VCE Environmental Science

Implementation of VCE Study Design 2022-2026

Unit 3 and Unit 4 knowledge, skills and assessment

VICTORIAN CURRICULUM AND ASSESSMENT AUTHORITY

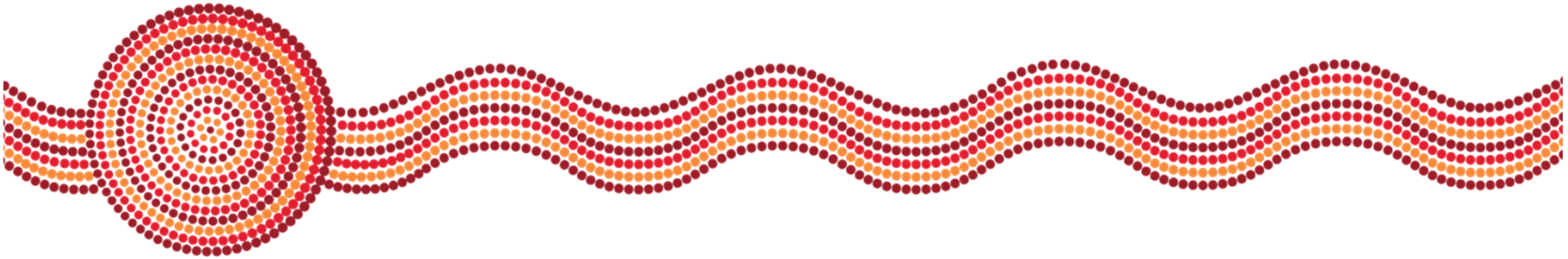
VICTORIA State Government

Acknowledgment of Country

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

For myself, located at Fairhaven, I acknowledge the Eastern Maar Peoples as the traditional custodians of the land.

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.



Purpose

- **Support VCE Unit 3 and 4 teachers in delivering the newly accredited Environmental Science Study Design 2022-2026**
  - Consider how key science skills, scientific methodologies and practical work link to key knowledge
  - outline content for Units 3 and 4
  - discuss how assessment tasks for Units 3 and 4 can be developed to align with VCE assessment principles

Units 3 and 4 Structure

Unit titles	Area of Study titles
Unit 3: How can biodiversity and development be sustained?	**Area of Study 1:** Why is maintaining biodiversity worth a sustained effort? **Area of Study 2:** When is development sustainable?
Unit 4: How can climate change and the impacts of human energy use be managed?	**Area of Study 1:** How can we respond to climate change? **Area of Study 2:** What might be a more sustainable mix of energy sources? **Area of Study 3:** How is scientific inquiry used to investigate contemporary environmental challenges? (relates to content in Unit 3 and/or Unit 4)

Developing a Unit 3 and 4 curriculum and assessment program

- **Each school is different:**
  - different contexts in which students operate
  - different circumstances in which schools are situated
- **Students will have different:**
  - strengths and talents
  - available resources
- **Schools have flexibility in:**
  - designing curriculum programs that meet the needs of their cohort and the context in which they are learning
  - developing assessment programs that are aligned to the *VCE Environmental Science Study Design* and comply with VCE assessment principles.

Planning template

Provide details of the outcome, time period (Term/Week–Term/Week), key knowledge and key science skills *(from the study design)*		List and describe the learning activities that will be used to provide appropriate opportunity for students to demonstrate satisfactory achievement of the outcome (this includes practical activities, demonstrations and excursions/field work)	List and describe the assessment tasks that will be used to assess students level of achievement. Include an estimate of when each task will occur
Unit 1, Outcome 1: <insert outcome statement – see page 14 of VCE study design>			
Anticipated teaching time allocation: <insert as appropriate; e.g. Term 1 Week 1 – Term 1 Week 6>			
Key knowledge:	**Env. Science Units 1–4 Key science skills:**	<Consider a range of resources when developing appropriate learning activities; e.g. VCE Advice for Teachers located on the VCAA website: www.vcaa.vic.edu.au/curriculum/vce/vce-study-designs/environmentalscience/advice-for-teachers/Pages/Index.aspx – ensure that any activities directly sourced from a public resource are contextualised to your school/provider's approach>	<Select and describe as appropriate. See page 17 of the VCE study design. Include an estimate of when the task will occur>
• <Select as appropriate. See pages 14–15 of VCE study design>	• <Select as appropriate. See pages 11–12 of VCE study design>		

Whilst designed specifically for schools seeking to deliver a VCE study for the first time, the VCE Curriculum and Assessment Plans are a useful tool for all teachers in planning assessment.

