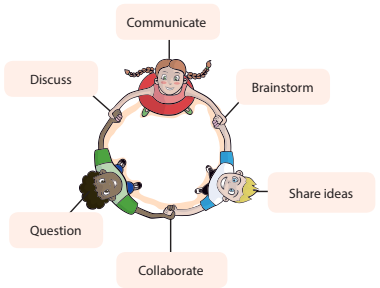
Cooperative learning groups

Cooperative learning groups may work more efficiently if students are assigned certain roles. The roles may rotate among the group members so each student will have plenty of opportunities to practice each role.

- The **Questioner** presents the task to the group.
- The **Encourager** prompts others to answer and congratulates them for good ideas.
- The **Checker** makes sure that everyone understands and stays on task.
- The **Reporter** shares the group's findings with the whole group.
- The **Timekeeper** makes sure every member of the group stays within time limits.

Round Robin

Students form groups of four to six. One student is assigned to be the recorder of the group. Next, the group is assigned a question that has multiple possible answers. Each student around the table answers the question while the recorder writes down their answers.



How does cooperative learning work?

Motivation: students help their peers to learn because, in well-structured cooperative learning settings, it is in their own interests to do so, and so effort is increased.

Social cohesion: students help their peers because they care about the group, again leading to increased effort.

Personalisation: students learn more because more able peers can engage with the particular difficulties a student is having.

Cognitive elaboration: those who provide help in group settings are forced to think through the ideas more clearly.

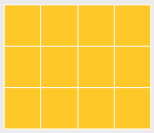
Group Grid

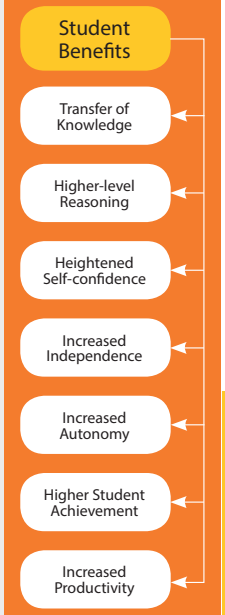
Students fold a piece of paper into at least four rectangles, to create a grid page. Students then read a text together and use the grid to analyse, classify and group concepts, words and ideas about the topic. After groups complete their discussion and organise the information into their grids, the teacher shares an exemplar with each group. (The exemplar may be another group's grid or the teacher's work). Students compare their work, ask questions and revise their ideas.

1. Students form groups and fold a piece of paper into the grid.
2. Students are provided with a text with annotations and uncategorised information and ideas.
3. Groups categorize the information in the grid. Students are encouraged to engage in the process of open discussion, taking turns, and dividing ideas in order to collaboratively decide how to organise the information into categories.
4. The teacher then shares an exemplar grid. Students compare their work, ask questions and revise.

Why use it?

1. To help students process and re-organise information.
2. Useful when students are trying to absorb a lot of new information. Analysing and re-organising the material is better than simply re-reading it.





Tips

There are two essential components of cooperative learning.

1. Group goals:
   - so students are working *as* a group, not just *in* a group.
2. Individual accountability:
   - the best learning efforts of every member of the group must be necessary for the group to succeed
   - the performance of each group member must be clearly visible and quantifiable to the other group members.

Reciprocal Teaching

Reciprocal teaching uses 4 roles to foster good discussions about a text.

Predictor
I think this will be about...
I expect _____ will happen next.
I wonder if this will occur...
(Use what you have previously read.)
Questioner
Who did...
What happened...
Where does...
When did...
Why did...
How does...
(Where the answers are in the text.)
Clarifier
I think this word means...
After I reread...
When I look at the context...
I'm confused about...
I wonder if this means...
This phrase is confusing but maybe...
Summariser
The main ideas are...
This reading discusses...
After reading this, I know that...

Why?

- Creates safe space for expression.
- Expands diversity of inputs.
- Engages every individual in a group.
- Develops shared understanding.
- Builds consensus on issues.

