# Critical thinking – core 1: Understanding critical thinking



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## Focus

This core unit examines thinking as a human endeavour. Thinking is an intrinsic property of the human mind. However, there are different types of thinking. Higher-order thinking is purposeful thinking. Critical thinking is an example of higher-order thinking. In this unit, students will examine critical thinking routines, including some examples that illustrate critical thinking. Students will also explore some barriers to critical thinking, such as biases and cognitive fallacies.

### Outcomes

A student:

* **CT5-1** distinguishes different modes of thinking and identifies the characteristics and perspectives that are central to critical thinking
* **CT5-2** evaluates a range of evidence to consider bias, generalisation, simplification, stereotyping and fallacies
* **CT5-3** constructs and builds stronger arguments with evidence-based decision making by discerning fact from fiction
* **CT5-4** undertakes research and engages in self-reflection throughout the critical thinking process
* **CT5-5** communicates arguments logically in a range of modes.

Outcomes referred to in this document are from the [Critical thinking course document](https://education.nsw.gov.au/teaching-and-learning/curriculum/department-approved-courses/critical-thinking#/asset2) © NSW Department of Education for and on behalf of the Crown in the State of New South Wales (2021).

### Rationale

Critical thinking is a form of purposeful thinking that emphasises evidence and reasoning. In today’s world, where information is readily available, critical thinking is becoming more important than remembering and recalling facts. Society values critical thinking because it is an interdisciplinary and transferable skill. It means that no matter what path or profession is pursued, critical thinking skills will always be relevant and useful.

Critical thinking skills include the ability to deconstruct, analyse, synthesise and reconstruct ideas while emphasising evidence and reasoning. Those skills are part of every toolkit for success in educational and professional arenas.

The Critical thinking course emphasises the fundamental attributes of critical thinkers and gives students a wide range of opportunities to transfer these skills across multiple disciplines. The course structure encourages students to think about thinking and transcend factual learning.

The core units introduce students to the key features of critical thinking, including how critical thinking is distinguished from other models of thinking. Students will learn about the process of argumentation and apply it to evaluate claims. Students will also gain practical research skills to collect information from various sources and evaluate their credibility.

A choice from the available options engages students in various areas of interest to reinforce the skills learnt from the core units. In addition, the options allow students and teachers to delve deeper into specific scenarios of interest. They will be guided to ask probing questions to strengthen their critical thinking skills and challenge their perceptions of the world around them.

After completing the Critical thinking elective, students will be able to apply critical thinking processes to analyse the strength and validity of information and claims. Those skills are valuable for learning in Stage 6. Critical and creative thinking is a general capability in most Stage 6 courses. By applying their critical thinking skills, students will deepen their understanding of content and skills across many disciplines.

### Aim

The course aims to engage and encourage students to develop their critical thinking skills and recognise the key aspects of a critical thinking mind. They will develop the essential skills to evaluate the vast and diverse amount of information they encounter in their daily lives. This will help them face future challenges in a continually evolving world.

### Purpose and audience

This teaching resource is for teachers delivering or planning to deliver the course. The learning sequence demonstrates how a combination of outcomes can be used to develop teaching and learning activities. It also suggests a range of resources to support teachers when planning and/or teaching the course.

### When and how to use this document

Use this resource when designing learning activities that align with the course outcomes and content. The activities and resources can be used directly or may be adapted based on teacher judgment and knowledge of their students. Core modules must precede options in the delivery of the course, consult the course document for further details on timing of core and options.

## Teacher note

The lesson sequences and suggested activities presented in this resource are examples of activities which can be used to address a sample of student descriptors from the course documents. The length and timing of each activity will be dependent on your class and teacher judgement. The intention of the activities is to promote deep thinking and make it visible for students. Some activities may need refinement to cater for your classes interest or abilities.

The reflective questions at the conclusion of each sequence are intended to promote thought and discussion for students. There is no correct answer to the questions rather a focus on the thinking used to address it.

The course supports the opportunity to explore a range of areas within the scope of Critical thinking. It is recommended that teachers should refer to the [Controversial Issues in Schools](https://education.nsw.gov.au/policy-library/policies/pd-2002-0045) policy.

Aboriginal and Torres Strait Islander peoples should be aware that this document may contain images, voices or names of deceased persons in photographs, film, audio recordings or printed material.

## Learning sequence 1

Whilst the resources presented in this sequence are not linked to a particular student descriptor, they are important themes to learning. They can be introduced at the beginning of the course or at a stage judged best to support student learning by the classroom teacher.

### Reflecting on ideas and your learning

**Note**: Becoming a reflective learner and person is an important lifelong skill. It is recommended that students are introduced to the idea of reflective learning focus questions and templates to help them capture their ideas. Reflection statements should be personal to them and not used as a source of judgment on their learning but rather used as documentation of the evolution of ideas and reflections on their learning. These questions can be revisited in various stages of the course and used in conjunction with appropriate lessons to reinforce the idea of reflecting on your own learning and growing as a learner. Examples of the types of reflective questions teachers may use are included below.

