Critical and Creative Thinking

Victorian Curriculum F–10 Version 2.0

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Contents

[Introduction 1](#_Toc168580807)

[Rationale 1](#_Toc168580808)

[Aims 1](#_Toc168580809)

[Structure 1](#_Toc168580810)

[Learning in Critical and Creative Thinking 2](#_Toc168580811)

[Curriculum 5](#_Toc168580812)

[Foundation to Level 2 5](#_Toc168580813)

[Levels 3 and 4 8](#_Toc168580814)

[Levels 5 and 6 11](#_Toc168580815)

[Levels 7 and 8 15](#_Toc168580816)

[Levels 9 and 10 19](#_Toc168580817)

# Introduction

## Rationale

Developing the capability to think critically and creatively is an essential part of the development of successful, confident and innovative members of the community. Identifying and responding effectively to environmental, social and economic challenges, as well as technological changes, requires young people to be creative, innovative, enterprising and adaptable, with the confidence and skills to use critical and creative thinking purposefully.

Critical thinking and creative thinking are strongly linked and work together to help students inquire into the world around them. Students require explicit support to develop the breadth and depth of their thinking and to take intellectual risks. This attention to thinking helps students to build their self-awareness and capacities for reflection and self-correction.

Thinking that is productive, purposeful and intentional is at the centre of effective learning and the creation of new knowledge. Explicit attention to and application of thinking skills and dispositions enables students to develop an increasingly sophisticated understanding of general strategies they can use whenever they encounter learning challenges. The progressive development of knowledge about thinking and the practice of using thinking strategies fosters students’ motivation for, and management of, their own learning.

## Aims

The Critical and Creative Thinking capability curriculum aims to ensure that students develop:

* an understanding of thinking processes and an ability to manage and apply these intentionally
* skills and dispositions that support logical, strategic, flexible and adventurous thinking
* confidence in analysing, evaluating and improving reasoning and thinking processes across a range of familiar and unfamiliar contexts.

## Structure

Critical and Creative Thinking is organised into 3 interrelated strands:

* Questions and Possibilities
* Reasoning
* Metacognition.

These 3 strands focus on the following areas.

#### Questions and Possibilities

Students explore the nature of questioning and a range of strategies to develop new ideas and possibilities.

#### Reasoning

Students explore how to structure, analyse, evaluate and communicate reasoning, and how to think analytically.

#### Metacognition

Students explore learning strategies, the use of thinking processes to manage thinking for different purposes, and the use of criteria to identify and evaluate proposed solutions to a problem.

### Achievement standards

Achievement standards describe what students are typically able to understand and do, and they are the basis for reporting student achievement.

In Critical and Creative Thinking, students progress along a learning continuum that provides the first achievement standard at Level 2, and then at Levels 4, 6, 8 and 10.

The skills developed in Critical and Creative Thinking are described in the achievement standards. These skills can be developed by teaching the underpinning knowledge that is described in one or more content descriptions within or across strands, selecting different content descriptions as appropriate, taking into account student need and the learning context. It may be the case that a particular content description links to more than one part of an achievement standard, in that it describes knowledge that is relevant to more than one skill.

### Content descriptions

In Critical and Creative Thinking, content descriptions sequence and describe the knowledge and understanding that teachers need to teach and students are expected to learn.

### Elaborations

Elaborations are examples that provide guidance on how the curriculum may be transformed into a classroom activity or learning opportunity. They are provided as advisory material only.

## Learning in Critical and Creative Thinking

### Connections within and between strands

Critical and creative thinking skills are not discrete but interconnected. For example, creative thinking involves establishing and using criteria to critically evaluate the merits of various ideas generated by creative thinking strategies in order to identify appropriate possibilities. Likewise, critical thinking can involve the application of creative thinking strategies, for example to identify an analogy to support reasoning.

There are interconnections between the 3 Critical and Creative Thinking strands. For example, the Questions and Possibilities strand and Reasoning strand are interconnected when constructing questions to gather high-quality evidence to support an inquiry, or when suspending judgement to support robust evaluation of competing claims. The Questions and Possibilities strand is also interconnected with the Metacognition strand, for example when incorporating divergent thinking as part of a problem-solving process or designing a research question as part of an inquiry process.

Thinking for a particular purpose might also lead to making connections between strands. For example, problem-solving draws on all 3 strands.

Connections can also be made within strands. For example, the Reasoning strand involves students learning how to identify, analyse, evaluate and communicate claims, grounds for claims and inferences made to draw conclusions. When, for example, students are required to communicate a conclusion justified by a range of reasons, they draw on their learning from other content in this strand, such as content that enables them to make sure justifications are free from reasoning errors, to help develop high-quality justifications.

### Dispositions for critical and creative thinking

Dispositions such as inquisitiveness, reasonableness, intellectual flexibility, open- and fair-mindedness, and a readiness to try new ways of doing things and to persist in the face of difficulties are interrelated with critical and creative thinking skills. On the one hand, proficiency in these skills improves students’ confidence to try new ways of doing things. On the other hand, being inclined to use thinking skills requires particular dispositions; for example, open-mindedness is more likely to lead to a higher-quality consideration of different points of view.

Teachers are encouraged to foster students’ critical and creative thinking dispositions. The Personal and Social Capability curriculum can help to foster a classroom climate that encourages students to develop these dispositions and use them to support themselves and each other, for example through its content on personal strengths.

