

# VCE Psychology

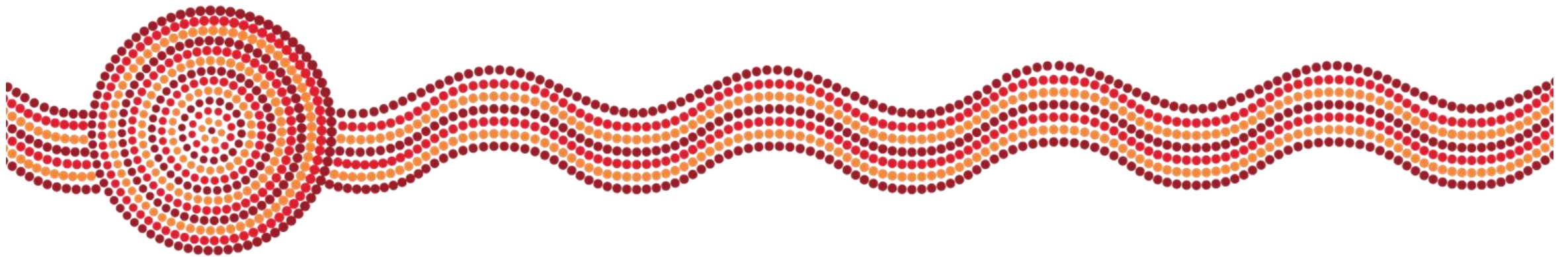
Implementation of VCE Study Design for 2023  
Introduction and overview of Unit 4

2022

# 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. For myself, I acknowledge the Dja Dja Wurrung as the traditional custodians of the land from which I am presenting today.*

*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.*



# Creating a culturally safe classroom

- **Approach with an openness and willingness to listen and keep learning**
- **Acknowledge that some topics consider knowledge from a different world view and way of knowing**
- **Set the ground rules for respectful discussions at all times**
- **Be careful not to fall into stereotypes and/or ‘othering’.**

# PROTOCOLS

FOR KOORIE EDUCATION IN VICTORIAN PRIMARY & SECONDARY SCHOOLS



VICTORIAN ABORIGINAL EDUCATION ASSOCIATION INC. (VAEAI)

The Victorian Aboriginal Education Association (VAEAI) has produced this guide – *Protocols for Koorie education in Victorian primary and secondary schools* – in response to requests for guidance on appropriate protocols for schools to follow when seeking to provide a welcoming school environment for Victoria’s Koorie communities, and for working respectfully with our Koorie community to enrich school curricula.



VICTORIAN CURRICULUM  
AND ASSESSMENT AUTHORITY



# Unit 4 Structure

Unit titles	Area of Study titles
<b>Unit 4:</b> How is mental wellbeing supported and maintained?	<b>Area of Study 1:</b> How does sleep affect mental processes and behaviour?  <b>Area of Study 2:</b> What influences mental wellbeing?

# Planning template



<p>Provide details of the outcome, time period (Term/Week–Term/Week), key knowledge and key science skills <i>(from the study design)</i></p>	<p>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).</p>	<p>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</p>
<p>Unit 1, Outcome 1: &lt;insert outcome statement – see page 13 of VCE study design&gt;</p>		

**Anticipated teaching time allocation:** <insert as appropriate; e.g. Term 1 Week 1 – Term 1 Week 6>

<p><b>Key knowledge:</b></p> <ul style="list-style-type: none"> <li>&lt;Select as appropriate. See pages 13–14 of VCE study design&gt;</li> </ul>	<p><b>Biology Units 1–4 Key science skills:</b></p> <ul style="list-style-type: none"> <li>&lt;Select as appropriate. See pages 10–11 of VCE study design&gt;</li> </ul>	<p>&lt;Consider a range of resources when developing appropriate learning activities; e.g. VCE Advice for Teachers located on the VCAA website: <a href="http://www.vcaa.vic.edu.au/curriculum/vce/vce-study-designs/biology/advice-for-teachers/Pages/Index.aspx">www.vcaa.vic.edu.au/curriculum/vce/vce-study-designs/biology/advice-for-teachers/Pages/Index.aspx</a> – ensure that any activities directly sourced from a public resource are contextualised to your school/provider’s approach&gt;</p>	<p>&lt;Select and describe as appropriate. See page 16 of the VCE study design. Include an estimate of when the task will occur&gt;</p>
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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.