This idea is unpacked in greater detail in Core 2, however introducing the idea of reflecting on your ideas and information should be introduced earlier to help students develop their critical thinking skills.

**Reflective questions**

A part of becoming a critical thinker is the ability to ask probing questions which facilitate a reflective mind. The list of questions below can help you think about the information and ideas presented to you.

What is the purpose of my thinking?

What precise question am I trying to answer?

What point of view am I influenced by?

What information am I using?

How am I interpreting that information?

What concepts or ideas are central to my thinking?

What conclusions am I coming to?

What am I taking for granted, and what assumptions am I making?

If I accept the conclusions, what are the implications?

What would the consequences be if I put my thought into action?

**Note**: [Learning portfolios](https://aus01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fapp.education.nsw.gov.au%2Fdigital-learning-selector%2FLearningActivity%2FCard%2F583%23.Y9mUe70AtNc.link&data=05%7C01%7Cjarrad.cox1%40det.nsw.edu.au%7C78bb6b78546e49db320908db03dc2ab4%7C05a0e69a418a47c19c259387261bf991%7C0%7C0%7C638108016365147499%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&sdata=QUoEhf3iE9UFjozdEOADptOPXgldK%2BF2tWZlcJ3DBsY%3D&reserved=0) are another format that can be used in class to support students in thinking about their own learning and to journal their ideas, thoughts and questions.

### Understanding the language and key terms

**Note**: Understanding the metalanguage of a new course may be challenging for some students. Identifying key words and their meaning in context is of vital importance not only in critical thinking but as a lifelong skill. The template provided below is one suggestion to track key words and meanings throughout the course and can be revisited at regular intervals to build a student’s vocabulary. An example has been included to support the use of this table.

**Table 1 – vocabulary tracker**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Word/phrase | Definition | Synonyms | Antonyms | Use in a sentence |
| **Adapt** | Make something suitable for a new use or purpose; modify. | Modify; alter; change; adjust; convert; transform. | Conform; misapply; misadjust; stay. | Any life form must adapt to and interact with its physical environment. |
| **Assumptions** | Accepted as true without proof. |  |  |  |
| **Bias** | Prejudice. |  |  |  |
| **Critical** | Analyse the positive and negative parts. |  |  |  |
| **Cognition** | The process of thinking and knowing. |  |  |  |
| **Deconstruct** | Looking at the parts of something to understand it better. |  |  |  |
| **Discern** | To recognise or find out. |  |  |  |
| **Distorted** | Changed to become misleading or a false account. |  |  |  |
| **Disposition** | A person's inherent qualities of mind and character. |  |  |  |
| **Distinguish** | To recognise the difference between things. |  |  |  |
| **Fallacy** | Incorrect belief based on unsound arguments. |  |  |  |
| **Generalisation** | A general statement based on specific cases. |  |  |  |
| **Higher-order thinking** | Beyond remembering facts, exploring and questioning ideas on a deeper level. |  |  |  |
| **Human endeavour** | Effort made by human beings to improve their condition. |  |  |  |
| **Implications** | A conclusion drawn from incomplete information. |  |  |  |
| **Influential** | Capacity to have an effect on the character or behaviour of others. |  |  |  |
| **Inquisitive** | Likes learning things or curious. |  |  |  |
| **Intrinsic** | Essential – comes from within. |  |  |  |
| **Metacognition** | Thinking about thinking. |  |  |  |
| **Misinformation** | Information that is incorrect. |  |  |  |
| **Modes of thinking** | Different types of thinking. |  |  |  |
| **Operating** | Carrying out a thought or task. |  |  |  |
| **Partial** | Preferred or bias. |  |  |  |
| **Perspective** | A lens through which we see the world. |  |  |  |
| **Precise** | Exact and accurate. |  |  |  |
| **Reasonable** | Sound judgement or fairness. |  |  |  |
| **Scrutinises** | Look at something carefully to discover information. |  |  |  |
| **Self-reflection** | Thinking about and assessing your own thoughts and actions. |  |  |  |
| **Stereotyping** | Widely held but oversimplified idea or perspective. |  |  |  |
| **Superior** | More important or of higher quality. |  |  |  |
| **Synthesis** | Pulling together knowledge, ideas and connections to better understand something. |  |  |  |

**Note:** The [Critical thinking](https://education.nsw.gov.au/teaching-and-learning/education-for-a-changing-world/thinking-skills/critical--thinking#How1) department webpage provides resources to support your understanding of critical thinking.

## Learning sequence 2

Students reflect on and categorise the different types of thinking that they undertake in their lives.

