Introducing the Victorian Curriculum: Science F-6

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VICTORIAN CURRICULUM AND ASSESSMENT AUTHORITY

VICTORIA State Government

Acknowledgment of Country

I would like to acknowledge the traditional custodians of the many lands across Victoria on which each of you are living, learning and working from today.

For myself and those of us in the Melbourne metropolitan area, we acknowledge the traditional custodians of the Kulin Nations.

When acknowledging country, we recognise Aboriginal and Torres Strait Islander peoples' spiritual and cultural connection to country and acknowledge their continued care of the lands and waterways over generations, while celebrating the continuation of a living culture that has a unique role in this region.

I would like to pay my respects to Elders past, present and emerging, for they hold the memories, traditions, culture and hopes of all Aboriginal and Torres Strait Islander peoples across the nation, and hope they will walk with us on our journey.

Objectives

- Provide an overview:
  - Victorian Curriculum F–6: Science

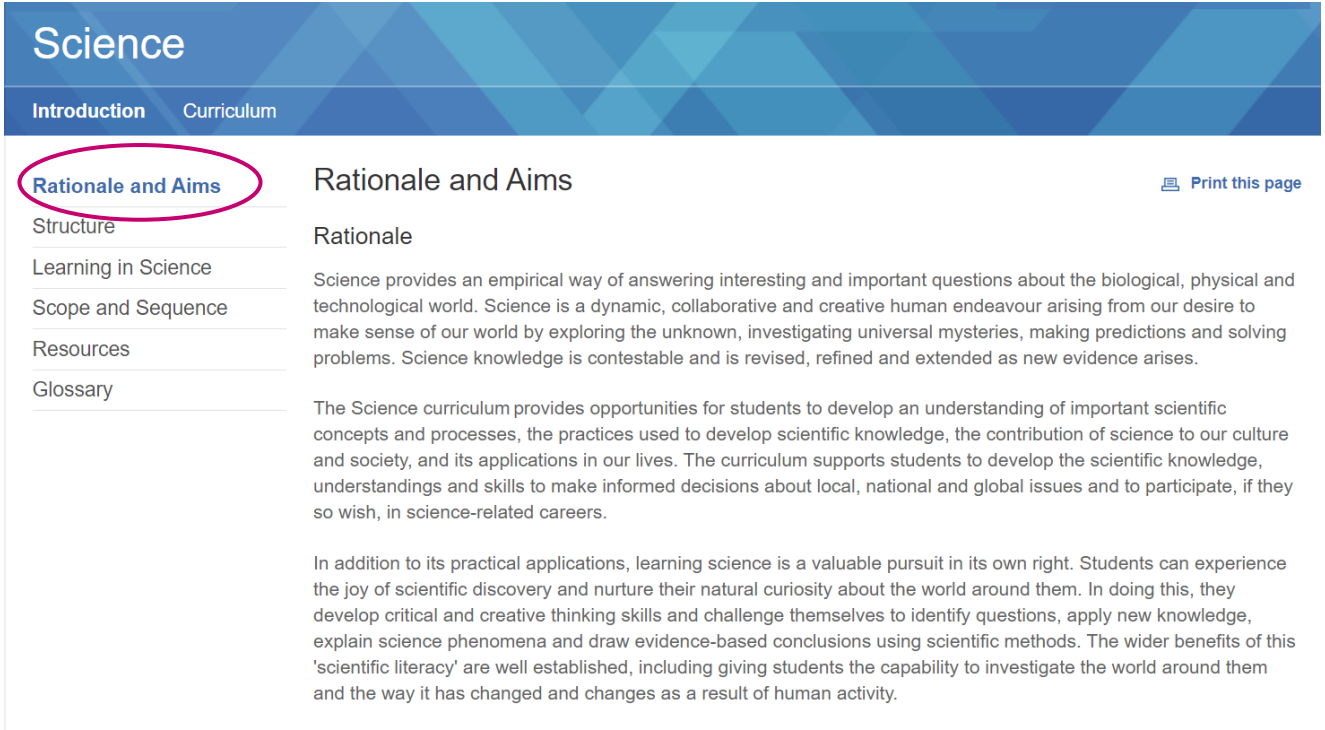
- Enhance understanding:
  - Sub-strands, content descriptions, achievement standards
  - Planning opportunities
  - Assessment
  - Resources available

Victorian Curriculum F–10

Introduction	Curriculum
The introduction includes material that will assist teachers to understand the specific purpose and features of the curriculum, and to locate additional documentation. It includes: • Rationale and Aims • Structure • Learning in (the specific curriculum) • Scope and Sequence • Glossary	The curriculum sets out the learning continuum and offers a range of viewing options. This is done by selecting a 'view mode' or a level/band within the curriculum area. It includes: • Level/band descriptions • Content descriptions organised by strands • Achievement standards

Term	Explanation
Achievement standards	Statements that describe what students are typically able to understand and do, and are the basis for reporting student achievement.
Content descriptions	Specific and discrete information identifying what teachers are expected to teach and students are expected to learn.
Elaborations	Non-mandated, advisory examples that provide guidance on how the curriculum may be transformed into a classroom activity or learning opportunity.
Level/Band descriptions	Statements that provide an overview to the content descriptions and achievement standard within the level or band.
Strands	Key organising elements within each curriculum area.
Sub-strands	Supplementary organising elements within some curriculum areas.