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Synthesising Information Across Texts

BUILD SURFACE KNOWLEDGE | DEEPEN LEARNING | TRANSFER AND APPLY UNDERSTANDING

Synthesising is when students combine their own prior knowledge with new ideas or information from a text/s to create new thoughts, ideas, opinions or perspectives. Synthesising requires more than a restatement of points from a text/s; it involves combining ideas and reflecting on the text so that original insights, perspectives and understandings can be merged with existing knowledge. It has been described as putting the pieces together to see them in a new way. Synthesising is most effective when transferring and applying understandings.

EFFECT SIZE 0.63

How does synthesising support learning?

Efficient readers use synthesising to bring together information from their prior knowledge and new knowledge from the text/s. As students read and use synthesising, they pause during reading and consider what has been read and how this fits with other information and knowledge they have. This encourages students to keep track of the text and to monitor meaning. It also creates ownership of the thinking, which can be a powerful experience that makes it more likely a student will remember the information and transfer it to new situations. When students consider information from multiple sources and then identify connections and points of contrast, they comprehend what they have read at a deeper level.

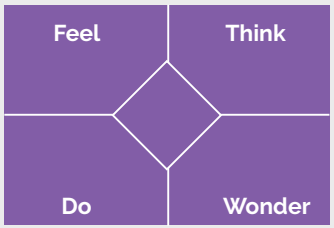
Language we can use when synthesising

- What are the key ideas and how do these fit with what I already know?
- Are there ideas raised in the text that are common to other texts I have read or knowledge I have?
- Has my thinking changed after reading this text? Why/Why not?
- How can I use what I have read to create my own ideas?
- How can I weave together the insights I have gained from this text, and other knowledge or information I have?
- Reading this text has made me think. My new understanding is that …
- How else could I use this information?
- Can the connections I made reading this text help me to gain a new perspective on…?

Adapted from Zimmerman, S. (2003); Cameron, S. (2009) and First Steps Reading Resource Book, 2013.

Discussion round table

Folding A4 paper: Fold the paper in half, and then half again. Then from the centre of the folds, fold the corner over, press down and open to reveal lines on the paper as below. Students may then add titles to the shapes on the paper, in which to record the appropriate responses.



Ask students to add their thinking about the topic into each pentagon individually:

1. **Think:** What did you learn from this? What is the most important thing you have learnt? What new ideas or information did this give you?
2. **Feel:** How do you feel about this? Draw or describe your feelings about your learning.
3. **Wonder:** What does this make you wonder? What are your questions? What is going around in your head?
4. **Do:** How might this change the way you work? What could you do that uses some of the ideas or techniques you have seen or heard?
5. Students then discuss their **think, feel, wonder, do** with their group. After listening to all in the group, they record a **synthesis** of the ideas discussed in the centre diamond of the graphic outline.

Synthesising graphic organiser

1. Ask students to activate their prior knowledge about a topic and record responses in the **Prior knowledge** circle. Prompting questions include: What do you know that will help you understand this text? What comes to mind when you hear the word…? What do you already know about…? What personal connections can you make with…?
2. Begin reading the text and pause to record any new information encountered in the **New information** circle. Remind students to stop to think about what they have read and engage in discussion with peers about the new or important information.
3. Model how the new information, combined with prior knowledge begins to change thinking and new ideas are created. Encourage students to share how their thinking and understandings have developed and record this in the **Synthesis** circle.

Discussion prompts to support understanding of complex texts:

- What is in the text that makes you say that?
- Where is the evidence for that idea?
- What might be some additional interpretations?
- What makes you agree/disagree?
- How might you explain the different perspectives presented?
- What is the author trying to prove?
- Does the author defend their argument?
- Is there something the author has left out that would strengthen the argument?

Envoy

Envoy encourages students to learn from one another, helping to develop listening and oral communication skills whilst promoting the skills required for synthesising and summarising.