Key Science Skills
(pp 7-9 of the study design)

VCE Enviro Study Design 2022–2026
Develop aim and questions, formulate hypotheses and make predictions
Plan and conduct investigations
Comply with safety and ethical guidelines
Generate, collate and record data
Analyse and evaluate data and investigation methods
Construct evidence-based arguments and draw conclusions
Analyse, evaluate and communicate scientific ideas

Explicit integration of key knowledge and key science skills

Key science skills:

- **are not an 'add on' to the key knowledge**
- **may be explicit in key knowledge, or may be implicit, allowing flexibility for teachers to choose when/how to include in teaching and learning programs**

Key science skill	Key knowledge examples of the inclusion of key science skills
• analyse and evaluate environmental science scenarios, case studies, issues and challenges using the sustainability principles of conservation of biodiversity and ecological integrity, efficiency of resource use, intergenerational equity, intragenerational equity, precautionary principle, and user pays principle	***Unit 3 Area of Study 1*** • sustainability principles as they apply to biodiversity conservation: conservation of biodiversity and ecological integrity; efficiency of resource use; intergenerational equity; intragenerational equity; precautionary principle; and user pays principle ***Unit 4 Area of Study 2*** • sustainability principles as they apply to accessing, extracting, processing, transporting, and using energy resources: conservation of biodiversity and ecological integrity; efficiency of resource use; intergenerational equity; intragenerational equity; precautionary principle; and user pays principle

Integration of key knowledge and key science skills

Teachers have the flexibility to apply the key skills to key knowledge in relevant contexts.

Key science skill	Key knowledge examples of the inclusion of key science skills
• Use appropriate environmental science terminology, representations and conventions, including standard abbreviations, graphing conventions and units of measurement	***Unit 3 Area of Study 1*** • Representations of: population changes in threatened plants and/or animals • Use past examinations, media or online reports for data sources
	Unit 3 Area of Study 2 • Representations of: environmental change over time; before/after data • Use past examinations, media or online reports for data sources
	Unit 4 Area of Study 1 • Representations of: changed atmospheric conditions over time • Use past examinations, media, online reports, or the AR6 report for data sources
	Unit 4 Area of Study 2 • Representations of: current energy use; changed energy use over time • Use past examinations, media or online reports for data sources

Scientific methodologies

Methodology	Example
Case study	https://envirobites.org/2021/03/09/increasing-temperatures-and-decreasing-insect-populations/
Classification and identification	Use classification keys to identify % invasive/ non-invasive plant species in selected locations
Controlled experiment	How is colour associated with capacity to absorb heat?
Correlational study	Is the presence of migratory birds in a wetland related to species diversity?
Fieldwork	Does biodiversity increase with distance from a road?
Literature review	Research artificial processes for carbon sequestration
Modelling	Model the sea level rise due to melting of polar caps
Product, process or system development	Devise a sustainability scale for school use

Practical work

- Central component of learning and assessment
- Includes activities related to the 8 scientific investigation methodologies, for example, work undertaken on a field trip
- Simulations, remote experiments and virtual experiments may be used as the basis for practical work
- A minimum of 10 hours of class time should be devoted to student practical activities and scientific investigations across Areas of Study 1 and 2 for each of Units 3 and 4
- A minimum of 10 hours should be devoted to the student-designed investigation in Unit 4, Area of Study 3
- The support resources on the website provide suggestions for practical work

Fieldwork

A variety of techniques may be used for fieldwork, as decided by schools:

Technique	Examples
Counting	Unit 3: counts of flora or fauna Unit 4: energy use surveys such as number of solar panels per household
Measuring	Unit 3: height of beach sediment on either side of groynes placed as a management strategy to minimise beach erosion Unit 4: ocean temperature monitoring
Environmental quality surveying	Unit 3: use of bipolar scales, e.g., aesthetic values provided by a specified environment Unit 4: use of sliding scales, e.g., greenhouse gas emissions per capita (tonnes CO_2-eq per capita, from 0 to 25+)
Sketching and photography	Unit 3: Use of 'before' and 'after' photographs at the same location to show the effects of an environmental management strategy Unit 4: qualitative comparison of the extent of retreat of coastlines over time
Questionnaires and interviews	Unit 3: Stakeholder opinions about a proposed development Unit 4: Stakeholder opinions about whether to introduce a carbon tax

Unit 3 Area of Study 1 outcome

(pp 30-32 of the study design)

- On completion of this unit the student should be able to explain the importance of Earth's biodiversity and how it has changed over time, analyse the threats to biodiversity, and evaluate management strategies to maintain biodiversity in the context of one selected threatened endemic species.

Unit 3 Area of study 1: Why is maintaining biodiversity worth a sustained effort?

Both of these animals are endangered – which would you rather save?

A purple pig-nosed frog

A giant panda

Unit 3 Area of Study 1 key knowledge:

Why is maintaining biodiversity worth a sustained effort?

- **Importance of biodiversity:** biodiversity categories; genetic diversity importance; ecosystems as a source of renewable services
- **Biodiversity changes over time:** evidence of variation and extent of biodiversity; natural changes over time; species endemism; diversity hotspots; rate of extinction
- **Assessing changes in species diversity:** practical techniques; Simpson's index of diversity; conservation categories and assessment
- **Threats to biodiversity:** human and non-human threats
- **Protection and restoration of biodiversity:** strategies of maintaining and growing populations that also build species resilience; renewing and regenerating degraded ecosystems; regulatory frameworks

Examples of threatened endemic species

- **Ideally, select species with an associated management strategy**
- **A range of species may be investigated:**
  - the Eastern Barred Bandicoot
  - the Helmeted Honeyeater
  - the Regent Honeyeater
  - the Pink-tailed Worm-lizard
- **Comparisons between threatened plant and animal species may be considered:** Leadbeater's Possum compared with the Basalt Greenhood
- **Students may all investigate the same species, or choice could be offered by providing a set of scaffolded questions to which students respond.**
- **Different species may be used to investigate different biodiversity threats**

Unit 3 Area of Study 2 outcome:
(pp 32-34 of the study design)

- **On completion of this unit the student should be able to explain how sustainability principles relate to environmental management, analyse how stakeholder perspectives can influence environmental decision-making, and evaluate the effectiveness of environmental management strategies in a selected case study.**

What is happening around you?

Local and national media reports are good sources of stimulus material in which to consider environmental management

Unit 3 Area of Study 2 key knowledge:
When is development sustainable?

- **Case study overview:** aim and strategies for addressing challenges
- **Sustainability principles:** distinction between sustainability and sustainable development; sustainability principles; challenges to upholding sustainability principles
- **Environmental decision-making and management:** circular economy thinking and tools for integrated sustainability assessment; responsible decision-making

Environmental management projects

- **The study design provides general examples of possible management projects and case studies (pages 32 - 33)**
- **Other examples of case studies:**
  - Barwon Water Black Rock Water Reclamation Plant
  - Budj Bim Master Plan https://www.budjbim.com.au/about-us/master-plan/
  - City of Bendigo Urban Stormwater Management Plan
  - Organ Pipes National Park
  - Ravenswood Interchange Development
  - Western Treatment Plant
  - Wonga Wetlands

Sustainability

(pp 16-18 of the study design)

- **Sustainability principles:** conservation of biodiversity and ecological integrity; efficiency of resource use; intergenerational equity; intragenerational equity; precautionary principle; user pays principle
- **Sustainable development:** meets present needs without compromising future generations' needs; ecological, socio-cultural and economic 'pillars'
- **Systems thinking:** Earth systems thinking; circular economy thinking
- **Stakeholders and decision-making:** individuals, groups or organisations with knowledge and values that affect decision-making
- **Value systems:** anthropocentrism; biocentrism; ecocentrism; technocentrism

Unit 4 Area of Study 1 outcome

(pp 36-38 of the study design)

- **On completion of this unit the student should be able to analyse the major factors that affect Earth's climate, explain how past and future climate variability can be measured and modelled, and evaluate options for managing climate change.**

Unit 4 Area of Study 1: How can we respond to climate change?