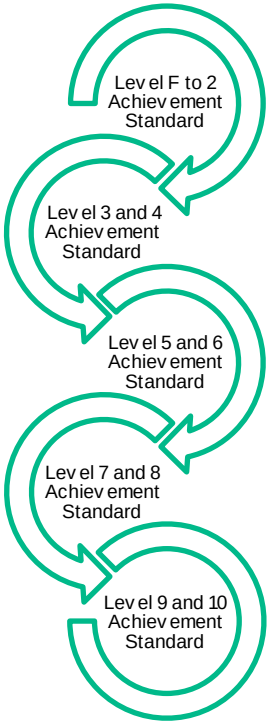
Victorian Curriculum F–10: Science



Victorian Curriculum F–10: Science

Strands	Science Understanding	Science Inquiry Skills
Sub-strands	Science as a Human Endeavour	Questioning and predicting
	Biological Sciences	Planning and conducting
	Chemical Sciences	Recording and processing
	Earth and Space Sciences	Analysing and processing
	Physical Sciences	Communicating

Curriculum Continuum



Science

Introduction **Curriculum**

Filter: Showing all levels | Showing all strands — Apply filters | Clear filters

View | Show: Level descriptions, Content descriptions, Achievement standards | Print this page

Previous | A B C D F-2 3-4 5-6 7-8 9-10 | Next

Foundation to Level 2	Levels 3 and 4	Levels 5 and 6
Foundation to Level 2 Description	**Levels 3 and 4 Description**	**Levels 5 and 6 Description**
In Foundation to Level 2, the curriculum focus is on awareness of self and the local world. Students observe changes that can be large or small and happen quickly or slowly. They explore the properties...	In Levels 3 and 4, the curriculum focus is on recognising questions that can be investigated scientifically and undertaking investigations. Students observe heat and its effects on solids and liquids...	In Levels 5 and 6, the curriculum focus is on recognising questions that can be investigated scientifically and undertaking investigations. Students explore how changes can be classified in differen...
Show more	Show more	Show more
Foundation to Level 2 Content Descriptions	**Levels 3 and 4 Content Descriptions**	**Levels 5 and 6 Content Descriptions**
Science Understanding	**Science Understanding**	**Science Understanding**
Science as a human endeavour	Science as a human endeavour	Science as a human endeavour
People use science in their daily lives (VCSSU041)	Science knowledge helps people to understand the	Scientific understandings, discoveries and inven[illegible]ons
Biological sci[illegible]	[illegible]	and to solve problems that directly affect people's live[illegible] (VCSSU073)
Living things have a variety of external features and		

Progression of knowledge, Concepts and Skills

Progression along the continuum of learning

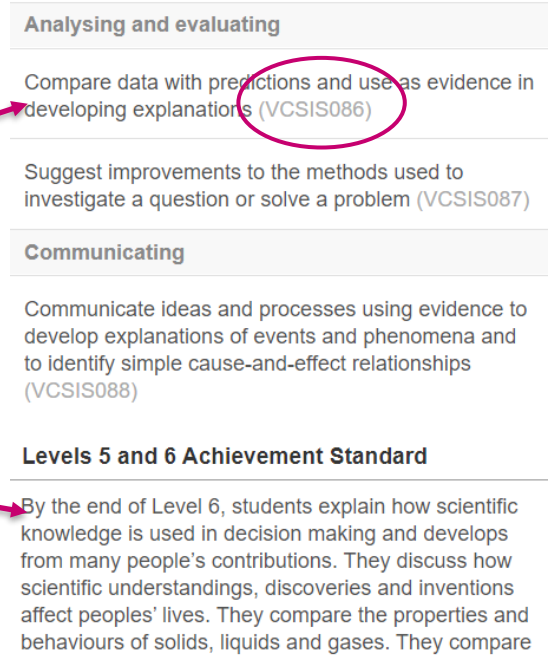
Victorian Curriculum F–10: Science

[Science - Curriculum - Victorian Curriculum (vcaa.vic.edu.au)]

Content descriptions

- Elaborations

Achievement standard



Analysing and evaluating

Compare data with predictions and use as evidence in developing explanations (VCSIS086)

Suggest improvements to the methods used to investigate a question or solve a problem (VCSIS087)

Communicating

Communicate ideas and processes using evidence to develop explanations of events and phenomena and to identify simple cause-and-effect relationships (VCSIS088)

Levels 5 and 6 Achievement Standard

By the end of Level 6, students explain how scientific knowledge is used in decision making and develops from many people's contributions. They discuss how scientific understandings, discoveries and inventions affect peoples' lives. They compare the properties and behaviours of solids, liquids and gases. They compare

Assessment

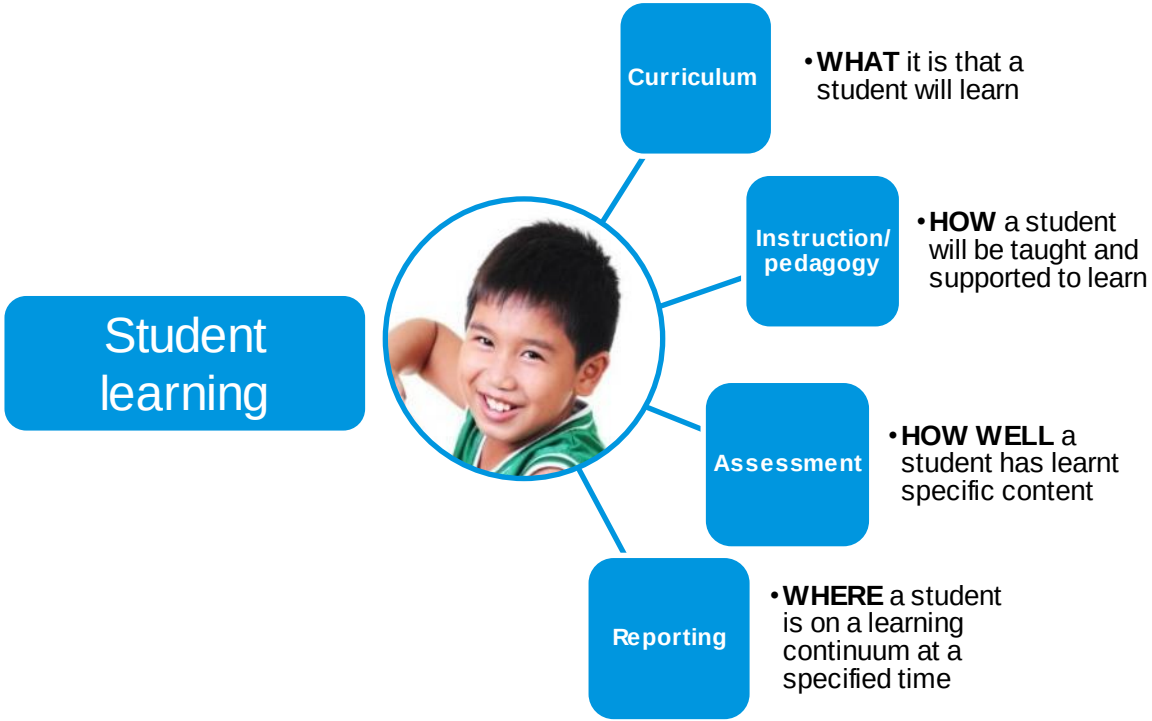
- Students are assessed against the achievement standards:
  - describe what students are typically able to understand and do, and are the basis for reporting student achievement

- Assessment is the measurement of how well a student has demonstrated the application of knowledge, skills and understandings set out in the achievement standards of a curriculum area.