## Unit 4, Outcome 1: How does sleep affect mental processes and behaviour

**Anticipated teaching time allocation:** Term 1, weeks 1-8

Key knowledge	Key science skills	Learning Activities	Assessment Tasks
<p>Sleep...the measurement of physiological responses associated with sleep, through electroencephalography (EEG), electromyography (EMG), electro-oculography (EOG), sleep diaries and video monitoring</p>	<ul style="list-style-type: none"> <li>• Types of research investigations</li> <li>• Generate and record primary data</li> <li>• Organise and present data in useful and meaningful ways</li> </ul>	<p><b>Fieldwork</b> - Complete a sleep diary over the course of a one week period. Relate to data collection considerations including subjectivity, type of data and quality of data</p> <p>Provide examples of times when video monitoring may be a more useful measurement tool compared to electroencephalography (EEG), electromyography (EMG) and electro-oculography (EOG)</p> <p><b>System design</b> - Design a system that uses a combination of electroencephalography (EEG), electromyography (EMG) and electro-oculography (EOG) technology to monitor drowsiness levels and alert shift workers or long distance drivers when they are at risk</p>	<p><b>S/N assessment for evidence of satisfactory completion of outcome-</b></p> <p>Logbook activity – System design activity including visual diagram and responses to set questions</p>
<p>Regulation of sleep-wake patterns by internal biological mechanisms, with reference to circadian rhythm, ultradian rhythms of REM and NREM Stages 1–3, the suprachiasmatic nucleus and melatonin</p>	<ul style="list-style-type: none"> <li>• Types of research investigations</li> <li>• Design investigation</li> <li>• Construct evidence-based arguments and draw conclusions</li> <li>• Analyse, evaluate and communicate scientific ideas</li> </ul>	<p>Construct a flow chart with visuals to show the role of the suprachiasmatic nucleus in regulating melatonin</p> <p><b>Controlled experiment</b> - Analyse a media article claiming links between a certain food, melatonin levels and sleep quality in terms of psychological theory and key science skills. Use the article as stimulus material to design a controlled experiment to test the claims.</p>	<p><b>S/N assessment for evidence of satisfactory completion of outcome</b></p> <p>Logbook activity - Media analysis responses</p>



# Unit 4 Area of Study 1

On completion of this unit the student should be able to analyse the demand for sleep, and evaluate the effects of sleep disruption on a person's psychological functioning.

To achieve this outcome students will draw on key knowledge outlines in Area of Study 1 and relevant key science skills on pages 12 and 13 of the study design.



# Unit 4, AOS 1 - Key knowledge

## The demand for sleep

- sleep as a psychological construct that is broadly categorised as a naturally occurring altered state of consciousness and is further categorised into REM and NREM sleep, and the measurement of physiological responses associated with sleep, through electroencephalography (EEG), electromyography (EMG), electro-oculography (EOG), sleep diaries and video monitoring
- regulation of sleep-wake patterns by internal biological mechanisms, with reference to circadian rhythm, ultradian rhythms of REM and NREM Stages 1–3, the suprachiasmatic nucleus and melatonin
- differences in, and explanations for, the demands for sleep across the life span, with reference to total amount of sleep and changes in a typical pattern of sleep (proportion of REM and NREM)

## Importance of sleep to mental wellbeing

- the effects of partial sleep deprivation (inadequate sleep either in quantity or quality) on a person's affective, behavioural and cognitive functioning, and the affective and cognitive effects of one night of full sleep deprivation as a comparison to blood alcohol concentration readings of 0.05 and 0.10
- changes to a person's sleep-wake cycle that cause circadian rhythm sleep disorders (Delayed Sleep Phase Syndrome [DSPS], Advanced Sleep Phase Disorder [ASPD] and shift work) and the treatments of circadian rhythm sleep disorders through bright light therapy
- improving sleep hygiene and adaptation to zeitgebers to improve sleep-wake patterns and mental wellbeing, with reference to daylight and blue light, temperature, and eating and drinking patterns

Scientific Investigation Methodology	Unit 4 Area of Study 1 Examples
Case study	Create a flow chart to summarise the article <a href="#">Sleep Deprivation and Physiological Responses. A Case Report</a>
Classification and identification	Brainstorm the possible effects of partial sleep deprivation and then classify as affective, behavioural or cognitive
Controlled experiment	Read the media article <a href="#">New research into sleep disruption aims to make emergency workers safer</a> and discuss the strengths and limitations of using a simulated shift schedule. Suggest controlled experiment designs that could be used to carry out the study and predict the results.
Correlational study	Carry out a correlational study to investigate the relationship between number of hours of sleep and cognitive ability by undertaking a test such as the <a href="#">Face Memory Game by Neuroscience for Kids</a>
Fieldwork	<p>Complete a sleep diary over the course of a one week period. Relate to data collection considerations including subjectivity, type of data and quality of data.</p> <p>Design and carry out out fieldwork to investigate sleep patterns across the lifespan</p>
Literature review	Using a science news website such as <a href="https://www.sciencedaily.com/">https://www.sciencedaily.com/</a> carry out a literature review on the relationship between mobile phones and sleep. Report on the methodology, results and conclusion of at least three studies.
Modelling	Design an animal model study to test the impact of an eating pattern (eg. larger morning vs evening meal, fasting, carbohydrate ratio) on daily rhythms in melatonin, core body temperature and heart rate
Product, process or system development	<p>Design a system that uses a combination of electroencephalography (EEG), electromyography (EMG) and electro-oculography (EOG) technology to monitor drowsiness levels and alert shift workers or long distance drivers when they are at risk</p> <p>Produce a process that that individuals could use at night to try and increase their natural melatonin levels</p>
Simulation	Discuss the strengths and limitations of using driving simulators to research the impacts of sleep deprivation on driving ability

# Updated dot point AOS1- Suprachiasmatic nucleus

- **Construct a flow chart with visuals to show the role of the suprachiasmatic nucleus in regulating melatonin (could incorporate air dry modelling clay)**
- **Design a process that individuals could use to try and increase their natural melatonin levels. Consider how you could test its effectiveness**
- **Present an argument for delaying school start times for secondary school students based on circadian rhythms**

## Detailed example 2



### Analysis of a contemporary media text and design of a related investigation

#### Aim

To analyse and evaluate a media article regarding sleep in relation to key science skills and psychological theory.