### Ways of knowing

**Note**: The purpose of this lesson sequence is to help students dig deeper from constructing knowledge to ways of thinking by starting with a big picture idea. Time allocated for suggested tasks will vary according to teacher judgement. Students should be encouraged to start thinking about the ways we construct knowledge and then build up to the different models of thinking.

#### How do we construct knowledge?

**Note**: It is important to build students’ language capacity and thinking about the meaning of each way of thinking before answering the reflective question in this task. This may be in the form of a short discussion before answering the reflective questions.

**Table 2 – ways of knowing**

|  |  |
| --- | --- |
| Ways of knowing | Description |
| Emotion | Feeling, as opposed to reasoning. |
| Belief | Trust or confidence. |
| Imagination | Forming new ideas, or images or concepts of external objects not present to the senses. |
| Intuition | A form of knowledge that appears in consciousness without obvious deliberation. |
| Language | A system of communication used by a particular country or community. |
| Memory | The faculty by which the brain encodes, stores, and retrieves information. |
| Reason | A basis or cause, as for some belief, action, fact or event. |
| Sense perception | Understanding gained through the use of one of the senses such as sight, taste, touch or hearing. |

**Note**: The following TED talk, [How language shapes the way we think – Lera Boroditsky (14:03)](https://www.ted.com/talks/lera_boroditsky_how_language_shapes_the_way_we_think) could be used as a stimulus to start unpacking the different ways of knowing. It may be beneficial to pause the clip at certain points to unpack the ideas from the video and stimulate class discussions.

Each ‘way of knowing’ has a few reflective questions linked to it. Choose one ‘way of knowing’ and address the reflected question associated with it. Share your answer with the class and clearly explain the thinking you used to formulate your response.

**Table 3 – ways of knowing reflective questions**

|  |  |
| --- | --- |
| Ways of knowing | Reflective questions |
| Emotion | Can/should we control our emotions? Are emotions the enemy of, or necessary for, good reasoning? |
| Belief | Can beliefs be considered knowledge because they are produced by a special cognitive faculty? Does belief meet a psychological need? |
| Imagination | What is the role of imagination in producing knowledge about the real world? Can imagination reveal truths that reality hides? |
| Intuition | Are there certain things that you have to know before being able to learn anything at all? Should you trust your intuition? |
| Language | How does language shape knowledge? Is the importance of language cultural? |
| Memory | Can we know things which are beyond our personal present experience? Can our beliefs contaminate our memory? |
| Reason | What is the difference between reason and logic? How reliable is inductive reasoning? |
| Sense perception | How can we know if our senses are reliable? What is the role of expectation or theory in sense perception? |

* Think about your past week, which ‘way of knowing’ have you used and when? How do you know this?
* Complete the table below to assess the strengths and weakness of each ‘way of knowing’.
* Do you think it is fair to rank them in order of best to worst? Explain your reasoning.

**Table 4 – ways of knowing template**

|  |  |  |
| --- | --- | --- |
| Ways of knowing | Strengths | Weakness |
| Emotion |  |  |
| Faith/Belief |  |  |
| Imagination |  |  |
| Intuition |  |  |
| Language |  |  |
| Memory |  |  |
| Reason |  |  |
| Sense perception |  |  |

**Reflective question**: What do the ‘ways of knowing’ have to do with the way we think?

**Note**: Students may reflect on the classroom activities or keep a learning journal throughout the course. This provides opportunities to track how their ideas and thoughts develop.

#### Models of thinking

**Note**: Metacognition can be a difficult concept for students to grasp and there are multiple views presented in literature and popular media. In the table below are 7 common thinking types which will be used for this lesson sequence. This activity builds on from the ‘ways of knowing’. Students are encouraged to start the process of unpacking the way they now think. [The Growth of Knowledge – Crash Course Psychology #18 (9:49)](https://thecrashcourse.com/courses/the-growth-of-knowledge-crash-course-psychology-18/) from thecrashcourse.com can be used as a connection between both sets of activities.

**Table 5 – 7 most common types of thinking**

|  |  |
| --- | --- |
| Type of thinking | Description |
| Creative | An ability to conceive new and innovative ideas by breaking from established thoughts, theories, rules, and procedures. |
| Analytical | An ability to separate a whole into its basic parts in order to examine the parts and their relationships. |
| Critical | The process of exercising careful evaluation or judgment. Critical thinkers do this in order to determine the authenticity, accuracy, worth, validity, or value of something. |
| Concrete | More often than not, these types of thinkers prefer to think, comprehend and apply factual knowledge. It relies on the exact interpretations or the literal meanings of claims. |
| Abstract | An ability to relate seemingly random things with each other and make the connections that others find difficult to see. |
| Divergent | This mindset takes the path of exploring an infinite number of solutions to find one that is effective. |
| Convergent | A process of combining a finite number of perspectives or ideas to find a single solution. |

**Note**: Possible introductory activities include presenting Table 5 without the description and asking students to complete or using Table 5 for a matching activity.