1. Students work in groups of 5 or 6 to discuss the topic.
2. One student from each group is selected to be the "envoy". This student visits another group to explain the first group's discussion about the topic.
3. The "envoy" then listens to the group reporting on what they have discussed about the topic.
4. The "envoy" then returns to their original group to report back. (Each group has now received information from 2 other groups.)
5. After further discussion about the topic, each group reports back to the whole class.

To understand complicated ideas, complex problems and to turn information into knowledge, students need to be explicitly taught:

- to think about what they already know and connect it to new information
- to think inferentially to figure out meaning in the absence of explicit information
- to question the text, identify big ideas and synthesise information.

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Problem Solving Teaching

Problem-solving requires us to define or determine the cause of the problem; identify prioritise and select alternative solutions; or use multiple perspectives to uncover the issues related to a particular problem, design an intervention plan, and then evaluate the outcome. Solving problems requires that the problem is analysed and interpreted relative to context, a strategy is chosen and applied, and the outcome reviewed, justified and communicated. Problem solving teaching is most effective when transferring and applying understanding.

EFFECT SIZE 0.61

SCAMPER

SCAMPER supports the design of questions that encourage creative thinking. Select techniques that best suit the purpose, there is no need to use all 7 at once.

This strategy can be applied:
- to a text
- to adapt a product
- to think differently about an issue
- to solve a problem more creatively
- to consider alternatives to existing storylines or structures

S ubstitute?	who else, what else, other ingredient, materials, places?
C ombine?	how about a blend? combine units? combine purpose?
A dapt?	what else is like this? what other idea does this suggest?
M odify?	new twist? change meaning, colour, motion, sound, odour, form, shape? what to add? more time? greater frequency? higher, longer, thicker?
M inimise?	subtract, divide, eliminate, shorten, simplify, etc.
M agnify?	enlarge, multiply, add, increase, exaggerate, etc.
P ut to other uses?	new ways to use as is? other uses if modified? other places to use?
E liminate?	what to subtract? smaller? condensed? miniature? lower? shorter? lighter? omit? streamline? understate?
R earrange?	interchange components? reverse? other patterns? other layout? other sequence? transpose cause and effect? transpose positive and negative? how about opposites? turn it backward? turn it upside down? reverse roles?

Plan, Do, Check, Act

Plan: identify and analyse the problem or opportunity, develop hypotheses about what the issues may be, and decide which one to test.
Do: test the potential solution, on a small scale first, and measure the results.
Check: study the result, measure effectiveness, and decide whether the hypothesis is supported or not.
Act: if the solution was successful, implement it.

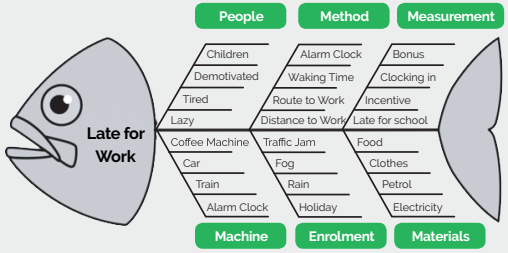
Creative problem solving

1. **Clarify:** explore the vision, gather data, formulate questions.
2. **Ideate:** explore ideas
3. **Develop:** formulate solutions
4. **Implement:** formulate a plan

From The CPS Process and Learner's Model by the Creative Education Foundation, based on the work of Alex Osborn and Sid Parnes.

Cause and effect (fishbone)

Find 3 alternative solutions to a real-world problem and explain why.



Problem Solving Strategy

Understand the problem

Devise a plan

Carry out a plan

Check and extend

Understand the problem (SEE)
Carefully read the problem.
Decide what you are trying to do.
Identify the important data.

Devise a plan (PLAN)
Gather together all available information.
Consider some possible actions e.g.
- look for a pattern
- draw a sketch
- make an organised list
- simplify the problem

Carry out the plan (DO)
Implement a particular plan of attack.
Revise and modify the plan as needed.
Create a new plan if necessary.

Check the answer (CHECK)
Ensure you have used all the important information.
Decide whether or not the answer makes sense.
Check that all of the given conditions of the problem are met by the answer.