Which nations contribute most to climate change?

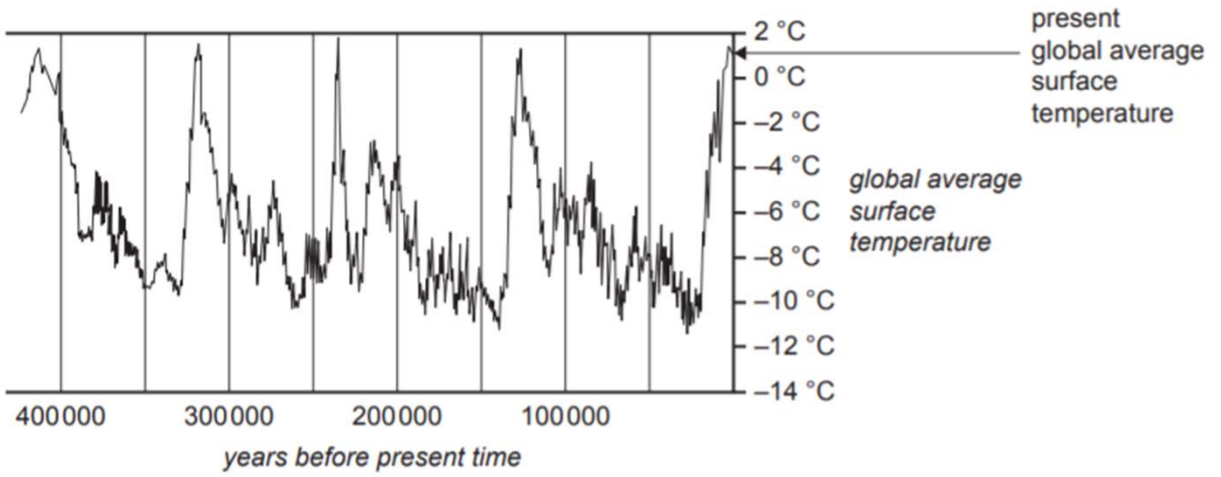
Data extracts from Netherlands Environment Agency, 2011; World Resources Institute

Rank	Fossil fuel and cement CO_2 emissions	All greenhouse gas emissions	Emissions per capita	Historical emissions	Historical emissions per capita
1	China	China	Qatar	USA	Luxembourg
2	USA	USA	USA	China	UK
3	India	Brazil	Australia	Russia	USA
4	Russia	Indonesia	Russia	Germany	Belgium
5	Japan	Russia	Germany	UK	Czech Republic
6	Germany	India	UK	Japan	Germany
7	South Korea	Japan	China	France	Estonia
8	Canada	Germany	World average	India	Canada
9	Indonesia	Canada	India	Canada	Kazakhstan
10	Saudi Arabia	Mexico	Africa average	Ukraine	Russia

Unit 4 Area of Study 1: How can we respond to climate change?
Data analysis

Key science skills (on pp 7-9 of the study design) should be incorporated into the teaching of key knowledge.

The graph below shows approximate global average surface temperature versus years before present time.



Data: adapted from Climate Data Information, <www.climatedata.info/proxies/ice-cores>

Key science skill: process and analyse data to identify cause-and-effect relationships, and linear, non-linear or cyclic patterns

Graph was accessed from the 2020 VCE Environmental Science examination

Unit 4 Area of Study 1 key knowledge:

How can we respond to climate change?