* What do you think about the statement ‘all thinking is the same’? Research the different models of thinking and identify their key characteristics to assess the statement.
* Reflect on your own style of thinking. Can you only be one type of thinker or does the situation dictate the type of thinking you would use?
* The table below has some examples of riddles, problems and puzzles to solve. Describe the type of thinking process you took to come to the answer. The important thing is not the answer but the thinking you used to come to the answer.

**Note** The focus of Table 6 is to draw attention to the thinking process used to come up with the solution.

**Table 6 – challenge your brain, problem set 1**

|  |  |  |
| --- | --- | --- |
| Problem | Solution | Thinking process used |
| Bridge riddle  [Can you solve the bridge riddle? – Alex Gendler (3:50)](https://ed.ted.com/lessons/can-you-solve-the-bridge-riddle-alex-gendler) |  |  |
| Chess Problem  [Here’s A Delicious Chess Problem That Had Me Scratching My Head For Hours](https://www.businessinsider.com.au/black-to-move-and-mate-in-3-problem-2013-8) |  |  |
| Cryptic Crossword  ‘By the way, in the centre of the Earth is a dead body’ (6)  [How to Solve Cryptic Crossword Puzzles – The New Yorker (8:57)](https://www.newyorker.com/video/watch/how-to-solve-cryptic-crosswords) |  |  |
| What number is next?  0, 1, 1, 2, 3, 5, 8, 13, \_\_? |  |  |

**Note**: Table 7 now presents students with some open-ended problems. Students should choose one or more of the different thinking styles to apply to the problem. Having multiple thinking types on a single problem will form the basis of rich discussions on their own thinking. It may be useful to find out which problems students found the most challenging.

The examples used in Table6 and Table 7 are suggestions. As the classroom teacher, the style and difficulty of problems presented may be different to the ones suggested here.

**Table 7 – challenge your brain, problem set 2**

|  |  |  |
| --- | --- | --- |
| Problem | Solution with reasoning | Thinking type used |
| Candle problem (Duncker's candle problem)  Tell students that they are in a room with a table pushed up against the wall. On the table there is a candle, a box of drawing pins, and a book of matches. Their challenge is to affix the lit candle to the wall so that it will not drip wax onto the table below.  Do not give students access to the objects – say that they will have to visualise and verbalise their solutions rather than use the objects to show you. |  |  |
| Hybrid model of higher learning and work  Some businesses and higher learning institutions are investigating the possibility of a hybrid model of working or teaching.  [Sydney University pursues hybrid model of online and in-person classes](https://www.smh.com.au/national/nsw/sydney-university-pursues-hybrid-model-of-online-and-in-person-classes-20211201-p59duj.html) (Baker 2021).  Suggest a model which can be used, including resources required and timeline for implementation at a minimum consideration. |  |  |
| Sydney to Perth on a budget  Plan a trip to Perth for a family of 4 (2 adults and 2 children, 3-year-old and 8-year-old).  The family does not like flying.  Whilst travelling they would like to see some sites (more than 2).  They don’t want to be limited to only one type of travel.  You will also need to think of the needs of a family of 4 travelling this distance.  They have not indicated a budget or how much they are willing to spend. |  |  |
| Which decade has had the best music or dance?  Create a criterion to judge which decade had either the best music or dance. Use your criteria to make a judgement supported with reasons. |  |  |

**Reflective question:** Is it fair to categorise people as having only one type of thinking?

**Note**: This short clip [Plato’s Allegory of the Cave – Alex Gendler (4:33)](https://ed.ted.com/lessons/plato-s-allegory-of-the-cave-alex-gendler) from TED-Ed can be used as a stimulus or class discussion before answering the reflective question. The purpose is for students to start the process of thinking about their own thinking and the barriers they may face.

## Learning sequence 3

Students define critical thinking and demonstrate an understanding of the dispositions that contribute to critical thinking.

### Recognising critical thinking

**Note**: These classroom activities focus on bringing student thinking to the forefront. When using or modifying the suggested activities, students should be encouraged to document their thoughts whilst answering the question at hand. This can be done in a form of a reflective or learning journal.

* Read the passage below about critical thinking and watch [This tool will help improve your critical thinking – Erick Wilberding (5:08)](https://www.ted.com/talks/erick_wilberding_this_tool_will_help_improve_your_critical_thinking) from TED-Ed.
* Describe what you think critical thinking looks like and what are the main characteristics or inherent qualities of critical thinking?

Everyone thinks. How is critical thinking different to ordinary thinking? The term ‘critical’ is derived from the Greek word *kritikos* that means discerning. Critical thinking refers to a higher quality of thought. Uncritical thinking is subject to many influences and produces ideas that may be biased, distorted, partial, uninformed, or prejudiced. On the other hand, critical thinking scrutinises the thinking process itself (‘thinking about thinking’). It involves the thinker deconstructing, analysing, and then synthesising or reconstructing those ideas. There is an emphasis on evidence and reasoning (logical and rational). The critical thinker questions the quality of evidence and assumptions behind beliefs and ideas.