Assessment

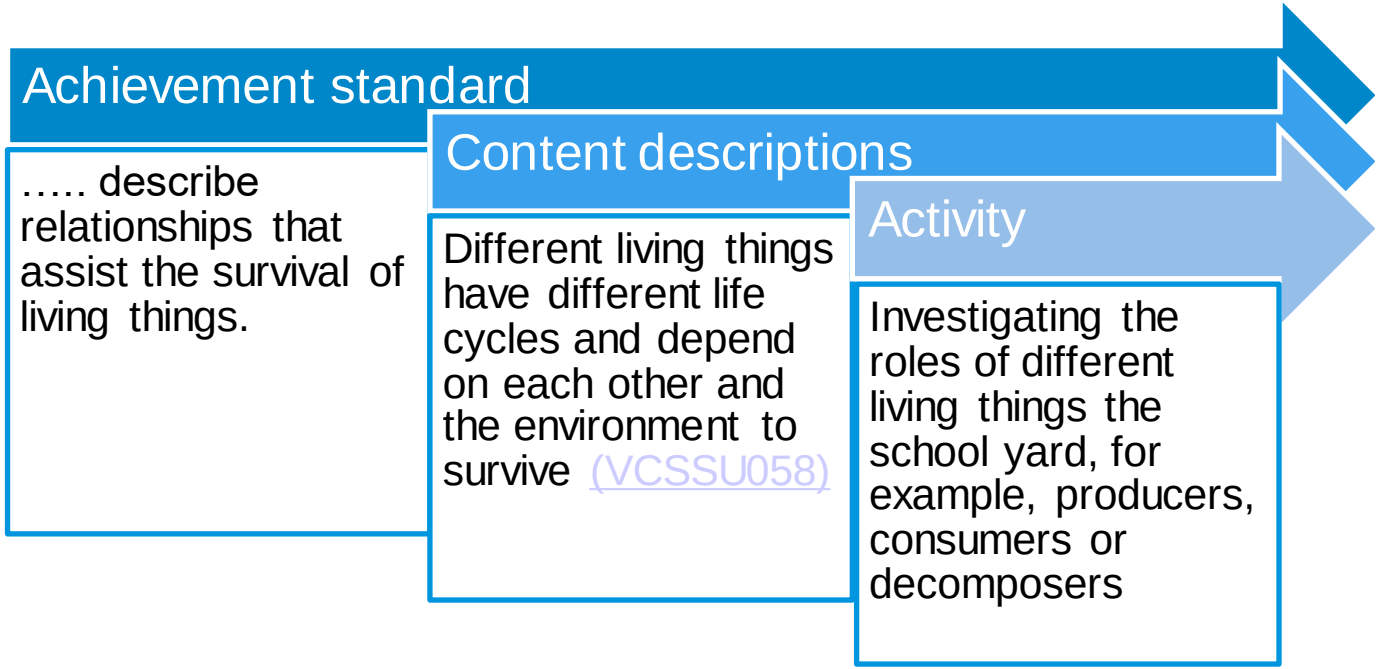
- is part of teaching and learning
- can improve student learning
- uses a range of methods
- aligns to curriculum outcomes and the teaching and learning
- is authentic (real world challenges)
- provides feedback to students

Assessment as part of the teaching and learning program



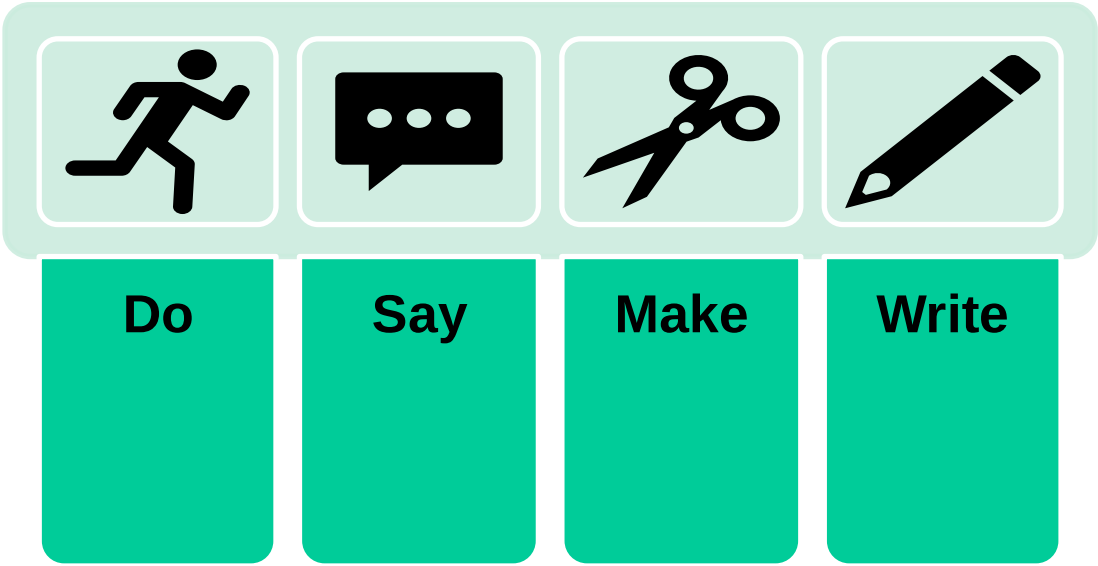
VCAA (2019), *Guide to Formative Assessment Rubrics*