### Critical and Creative Thinking in and through learning areas

The knowledge and skills set out in this capability should be taught, learnt, developed and applied in and through each learning area as appropriate. Students develop critical and creative thinking skills in conjunction with learning areas. Specific critical and creative thinking skills are represented in each learning area as appropriate, and this capability complements rather than replicates these skills.

The Questions and Possibilities strand complements learning area contexts that involve the investigation and proposal of ideas and possibilities. It also complements contexts where students are required to consider more than one perspective and where suspending judgement would be useful.

The Reasoning strand complements areas of the curriculum in which students are required to identify, analyse and evaluate propositions, data and other forms of evidence and then make inferences to draw conclusions.

The Metacognition strand defines the knowledge and skills that enable students to better identify, describe, understand, practise, develop and manage their own thinking and learning processes.

Students will learn critical and creative thinking skills when an appropriate challenge is provided – that is, a level of challenge that activates a need to think critically and creatively. This is learning-area dependent and might involve problematisation, experimentation, engaging with ideas and issues that involve different points of view, inquiry learning and other forms of challenge.

The Critical and Creative Thinking capability is not a description of the full development of creativity. It is concerned with the development of one element of creativity, that of creative thinking. Other vital elements of creativity – for example, creative expression, creative endeavour and creative collaboration – are included in other curriculum areas.

### Transfer of knowledge and skills

Students learn general critical and creative thinking skills in the context of learning areas. General critical and creative thinking skills are general in the sense that they are used across different contexts. For example, using critical and creative thinking to propose that criteria be developed as a basis for judgement to assist decision-making in a particular situation is common to a wide range of learning area contexts, but the criteria themselves are learning-area dependent.

Developing general critical and creative thinking skills involves learning the knowledge that underpins the skill and then applying that knowledge to a variety of learning area contexts. As students reflect on the application of their knowledge and extend their knowledge, they gain further insights into the skill. They apply this more nuanced knowledge to a range of contexts to further develop the skill in an iterative way.

Students require scaffolding in order to transfer general critical and creative skills from one context to another, including from learning area contexts to broader life. This involves assisting students to make links to contexts that may be similar or quite different to their background learning, gradually building their capacity to recognise these links for themselves. This can be enabled through a whole-school approach to delivery of the capability, which provides a shared understanding of students’ background learning.

# Curriculum

## Foundation to Level 2

### Band description

From Foundation to Level 2, the curriculum focuses on developing the knowledge and skills that enable students to express reasoning, problem-solve and learn more effectively. Students become familiar with key vocabulary and simple strategies to structure and improve thinking. Students develop an understanding that thinking can be made explicit.

### Achievement standard

By the end of Level 2, students construct and use questions with a range of stems. They generate ideas and possibilities that are new to them and identify the strategy used. They describe personal responses to ideas and possibilities and identify how these influenced their thinking.

Students identify and use words that show reasons and conclusions and identify suitable examples to support claims when reasoning. They practise and use a range of simple general learning strategies and express and describe their thinking processes. Students propose a solution to a problem, describing how the solution was selected.

### Content descriptions and elaborations

#### Strand: Questions and Possibilities

| Content descriptions*Students learn about:* | Elaborations*This may involve students:* |
| --- | --- |
| different kinds of question stems for gathering information and ideasVC2CC2Q01 | * constructing questions with different stems (such as what, how, when or why) to match a given range of answers, for example about the seasons
* responding to a prompt, such as a historical image or an image of a local place, and using question stems to construct as many different questions as possible to gather information
 |
| how personal responses may influence thinking about ideas and possibilitiesVC2CC2Q02 | * responding to a variety of stimuli and reflecting on how this influenced their creation of ideas, for example a variety of sounds when creating a soundscape; or responding with their bodies to a prompt such as ‘What does sleepiness look like?’ and reflecting on how this influenced their ideas for a story or other artwork
* responding to a variety of stimuli and considering whether their initial reaction influenced their thinking; for example, reacting to an unfamiliar object as ‘biggest and darkest in colour’ and reflecting on whether this influenced a prediction as to whether it was heaviest or lightest
* identifying a favourite idea and then working with a group to evaluate ideas and shortlist possibilities, and reflecting whether having a favourite idea influenced how hard or easy it was to reach agreement within the group
 |
| modification as a strategy to generate a new idea or possibilityVC2CC2Q03 | * investigating how making one change to a characteristic such as shape, position, size or materials can make a significant difference, for example how changing the size of the school garden could reduce the amount of water it requires; or how changing the loudness or softness of sounds can generate new ideas for a music performance
* reading a picture book with alternate endings and exploring how the author makes modifications to create different endings
 |

#### Strand: Reasoning

| Content descriptions*Students learn about:* | Elaborations*This may involve students:* |
| --- | --- |
| words that show reasons and conclusions, and examples of how to use themVC2CC2R01 | * listening to sentences that show a reason and a conclusion in a variety of ways and identifying which words or phrases show each
* selecting words or phrases that show a reason or a conclusion and creating an example to illustrate how they are used
 |
| the use of examples to support claimsVC2CC2R02 | * comparing a reason supported by an example with one that is not supported by an example to show how examples clarify what is meant
* participating in a discussion with peers about a topic that is likely to have several opinions, using examples to support their claims, and reflecting on how examples helped to understand another point of view
 |