Critical thinking is purposeful – we engage in it when important decisions are to be made. Thus, critical thinking produces a superior habit of mind - thinking routines that produce better ideas. The Australian Curriculum, Assessment and Reporting Authority (ACARA) describes those thinking routines as inquisitiveness, reasonableness, intellectual flexibility, open- and fair-mindedness, a readiness to try new ways of doing things and consider alternatives, and persistence.

I found that I was fitted for nothing so well as for the study of Truth…with desire to seek, patience to doubt, fondness to meditate, slowness to assert, readiness to consider, carefulness to dispose and set in order … being a man that neither affects what is new nor admires what is old, and that hates every kind of imposture. – Francis Bacon (1603)

* After describing what critical thinking is, what do you think critical thinking is not? Create a list to describe characteristics which are not qualities of a critical thinker.
* Compare your ideas about what critical thinking is to what it is not. How does this information help you recognise critical thinking and help you develop critical thinking skills?

#### Becoming a critical thinker

* The table below contains some statements made by popular figures, influencers, organisations and leaders. After reading the statement and conducting your own research, complete the table below (you can choose to complete the table for all the statements or choose one or more that interest you). The 3 rows for completion are:
* What is the claim being made?
* What evidence has been used
* What is the reasoning behind it?

**Table 8 – Claim-Evidence-Reasoning (CER)**

|  |  |  |  |
| --- | --- | --- | --- |
| Link to Statement | Claim | Evidence | Reasoning |
| BBC News – [Climate change: Sir David Attenborough in 'act now' warning](https://www.bbc.com/news/science-environment-59039485). |  |  |  |
| Fox Sports News Australia – [Messi or Ronaldo? Current stars answer football’s most divisive question – and we have a winner](https://www.foxsports.com.au/football/messi-or-ronaldo-current-stars-answer-footballs-most-divisive-question-and-we-have-a-winner/news-story/c0b223fbbb4ab45905dee9f9c131c78c). |  |  |  |
| Sydney Morning Herald – [ASIC boss urges ‘great caution’ to cryptocurrency investors](https://www.smh.com.au/business/banking-and-finance/asic-urges-great-caution-to-cryptocurrency-investors-20211122-p59b0i.html) (Yeates 2021). |  |  |  |
| Ted Talks Education – [Angela Lee Duckworth – Grit: The power of passion and perseverance (6:00)](https://www.ted.com/talks/angela_lee_duckworth_grit_the_power_of_passion_and_perseverance). |  |  |  |

#### Improving critical thinking skills

* If you were asked to design a short course for your school to help your peers improve their critical thinking skills. What key design elements would you include in your course? How could you find out that your course had achieved its purpose?

**Extension:** Design your short course and deliver to the class. The presentation style is reflective of school context. This short clip [5 tips to improve your critical thinking – Samantha Agoos (4:16)](https://www.ted.com/talks/samantha_agoos_5_tips_to_improve_your_critical_thinking) from TED-Ed may help you start the process on designing and presenting your course.

* Think back to the last 2 weeks, can you recognise any circumstances where you used critical thinking? How do you know you were being a critical thinker and what evidence do you have to support your claim? Would other people recognise you as a critical thinker?

**Note**: The key characteristics and elements of critical thinking should be revisited throughout the teaching of this course to help consolidate and reinforce the ideas central to critical thinking.

### Critical thinking matrix

**Note**: The [Critical Thinking Matrix [PDF 42KB]](https://criticalthinking.org.au/critical-thinking-matrix/) was developed by Peter Ellerton from the University of Queensland. This is an example of a matrix that be used for students as a self-reflection tool or used as a teaching resource to unpack critical thinking. Students can interact with the website via the link above.

* As a student learning about critical thinking, how does this matrix give you an insight into what it means to be a critical thinker?
* This matrix was developed by the University of Queensland and can be quite complex to unpack.
* Can you modify and adapt the key ideas to help Year 7 students better understand critical thinking?
* Would you still use the format of a matrix or would you adjust the way you communicate your ideas?

**Reflective question**: Can anyone develop critical thinking skills?

## Learning sequence 4

Students evaluate the barriers to critical thinking, including thinking biases and cognitive fallacies.

### Barriers to critical thinking

**Note**: Students are given the opportunity to reflect on the types of bias that may have an impact on their ability to think critically. In teaching activities, great care must be taken in the choice of examples and consideration given to the intent of the lesson. The purpose is for students to begin to recognise the types of bias present and not to analyse the bias.

* Reflect on your own thinking and the thinking presented in popular media. What bias should you be aware of when assessing the information given to you? How are you able to recognise this bias?
* Access the following video [Julia Galef – Why you think you're right – even if you're wrong (11:28)](https://www.ted.com/talks/julia_galef_why_you_think_you_re_right_even_if_you_re_wrong). How would a critical thinker approach the scenario and what barriers would they have to overcome?