- **Major factors that affect Earth's climate:** natural phenomena and anthropogenic factors; interactions between solar energy and Earth; carbon sequestration
- **Understanding climate change:** natural and enhanced greenhouse effects; altered greenhouse gas concentrations over time; climate data; climate change projections
- **Managing climate change:** risks and opportunities at a selected location; mitigation options; adaptation options; responsible decision-making in managing climate change

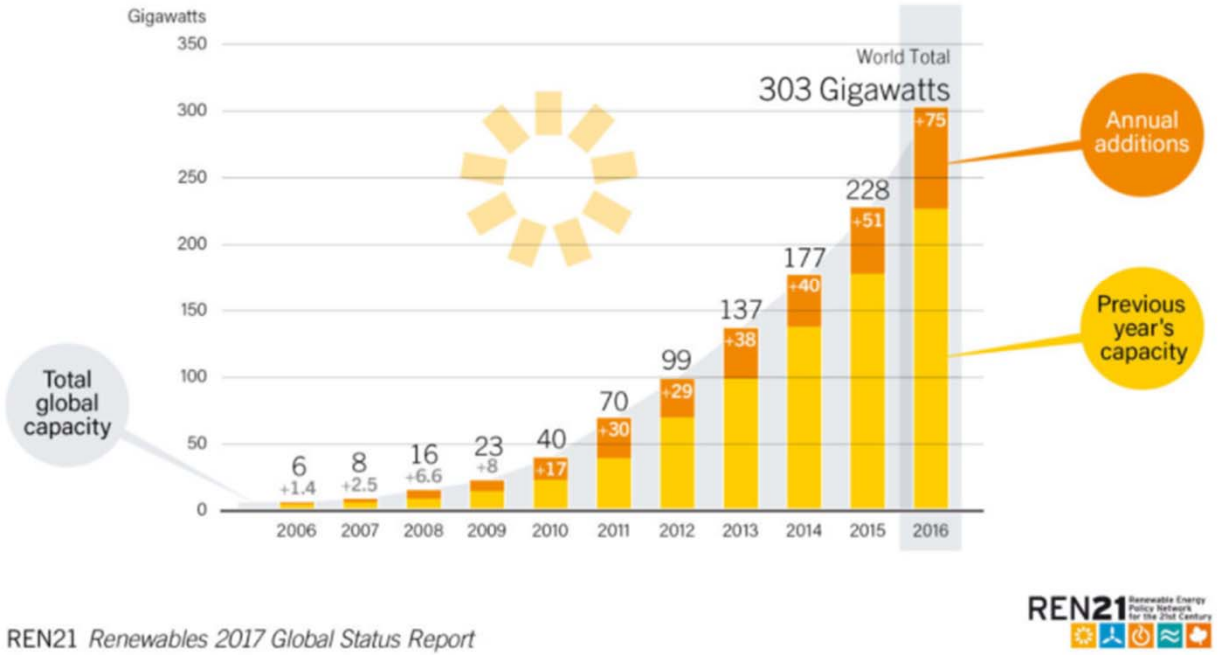
Unit 4 Area of Study 2 outcome:
(pp 38-39 of the study design)

- **On completion of this unit the student should be able to compare the advantages and disadvantages of using a range of energy sources, and evaluate the suitability and impacts of their use in terms of upholding sustainability principles.**

Data

Access various sources of data to develop key science skills related to data evaluation (page 8) in the context of options for building a sustainable energy future

Solar PV Global Capacity and Annual Additions, 2006-2016



Above: Growth in global rooftop solar capacity from 2005 to 2016. **Source**: REN21

“Renewable energy is a clear winner when it comes to boosting the economy and creating jobs”

Tom Steyer

Use and compare quotes to explore student knowledge and key science skills

- Relates to renewable and non-renewable energy sources (p 38)
- Is this an opinion, anecdote, or evidence? (p 8)
- Is it a scientific or non-scientific idea? (p 8)

Unit 4 Area of Study 2 key knowledge:

What might be a more sustainable mix of energy sources?

- **Comparison of different energy sources:** non-renewable and renewable energy sources; consequences of fossil fuel combustion for the carbon cycle; changes in fossil fuel usage over time; energy efficiency calculations; 1st and 2nd laws of thermodynamics in making energy choices; sustainability
- **Managing the impacts of human energy use:** rehabilitation of sites form which energy has been sourced; extent to which different energy sources can supply current and projected needs; options for, and responsible decision-making around, building a sustainable energy future

Unit 4 Area of Study 3 outcome

(pp 39-40 of the study design)

- **On completion of this unit the student should be able to design and conduct a scientific investigation related to biodiversity, environmental management, climate change and/or energy use, and present an aim, methodology and method, results, discussion and a conclusion in a scientific poster.**

Unit 4 Area of Study 3 key knowledge:

How is scientific inquiry used to investigate contemporary environmental challenges?