#### Strand: Metacognition

| Content descriptions*Students learn about:* | Elaborations*This may involve students:* |
| --- | --- |
| simple general learning strategies including practising, narrating a process, rewording and reflecting on feelings about learningVC2CC2M01 | * practising an oral presentation or performance by intentionally rehearsing small parts of the presentation often
* using a set of pictorial symbols to represent their feelings about learning and explaining how their feelings might be influencing their learning
* retelling a process that can be used to reach a goal
 |
| verbal and non-verbal strategies to express and describe thinking processes, including for problem-solvingVC2CC2M02 | * discussing sequencing of steps as a problem-solving approach in response to a ‘how do I …?’ problem and experimenting with different sequences
* drawing and displaying pictures or symbols to represent the meaning of words associated with thinking activities, such as ‘watching’, ‘wondering’, ‘finding’ and ‘trying’, and building a wall display of examples of each over time
 |
| ways to make choices between alternative possibilities and propose a solutionVC2CC2M03 | * identifying personal preferences and linking these to alternative possibilities to propose a solution
* referring to a goal as a way to help choose the best solution from a range of alternatives
 |

## Levels 3 and 4

### Band description

In Levels 3 and 4, the curriculum focuses on students developing the knowledge and skills to support their thinking for a range of purposes. Students learn and use simple strategies to support questioning, ideation and learning. They begin to develop an understanding that conclusions can be justified by providing reasons that are in turn supported by evidence and/or values. They are introduced to basic inferencing and how to use criteria to support their reasoning.

Students build further understanding of how thinking processes facilitate thinking. The Critical and Creative Thinking capability provides the opportunity for students to engage in problem-solving while drawing on all 3 strands, covering questioning, divergent and convergent thinking, problem-solving processes and justification of solutions.

### Achievement standard

By the end of Level 4, students identify, construct and use open and closed questions for different purposes. They describe and use simple strategies to generate and evaluate new ideas and possibilities, reflecting on the effect of pre-established preferences.

Students identify a conclusion justified by a range of reasons, and structure and communicate a conclusion justified by a range of reasons. They use evidence, values, criteria and ‘if-then’ thinking to support their reasoning and identify errors in examples of ‘if-then’ thinking.

Students practise and use an extended range of general learning strategies. They represent and use thinking processes and describe how thinking processes facilitate thinking. They evaluate a proposed solution to a problem by considering given criteria.

### Content descriptions and elaborations

#### Strand: Questions and Possibilities

| Content descriptions*Students learn about:* | Elaborations*This may involve students:* |
| --- | --- |
| the construction and use of open and closed questions for different purposesVC2CC4Q01 | * considering a range of sample questions about a text and classifying them in terms of having one right answer or many different possibilities
* constructing and using open and closed questions for a given purpose, for example to investigate the characteristics of a place and how people describe these characteristics
* elaborating on closed questions to transform them into open questions; for example, transforming the closed question ‘Was this lion born in the zoo?’ to ‘Should lions be kept in zoos?’
 |
| how pre-established preferences may influence thinking when generating and responding to alternative ideas and possibilitiesVC2CC4Q02 | * examining messages aimed at young people to encourage particular behaviour and reflecting on whether their reaction to the message is influenced by their preferences; for example, examining health messages about particular foods and reflecting on whether their reaction to the message is influenced by whether they like the food that is featured in the message
* comparing a range of ideas they have generated to their general preferences, identifying how many ideas align with their preferences and reflecting on the result; for example, comparing story ideas with their favourite kind of story, or comparing game ideas with their favourite kind of game
* participating in a group discussion where each member identifies and explains their pre-established preferences with regard to finding a solution to a problem, and reflecting on how this discussion affected the solutions that were generated, for example when proposing a solution to reduce waste generated in the school
 |
| simple strategies for generating new ideas and possibilities, including repurposing or rearrangingVC2CC4Q03 | * exploring the technique of breaking down a whole into various parts and then rethinking the combination of those parts to generate new ideas; for example, breaking down a movement sequence into its smaller parts to create a new movement sequence
* adapting an object originally intended for a specific purpose to generate a new idea; for example, using an object designed for cooking as a musical instrument
 |

#### Strand: Reasoning

| Content descriptions*Students learn about:* | Elaborations*This may involve students:* |
| --- | --- |
| ways to identify, structure and communicate a conclusion justified by a range of reasonsVC2CC4R01 | * constructing and annotating a basic argument – that is, a conclusion supported by at least one reason
* dropping and dragging jumbled sentences into order using digital technologies or hard-copy cards, comparing different orderings and making a selection to communicate a point of view and reflecting on why they made that selection
* identifying a conclusion and reasons given to support the conclusion in a specific stimulus text
* using a given structure to communicate a point of view that draws a conclusion justified by a range of reasons
 |
| what is meant by evidence and what is meant by a value and how they are used to support reasoningVC2CC4R02 | * exploring how factual information can be used to help support a claim
* exploring how a value (what is believed to be important) can be used to support the strength of a claim; for example, when reasoning about a preferred action, supporting a claim that a particular action is preferred with a reason that it would be the fairest thing to do
 |
| the use of ‘if-then’ thinking to come to a conclusion when reasoning, and simple errors that can be made when using this thinkingVC2CC4R03 | * exploring how ‘if-then’ reasoning can be used to make an inference to reach a conclusion; for example, knowing that ‘all spiders have 8 legs’ or ‘all insects have 6 legs’ means that an unfamiliar creature could be identified as a spider or insect: ‘If this creature has 6 legs, then it is an insect’
* exploring how to identify reasoning errors associated with general claims made in an ‘if-then’ argument; for example, considering (as part of a cyber safety program) the argument ‘If this person is playing this online game designed for children, then they must be a child’ by identifying the general claim supporting the argument (‘Only children like children’s games’) and identifying whether there are examples where this is not true
 |
| the basis for different kinds of criteria, such as desired qualities or given rules; and how criteria are used to help make judgements when reasoningVC2CC4R04 | * discussing why desired qualities might need to be identified when developing a design solution for packaging, for example to find the material that is the strongest or most durable, most environmentally friendly and cheapest
* exploring a given scenario and discussing how consideration of rules can be used when reasoning, for example to support concluding whether a new idea is acceptable (within the rules) or to support concluding whether someone cheated or not in a game
 |