Assessment – curriculum- pedagogy



Demonstrating achievement

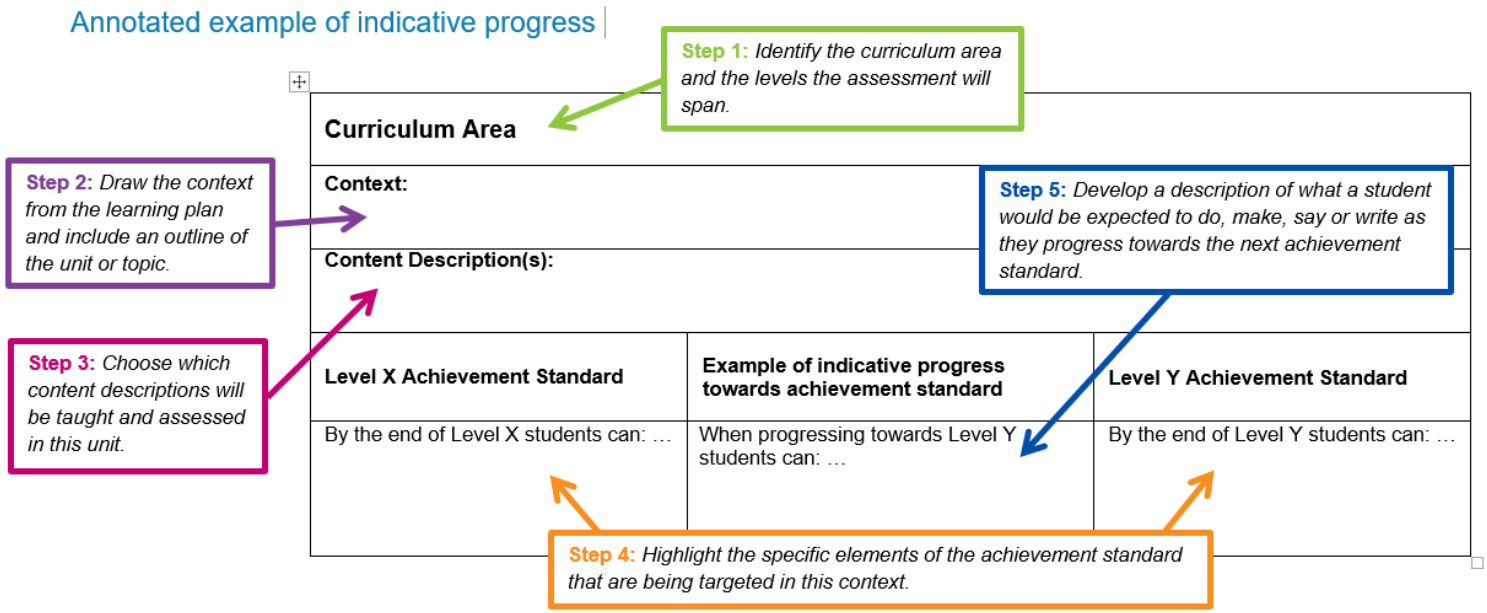
- What can the student…



Indicative progress

- articulates what student progress looks like *between* achievement standards
- assess and report the student's learning progress *when they are only partially through teaching the level* and e the student is still working towards the level achievement standard.

Indicative progress template



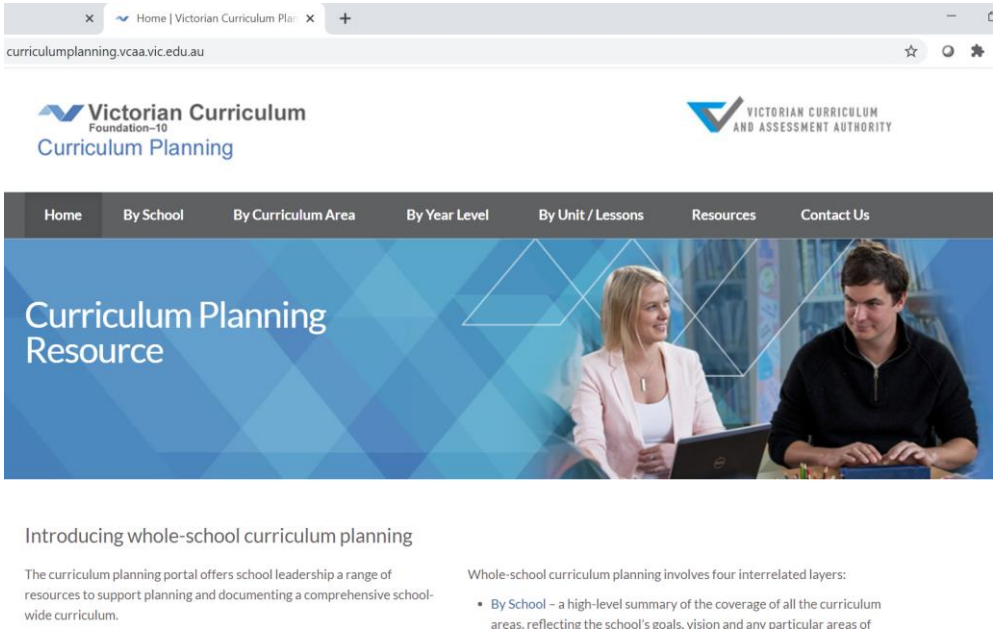
Learning activity:

Students use the story and illustrations in the book ‘Wilam: A Birrarung Story’ to examine the features and life cycles of Australian animals and how understanding our environment helps us understand the effects of our actions, including on the life cycle of the Imperial Blue butterfly

