# 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%

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| Assessment details | Assessment design criteria | | | | Assessment conditions  (e.g. task type, word length, time allocated, supervision) |
| I | AE | A | KU |
| Practical investigation (completion): Water quality  Students evaluate the quality of a local waterway through a series of indicator tests in a completion type practical in which they are provided with the method. They undertake a practical investigation to collect data on dissolved oxygen levels, phosphate levels, turbidity, biochemical oxygen demand (BOD), faecal coliform, pH, temperature, flow rate, nitrate levels, smell, and appearance. Students collate the data and look for patterns and relationships between land use, community attitudes and behaviours, and water quality. They report their findings and make recommendations to the local council on how to develop and maintain a healthy waterway. | 3,4 | 1 | 1,2 | 2 | The class walks to the local water way during two double lessons to collect data.  Students may work collaboratively but present individual reports with data.  Written or multimodal.  Due date to be negotiated with class. |
| Practical investigation (design): Microbial growth  Students design and conduct an investigation to determine how a particular factor affects microbial growth. They formulate a hypothesis, design and conduct an investigation, identify variables, collect, display, analyse and interpret data, evaluate results, suggest improvements, draw conclusions, and communicate their knowledge and understanding of any concepts that are linked to course work. | 1,3,4 | 2 | 2,3 |  | Students work individually.  Individual student’s designs are assessed, modified if necessary, and then implemented.  Teacher observes and record student’s practical skills on a checklist.  Due date to be negotiated with the class. |
| Issues investigation: Fish stocks  In groups of two or three, students investigate an issue related to the decline of fish stocks in the world’s oceans. They formulate a question and gather information from different sources, identify and discuss at least two points of view that members of the community might hold on the issue, and critically evaluate their findings. Students reflect upon the collaborative process and provide an evaluation of the skills demonstrated and/or developed. | 2 |  | 1,3 | 1,2,3 | Students work collaboratively to present findings of their investigation.  Oral (maximum 8 minutes) or equivalent in multimodal form.  Individual students present a written evaluation (maximum 250 words) of the collaborative process. |
| Issues investigation: Human population growth  Students select and investigate an issue associated with human population growth. They may consider the availability of arable land, water scarcity, energy demands, species extinction, food supply and/or biological resources when presenting the relevant scientific background and alternate view points on the issue. Students gather information from at least three different sources, identify at least two points of view that members of the community might hold on the issue, analyse their findings, critically evaluate the evidence, and develop and explain their conclusions from the investigation. Students are encouraged to use primary and/or secondary sources of information. | 2 | 1 | 1 | 1,2 | Students present the issue for approval prior to commencing the investigation.  Individual – written. Maximum 1500 words.  Four lessons plus two weeks of personal 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 |
| Data interpretation exercise: Health and hygiene in the Middle Ages  Students are presented with data, diagrams and information about health and hygiene in the Middle Ages. Through answering a series of questions, they demonstrate knowledge and understanding of how improved medical technologies have contributed to extended life spans, and evaluate the health and hygiene practices in Europe during the Middle Ages. |  | 1 | 2 | 1,2 | Students work individually during a 45 minute lesson.  Supervised. |
| Oral presentation: Australia’s contribution to the world health scene  Students are provided with data from the World Health Organisation outlining the status of various diseases in developing countries, and in Australia. Students select one country and compare the statistics with those of Australia, analysing why differences exist. By assuming the role of an aid worker, students develop a plan of how assistance (using current medical procedures, tools and/or technologies) could be provided to affected people in that country. Students reflect upon the plan and evaluate its possible effectiveness and limitations. | 2 | 1 | 1 | 3 | Oral presentation – either live or recorded.  Students work collaboratively or independently.  Individual student contribution must be evident.  Maximum 5 minutes. |
| Practical demonstration  Students undertake a practical demonstration in front of the class to explain a scientific concept related to the *Water for Life* or *Humans on Earth* unifying themes. Students may choose from a list provided by the teacher or negotiate an alternative demonstration. Demonstrations could include manipulation of apparatus, scientific testing, measurement and/or data collection. During the presentation, students explain the relevance of the practical demonstration to issues associated with water, pollution, and/or the impact of humans on the earth. | 3 | 2 | 2,3 | 1,2,3 | Individual presentation.  Supervised.  Maximum 5 minutes. |

Assessment Type 3: Practical Investigation – weighting 30%

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| 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.*