#### Strand: Metacognition

| Content descriptions*Students learn about:* | Elaborations*This may involve students:* |
| --- | --- |
| an extended range of general learning strategies including connecting to prior learning, self-questioning, self-explanation and peer instructionVC2CC4M01 | * working together with peers to construct questions to help make connections between new learning and prior learning
* using a range of given questions to test their understanding of a concept or skill
* working in jigsaw groups as part of an inquiry and reflecting on how instruction from peers affected their own learning
 |
| the use of thinking processes to facilitate thinking, including for problem-solving, and verbal and non-verbal strategies for representing thinking processesVC2CC4M02 | * exploring, developing and testing hypotheses as a thinking process and undertaking trials to develop a hypothesis about the relationship between 2 variables (for example between the angle of a boomerang and distance), and reflecting on how hypotheses can be used to make predictions for different purposes
* exploring how tables or bar graphs are constructed to represent data and how they can be used to facilitate thinking
 |
| how to evaluate a proposed solution using given criteriaVC2CC4M03 | * comparing a solution that might be selected if all criteria were equally important, compared to when some criteria are more important than others
* exploring how to test whether a proposed solution meets a given criterion
 |

## Levels 5 and 6

### Band description

In Levels 5 and 6, the curriculum focuses on further developing the knowledge and skills that enable students to test the strength of their thinking. Students extend their range of strategies for ideation and practise setting aside preconceptions, recognising why it is important to do so.

Students begin to engage with more complex reasoning, developing an understanding that some arguments contain reasons that are themselves argued for as a way to strengthen justification. Students develop their capacity to identify reasoning errors and improve reasoning. They are introduced to context-specific learning strategies and continue to apply general learning strategies.

They extend their understanding of thinking processes to begin to consider what is suited to specific contexts. The Critical and Creative Thinking capability provides the opportunity for students to engage in problem-solving while drawing on all 3 strands, covering questioning, divergent and convergent thinking, problem-solving processes and justification of solutions, supporting their ability to make critical comparisons of proposed solutions.

### Achievement standard

By the end of Level 6, students identify, construct and use questions to focus or expand their thinking. They explain and use a range of strategies to generate and evaluate new ideas and possibilities, reflecting on the importance of setting aside preconceptions.

Students identify an argument that uses sub-arguments that lead to a main conclusion. They structure and communicate an argument that uses sub-arguments that lead to a main conclusion. They use criteria and consider competing values and the strength of evidence when supporting, analysing and evaluating reasoning. They identify and describe simple reasoning errors and improve the reasoning involved.

Students practise and use general and context-specific learning strategies. They explain, use and reflect on thinking processes suited to different contexts. They use criteria to identify and compare proposed solutions to a problem and to identify a suitable solution.

### Content descriptions and elaborations

#### Strand: Questions and Possibilities

| Content descriptions*Students learn about:* | Elaborations*This may involve students:* |
| --- | --- |
| the construction of questions for identifying and building understanding of information, possibilities, processes and activitiesVC2CC6Q01 | * exploring how different questions (for example social, political, historical and economic questions) can change the focus of a topic, as part of planning an inquiry
* comparing 2 sets of survey questions about the same topic, identifying similarities and differences, and discussing possible reasons for these
* discussing questions designed to elicit quantitative responses and those designed to elicit qualitative responses, and constructing both kinds of questions, for example as part of research into consumer decision-making
* constructing questions to ask an expert in a particular area in order to build understanding
* using a given stimulus, constructing a range of different questions about the stimulus, swapping with a peer and answering each other’s questions and reflecting on whether the questions were interpreted in the same way
 |
| the importance of setting aside preconceptions; strategies for setting preconceptions aside when generating and evaluating alternative ideas and possibilitiesVC2CC6Q02 | * using given brainstorming rules such as deferring judgement, or building on different ideas, for example as part of a small group creating a Rube Goldberg machine
* identifying and then setting aside preconceptions in order to consider different perspectives when discussing ideas
* exploring how to set preconceptions aside by constructing an opposing view; for example, writing a paragraph about their favourite book or movie, preparing possible ideas to oppose their original view and reflecting on why considering different views is important
* identifying and discussing preconceptions about the use of artificial intelligence tools to support the generation of ideas
* discussing how evidence can challenge preconceptions, and the importance of testing preconceptions through research
 |
| an extended range of strategies to generate new ideas and possibilities including forming a link between different information sourcesVC2CC6Q03 | * discussing how identifying common factors such as shared underlying skills, causes or processes can assist in finding a link across apparently unconnected sources
* exploring examples such as artworks from a particular movement unfamiliar to them or stories from an unfamiliar genre, identifying links between the examples to identify the style, and creating their own work using that style
* practising finding links by constructing analogies and discussing how analogies show a similarity between 2 different things
* undertaking research to find links between different information sources to support the generation of ideas, for example between different sources that encourage children to save, when designing a campaign to encourage saving; or between different invasion games such as basketball and hockey when generating ideas for a movement sequence
 |