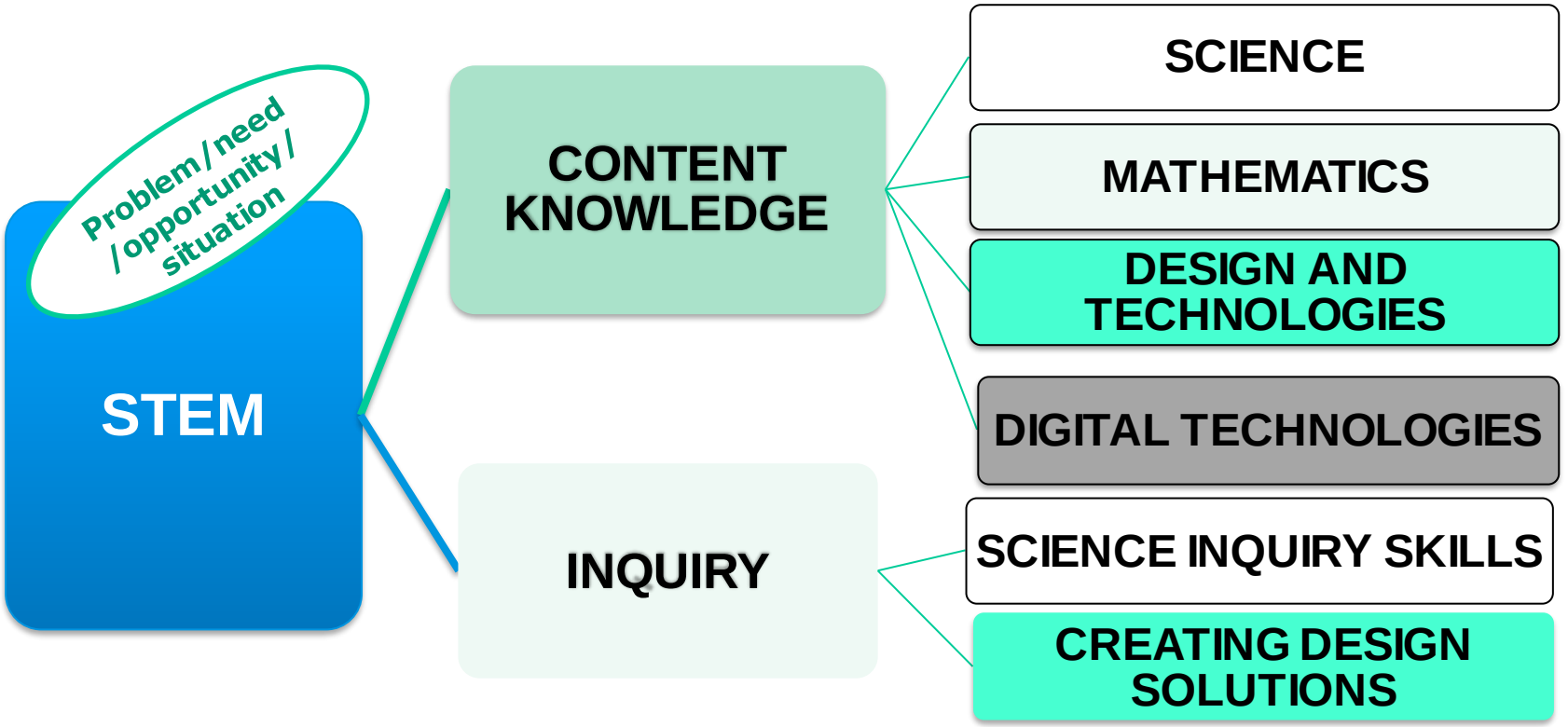
Achievement standard extract	By the end of Level 4…They group living things based on observable features and distinguish them from non-living things. They describe relationships that assist the survival of living things. They compare the key stages in the life cycle of a plant and an animal and relate life cycles to growth and survival.		
Evidence of learning	**Working Towards**	**At Level**	**Extending**
	Student responses might include: • explaining how the places that animals live in the book meet their needs. • describing the basic features of some of the animals in the book.	**Student responses might include:** • being able to categorise things as living (plants and animals) and non-living • comparing two similar living species (wedge-tail eagle and raven) and explaining how they are different to non-living things. • Giving a specific example from the book of a relationship between two living things that help them to survive. • drawing and labelling the life cycle of the Imperial blue butterfly. • explaining the role of acacia trees and ants in the life cycle of Imperial blue butterflies. • explaining the effect on the butterfly if either of these is removed or dies out. Students can link human actions to these effects.	**Student evidence might include:** • explaining how the structure and behaviour of the imperial blue butterfly helps it to survive. • Identifying how physical changes to the environment will affect the growth and survival of living things