Prompts to assist students with problem solving

Ask students to predict "what would happen if..." or explain why something happened. This will help them to develop thinking skills.
Ask questions and make suggestions about strategies to encourage students to reflect on the problem-solving strategies that they use.

9 Problem Solving Strategies

1. **Look for the important words in the question**
   Write them down.
   Underline them.
   Make sure I know what to do.
2. **Look for a pattern**
   Can I see something happening over and over again?
   Will this help me solve the problem?
3. **Have a go**
   Try an answer.
   Does the answer make sense?
4. **Use a table or chart**
   Will something like this help?

5. **Use a drawing**
   Can I draw something about the problem?
   Will this help me to find the answer?
6. **Work backwards**
   Can I start at the end of the question to help work it out?
   Will my answer work?
7. **Try an easier problem**
   Can I change the numbers in the question to make it simpler?
   Will this make finding the answer easier?
8. **Make a model**
   Can I use paper or blocks to help me find the answer?
   Can I use people to help me find the answer?
9. **Think logically**
   Can I tell something about the answer straight away?
   Can I get rid of answers that are not correct?

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Transfer

BUILD SURFACE KNOWLEDGE · DEEPEN LEARNING · TRANSFER AND APPLY UNDERSTANDING

Demonstrating learning in new contexts requires transfer of learning. Transfer is the ability to apply relevant knowledge, skills, understandings, dispositions and learning strategies to new learning contexts. Teaching for transfer is one of the most important goals of education as students apply their learning both in school and outside of school, immediately and in the future. Planning for teaching, learning and assessing needs to provide opportunities for students to demonstrate their learning in different contexts.

EFFECT SIZE 1.32

Mechanisms of Transfer

Low Road Transfer occurs when well-practised routines are automatically triggered - there is very little conscious attention on the part of the learner - most often occurs in situations of near transfer.

High Road Transfer depends on the deliberate abstraction of knowledge or skills from one context for application in another seemingly dissimilar context - the learner employs conscious thinking to find connections between contexts that have no perceptual similarity - most often occurs in situations of far transfer.

Near Transfer

Setting explicit goals
- How does this connect to what you already know?
- Where might you use this?
- How does it fit with what we've already done?
- How is this relevant to what we're doing?

Modelling: demonstrating
- Here is an example.
- This is a specific instance.
- Use this as a prototype.
- Watch while I...

Matching: experiencing, immersing
- Practice the model.
- Repeat the process.
- Try it for yourself.

Using Analogies: comparing, finding similarities and differences
- How is ... like ...?
- ... is like ... because both ...
- Compare ... (abstract) to ... (concrete)
- Find the similarities in ... as compared to...

Examples of using Analogies
- How is an atom like the solar system?

Explain in your own words:
- Photosynthesis is a factory operation.
- Gravity is the glue holding us on the Earth.
- The brain is a computer.
- Australia is a melting pot.

Metacognitive Reflection: thinking about thinking, planning, monitoring, evaluating
- What would you do the same/differently next time?
- What's your goal?
- Look back and evaluate your work.
- Track your steps so far.

Examples of Metacognition
Using and reinforcing thinking language in the classroom:
- Take a minute to think it through before discussing your answer.
- Thinking about this...

Encourage students to use thinking language:
- I have a hypothesis...
- My theory is...
- When I compare...
- What I need to know is...

Far Transfer

Simulation: role playing
- Put yourself in this situation/role
- Imagine
- How might he/she feel about this?

Examples of Simulation
Humanities and Social Sciences – Civics and Citizenship
In pairs, one student plays the interviewer for a documentary and the other student imagines they come from a different cultural or religious background. Together, students decide the questions that they need to ask and the information that is most important for the documentary in order to let others know about day to day life in that family/community.

Parallel Problem Solving: moving from one text to another
- How is this like ... ?
- Does this seem familiar?
- How can you relate to this?
- Where else can you see similarities or differences?

