# Pre-approved Learning and Assessment Plan

Stage 2 Scientific Studies

Pre-approved learning and assessment plans are for *school use only*.

* Teachers may make changes to the plan, retaining alignment with the subject outline.
* The principal or delegate endorses the use of the plan, and any changes made to it, including use of an addendum.
* The plan does not need to be submitted to the SACE Board for approval.

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| School |  | Teacher(s) |  |

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| SACE school code | | |  | Year |  | Enrolment code | | | | |  | Program variant code (A–W) |
| Stage | Subject code | | | No. of credits (10 or 20) |
|  |  |  |  | **2** | **S** | **C** | **F** | **20** |  |

Addendum – changes made to the pre-approved learning and assessment plan

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| Describe any changes made to the pre-approved learning and assessment plan to support students to be successful in meeting the requirements of the subject. In your description, please explain:  what changes have been made to the plan   * the rationale for making the changes * whether these changes have been made for all students, or for individuals within the student group. |

Endorsement

The use of the learning and assessment plan is approved for use in the school. Any changes made to the plan support student achievement of the performance standards and retain alignment with the subject outline.

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| Signature of principal or delegate |  | Date |  |

# Assessment overview

Stage 2 Scientific Studies – 20 credits

The table below provides details of the planned tasks and shows where students have the opportunity to provide evidence for each of the specific features of all of the assessment design criteria.

Assessment Type 1:Investigations Folio – weighting 40%

| Assessment details | Assessment design criteria | | | | Assessment conditions  (e.g. task type, word length, time allocated, supervision) |
| --- | --- | --- | --- | --- | --- |
| I | AE | A | KU |
| Practical Investigation – Biomimicry: design and construction of a shelter  Students work in small groups and over two 100 minute sessions, hypothesise, using a biomimetic design process (‘biomimicry’ = observing and learning from nature), an environmentally sustainable shelter that would protect them in a range of conditions experienced in the field investigation area. Students may research features and placement of traditional and basic contemporary Aboriginal shelters.  In a 100 minute session, groups construct their shelter in a bush setting in or near the school.  They graph results as they monitor temperature, humidity and other factors over a 24 hour period to test the design of their construction and sleep overnight to test the suitability of the structure for longer term habitability. They compare their results with a similar test on a two-person tent.  In individual reports, they include their hypothesis, graphed results, evaluate their design and suggest improvements, explain their understanding of any sources of errors, formulate a conclusion, make relevant predictions, and explain relevant safety considerations. They comment on sustainability of tents versus bush shelters. | 1,3,4 | 1,2 | 1,2,3 | 1,3 | Teacher observation of collaborative work.  Individual investigation should be a maximum of 1500 words if written or a maximum of 10 minutes for an oral presentation, or the equivalent in multimedia form. |
| Practical investigation – field trip  Students use initiative to hypothesise or formulate questions, identify and record data as they participate in a five day field camp where they work collaboratively with archaeologists and other Aboriginal Heritage personnel, local community and post-graduate research students. Students unable to participate in the camp negotiate an alternative field study.  They use scientific research methods and safely use equipment as they plan and select equipment, use topographic and geological maps, construct maps, identify aspects of sites, photograph relevant information, record site conditions and record informants.  In their report, students focus on an aspect of the field work to show how they have designed and performed an experiment (aspect of the field study) to test a hypothesis or guiding question, plotted results, evaluated their learning, suggested improvements, showed understanding of any source of errors, formulated a conclusion and made relevant predictions, and showed understanding of relevant safety considerations. | 1,2,3,4 | 1,2 | 1,3 | 2,3 | Individual investigation should be a maximum of 1500 words if written or a maximum of 10 minutes for an oral presentation, or the equivalent in multimedia form. |
| Issue Investigation – Science and Aboriginal site protection  In small groups, students design and undertake an investigation related to how science (e.g. biology, geology, archaeology) can help protect Aboriginal heritage that may be under threat from feral animals or plants, overgrazing, road-building, tourism, mining or other development. They formulate a question, access and acknowledge information from at least two points of view. Sources may include the Australian Natural Heritage Charter, ask First: a guide to recording and conserving Aboriginal heritage sites and the South Australian Aboriginal Heritage Act.  Other sources may refer to particular sites or the work of scientists involved in working with Aboriginal people and heritage, e.g. the DVD Emu, possum, we want them back, a documentary showing how Pitjantjatjara people and scientists are working together, and learning from each other, to monitor and reduce risk to endangered species in the north west of SA. Students may interview one or more scientists and/or Aboriginal people.  Students analyse their findings, critically evaluate the evidence, develop and explain their conclusions in an individual report. They use scientific literacy skills to explain links between scientific data, concepts, and issues. The report includes an introduction, relevant scientific background, identification of alternative views, understanding of different perspectives, evaluation of information gathered, a summary of results or findings and conclusions drawn and well as citations and a reference list. | 2,4 | 1 | 3 | 1,3 | Report should be a maximum of 1500 words if written or a maximum of 10 minutes for an oral presentation, or the equivalent in multimedia form.  Unsupervised. 2-3 weeks preparation time. |