#### Strand: Reasoning

| Content descriptions*Students learn about:* | Elaborations*This may involve students:* |
| --- | --- |
| ways to identify, structure and communicate an argument that uses sub-arguments leading to a main conclusionVC2CC6R01 | * exploring stimulus texts to identify an overall conclusion and the reasons given to support it, and identifying arguments given in support of each of these reasons; for example, identifying that a media text concludes that volunteering is a positive way to contribute to the local community for 3 reasons: it promotes belonging, saves resources and develops skills, and identifying the arguments given in support of each of these reasons
* constructing a point of view that is justified by a range of reasons and then considering which reasons could be unpacked further and argued for; for example, the conclusion ‘Exercise is good for you’ is supported by the reasons ‘It is fun’ and ‘It is healthy’, and considering whether ‘It is fun’ and ‘It is healthy’ should have their own reasons to support them (‘It is fun because …’ and ‘It is healthy because …’)
 |
| ways to consider competing values and the strength of evidence when reasoningVC2CC6R02 | * investigating different ways to evaluate evidence; for example, checking how data was collected, sources of funding and the appropriateness of selected criteria
* discussing 2 pieces of evidence and which should be given more weight when presenting a point of view
* investigating values held by stakeholders with regard to an issue, such as a local planned development, identifying if any values come into conflict and exploring actions and consequences associated with each value as a way to help consider competing values
* investigating a topic where both evidence and values can be used to support reasoning, for example an investigation of how artificial intelligence may affect work in the future and whether these effects are desirable
 |
| simple reasoning errors including hasty generalisations, false analogies and contradiction, and how reasoning associated with these errors can be improvedVC2CC6R03 | * discussing the strength of an analogy by examining whether there is good reason to think that a particular characteristic is shared, for example that people’s bodies share an adequate degree of similarity with machines in an analogy about the need to maintain ourselves through exercise just as we maintain machines to stop them from rusting
* identifying an apparent contradiction in a point of view and discussing whether clarifying what is meant could have prevented this; for example, replacing a phrase such as ‘minor crisis’ with an alternative that shows more clearly whether the situation was minor or a crisis
* using an example that appears to be a contradiction, such as the statement ‘I love chocolate and I hate chocolate’, to discuss whether different contexts can explain apparent inconsistencies, and considering how to express contexts to avoid perception of a reasoning error
* exploring cases where a conclusion has been drawn too quickly and why, for example in relation to negative media reporting of an unfamiliar minority; discussing why this is an error in reasoning; and considering how it can be improved
* exploring how sometimes conclusions can be drawn on insufficient evidence (that is, making a hasty generalisation reasoning error), and discussing why the evidence is insufficient, for example due to a sample size that is too small, and how it can be improved
 |
| the use of criteria to support analysis and evaluation when reasoningVC2CC6R04 | * developing a definition of a criterion as a consideration used to help make a decision, and exploring a range of examples linked to both analysis and evaluation
* exploring how using rules or criteria associated with a concept can assist with analysis or evaluation, for example when classifying animals or objects; or when reasoning to a conclusion about whether an event was significant, whether an object was stolen or merely borrowed or whether a spending plan has any disadvantages
 |

#### Strand: Metacognition

| Content descriptions*Students learn about:* | Elaborations*This may involve students:* |
| --- | --- |
| learning strategies suited to general and specific contexts, including different ways of identifying, expressing and organising key learning, and undertaking spaced practiceVC2CC6M01 | * experimenting with allowing different amounts of time between multiple attempts at a process and reflecting on which amount of time was most effective; for example, when learning a recipe, repeating the process a day or a week later and reflecting on which attempt (and therefore which period of time) was most effective
* constructing an analogy to assist in learning, for example an analogy between a home and a habitat to assist learning the concept of a habitat
* applying different ways to organise key learning to suit the nature of different learning areas
 |
| thinking processes suited to different contexts and when and how to use them, including for problem-solving VC2CC6M02 | * exploring how thinking routines can be used for different purposes, such as using mind maps for classifications or to identify connections
* exploring processes for solving problems and reflecting on which they prefer to use and why, for example for multiplication
* exploring a decision-making process and the kinds of decisions it is suitable for, for example to assist with decisions about spending and saving
 |
| the use of criteria to identify and compare proposed solutionsVC2CC6M03 | * working within a group to individually propose a solution and then using criteria to compare solutions suggested by the group and make a choice; for example, using criteria to identify the most appropriate materials to use for a design
 |

## Levels 7 and 8

### Band description

In Levels 7 and 8, the curriculum focuses on developing the knowledge and skills that enable students to extend the complexity of thinking that they engage with and undertake themselves. Students learn strategies to assist them to synthesise their thinking. The curriculum enables students to critically engage with competing ideas and claims, including fostering open-mindedness through a focus on suspension of judgement and building capacity to understand why thinking may be contested and that flexibility in thinking is often required. The curriculum supports students to undertake more complex inquiries or other forms of investigation where a major focus question might need to be broken down into smaller questions. Students extend their knowledge of reasoning errors and the use of criteria to support reasoning. They are supported to become more independent in their selection and use of learning strategies and thinking processes.

### Achievement standard

By the end of Level 8, students construct and use main questions and sub-questions for different purposes. They select, use and reflect on a range of strategies to generate new ideas and possibilities, they suspend judgement to support generating and evaluating alternative ideas and possibilities and they reflect on the importance of suspending judgement.

Students identify, structure and communicate a conclusion and a justification for the conclusion that involves analysis and evaluation of competing claims and grounds for these claims. They identify and use criteria to support, analyse, evaluate and improve reasoning. They identify and explain a range of reasoning errors and improve the reasoning involved.