Relates to content in either Unit 3 and/or Unit 4

- **Investigation design:** relevant scientific concepts; methodology and method; primary data; measurement terms
- **Scientific evidence:** organising, analysing and evaluating primary data to establish patterns and relationships; logbook entries; assumptions and limitations of investigation
- **Science communication:** scientific terminology and representations; poster presentation; key findings

Unit 4 Area of Study 3 investigation examples

Unit/ A of S	Investigation questions, and identified methodologies
Unit 3 AoS1	**Correlational study**: Is the presence of migratory birds in a wetland environment related to species diversity? **Product, process or system development**: How is bait type related the effectiveness of insect traps, and what are the implications for biodiversity audits? **Fieldwork**: Is biodiversity greater at the Portsea or Mornington piers? (associated with students learning to snorkel count)
Unit 3 AoS2	**Fieldwork**: Seahorses and blue gropers are protected in Victoria: are the management strategies for these species working?
Unit 4 AoS1	**Controlled experiment**: How does the concentration of acid (simulating acid rain) affect the germination of radish seeds?
Unit 4 AoS2	**Fieldwork**: How does the percentage of cloud cover affect the efficiency of electricity generation by a photovoltaic system?

Units 3 and 4 external and internal assessment

Type of assessment	Assessment component	Contribution to a study score
Satisfactory completion of Units	School determines S or N for each Unit	Not applicable
Levels of achievement Scored assessment (study score)	School-assessed Coursework (SACs) – moderated against the external examination	50% • 20% Unit 3 • 30% Unit 4
	External examination	50%

VCE assessment principles

The VCE Assessment Principles state that assessment will be:

- ***valid and reasonable -*** **should not assess learning that is outside the scope of a study design**
- ***equitable -*** **should neither privilege nor disadvantage certain groups of students**
- ***balanced -*** **a variety of task types should be used**
- ***efficient -*** ***only need to assess enough to rank students.***

TEACHERS DISCUSS SCHOOL-BASED ASSESSMENT

The VCAA has produced a series of short videos to help teachers use the VCE Assessment Principles when developing School-based Assessment.

- ***School-based Assessment – Valid and reasonable***
- ***School-based Assessment – Equitable***
- ***School-based Assessment – Balanced***
- ***School-based Assessment – Efficient***
- ***School-based Assessment – Authentic and moderated***
- ***School-based Assessment – Tips***

https://www.vcaa.vic.edu.au/assessment/vce-assessment/School-basedAssessment/Pages/School-based-Assessment-Teacher-videos.aspx

Assessment validity:
how much of an Outcome should be assessed?

VCE Environmental Science Unit 3 Outcome 1

Explain the importance of Earth's biodiversity, analyse the threats to biodiversity, and evaluate management strategies to maintain biodiversity in the context of one selected threatened endemic species

Notes:

- All of the Outcome should be assessed to determine an 'S' or an 'N', noting the 'level' of command terms
- Not all of an Outcome is required to be assessed in a SAC task

Overview of assessment for Units 3 and 4

Unit & Outcome (% study score)	Elements of the achievement standards	Assessment task type (pp 35 and 41)
Unit 3 Outcome 1 (12%)	Change in biodiversity over time; biodiversity threats; threatened species	• Evidence-based decision making using primary data • Response to an issue or challenge • Sustainability principles and stakeholder perspectives • Earth systems thinking
Unit 3 Outcome 2 (8%)	Environmental management; stakeholder perspectives; case study	
Unit 4 Outcome 1 (10%)	Factors affecting Earth's climate; measuring climate variability; evaluation of climate management options	
Unit 4 Outcome 2 (10%)	Comparison of energy sources; evaluation of energy sources in terms of sustainability	
Unit 4 Outcome 3 (10%)	Student-designed investigation related to content in Units 3 and/or Unit 4	Scientific poster and logbook

Assessment: Which task for Unit 3 Outcome 1?