To use the article as stimulus material to design a study.

#### Background

This activity relates to numerous key knowledge points in Unit 4, Area of Study 2, including regulation of sleep-wake patterns by internal biological mechanisms, with reference to melatonin; and improving sleep-wake patterns with reference to eating and drinking patterns. The activity also links heavily to the key science skills. It would be best to run the activity at the completion of the area of study. The activity could be run as a structured class discussion or individual student entry into logbooks.

Read one of the following articles which claim a link between eating eggs and increased melatonin levels for a good night's sleep: '[Sleep experts say eggs are the secret to a good night's sleep](#)' or '[This 50c staple is scientifically proven to help you sleep better](#)'.

#### Questions for class discussion or individual student entry into logbooks

*Integration of cross study specifications in this activity*

#### KEY SCIENCE SKILLS

- Critically evaluate media texts
- Distinguish between opinion, anecdote and evidence and scientific and non-scientific ideas
- Design an investigation

#### CRITICAL & CREATIVE THINKING

- Make evidence based decisions
- Design an investigation

#### ETHICAL UNDERSTANDING

- Recognise economic and political factors

#### INDIVIDUAL & COLLABORATIVE SCIENTIFIC ENDEAVOUR

- Problem solving and decision making

From the [VCAA Psychology Teaching & Learning Activities webpage](#)

# New AOS1 content- Advanced sleep phase disorder

- **Class competition to come up with the best diagram/graph to show the difference between Delayed Sleep Phase Syndrome and Advanced Sleep Phase Disorder**
- **Provide a range of possible shift work timetables that could cause circadian rhythm sleep disorders. Identify whether Delayed Sleep Phase Syndrome or Advanced Sleep Phase Disorder is most likely to occur. Suggest bright light therapy regimes that could be used as treatment options.**

# New AOS1 content- Sleep hygiene and zeitgebers

- **Create a different cartoon character to represent each zeitgeber. For each character add speech bubbles with related sleep hygiene hints**
- **Design an animal model study to test the impact of an eating pattern (eg. larger morning vs evening meal, fasting, carbohydrate ratio) on daily rhythms in melatonin, core body temperature and heart rate**
- **Draw a diagram to represent the bi-directional way relationship between sleep and mental wellbeing. Add in stress and any other previous related content for an extra challenge.**

# Links to data and measurement

**This area of study has a number of quantitative objective measures that link strongly to the new data and measurements terms defined on page 19 of the Study Design.**

**These measures include heart rate, body temperature, melatonin levels, room temperature and time spent in REM/NREM sleep.**

**These measures are all potential illustrations for the concept of true value (the value or range of values, that would be found if the quantity could be measured perfectly).**

## Example of a scenario with generated primary data

Amara is a university psychology student who conducted a study to test the influence of mobile phone use on melatonin levels. She recruited seven other university psychology students to take part in the study, ensuring that none of them were on melatonin medication or supplements. After reading the participant information sheet about the specific purposes of the study and signing a consent form, the participants were asked to record the number of hours spent on their phone after 5pm each night for one week. Participants who on average used their phones for more than 150 minutes per evening were categorised as the high user group. Those who used their phone on average for less than 150 minutes per evening were categorised as the low user group.

When designing the study Amara had a choice of two different branded melatonin test kits. To determine the most precise test she repeated each test herself three times within a ten-minute period around midnight on a single night. The results were as follows:

*Table 1: Results of Amara's testing of the two different branded melatonin test kits at midnight*

	Test 1	Test 2	Test 3
Melatonin Testing Kit A	91	85	95
Melatonin Testing Kit B	80	81	79

See the [Teaching and Learning activities](#) for an example with generated data linked to melatonin levels



# Links to data and measurement

Another activity is to generate primary data by carrying out a series of measurements on room temperature. This can then be linked to:

**Repeatability** (closeness of successive measurements of the same quantity being measured, carried out under the same conditions)

*Eg. Measure room temperature several times using the same measuring device in a short period of time*

**Reproducibility** (closeness of measurements of the same quantity being carried out under changed conditions, such as instrument)

*Eg. Measure room temperature with different instruments, such as mobile phone apps, infrared thermometer, mercury thermometer.*

# Links to data and measurement

Following on from this discuss accuracy (closeness of a measurement to the true value).

To do this, select a measurement that could be taken as the true value and then discuss the accuracy of all the readings in relation to this 'true value'.