Students select, use and reflect on general and context-specific learning strategies. They identify, justify, use and reflect on thinking processes suited to different contexts. They develop and use criteria to evaluate proposed solutions to a problem, synthesise new knowledge and explain a suitable solution.

### Content descriptions and elaborations

#### Strand: Questions and Possibilities

| Content descriptions*Students learn about:* | Elaborations*This may involve students:* |
| --- | --- |
| the construction of a main question and sub-questions for different purposesVC2CC8Q01 | * dividing an inquiry into a particular major topic into sub-topics and constructing questions associated with each sub-topic to guide their research, for example with regard to sustainable food production in Australia
* defining a focus question for investigating a different culture and creating specific sub-questions that allow for investigation of different aspects of culture
* comparing the wording and features of questions that allow the investigation of causes versus consequences, for example with regard to conflicts between societies in the ancient world
* developing questions to investigate the properties of potential materials for a proposed design solution and using findings to define a further question and sub-questions for investigation
 |
| when and how judgement is suspended to support generating and evaluating alternative ideas and possibilitiesVC2CC8Q02 | * engaging with representatives of creative industries to explore the extent to which they suspend judgement when generating new ideas for products and services
* engaging with representatives of different disciplines to explore how and when they suspend judgement, for example in relation to science and hypothesising or in relation to history and historical perspectives
* exploring how the inclusion of different stakeholder voices might broaden ideas and possibilities, and discussing the importance of suspending judgement when engaging with diverse voices
* discussing suspension of judgement when engaging with sources from unfamiliar contexts, for example unfamiliar places or unfamiliar cultures or times
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| strategies for generating new ideas and possibilities including identifying a pattern across multiple information sourcesVC2CC8Q03 | * examining the approach to a particular problem in multiple sources and looking for a pattern in approaches; for example, when generating ideas for the creation of a text, comparing written, spoken and multimodal sources to look for a pattern in how they represent a particular aesthetic effect or emotion
* investigating the similarities between algorithms used for different purposes and synthesising this information into a more general algorithm for broader applications
* examining a series of diverse artworks that employ different portals into space, such as frames or mirrors, identifying what all of these might have in common and using this as inspiration for their own work
* investigating how scientists make connections across different disciplines within and beyond their own to develop new ideas and eventually develop new knowledge and solutions to a range of contemporary issues
 |

#### Strand: Reasoning

| Content descriptions*Students learn about:* | Elaborations*This may involve students:* |
| --- | --- |
| ways to identify, structure and communicate a conclusion and its justification where competing claims, and grounds for claims, are analysed and evaluatedVC2CC8R01 | * exploring an issue such as whether Australia should become a republic and researching and assessing the strength of arguments for and against, including the strength of supporting evidence, and using digital technologies to help plan the structure of a response to the issue
* annotating a written response to show where competing claims and grounds for these claims are analysed and evaluated, and reflecting on the effectiveness of the structure of the written response, making improvements where necessary
* exploring how to structure and communicate ideas, findings and solutions to problems where impacts and limitations of conclusions are identified and appropriate language and representations are used
* investigating a range of sources to identify conclusions made and how competing claims are analysed, for example as part of an exploration of different views on how to improve community health
 |
| reasons for competing claims about matters of fact and matters of value, including consideration of evidence and expertise, and ways to analyse and evaluate competing claims and grounds for claimsVC2CC8R02 | * exploring what agreement or consensus means in different learning area contexts and the extent to which agreement or consensus would indicate certainty about matters of fact, such as how the Pyramids were built, and matters of value, such as the meaningfulness of an artwork
* exploring case studies that illustrate issues of misinformation and disinformation, for example fake news, and how to evaluate competing claims
* discussing whether the way something *is* indicates how it *should be*; for example, considering whether data showing that consumers in a market trial prefer packaging that is the least sustainable option means that this packaging should therefore be used, and exploring how to analyse and evaluate a competing claim that a more sustainable alternative should be selected
* investigating how knowledge and understanding are developed in different academic contexts, why there may be competing claims and the role of expertise and research, for example in relation to proposals to improve the liveability of a particular place
* exploring an issue and identifying areas that require technical expertise, those that require broader citizen input or both, for example in relation to the location of a toxic waste facility
 |
| an extended range of reasoning errors including cause and effect fallacies and arguing from ignorance, and how reasoning associated with these errors can be improvedVC2CC8R03 | * discussing why a mere association does not in itself show a particular cause and effect, and learning how to discuss these associations, for example in relation to spatial patterns
* investigating cognitive biases that lead to common cause and effect reasoning errors, for example the gambler’s fallacy and how casinos exploit it, as part of a financial literacy program
* exploring how it is an error in reasoning to claim that something must be true because we don’t have any evidence that it is false (argument from ignorance), and discussing how to improve reasoning when there is a lack of evidence, using simple examples such as ‘My friend believes aliens are definitely out there because no-one has been able to prove they do not exist’
* investigating common reasoning errors in learning area contexts using historical case studies, for example how reasoning errors made by early scientists influenced views on how scientific thinking should operate
 |
| when and how criteria are selected to improve clarity and support analysis and evaluation, including of competing claims, when reasoningVC2CC8R04 | * exploring how ‘necessary and sufficient conditions’ can be used to help develop criteria; for example, examining whether a particular quality is necessary and sufficient, necessary but not sufficient or neither necessary nor sufficient
* discussing how criteria can be based on different considerations, such as goals/purpose, definitions/characteristics, standards/ideals and/or rules, giving examples for each consideration and exploring scenarios to practise making, developing and selecting criteria
* participating in a dialogue involving competing claims and using criteria to analyse and evaluate these claims, for example in relation to whether a local council initiative will improve liveability in the local area, using liveability criteria to assist with group deliberation to reason towards a conclusion
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#### Strand: Metacognition