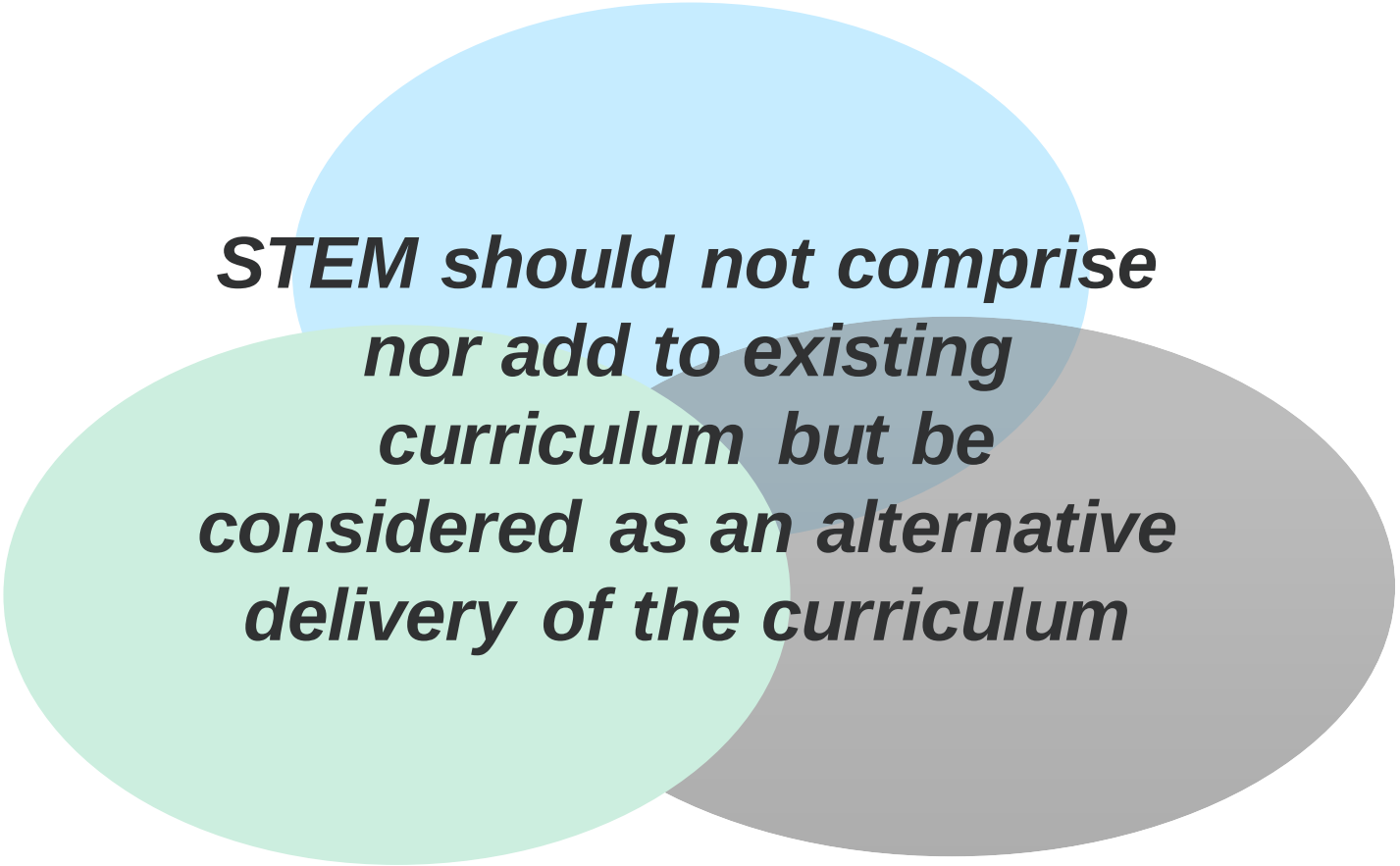
How can you link the curriculum to school planning and planning your classes?

Victorian Curriculum Planning Resource



STEM in the Victorian Curriculum F–10

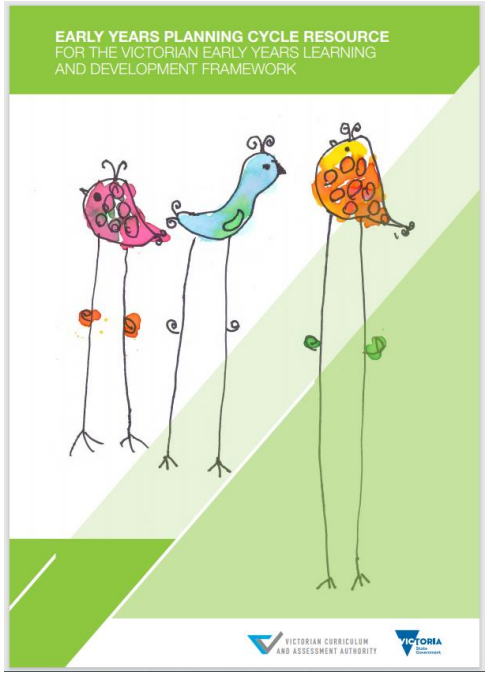




STEM Integration: Teacher Perceptions and Practice, Journal of Pre-College Engineering Education Research (J-PEER)

Early Years Planning Cycle Resource

- **This resource has been designed to:**
  - demonstrate how the Victorian Early Years Learning and Development Framework (VEYLDF) Early Years Planning Cycle can be applied to observe, assess and respond to evidence of children's learning
  - illustrate and provide a model for the teaching of specific concepts to children aged from birth to eight years within everyday learning environments.
- **supported by sample evidence markers that illustrate a continuum of learning from the VEYLDF evidence markers to the first three levels of the Victorian Curriculum F–10.**
- Early Years Planning Cycle Resource for the Victorian Early Years Learning and Development Framework (vcaa.vic.edu.au)



Making yoghurt

Collect information

During morning snack time, many of the learners were eating yoghurt. 'Yoghurt is good for you, because it's made out of milk,' said Grace, a Year 1 learner. 'That's true,' said the teacher. 'Do you know how yoghurt is made?' He addressed the question to the group. They all shook their heads. 'You don't make yoghurt, you buy it,' said Grace.

Question and analyse

Grace demonstrates knowledge of the different nutritional value of different foods, and provides sound scientific reasoning and evidence to back up her claim: 'Yoghurt is good for you because it's made of milk'.

Grace does not seem to know how yoghurt is made. Exploring where different foods come from can be a rich line of inquiry to follow.

VEYLDF Learning Evidence Marker

- Show an increasing awareness of healthy lifestyles and good nutrition.

Victorian Curriculum F–10

- Objects are made of materials that have observable properties (VCSSU044).
- Compare observations and predictions with those of others (VCSIS054).

Plan

Aims

For the learner to:

- assist as you follow a sequence of instructions to make yoghurt
- develop hypotheses about the outcomes of two temperature variables in an experiment and test the hypotheses.

VEYLDF Learning Evidence Marker

- Use reflective thinking to consider why things happen and what can be learnt from these experiences.
- Participate in a variety of rich and meaningful inquiry-based experiences.

Victorian Curriculum F–10

- Participate in guided investigations, including making observations using the senses, to explore and answer questions (VCSIS051).
- Respond to and pose questions, and make predictions about familiar objects and events (VCSIS050).
- Everyday materials can be physically changed or combined with other materials in a variety of ways for particular purposes (VCSSU045).
- Represent and communicate observations and ideas about changes in objects and events in a variety of ways (VCSIS055).

Present this lesson at the start of the day as the yoghurt needs at least five hours to set. Encourage the learners to assist you as much as possible.