**Note**: Students can be given the table below with the information in the description and examples columns. Students could be asked to research the barriers presented and complete the table for the description and the example. They could then present the completed table and facilitate a classroom discussion comparing their research to the presented information from Table 9.

An alternative could be using the Table 9 for a matching activity.

**Table 9 – barriers to critical thinking**

|  |  |  |
| --- | --- | --- |
| Barrier | Description | Example |
| Confirmation bias | Looking for, remembering, noticing or giving more weight to data that supports an existing view. This includes rejecting new evidence that contradicts our current thinking. | Reading news feeds from sources that align with one’s perspectives. |
| The bandwagon effect | Group thinking, going with the flow of the crowd or not thinking independently, is often based on a conscious or unconscious desire to fit in. | Dietary fads (for example keto and paleo diets) are examples of the bandwagon effect – we engage in those activities because many others are doing it. |
| Optimism bias | Over-emphasising satisfactory outcomes while failing to identify limitations and weaknesses. This might come about through evaluating ambiguous information in a favourable light. It might also take the form of requiring a higher standard of evidence for a negative conclusion while accepting a lower standard of evidence for a positive conclusion. | Some smokers live long lives without developing debilitating diseases. Others may cite these as examples to disregard the risks associated with smoking. |
| Pessimism bias | The opposite of optimism bias, where we over-emphasise negative events or outcomes. This can include ‘negativity bias’, where we perceive criticism or bad news as more important, profound or trustworthy than praise or good news. | A person feels that they will fail an exam or an interview, even though they are well-qualified. This is the ‘glass-half-empty’ view of life. |
| Status quo bias and the appeal to novelty fallacy | We prefer to do what we have always done simply because we have always done it that way (‘status quo bias’), or where we prematurely approve of a proposal merely because it is new and modern (the ‘appeal to novelty’ fallacy). | A person will stick with his or her internet service provider even though other companies may offer better-valued packages. |
| Self-serving bias | Claiming more personal responsibility for successes than for failures. | A sportsperson blames the umpire for losing a game rather than attributing it to his or her poor performance. |
| The clustering illusion | When we become aware of something, we start to see it everywhere and believe that it’s becoming more prevalent (when it’s just that we are noticing it more). | A person buys a new car and then notices that same make and models more frequently than before. |
| Social desirability bias | The natural human desire not to ‘say the wrong thing’. This is particularly important to be aware of when collecting self-report data, using tools such as surveys, focus groups or interviews. | On a survey on exercise habits, a person overstates his or her exercise frequency because of their expectation that they should be doing more. |

**Reflective question**: How can barriers to critical thinking be recognised and overcome in your everyday life?

## Additional information

**Resource evaluation and support**: Please complete the following [feedback form](https://forms.office.com/Pages/ResponsePage.aspx?id=muagBYpBwUecJZOHJhv5kbKo2q_ZUXlHndJMnh2Wd8NUOUk0VTIzUDVVSlVFQVM5MkdOMkJGTjVKNCQlQCN0PWcu) to help us improve our resources and support.

The information below can be used to support teachers when using this teaching resource for Critical thinking.

### Assessment for learning

Possible formative assessment strategies that could be included:

* Learning intentions and success criteria assist educators to articulate the purpose of a learning task to make judgements about the quality of student learning. These help students focus on the task or activity taking place and what they are learning and provide a framework for reflection and feedback. [Online tools](https://app.education.nsw.gov.au/digital-learning-selector/LearningActivity/Card/622) can assist implementation of this formative assessment strategy.
* Eliciting evidence strategies allow teachers to determine the next steps in learning and assist teachers in evaluating the impact of teaching and learning activities. Strategies that may be added to a learning sequence to elicit evidence include all student response systems, [exit tickets](https://app.education.nsw.gov.au/digital-learning-selector/LearningActivity/Card/543), mini whiteboards (actual or [digital](https://app.education.nsw.gov.au/digital-learning-selector/LearningActivity/Card/575)), [hinge questions](https://app.education.nsw.gov.au/digital-learning-selector/LearningActivity/Card/560#.Y9w1CT4W5as.link), [Kahoot](https://app.education.nsw.gov.au/digital-learning-selector/LearningTool/Card/621), [Socrative](https://app.education.nsw.gov.au/digital-learning-selector/LearningTool/Card/587), or quick quizzes to ensure that individual student progress can be monitored and the lesson sequence adjusted based on formative data collected.
* Feedback is designed to close the gap between current and desired performance by informing teacher and student behaviour (AITSL 2017). AITSL provides a [factsheet to support evidence-based feedback](https://www.aitsl.edu.au/teach/improve-practice/feedback#:~:text=FEEDBACK-,Factsheet,-A%20quick%20guide).
* [Peer feedback](https://app.education.nsw.gov.au/digital-learning-selector/LearningActivity/Card/549) is a structured process where students evaluate the work of their peers by providing valuable feedback in relation to learning intentions and success criteria. It can be supported by [online tools](https://app.education.nsw.gov.au/digital-learning-selector/LearningActivity/Browser?cache_id=1d29b).
* Self-regulated learning opportunities assist students in taking ownership of their own learning. A variety of strategies can be employed and some examples include reflection tasks, [Think-Pair-Share](https://app.education.nsw.gov.au/digital-learning-selector/LearningActivity/Card/645), [KWLH charts](https://app.education.nsw.gov.au/digital-learning-selector/LearningActivity/Card/562), [learning portfolios](https://app.education.nsw.gov.au/digital-learning-selector/LearningActivity/Card/583) and [learning logs](https://aus01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fapp.education.nsw.gov.au%2Fdigital-learning-selector%2FLearningActivity%2FCard%2F583%23.Y9mUe70AtNc.link&data=05%7C01%7Cjarrad.cox1%40det.nsw.edu.au%7C78bb6b78546e49db320908db03dc2ab4%7C05a0e69a418a47c19c259387261bf991%7C0%7C0%7C638108016365147499%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&sdata=QUoEhf3iE9UFjozdEOADptOPXgldK%2BF2tWZlcJ3DBsY%3D&reserved=0).