| Content descriptions*Students learn about:* | Elaborations*This may involve students:* |
| --- | --- |
| ways to select, use and reflect on general and context-specific learning strategiesVC2CC8M01 | * analysing specific learning strategies and how they should be used, for example when, why and how feedback should be sought and given
* identifying when exit cards could be used as a learning strategy
* using an artificial intelligence tool to record completed learning activities as ‘completed without reference to notes’, ‘completed with minimal reference to notes’, ‘completed with close reference to notes’, or ‘not able to be completed’, and constructing a plan for revision of learning
* reflecting on a learning strategy, such as documenting a learning process, and identifying improvements to documentation practices
* constructing diagrams or flow charts to assist in understanding how a system works, or building a physical model and explaining it to a peer to revise understanding
 |
| broad strengths and limitations of thinking processes in different contexts, including problem-solvingVC2CC8M02 | * identifying different ways to represent data and justifying a preferred way based on what will support purposeful thinking
* identifying different ways to represent ideas, such as storyboards, mock-ups and/or symbolically, and discussing their different applications
* identifying an appropriate type of investigation, for example experimentation, fieldwork or research of secondary sources, and planning each stage of investigation, with annotations to justify the proposed plan
* comparing different design thinking models and their strengths and limitations
* reflecting on the method used to investigate a question or solve a problem
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| the development of criteria for evaluating a range of proposed solutions; ways to evaluate and incorporate new knowledge that could affect the final decisionVC2CC8M03 | * adjusting evaluation of proposed solutions in light of new knowledge; for example, finding evidence of vested interests in collected sources
* using a range of examples to test the strength of given criteria, such as what counts as sustainable, and justifying refinements or additions to criteria
* responding to stakeholder feedback to adjust proposed solutions and discussing why changes were or were not made
* developing a range of proposed methods of investigation and developing criteria to evaluate these, based on the aim of the investigation, feasibility, availability of resources, and safety and other ethical considerations
* preparing a movement plan with a proposed solution to support a health and wellbeing outcome and responding to unexpected information that affects its implementation
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## Levels 9 and 10

### Band description

In Levels 9 and 10, the curriculum focuses on developing the knowledge and skills that enable students to undertake and express thinking effectively and constructively in different contexts, including questioning. Students learn and apply techniques to progress, analyse and evaluate thinking. This includes taking into consideration the desired qualities of claims and grounds for claims in different contexts, such as to support a description or an explanation, interpretation, analysis or evaluation. Students further develop their understanding that it is often necessary to suspend judgement and take a range of perspectives, while being self-aware of factors such as unconscious bias. They develop a capacity to identify and use patterns across sources of information and perspectives.

Students extend their understanding of reasoning errors and recognise their significance, for example as rhetorical devices. They learn how to refine criteria to support their reasoning. They further build their capacity to critically engage with learning strategies, thinking processes and proposed solutions in different contexts.

### Achievement standard

By the end of Level 10, students construct, use and adapt questions to support thinking in different contexts. They select, justify, use and reflect on a range of strategies to generate new ideas and possibilities and critically reflect on suspension of judgement when generating and evaluating alternative ideas and possibilities from different perspectives.

Students analyse and critically reflect on the structure, clarity, consistency and coherence of a conclusion and its justification in different contexts. They identify the qualities required when communicating a claim and grounds for a claim in different contexts and they analyse, evaluate and refine claims and grounds for a claim for required qualities when reasoning. They identify, use and refine criteria to support, analyse, evaluate and improve reasoning. They identify and analyse complex reasoning errors in different contexts and improve the reasoning involved.

Students select, monitor and adapt general and context-specific learning strategies. They analyse, justify, use and reflect on thinking processes suited to different contexts. They develop, use and adapt criteria in different contexts to evaluate the viability and sustainability of proposed solutions to a problem and to justify a suitable solution.

### Content descriptions and elaborations

#### Strand: Questions and Possibilities

| Content descriptions*Students learn about:* | Elaborations*This may involve students:* |
| --- | --- |
| the construction and adaptation of questions to suit different contexts VC2CC10Q01 | * discussing how a question might change to suit different contexts, for example how questions about human wellbeing might change depending on the scale of investigation
* examining a list of questions and identifying which are the most effective for a particular purpose and why
* using an artificial intelligence tool to generate survey questions and refining where necessary, for example to align more closely to the characteristics of the sample group
* constructing and adapting questions about a particular topic to suit engagement with different guest speakers; for example, exploring government intervention in the economy through a panel of guest speakers, each representing a different sector of intervention such as the Arts, industry and health
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| when and how to critically reflect on suspension of judgement when generating and evaluating alternative ideas and possibilities from different perspectivesVC2CC10Q02 | * comparing a creative process that quickly responds to initial judgements to one that intentionally suspends judgements over a period of time, reflecting on the quality of the ideas produced and discussing when each type of process might be used, for example when creating a music work
* discussing the concept of unconscious bias and how this might affect suspension of judgement when engaging with alternative perspectives, and discussing ways to mitigate this
* discussing how challenging assumptions and being open-minded can assist in evaluating ideas to generate possibilities, for example with regard to developing enterprising behaviours (supported by research on specific entrepreneurs), or when engaging with different perspectives on a social issue such as homelessness or unemployment
* exploring when it is appropriate to suspend judgement and when it is not, for the purpose of generating alternative ideas and possibilities, for example when considering different perspectives on whether a P-plater should wear a helmet when driving
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| strategies for generating new ideas and possibilities including identifying links and patterns across multiple information sources and perspectives VC2CC10Q03 | * undertaking research to gather a range of data from multiple information sources and stakeholders, and analysing it for a link or pattern to support generating new ideas and possibilities; for example, analysing it for a shared value underpinning different perspectives
* investigating how food myths and fads have been challenged and community perspectives shifted at different times or places to identify a pattern when planning a community health initiative, and reflecting on factors that might affect the usefulness of the identified pattern, such as cultural context, over time
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#### Strand: Reasoning