Insulation experiment

Collect information

In the Early Years Planning Cycle Resource for 6–8 years – Learning: Making Yoghurt, the teacher asked why the warm yoghurt mixture needed to be wrapped in a towel. 'Because the towel is like a blanket that will help heat up the yoghurt, and we want to make this jar warm,' said William.

Question and analyse

William appears to have a misconception about the way that blankets/insulators work. Rather than understanding that the heat is already present in the jar and is being trapped by the towel, his answer shows that he thinks the towel is the source of the heat. This is a common misconception in young learners.

However, William shows good reasoning skills, and understands the experimental variable (temperature) that is being used for the yoghurt making experiment. He communicates his thinking clearly using appropriate language (heat, warmth).

VEYLDF Learning Evidence Marker

- Use reflective thinking to consider why things happen and what can be learnt from these experiences.

Victorian Curriculum F–10

- Respond to and pose questions, and make predictions about familiar objects and events (VCSIS050).

Plan

Aims

For the learner to:

- observe that some materials slow down temperature cooling and warming; others speed it up
- develop hypotheses and test the insulation properties of several materials.

VEYLDF Learning Evidence Marker

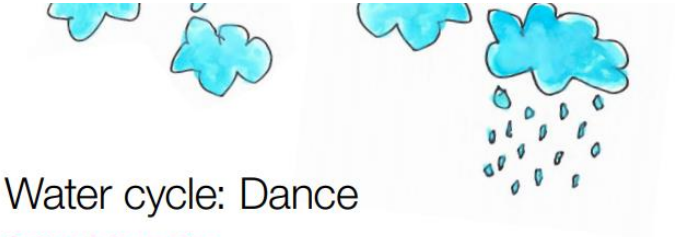
- Manipulate objects and experiment with cause and effect, trial and error, and motion.

Victorian Curriculum F–10

- Objects are made of materials that have observable properties (VCSSU044).
- Represent and communicate observations and ideas about changes in objects and events in a variety of ways (VCSIS055).

Explore the characteristics and properties of materials and components that are used to create designed solutions (VCDSTC017).

Learners often have misconceptions about heat as it is a complex concept. Presenting hands-on experiments about heat and energy transfer that the learners will remember are more appropriate than telling learners about it. Once they observed for themselves that different materials change the rate of heating and cooling in this experiment, they will be able to draw on this experience when thinking about how and why this happens.



Water cycle: Dance

Collect information

The learners were investigating how much water was wasted when a tap was left dripping. After collecting data, they gathered on the mat to share their information. The educator asked, 'What might happen if a tap is not turned off properly for a long time?' Mousa replied, 'If we don't turn the tap off properly, ocean water will be finished.' The educator asked, 'Is that where the water comes from?' Mousa said, 'Yes, there is so much water in the ocean.'

Question and analyse

Mousa seems to understand that the ocean is a water source. However, it is unclear whether Mousa is aware of the water cycle.

VEYLDF Learning Evidence Marker

- Explore their environment.

Plan

Aims

For the learner to:

- represent the main stages in the water cycle using body movements.

VEYLDF Learning Evidence Marker

- Make connections between experiences, concepts and processes.
- Transfer knowledge from one setting to another.

Victorian Curriculum F–10

- Use safe dance practice, fundamental locomotor and non-locomotor movements, body parts, bases and zones to explore, improvise and structure movement ideas for dance (VCADAE021).
- Use simple technical and expressive skills when presenting dance that communicates ideas about themselves and their world to an audience (VCADAP023).

As the water cycle describes the continuous movement of water on, above and below the surface of the Earth, it can be linked to the learners' sensory cognition. Their thinking and learning about the processes of evaporation, condensation and precipitation can occur in and through their bodily gestures.

In addition, creative movement activities provide learners with an opportunity to use problem-solving skills while matching their movements with the physical challenges asked of them. For instance, if learners are asked to move as if they were a cloud, they are first required to think about what a cloud is and how it moves and then to decide how they aim to imitate that movement using their bodies.

Materials

- A water cycle poster
- 'The Water Cycle' song by Mr Davies (see Resources p. 120)

Act and do

Show the water cycle poster to the learners. Point to each process in the cycle and, using open-ended questions, encourage the learners to talk about what they think is happening to the water shown on the poster. Then, ask the learners how they could represent each process in the water cycle through their body movements and gestures. Play 'The Water Cycle' song by Mr Davies.

Accompanied by the music, demonstrate movements and gesture. For example, act out the evaporation process by starting from a low level and rising slowly, while waving your hands. For condensation, ask the learners to show you how they make a big, heavy cloud with their bodies, and then to show you how it would move. This is also a great opportunity to introduce the learners to different types of clouds. For example, you could say, 'I am going to be a big cloud that looks like a cauliflower. Do you know its name? It's cumulus.' Assist the learners to create their own movements and use the relevant vocabulary.

After some practice, refer to the poster and encourage the learners to draw what they know about the water cycle. Explore their ideas while the learners create a visual artefact to represent the water cycle.

Vocabulary

water cycle, evaporation, condensation, precipitation, collection, vapour, gas

Reflect and review

Look back at the aims of this learning experience to guide your reflection and review.

- Were the learners able to match their body movements to each stage of the water cycle?
- Could the learners demonstrate their understanding of the water cycle by using the new words while creating relevant movements?
- How did using music and creating body movements and gestures affect the learners' understanding and learning about the water cycle?

How can you use the evidence you have collected to design a further plan to consolidate or extend this learning?