Assessment task type	Unit 3 Area of Study 1 task example (select one)
Presentation of recommendations using evidence-based decision-making, including analysis and evaluation of generated primary data	**Field trip** – Eastern Barred Bandicoot data in logbook. Overarching question, e.g. Should fences continue to be built? Set up a set of structured questions to analyse and evaluate data and make recommendations
Designed or practical response to a real or theoretical environmental issue or challenge	**Utah wildlife footbridge**: evaluation of the building and use of a footbridge over a 6-lane highway ,and student proposal for local application: https://edition.cnn.com/2020/11/26/us/utah-wildlife-bridge-trnd/index.html
Analysis and evaluation of a case study, secondary data or a media article, with reference to sustainability principles and stakeholder perspectives	**National Recovery Plan** for the Orange-bellied Parrot – selected extract: section/ information https://www.awe.gov.au/sites/default/files/documents/national-recovery-plan-orange-bellied-parrot.pdf Students given PowerPoint slides to analyse principles & perspectives
Application of Earth systems thinking in the evaluation of responses to an environmental scenario, issue, challenge, or case study	**Case study**: https://www.worldwildlife.org/species/tiger: How will different strategies impact on the atmosphere/ biosphere/hydrosphere/ lithosphere; may use a single item or multiple sources to evaluate at least two spheres per item

Sample assessment program for Units 3 and 4

Assessment task type	Example of a teacher's assessment plan
Presentation of recommendations using evidence-based decision-making, including analysis and evaluation of generated primary data	**Unit 3 Area of Study 2: Field trip** – impacts of a changed farming practice on farm productivity and biodiversity – includes comparison of primary data with historical/secondary data
Designed or practical response to a real or theoretical environmental issue or challenge	**Unit 3 Area of Study 1: Evaluation of an environmental issue:** Barcelona trees tempering the Mediterranean city climate (Spain) – analysis in terms of sustainability principles and applications to own town
Analysis and evaluation of a case study, secondary data or a media article, with reference to sustainability principles and stakeholder perspectives	**Unit 3 Area of Study 1: National Recovery Plan** for the Orange-bellied Parrot –Students given PowerPoint slides as scaffolding to analyse principles & perspectives
Application of Earth systems thinking in the evaluation of responses to an environmental scenario, issue, challenge, or case study	**Unit 4 Area of Study 2: Energy options scenario**– explanations of how Earth's four systems are affected in the transition from the use of coal-fired power stations to wind farms as source of power supply – comparison table
Student-designed practical investigation	Negotiation with students

Revised Units 3 & 4 School-based Assessment tasks

SAC task type	Employability skills	Relevant Key Science Skills
Presentation of recommendations using evidence-based decision-making, including analysis and evaluation of generated primary data	• Initiative and enterprise • Planning and organising • Technology • Communication	• Analyse and evaluate data and investigation methods • Construct evidence-based arguments and draw conclusions • Analyse, evaluate and communicate scientific ideas

Revised Units 3 & 4 School-based Assessment tasks

SAC task type	Employability skills	Relevant Key Science Skills
Designed or practical response to a real or theoretical environmental issue or challenge	• Planning and organising • Problem solving • Initiative and enterprise • Self-management • Communication	• Plan and conduct investigations • Comply with safety and ethical guidelines • Generate, collate and record data • Analyse and evaluate data and investigation methods • Construct evidence-based arguments and draw conclusions

Revised Units 3 & 4 School-based Assessment tasks

SAC task type	Employability skills	Relevant Key Science Skills
Analysis and evaluation of a case study, secondary data or a media article, with reference to sustainability principles and stakeholder perspectives	• Planning and organising • Problem solving • Technology • Communication	• Develop aims and questions, formulate hypotheses and make predictions • Plan and conduct investigations • Generate, collate and record data • Analyse and evaluate data and investigation methods • Construct evidence-based arguments and draw conclusions • Analyse and evaluate and communicate scientific ideas

Revised Units 3 & 4 School-based Assessment tasks

SAC task type	Employability skills	Relevant Key Science Skills
Application of Earth systems thinking in the evaluation of responses to an environmental scenario, issue, challenge, or case study	• Planning and organising • Problem solving • Communication	• Construct evidence-based arguments and draw conclusions • Analyse, evaluate and communicate scientific ideas