The primary role of assessment is to establish where individuals are in their learning so that teaching can be differentiated and further learning progress can be monitored over time.

Feedback that focuses on improving tasks, processes and student self-regulation is the most effective. Students engaging with feedback can take many forms including formal, informal, formative, summative, interactive, demonstrable, visual, written, verbal and non-verbal.

[What works best update 2020](https://education.nsw.gov.au/about-us/educational-data/cese/publications/research-reports/what-works-best-2020-update) (CESE 2020a)

### Differentiation

Differentiated learning can be enabled by differentiating the teaching approach to content, process, product and the learning environment. For more information on differentiation go to [Differentiating learning](https://education.nsw.gov.au/teaching-and-learning/professional-learning/teacher-quality-and-accreditation/strong-start-great-teachers/refining-practice/differentiating-learning) and [Differentiation](https://education.nsw.gov.au/campaigns/inclusive-practice-hub/secondary-school/teaching-strategies/differentiation).

When using these resources in the classroom, it is important for teachers to consider the needs of all students in their class, including:

* **Aboriginal and Torres Strait Islander students**. Targeted [strategies](https://education.nsw.gov.au/teaching-and-learning/aec/aboriginal-education-in-nsw-public-schools) can be used to achieve outcomes for Aboriginal students in K-12 and increase knowledge and understanding of Aboriginal histories and cultures. Teachers should utilise students’ Personalised Learning Pathways to support individual student needs and goals.
* **EAL/D learners**. EAL/D learners will require explicit English language support and scaffolding, informed by the [EAL/D enhanced teaching and learning cycle](https://education.nsw.gov.au/teaching-and-learning/curriculum/literacy-and-numeracy/resources-for-schools/eald/enhanced-teaching-and-learning-cycle) and the student’s phase on the [EAL/D Learning Progression](https://education.nsw.gov.au/teaching-and-learning/curriculum/multicultural-education/english-as-an-additional-language-or-dialect/planning-eald-support/english-language-proficiency). In addition, teachers can access information about [supporting EAL/D learners](https://education.nsw.gov.au/teaching-and-learning/curriculum/multicultural-education/english-as-an-additional-language-or-dialect/planning-eald-support/english-language-proficiency) and [literacy and numeracy support specific to EAL/D learners](https://education.nsw.gov.au/teaching-and-learning/curriculum/literacy-and-numeracy/resources-for-schools/eald).
* **Students with additional learning needs**. Learning adjustments enable students with disability and additional learning and support needs to access syllabus outcomes and content on the same basis as their peers. Teachers can use a range of [adjustments](https://education.nsw.gov.au/teaching-and-learning/disability-learning-and-support/personalised-support-for-learning/adjustments-to-teaching-and-learning) to ensure a personalised approach to student learning. In addition, the [Universal Design for Learning planning tool](https://education.nsw.gov.au/teaching-and-learning/learning-from-home/teaching-at-home/teaching-and-learning-resources/universal-design-for-learning) can be used to support the diverse learning needs of students using inclusive teaching and learning strategies. Subject specific curriculum considerations can be found on the [Inclusive Practice hub](https://education.nsw.gov.au/campaigns/inclusive-practice-hub).
* **High potential and gifted learners**. [Assessing and identifying high potential and gifted learners](https://education.nsw.gov.au/teaching-and-learning/high-potential-and-gifted-education/supporting-educators/assess-and-identify#Assessment1) will help teachers decide which students may benefit from extension and additional challenge. [Effective strategies and contributors to achievement](https://education.nsw.gov.au/teaching-and-learning/high-potential-and-gifted-education/supporting-educators/evaluate) for high potential and gifted learners help teachers to identify and target areas for growth and improvement. In addition, the [Differentiation Adjustment Tool](https://education.nsw.gov.au/teaching-and-learning/high-potential-and-gifted-education/supporting-educators/implement/differentiation-adjustment-strategies) can be used to support the specific learning needs of high potential and gifted students. The [High Potential and Gifted Education Professional Learning and Resource Hub](https://schoolsnsw.sharepoint.com/sites/HPGEHub/SitePages/Home.aspx) supports school leaders and teachers to effectively implement the High Potential and Gifted Education Policy in their unique contexts.