*Eg. Which readings had high accuracy? Low accuracy?*

*Eg. What is the importance of accuracy in terms of internal validity and ability to draw conclusions?*

# Links to data and measurement

Can also discuss precision (how closely a set of measurement values agree with one another)

*Eg. How precise/close were the room temperature readings with the same measuring device? Which measurement instrument showed the greatest precision?*

*Eg. How precise/close were the room temperature readings taken with different measuring devices?*

# Links to data and measurement

Can also discuss the temperature readings in terms of the different types of errors

*Eg. Were any variations in the values likely to be caused by a personal error (such as a student misreading the value)?*

*Eg. Were any variations in the values likely to be caused by a random error (an unpredictable variation due to a limitation of the thermometer)?*

*Eg. If there were systematic errors (readings all differ from the true value by a consistent amount due to an imperfect instrument calibration) would this influence accuracy or precision?*

# SAC possibilities for AOS1

Task type	Possible contexts
<ul style="list-style-type: none"><li>analysis and evaluation of at least one psychological case study, experiment, model or simulation</li></ul>	Analyse an actual or teacher generated case study of sleep deprivation eg. in a shift worker or a long haul truck driver
<ul style="list-style-type: none"><li>analysis and evaluation of generated primary and/or collated secondary data</li></ul>	Fieldwork survey on sleep patterns across the lifespan
<ul style="list-style-type: none"><li>comparison and evaluation of psychological concepts, methodologies and methods, and findings from three student practical activities</li></ul>	Fieldwork - Sleep log  Correlational study- Amount of sleep & performance on a cognitive test (eg. short term memory)  Modelling - Design an animal model study to test the impact of an eating pattern (eg. larger morning vs evening meal) on daily rhythms in melatonin
<ul style="list-style-type: none"><li>analysis and comparison of two or more contemporary media texts.</li></ul>	Analyse and compare a social media post, newspaper article and an experiment abstract on the topic of sleep hygiene

# Detail of one assessment option

**Task type: analysis and evaluation of at least one psychological case study, experiment, model or simulation**

**Visit the [VCAA Psychology page](#) for detailed assessment advice on each task type**

▼ Analysis and evaluation of at least one psychological case study, experiment, model or simulation

Students may be presented with a classic, contemporary or original psychological case study, experiment, model and / or simulation for analysis and evaluation. The selected investigation(s) may involve the analysis and evaluation of primary data or secondary data. Contemporary investigations are those undertaken or published in print and / or electronic media within the last calendar year. Case studies and experiments do not necessarily need to be sourced from original journal articles; reports and or references to case studies and experiments accessed through a variety of print and electronic sources may be used as long as they contain sufficient information for students to be able to identify, analyse and evaluate the relevant psychological concepts, methodologies and method, data and findings.

# Detail of one assessment option

**Task type: analysis and evaluation of at least one psychological case study, experiment, model or simulation**

## ***Ideas:***

- **Case study: Analysis of teacher generated sleep logs from different age groups**
- **Case study: Self report on sleepy driving in truck drivers**
- **Experiment using simulation: Impact of sleep deprivation on anaesthesia resident's skills**

# Detail of another assessment option

**Task type: analysis and comparison of two or more contemporary media texts.**

***Ideas:***

- **Analyse and compare a social media post on sleep hygiene tips to a fact sheet**
- **Choose two articles from The Other Shift website to explore the impacts of shift work and techniques to minimise its effects**
- **Compare an advertisement's claims for blue light restricting glasses with a scientific article summarising research on their effectiveness**



# Possible media text sources

[ABC Everyday](#) for accessible newspaper articles (also worth looking at their social media posts)

[Sleep Health Foundation Australia Fact Sheets](#)

[BrainFacts website](#)

[The Other Shift](#) - blog and articles on shift work

The VicRoads Learner Permit Test Online has a brief section on BAC levels & sleep deprivation. Another Vicroads source

is: <https://www.vicroads.vic.gov.au/safety-and-road-rules/driver-safety/fatigue/fatigue-and-road-safety>

# Unit 4 Area of Study 2

On completion of this unit the student should be able to **discuss the concept of mental wellbeing, apply a biopsychosocial approach to explain the development and management of specific phobia, and discuss protective factors that contribute to the maintenance of mental wellbeing.**

To achieve this outcome students will draw on key knowledge outlined in Area of Study 2 and relevant key science skills on pages 12 and 13 of the study design.

# Unit 4, AOS 2 - Key knowledge

## Defining mental wellbeing

- ways of considering mental wellbeing, including levels of functioning; resilience, as the ability to cope with and manage change and uncertainty; and social and emotional wellbeing (SEWB), as a multidimensional and holistic framework for wellbeing that encapsulates all elements of being (body, mind and emotions, family and kinship, community, culture, country, spirituality and ancestors) for Aboriginal and Torres Strait Islander people
- mental wellbeing as a continuum, with an individual's mental wellbeing influenced by the interaction of internal and external factors and fluctuating over time, as illustrated by variations for individuals experiencing stress, anxiety and phobia