Revised Units 3 & 4 School-based Assessment tasks

Unit 4 AoS3 SAC task type	Employability skills	Relevant Key Science Skills
Design and conduct a scientific investigation related to biodiversity, environmental management, climate change and/or energy use, and present an aim, method, results, discussion and a conclusion in a scientific poster	• Planning and organising • Self-management • Initiative and enterprise • Problem solving • Communication • Learning • Technology	• Develop aims and questions, formulate hypotheses and make predictions • Plan and conduct investigations • Comply with safety and ethical guidelines • Generate, collate and record data • Analyse and evaluate data and investigation methods • Construct evidence-based arguments and draw conclusions • Analyse and evaluate and communicate scientific ideas

New Unit 4 Outcome 3 Scientific poster format

Maximum: 600 words. ***Refer to the template on page 11 of the study design***
20 – 25% of space allocated to communicating main finding

<table>
<tr><td colspan="3">Title as an investigation question
Student name</td></tr>
<tr><td>Introduction

Methodology and methods

Results</td><td>Communication statement reporting the key finding of the investigation in response to the investigation question as a one-sentence summary</td><td>Discussion

Conclusion</td></tr>
<tr><td colspan="3">References and acknowledgments</td></tr>
</table>

VCE Environmental Science scientific poster example:
fieldwork methodology in Unit 3 Outcome 1

Does the presence of migratory birds indicate greater biodiversity? Stu Dent		
Introduction Methodology and methods Results	The presence of a migratory bird species in a wetland environment does not necessarily indicate a higher level of biodiversity	Discussion Conclusion
References and acknowledgments		

VCE Environmental Science scientific poster example:
correlational study methodology in Unit 3 Outcome 1

How does the presence of Noisy Minors affect other bird populations? Stu Dent		
Introduction Methodology and methods Results	As the abundance of Noisy Miners (*Manorina melanocephala*) *increases*, species diversity of other bird species *decreases*	Discussion Conclusion
References and acknowledgments		

VCE Environmental Science scientific poster example:
fieldwork methodology in Unit 3 Outcome 1 (citizen science)

Are there more birds in the Murray Sunset National Park than in the remnant bird population on the outskirts of town? Stu Dent		
Introduction Methodology and methods Results	The bird population of the Murray Sunset National Park shows greater species diversity but lesser species richness when compared with the remnant bird population on the outskirts of town	Discussion Conclusion
References and acknowledgments		

VCE Environmental Science scientific poster example:
correlational study methodology in Unit 3 AoS1 (citizen science)

Are conservation efforts to save the Grey-headed Flying-fox working? Stu Dent		
Introduction Methodology and methods Results	Conservation efforts to protect the Grey-headed Flying-fox appear to be working since populations have increased over time, both seasonally and overall	Discussion Conclusion
References and acknowledgments		

VCE Environmental Science scientific poster example:
fieldwork methodology in Unit 3 Outcome 2

Have revegetation efforts at the Yan-Yan-Gurt West farm been successful? Stu Dent		
Introduction Methodology and methods Results	Revegetation efforts in Yan-Yan-Gurt West have been successful based on biodiversity assessments of the revegetated and non-revegetated dams	Discussion Conclusion
References and acknowledgments		

VCE Environmental Science scientific poster example:
modelling methodology in Unit 4 Area of Study 1

How does ocean salinity affect the rate at which icebergs melt? Stu Dent		
Introduction Methodology and methods Results	Increased salinity levels decrease the rate at which icebergs melt	Discussion Conclusion
References and acknowledgments		

VCE Environmental Science scientific poster example:
controlled experiment methodology in Unit 4 Area of Study 2

Can the albedo effect be demonstrated in the ability of different colours to differentially absorb solar energy? **Stu Dent**		
Introduction Methodology and methods Results	Black surfaces absorb more heat than brown or white surfaces, having implications for choice of colour for road surfaces and adaptation strategies in response to climate change	Discussion Conclusion
References and acknowledgments		

VCE Environmental Science scientific poster example:
modelling methodology in Unit 4 Area of Study 2

Does increasing the number of blades on a wind turbine generate more power? Stu Dent		
Introduction Methodology and methods Results	Increasing the number of blades on a wind turbine to 6 increases the generated power, but more than six blades decreases power	Discussion Conclusion
References and acknowledgments		

Contact

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