Anticipating applications: developing rationale, predicting future use, scouting for relevant use
- Where else is this used?
- What opportunities can you see with this?
- How else can this be used / adapted?

Generalising Concepts: finding common threads
- What big ideas can we pull from this?
- What patterns seem to be emerging?
- What is the real lesson here?
- Is there a rule, law or principle emerging here?

Examples of Generalising Concepts
Humanities and Social Sciences – Civics and Citizenship, government and democracy
- If this is true for Australia is it also true for ... Why? How? What principles underpin our system of government?

English
- We've studied two novels and poetry from the same era, what key issues are emerging and how are they linked? Why?

Getting Started

What is the big idea / key concept in this series of lessons?
What do you already know?
What does it remind you of?
How does it fit with what you are already learning in other learning areas?
What is similar or different between learning situations, modes or contexts?
Where does it fit with your life?
Where could you use this?
How relevant is this to us?

Problem Based Learning: experiential learning
Here's the situation...
What do you know?
What can you do?
What is the goal?

Examples of Problem Based Learning
Mathematics – compound interest
When learning about compound interest, have students gather information from 4 different banks about savings and loans. Stimulate discussions with questions such as:
How do these institutions describe their method of calculation of interest?
Do they all offer similar plans?
How are these different?
What terms do they use?
Are there special restrictions on accounts? What are they? What do they mean?
Provide examples where interest has been calculated (compound and simple) and no significant difference is evident. Ask students to discuss:
Why did it work in this manner?
Why are the equations set up the way they are?
When would one type of interest be more desirable than another?
When would this kind of account be best?

Methods of Transfer

Hugging Method
Involves teacher instruction that is close to the context to which it will be applied.

Bridging Method
Encourages abstraction of ideas and the search for connections between situations through mindfulness and metacognitive awareness.

Rich Transfer
Experiential nature of Hugging together with thoughtful and analytic character of Bridging.

Types of Transfer

Transfer enables learning to be consolidated into a rage of contexts and situations and enables the student to make connections to new learning.

Positive Transfer
Occurs when learning in one context improves performance in another.

Negative Transfer
Occurs when learning in one context has a negative impact on performance in another.

Near Transfer
Occurs between very similar contexts.

Far Transfer
Is when learning is applied in new situations and contexts other than that in which it was learnt.

Similarities and Differences

Being able to identify similarities and differences between contexts of learning is one of the most powerful learning skills to enable students to transfer their learning. Students need to be explicitly taught to think about what is similar or different between learning situations, modes and contexts.

For example:
- Identifying the similarities and differences in migration in the ancient Mediterranean world with the migration today.
- Comparing the impact of the Gold Rushes in the 1850's in Victoria to the potential environmental impact of coal mining in the Galilee Basin in Queensland in the 21st century.

How to provide opportunities for students to demonstrate learning in new contexts

English Year 9

Achievement Standard
Students select evidence from texts to analyse and explain how language choices and conventions are used to influence an audience.

Teaching
Model making meaning of poetry from particular author, focusing on examining metaphors using think-alouds.

Opportunity
Through a Gradual Release of Responsibility, students show their learning by selecting another poem by the same author, find the conventions and explain their use. Students then select a different poet or poem and explain the language choices and conventions (e.g.. Metaphors).

Mathematics Year 8

Achievement Standard
Students solve problems relating to the volume of prisms.

Teaching
Students construct the formula for volumes of rectangular and triangular prisms and then use the formula to solve problems involving volume.

Opportunity
Students calculate the dimensions of a prism from a given volume and produce a 3D model. Given relevant specifications, students calculate the number of various sized boxes and cartons that will fit into a container ship for transportation. They may develop an argument about the most efficient shape.

Digital Technologies Year 3 and 4

Achievement Standard
Students define simple problems, design and implement digital solutions using algorithms that involve decision-making and user input.

Teaching
Use pictures and text to describe the sequence of steps needed to navigate through a game.

Opportunity
Students demonstrate their learning by creating a new game with sequences and decisions. They then create a "choose your own adventure" game using a narrative that they have worked on as a literacy task.