| Content descriptions*Students learn about:* | Elaborations*This may involve students:* |
| --- | --- |
| ways to analyse and improve the structure, clarity, consistency and coherence of a conclusion and its justification in different contextsVC2CC10R01 | * analysing inferences and the assumptions they are based on and identifying if these need discussion when constructing a point of view
* examining strategies to resolve ambiguities, such as declaring a definition or making context clearer
* evaluating a response written using an artificial intelligence tool for coherence and clarity
* working with peers in small groups to improve the structure, clarity and coherence of a given text
 |
| ways to analyse and evaluate claims and grounds for claims for the qualities of accuracy, precision, depth or breadth when reasoning, and ways to identify what qualities are required in different contextsVC2CC10R02 | * exploring the nature of a problem, a particular aim or purpose as a way to identify whether depth and/or breadth is required when preparing and presenting a response
* developing a checklist of questions associated with particular qualities, such as ‘Is supporting evidence accurately presented?’
* critically comparing artificial intelligence tools used to analyse large volumes of data for precision and accuracy
* using an artificial intelligence tool to generate a summary and analysing claims and grounds for claims for desirable qualities such as breadth
* using knowledge of scientific concepts to evaluate investigation conclusions, including assessing the approaches used to solve problems, critically analysing the validity of information obtained from primary and secondary sources, suggesting possible alternative explanations and describing specific ways to improve the quality of data
* planning an investigation and response and analysing whether depth or breadth is required, or both, using a particular aim or purpose to help guide their thinking
 |
| complex reasoning errors including false dichotomies and appeal to consensus, their significance and how reasoning associated with these errors can be improvedVC2CC10R03 | * discussing how false dichotomies are used, for example at times by stakeholders in political issues when they try to persuade
* exploring cases when appeal to consensus might be acceptable and when it is an error in reasoning and how to improve reasoning involved, for example ‘I surveyed my classmates and they all think it is okay to eat hot chips daily; therefore, I am recommending the school canteen supplies some’
* exploring what scientific consensus means and when it is reasonable to appeal to scientific consensus to support reasoning, and distinguishing this from an appeal to consensus as a general reasoning error
 |
| when and how criteria are refined to improve clarity and support analysis and evaluation, including of competing claims, when reasoningVC2CC10R04 | * discussing desirable characteristics of criteria, such as specific, measurable, agreed and time-bound, and using these characteristics to refine criteria to improve evaluations when reasoning
* using a range of examples to test the strength of given criteria, such as what counts as sustainable, and justifying refinements or additions to criteria
* examining the clarity of a proposed conclusion and discussing what role criteria played in achieving clarity; for example, using criteria associated with the concept of ‘fairness’ to afford more clarity on whether concluding that a team member should continue as leader is appropriate
* exploring when criteria for evaluating costs and benefits might need to be refined, for example to take into account different values of different stakeholders, and discussing how these criteria can be used to help draw conclusions when reasoning, for example in relation to a proposed government policy
* refining general criteria used to evaluate accessibility to health information to suit accessibility for young people specifically, and using refined criteria to analyse a range of health messages
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#### Strand: Metacognition

| Content descriptions*Students learn about:* | Elaborations*This may involve students:* |
| --- | --- |
| ways to select, monitor and adapt general and context-specific learning strategiesVC2CC10M01 | * completing a journal to monitor and evaluate 2 strategies for a learning challenge, and reflecting on what was effective and how the learning strategies could be used in the future in different contexts
* investigating, selecting and using an artificial intelligence tool to support learning
* reflecting on learning strategies used for different learning areas over time and making improvements
* comparing learning strategies with peers and when and how they are used, and making adaptations to their own learning strategies
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| the importance of critical analysis of thinking processes in different contexts, including for problem-solving, considering factors such as cognitive biases VC2CC10M02 | * discussing examples of common cognitive biases and how to mitigate these, for example confirmation bias in the context of identifying sources when undertaking research; framing bias in the context of advertising; and clustering illusion in the context of making predictions
* discussing what cognitive biases might be involved when identifying sources and how to mitigate these, for example confirmation bias
* discussing why repeat trials are necessary in certain circumstances to improve accuracy, precision and reliability
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| the development and adaptation of criteria for evaluating the viability and sustainability of proposed solutions in different contextsVC2CC10M03 | * developing and applying criteria to assess a range of examples of proposals and justifying whether refinements are necessary
* assessing proposed criteria for the viability of a response to an issue by examining practical implementation in different contexts
* assessing the viability of a solution by considering the risks associated with it
* comparing different criteria that could be used to evaluate a design solution, including cost, time or sustainability, reflecting on why different groups may prioritise different criteria, and adapting criteria to suit different contexts
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