# Unit 4, AOS 2 - Key knowledge

## Application of a biopsychosocial approach to explain specific phobia

- the relative influences of factors that contribute to the development of specific phobia, with reference to gamma-amino butyric acid (GABA) dysfunction and long-term potentiation (biological); behavioural models involving precipitation by classical conditioning and perpetuation by operant conditioning, and cognitive biases including memory bias and catastrophic thinking (psychological); and specific environmental triggers and stigma around seeking treatment (social)
- evidence-based interventions and their use for specific phobia, with reference to the use of short-acting anti-anxiety benzodiazepine agents (GABA agonists) in the management of phobic anxiety and breathing retraining (biological); the use of cognitive behavioural therapy (CBT) and systematic desensitisation as psychotherapeutic treatments of phobia (psychological); and psychoeducation for families/supporters with reference to challenging unrealistic or anxious thoughts and not encouraging avoidance behaviours (social)

# Unit 4, AOS 2 - Key knowledge

## Maintenance of mental wellbeing

- the application of a biopsychosocial approach to maintaining mental wellbeing, with reference to protective factors including adequate nutritional intake and hydration and sleep (biological), cognitive behavioural strategies and mindfulness meditation (psychological) and support from family, friends and community that is authentic and energising (social)
- cultural determinants, including cultural continuity and self-determination, as integral for the maintenance of wellbeing in Aboriginal and Torres Strait Islander peoples

# Safety and wellbeing considerations

**Given the sometimes sensitive nature of content in Unit 4, AOS 2, preface the coursework for students with a reminder about:**

- **Looking ahead through content to identify any difficulties**
- **Providing a safe option to remove themselves from class**
- **Not self diagnosing or diagnosing friends and family**
- **Set ground rules for language and discussion**
- **Where to seek further assistance within your school**

Scientific Investigation Methodology	Unit 4 Area of Study 2 Examples
Case study	Consider the application of a biopsychosocial framework as it applies to a range of specific phobia case studies
Classification and identification	Discuss the meanings of the term holistic and multidimensional and try to find examples of other things that could be classified as both
Controlled experiment	Suggest research designs that could be used to investigate the effects of CBT on the management of specific phobia
Correlational study	Using the range of questions provided in the teacher support materials, decide whether the questions would be most suited to a correlational study or a controlled experiment. Then design a correlational study
Fieldwork	Interview a household member to gather qualitative information on their understanding of the meaning of resilience and the factors that increase resilience.
Literature review	Have a look at the literature review ‘The relationship between organised recreational activity and mental health’ provided by the Department of Local Government, Sport and Cultural Industries’ in Western Australia
Modelling	Evaluate mental health as a continuum (as an example of a model)
Product, process or system development	Read article on mental health apps and identify advantages and limitations
Simulation	Consider a media article such as ABC news “How virtual reality exposure therapy is helping to treat phobias and paranoia” in light of the psychological theory of systematic desensitisation

# New AOS2 concept- Social and emotional wellbeing

- Discuss the meaning of multidimensional and holistic
- Use symbols and images, stories and reflection to gain a deeper understanding of the elements of being
- Explore the [Yarn Safe website](#) and watch the music video clip [Got A Lot Going On - Yarn Safe Music Video](#) and relate to the elements of being
- Read and analyse the article '[Australia needs to decolonise its mental health system and empower more Indigenous psychologists](#)'

*Integration of cross study specifications*

## ABORIGINAL AND TORRES STRAIT ISLANDER KNOWLEDGE, CULTURES AND HISTORY

- understand and recognise the contribution of Aboriginal and Torres Strait Islander knowledges and Indigenous psychology as a field to the discipline of psychology

## ETHICAL UNDERSTANDING

- recognise the importance of values, and social, economic, political and legal factors in responsible science-related decision-making.



# Updated AOS2 topic - Biopsychosocial factors

- **Compare and evaluate studies on the impact of meditation or hydration on mental wellbeing (a mini literature review)**
- **Food insecurity can limit students' nutritional intake. Prepare a pitch to a selected audience (eg. school council, local council) on the importance of adequate nutritional intake for mental wellbeing and suggestions for improving access to nutritional food for all students**
- **Students write down their definition of 'authentic' in terms of relationships. Compare definitions and discuss in relation to the concepts of uncertainty and validity in psychological research.**

# New AOS2 content - cultural determinants of wellbeing

- Discuss the meaning of culture and the importance of cultural expression to wellbeing
- Research one or more expressions of Aboriginal and Torres Strait cultural continuity and try to find examples from your own region. Discuss its importance in maintaining mental wellbeing
- Listen to a reading of the Uluru Statement from the Heart. Discuss how it links to ideas of cultural continuity and self-determination
- Provide case studies from the [Stories of Resilience: Indigenous Resilience Project Report](#)

# Great minds podcast

- Explores various meditation styles from across the world
- **Wayapa Wuurrk: combines ancient Aboriginal knowledge of connection to country, earth mindfulness, narrative meditation and physical movement**
- **[Wayapa Wuurrk: Connect to the earth through this Indigenous mindfulness exercise | SBS English](#)**