All students need to be challenged and engaged to develop their potential fully. A culture of high expectations needs to be supported by strategies that both challenge and support student learning needs, such as through appropriate curriculum differentiation. (CESE 2020a:6).

### About this resource

All curriculum resources are prepared through a rigorous process. Resources are periodically reviewed as part of our ongoing evaluation plan to ensure currency, relevance and effectiveness. For additional support or advice contact the Teaching and Learning Curriculum team by emailing [secondaryteachingandlearning@det.nsw.edu.au](mailto:secondaryteachingandlearning@det.nsw.edu.au).

**Alignment to system priorities and/or needs**:

This resource aligns to the School Excellence Framework elements of curriculum (curriculum provision) and effective classroom practice (lesson planning, explicit teaching).

This resource supports teachers to address [Australian Professional Teaching Standards](https://educationstandards.nsw.edu.au/wps/portal/nesa/teacher-accreditation/meeting-requirements/the-standards/proficient-teacher) 2.1.2, 2.3.2, 3.2.2, 7.2.2.

This resource has been designed to support schools with successful implementation of new curriculum, specifically the NSW Department of Education approved elective course, Critical thinking © 2021 NSW Department of Education for and on behalf of the Crown in right of the State of New South Wales.

The resource is produced to assist schools with promoting and implementing the course for the first time. As the course may be taught by teachers from a range of key learning areas, the resource is designed to support teachers from a variety of KLA expertise.

**Department approved elective course**: Critical thinking

**Course outcomes** CT5-1, CT5-2, CT5-3, CT5-4, CT5-5

**Author**: Curriculum Secondary Learners

**Publisher**: State of NSW, Department of Education

**Resource**: Teaching resource

**Related resources**: Further resources to support Critical thinking can be found on the [Department approved elective courses](https://education.nsw.gov.au/teaching-and-learning/curriculum/department-approved-courses/critical-thinking) webpage including course document, sample scope and sequences, assessment materials and other learning sequences.

**Professional Learning**: Join the [Teaching and Learning 7-12 statewide staffroom](https://education.nsw.gov.au/teaching-and-learning/curriculum/statewide-staffrooms) for information regarding professional learning opportunities.

**Universal Design for Learning Tool**: [Universal Design for Learning planning tool](https://education.nsw.gov.au/teaching-and-learning/learning-from-home/teaching-at-home/teaching-and-learning-resources/universal-design-for-learning). Support the diverse learning needs of students using inclusive teaching and learning strategies.

**Consulted with**: Aboriginal Outcomes and Partnerships, Inclusion and Wellbeing, EAL/D.

**Reviewed by**: This resource was reviewed by Curriculum Secondary Learners and by subject matter experts in schools to ensure accuracy of content.

**Creation date**: 5 December 2022

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**Evidence Base**:

‘The long-term vision is for a curriculum that supports teachers to nurture wonder, ignite passion and provide every young person with knowledge, skills and attributes that will help prepare them for a lifetime of learning, meaningful adult employment and effective future citizenship’ (NESA 2020:xi).

The development of the course and the course document as part of department approved electives aims to respond to the goals articulated in NESA’s curriculum review. Consistent messages from the review include:

* ‘flexibility’ was the word most used by teachers to describe the systemic change they want
* teachers need more time to teach important knowledge and skills
* students want authentic learning with real-world application.

This teaching resource provides teachers with some examples of explicit and authentic learning experiences. The option to adjust these learning sequences leads to ‘increased local decision making in relation to the curriculum’ as this ‘is associated with higher levels of student performance’ (NESA 2020:52).

The suggested strategies for teaching and learning align with the principles of explicit teaching. ‘The evidence shows that students who experience explicit teaching practices perform better than students who do not. Explicit teaching reduces the cognitive burden of learning new and complex concepts and skills, and helps students develop deep understanding’ (CESE 2020a:11).

## References

**Links to third-party material and websites**

Please note that the provided (reading/viewing material/list/links/texts) are a suggestion only and implies no endorsement, by the New South Wales Department of Education, of any author, publisher, or book title. School principals and teachers are best placed to assess the suitability of resources that would complement the curriculum and reflect the needs and interests of their students.

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