Assessment Type 2: Skills and Applications Tasks – weighting 30%

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| Assessment details | Assessment design criteria | | | | Assessment conditions  (e.g. task type, word length, time allocated, supervision) |
| I | AE | A | KU |
| Weather prediction  In small groups, students graph and analyse data from the past ten years relating to the range of potential weather conditions for their field study area in the Flinders Ranges for the time of year for their camp. They individually make predictions. | 4 | 1 | 1 | 1,2 | Collaborative data gathering. Individual analysis and predictions in writing. One 100 minute session. |
| Artefact identification and classification  Students complete an ‘Introduction to Archaeological Lab. Methods’ session involving fish and shell analysis and stone tool identification. This is conducted at Flinders University. Students then identify and categorise midden materials with data collected contributing to PhD student research. They submit their analysis for assessment. | 3 | 1 | 3 | 1,3 | Individual short written response and data recorded in tables from three 100 minute sessions. Supervised. |
| Practical test – Earth materials identification  A practical test with a series of stations where students answer questions involving mineral and rock identification, relating the nature (the physical and chemical properties) of the materials to likely traditional Aboriginal uses e.g. cutting, grinding, pigment making, spear heads, axe heads. These skills help prepare students for their future field trip. | 4 | 1 | 2,3 | 1,2 | Short written response. Individual, supervised task in a 100 minute session. |
| Science and Indigenous knowledge multimodal presentation  Students work in small groups to develop a multimodal presentation explaining the relationship between two world views: scientific concepts and Indigenous knowledge and concepts as conveyed through story or song. It may be related to the field investigation area or elsewhere, e.g. in response to a story e.g. from the book *Flinders Ranges Dreaming*; *Songs for Aboriginal Studies and Reconciliation;* or *The story of the Flinders Ranges Mammals.* | 2 | 1 | 1,3 | 2,3 | A stand-alone multimodal presentation of up to a maximum 5 minutes. Three 100 minute sessions, collaborative, unsupervised. |

Assessment Type 3: Practical Investigation – weighting 30%

| Assessment details | Assessment conditions  (e.g. task type, word length, time allocated, supervision) |
| --- | --- |
| External Assessment | *Students carry out an individual practical investigation and present an individual written report. The practical investigation has two parts: the practical investigation design proposal, and a report of the investigation. The practical design proposal includes a statement of an investigable question or hypothesis, the identification of variables, and an outline of the proposed research approach and method. This proposal is assessed before the student begins the practical investigation. The investigation report includes the hypothesis investigated, the method used, the results, a discussion of the results, the conclusion, and an evaluation of the practical investigation.*  *Individual practical investigation followed by an individual written report of a maximum 2000 words.* |

*Eight to ten assessments. Please refer to the Stage 2 Scientific Studies subject outline.*