# Links to ethical concepts

**Beneficence:** temporary discomfort of systematic desensitisation outweighed by long term benefit of treating phobia

**Integrity:** reporting research responsibly

**Non-maleficence:** consideration of who participates in trials for medication and the impact on their current treatment

**Respect:** consider [Australian Psychological Society Formal Apology](#) to Aboriginal and Torres Strait Islander peoples in 2016

# SAC possibilities for AOS2

Task type	Possible contexts
<ul style="list-style-type: none"><li>analysis and evaluation of at least one psychological case study, experiment, model or simulation</li></ul>	Analysis of a phobia case study including application of biopsychosocial model for both influences and interventions
<ul style="list-style-type: none"><li>analysis and evaluation of generated primary and/or collated secondary data</li></ul>	Prepare and run an investigation into the effectiveness of different mindfulness or meditation apps or programs
<ul style="list-style-type: none"><li>comparison and evaluation of psychological concepts, methodologies and methods, and findings from three student practical activities</li></ul>	Evaluation of biopsychosocial model using three practical activities as reference.
<ul style="list-style-type: none"><li>analysis and comparison of two or more contemporary media texts.</li></ul>	Compare the findings from recent investigations into the success of programs aimed to improve Indigenous wellbeing

# Detail of one assessment option

**Task type: analysis and evaluation of generated primary and/or collated secondary data**

**Impact of mindfulness meditation - Trial and compare three online mindfulness meditations to find which one leads to the greatest focussed relaxation**

# Detail of another assessment option

**Task type: Comparison and evaluation of psychological concepts, methodologies and methods, and findings from three student practical activities**

**Evaluation of biopsychosocial model using three practical activities as reference:**

- 1) Psychological - role play of systematic desensitisation
- 2) Social - analyse online psychoeducation resource
- 3) Biological - student model of GABA and GABA agonists

# Unit 4 Area of Study 3

On completion of this unit the student should be able to **design and conduct a scientific investigation related to mental processes and psychological functioning and present an aim, methodology and method, results, discussion and conclusion in a scientific poster.**

To achieve this outcome students will draw on key knowledge outlined in Area of Study 3 and relevant key science skills on pages 12 and 13 of the study design.



# Unit 4, AOS 3 - Key knowledge

## Investigation design

- psychological concepts specific to the selected scientific investigation and their significance, including definitions of key terms
- characteristics of the selected scientific methodology and method, and appropriateness of the use of independent, dependent and controlled variables in the selected scientific investigation
- techniques of primary quantitative data generation relevant to the selected scientific investigation
- the accuracy, precision, repeatability, reproducibility and validity of measurements
- the health, safety and ethical guidelines relevant to the selected scientific investigation

# Unit 4, AOS 3 - Key knowledge

## Scientific evidence

- the nature of evidence that supports or refutes a hypothesis, model or theory
- ways of organising, analysing and evaluating primary data to identify patterns and relationships, including sources of error and uncertainty
- authentication of generated primary data using a logbook
- assumptions and limitations of investigation methodology and/or data generation and/or analysis methods
- criteria used to evaluate the validity of measurements and psychological research

# Unit 4, AOS 3 - Key knowledge

## Science communication

- conventions of science communication: scientific terminology and representations, symbols, formulas, standard abbreviations and units of measurement
- conventions of scientific poster presentation, including succinct communication of the selected scientific investigation and acknowledgements and references
- the key findings and implications of the selected scientific investigation

# Managing student investigations

## ‘Coupled’ or ‘open’ inquiry

- A range of inquiry types are appropriate for the student-designed investigation
- Commonly, this investigation would involve ‘coupled’ or ‘open’ inquiry
- Student skills in inquiry types should be scaffolded

Coupled (linked to an earlier inquiry)	Initial: Teacher Coupled: Student	Student	Student
Open	Student	Student	Student

Refer to the ‘[Scientific Investigations](#)’ section in the Psychology Support materials for more information about coupled and open inquiry

## Investigation approval

- Not all student-designed investigations can be allowed to proceed
- Investigations must be managed in terms of resources, safety and authenticity.

# Task logistics

- **In Unit 3 or 4, or across Units 3 and 4, the task:**
  - must involve generation of primary data
  - must include all sections of poster template on pg 15 of the Study Design, with acknowledgment of level of guidance
  - may be an extension of a common experiment, case study or fieldwork investigation
  - may be generated by students based on their own research and subject to authentication (use of photos/video...noted in logbook)
  - may be assessed in stages (if modification to design/method is required, original marks hold)
- **No drafts** of the poster allowed
- As part of the SAC task, students must be assessed on their capacity to **design** their own investigation.

# Scaffolding key science skills

**The student-designed practical investigation requires that teachers:**

- explicitly teach required key knowledge and skills
- ‘unpack’ students’ misconceptions/ uncertainties/ errors etc
- provide all students with adequate time to develop and practise the relevant key science skills before being asked to apply and demonstrate them as part of Unit 4 Outcome 3.

# Sample approach 1: Teacher-provided list of topics

- Teacher provides a list of possible research questions relating to Unit 3 and/or Unit 4
- Students submit a proposed timeline and research plan related to a research question of interest
- A negotiated research question is undertaken by the student and monitored by the teacher.