Science Year 5

Achievement Standard
Students classify substances according to their observable properties and behaviours.

Teaching
Solids, liquids and gases have different observable properties and behave in different ways. Investigate changes of state from ice to liquid water and then water vapour.

Opportunity
Observing a burning candle, students record their observations of solids and liquids, and explain how they distinguish between them. Students then observe a different substance during change of state such as methylated spirits evaporating and record their observations of liquids and gases and explain how they distinguish between them.

Health and Physical Education Year 5 and 6

Achievement Standard
Students access and interpret health information and apply decision-making and problem-solving skills to enhance their own and others' health, safety and wellbeing.

Teaching
Students investigate community resources and strategies where they and others can seek help, information and management strategies about their health, safety and wellbeing. This may include visiting or accessing local community health and safety service providers.

Opportunity
Students communicate the information they have gathered about how their local community health and safety services assist children and families to make healthy decisions, to other students in their school community. They design a social message which they then communicate through an event or publication.

Humanities and Social Sciences History Year 2

Achievement Standard
Students sequence familiar objects and events in order and use language to describe the passing of time.

Teaching
Investigate the history of a building, landmark, street or landscape in the local community using photographs. Sequence the photos from earlier to later, giving explanations for the sequencing.

Opportunity
Students create a timeline to demonstrate changing technology over time using annotated pictures of the changes in technology. (For example, toys and home appliances). Students then discuss how this has changed the way people live.





Feedback

Effective feedback leads to positive changes in teaching and learning practices and significant improvements in student outcomes.

WHAT IS FEEDBACK?

Feedback is:

- information for the student and/or teacher about the learner's performance
- relative to learning goals and based on evidence
- designed to close the gap between current and desired performance by informing teacher and student behaviour.

+ 8 MONTHS

Global evidence shows students who receive high quality feedback can make an additional eight months' progress over a year.

To find out more visit **http://evidenceforlearning.org.au/toolkit/feedback/**

WHAT DOES EFFECTIVE FEEDBACK LOOK LIKE?

Two evidence based models for thinking about feedback are Hattie & Timperley (2007) and Black & Wiliam (2009). Both models address **three important questions.**

	Hattie & Timperley *Feedback model*	Black & Wiliam *Formative assessment model*
Q.1	Where am I going?	Where the learner is going
	"To be able to plan and draft a narrative."	
Q.2	How am I going?	Where the learner is right now
	"Your plan includes most of the narrative stages we identified."	
Q.3	Where to next?	How to get there
	"Add the missing stages to the plan, then start your draft using our interesting sentence tip sheet."	

Hattie and Timperley outline four levels at which feedback is directed, in order of least to greatest impact

1. **Self** – personal evaluation and affect (usually positive) about the student
   "You always do great work."
2. **Task** – feedback on how well tasks are performed
   "You need to include appropriate scientific language."
3. **Process** – feedback on the learning processes underlining or relating and extending tasks
   "You need to take steps to ensure you use credible sources."
4. **Self-regulated** – feedback on how students monitor, direct and regulate their own learning
   "You sought feedback from a peer and I can see that helped with clarifying your argument."

Black and Wiliam detail five strategies to put feedback into practice

1. Clarifying, sharing and understanding learning intentions and criteria for success
2. Engineering classroom activities that elicit evidence of learning
3. Providing feedback that moves learners forward
4. Activating students as instructional resources for one another
5. Activating students as the owners of their own learning.

WHAT CAN EFFECTIVE FEEDBACK ACHIEVE?

- Students increase effort particularly when there is a clear goal that is appropriately challenging.
- Students develop and use more effective learning strategies such as error detection and self-assessment.
- Students increase autonomy, ownership and self-regulation of their learning.
- Teachers provide feedback aligned to specific goals and criteria for performance.
- Teachers understand the effectiveness of their teaching, and select and adapt strategies to meet students' needs.

Adapted from AITSL Spotlight on Feedback.

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