A new cycle begins

Identity

Experiences for Science and Maths

VEYLDF <- > Victorian Curriculum: Level F–2

Children feel safe, secure and supported

This is evident, for example, when children:	This develops, for example, when students:		
Use effective routines to help make predicted transitions smoothly	**Science** Observable changes occur in the sky and landscape; daily and seasonal changes affect everyday life (F–2) (VCSSU046)		
	Mathematics Compare and order the duration of events using the everyday language of time (F) (VCMMG079) Connect days of the week to familiar events and actions (F) (VCMMG080)	**Mathematics** Tell time to the half-hour (L1) (VCMMG096) Describe duration using months, weeks, days and hours (L1) (VCMMG097)	**Mathematics** Tell the time to the quarter-hour, using the language of 'past' and 'to' (L2) (VCMMG117) Name and order months and seasons (L2) (VCMMG118) Use a calendar to identify the date and determine the number of days in each month (L2) (VCMMG119)
Openly express their feelings and ideas in their interactions with others	**Science** Respond to and pose questions, and make predictions about familiar objects and events (F–2) (VCSIS050) Participate in guided investigations, including making observations using the senses, to explore and answer questions (F–2) (VCSIS051) Compare observations and predictions with those of others (F–2) (VCSIS054) Represent and communicate observations and ideas about changes in objects and events in a variety of ways (F–2) (VCSCIS055)		
Respond to ideas and suggestions from others	**Science** Respond to and pose questions, and make predictions about familiar objects and events (F–2) (VCSIS050)		
Initiate interactions and conversations with trusted educators	**Science** Represent and communicate observations and ideas about changes in objects and events in a variety of ways (F–2) (VCSIS055)		
Confidently explore and engage with social and physical environments through relationships and play	**Science** Participate in guided investigations, including making observations using the senses, to explore and answer questions (F–2) (VCSIS052)		

Making visible: Aboriginal Perspectives

- Partnering with key stakeholders, the VCAA ran in 2020 a series of webinars titled **'Making Visible: Aboriginal perspectives in the Victorian Curriculum F-6 Science'**
- **PowerPoints and recordings** of webinars are available **on the VCAA website**.

Pages - Past professional learning materials (vcaa.vic.edu.au)

Dja Dja Wurrung country

Koorie protocols – start local

Dja Dja Wurrung Clans Aboriginal Corporation website: https://www.djadjawurrung.com.au/

The two feuding volcanoes – Dja Dja Wurrung Creation Story:
https://cv.vic.gov.au/stories/aboriginal-culture/nyernila/dja-dja-wurrung-the-two-feuding-volcanoes/

Dja Dja Wurrung country

Four season of the European tradition do not adequate describe the climate and seasonal changes that happen in Victoria.

People of the Kulin Nations describe seven seasons while the Gariwerd (Grampians) Calendar describe six seasons.

Koorie Seasons & Astral Calendars: http://www.vaeai.org.au/wp-content/uploads/delightful-downloads/2019/06/Koorie-Seasons-and-astral-calendars_final.pdf

Dja Dja Wurrung country

Dja Dja Wurrung Aboriginal waterways assessment

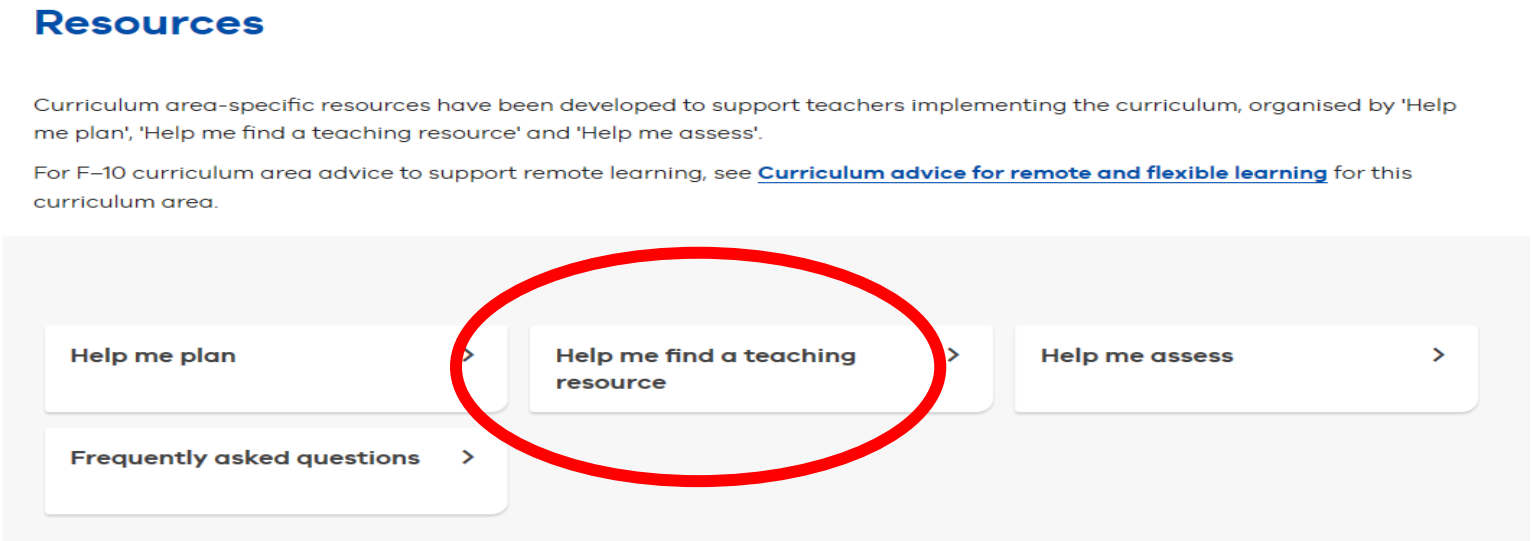
https://www.water.vic.gov.au/aboriginal-values/the-aboriginal-water-program/dja-dja-wurrung-aboriginal-waterways-assessment-coliban-river

Myrnong Daisy

https://www.anbg.gov.au/aborig.s.e.aust/roots.bulbs.html

F-10 Sciences Resources

- **NEW F-6 Science resources** will be available **from Term 3, 2021**



https://vcaa.vic.edu.au/curriculum/foundation-10/resources/science/Pages/default.aspx

Contacts

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For further advice about the implementation of the F–10 curriculum in Victorian schools, including developments, resources and professional learning opportunities, please subscribe to the F–10 Curriculum Update:
https://www.vision6.com.au/em/forms/subscribe.php?db=399327&s=112201&a=18689&k=799b5d6

Also the VCAA Bulletin: http://www.vcaa.vic.edu.au/Pages/correspondence/bulletins/bulletinonlinesubscribe.aspx