# Sample approach 2: Student topic selection

- The teacher provides students with the list of questions from each of Unit 3 Area of Study 1 and 2 and/or Unit Area of Study 1 and 2 as examples of possible scientific investigations
- Students are given an extended time to consider their own question for investigation, including allowing time for students to research other relevant topics on the Internet
- Students submit proposed topics to teacher
- Negotiated investigation topic between teacher and student.



# Sample approach 3: Flipped classroom

## Students:

- have open choice of topic
- undertake own research out of class
- submit scientific investigation proposal.

## Teachers:

- approve/provide feedback re appropriate modifications to methodology and method
- monitor undertaking of investigation
- assess student capacity to design further investigations following completion of investigation.

# Sample approach 4: Building on prior research

- Teachers or students identify a general research snippet, found in scientific publications and/or the media, as a stimulus for an investigation
- Students propose a research question, methodology and method that is prompted by the research snippet
- Teachers approve/modify the student proposed investigation so that the investigation is safe, ethical and manageable.
- If appropriate, assess student capacity to design further investigations following completion of investigation.

# Example of a ‘research snippet’

Often find yourself chewing gum like an upset coach on the sidelines? Don't worry. A study from Cardiff University in Wales found that chewing gum can boost thinking and alertness – particularly if chewed during a cognitive activity.

- *Herald Sun, Body & Soul, 23 July 2017*

# Sample approach: Case study

- The teacher provides a set of research questions that have a ‘case study’ theme (or student develop their own research question).
- Students work individually or in groups to design a case study method that will answer the selected research question.
- Sample topics from Unit 4 may include:
  - The effects of shift-work on individual wellbeing
  - Effects of sleep hygiene strategies on individual sleep-wake patterns
  - Differences in sleep patterns in individuals across the lifespan
  - Use of a meditation app over time and reported feelings of wellbeing

# Sample approach: Fieldwork

- The teacher provides a set of research questions that have a ‘fieldwork’ theme (or student develop their own research question).
- Students work individually or in groups to design a fieldwork method that will answer the selected research question.
- Sample topics from Unit 4 may include:
  - Survey investigating sleep hygiene practices
  - Survey investigating knowledge of protective factors to maintain wellbeing
  - Interviews at the beginning of Daylight saving in relation to effects of partial sleep deprivation

# Sample approach: Product, process or system development

- The teacher provides a set of research questions that have a ‘product, process or system development’ theme (students may also develop their own research question for the selected methodology).
- Students work individually or in groups to design a method for a product, process or system that will answer the selected research question.
- Sample topics from Unit 4 may include:
  - Evaluation of a selected sleep app with suggestions for improvement and/or development of another app
  - Creation and testing of a product that supports connections between family, friends and community to improve wellbeing

# Developing hypotheses

Any of the scientific methodologies that enable primary data to be generated are appropriate for Unit 4 Outcome 3.

A controlled experiment may not be the most appropriate scientific investigation methodology to answer the selected research question.

A suitable hypothesis should contain an IV, DV and a predicted effect of the IV on the DV.

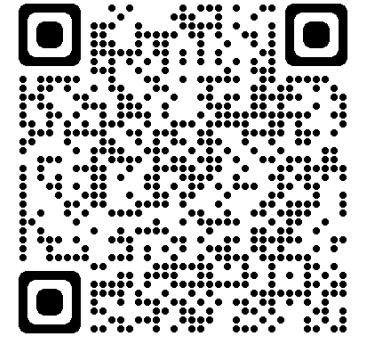
Variables do not need to be operationalised as part of the hypothesis. However as part of their method, students should be able to detail how they will manipulate and measure (operationalise) the IV and DV.

# Evaluation of research findings

- **In processing, evaluating and discussing their own data, students may be required to:**
  - presenting data in both tabular and graphical formats
  - distinguish between quantitative and qualitative data
  - consider the accuracy, precision, repeatability, reproducibility and validity of their measurements
  - identify patterns and relationships, including sources of error and uncertainty
  - identify assumptions and limitations of the selected methodology, data generation and/or data analysis
  - consider sources of bias and the appropriateness and application of data to different cultural groups



# Scientific posters: Succinct communication



## Issues with student posters typically include:

- poster title not worded as a question
- including data tables (unnecessary) as well graphs
- inappropriate graph scaling, axes and labelling
- small font size not easily read
- too wordy
- lack of graphics/illustrations/flowcharts to balance words
- inclusion of unnecessary information.

Further advice about the construction of scientific posters can be found under [Scientific Posters](#) in the 'Planning' section of the Psychology Support Materials.

# Evaluating scientific posters

**Prior to beginning work on constructing a scientific poster, it is useful to ‘unpack’ the strengths and weaknesses of de-identified student work from previous years and/or scientific posters accessed on the Internet**

- Display a selection of 10-20 posters around the classroom
- Students work in pairs or threes and use three different coloured ‘post it’ notes – representing ‘strengths’, ‘limitations’ and ‘suggestions for improvement’ – to evaluate a poster
- Student groups then move around the room to evaluate remaining posters, overlapping similar comments provided by earlier groups
- Teacher leads a discussion to compare ideas and to summarise elements of effective science communication.

# Task authentication strategies

**Depending on the structure of the task, authentication strategies can include but are not limited to:**

- Marking logbook progressively - logbook with dated entries should correlate to student work on poster
- Annotation of logbooks under teaching supervision; observe generation of data in class
- Provide specific questions about science investigation processes as part of the logbook entries that are done under test conditions
- Question students about content in specific parts of their logbook or poster.
- Include reflection components in logbook - ask student to justify/evaluate decisions, selected methodology and method
- use of the 'VCAA School-assessed Coursework Authentication' form for work completed outside class (available via VASS)

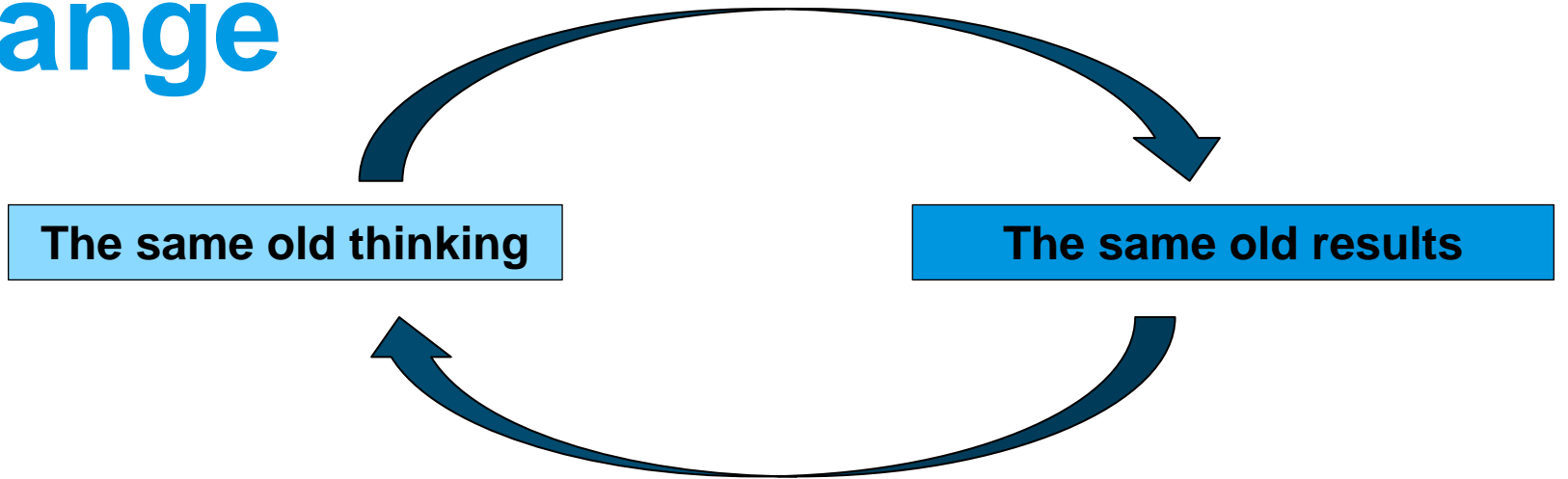
# Typical timeline

(minimum 10 hours of class time)

- **2-3 hours:** Students develop research question, research possible methodologies and methods, confirm investigation with teacher and provide equipment list needed for the task.
- **4-5 hours:** Students reflect on feedback from teacher about their proposed investigation, consider whether their proposed method is feasible and can be replicated and refine as required. Commence data generation. Students maintain logbook records. Teacher checks and signs off logbook entries.
- **3-4 hours:** Continuation of data generation, data processing and data analysis. Students given electronic poster template in the last double period of week 3 and complete their own scientific poster.

Note: Does not need to be completed in a single block of time in the academic year

# Managing change

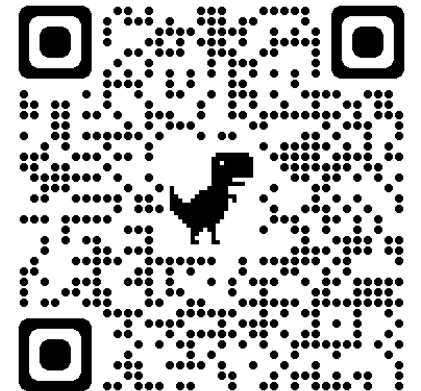


## Reflection:

- What worked well last year?
- What did not work well last year?
- How will student topic selection managed?
- How is practical work and the student investigations managed across the science faculty?
- How will the logbook and the poster be assessed?
- At what stages will students receive feedback?
- What could be improved next year?

# VCE resources

- **Administrative information for School-based Assessment**
- **VCAA Bulletin and Notices to schools**
- **School calendar and assessment policy**
- **Statistical moderation reports**
- **School-based assessment audit reports**
- **School-based assessment coursework reports**
- **Examination reports**
- **The school teaching and learning program**



# Questions?

# Contact

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