LEARNING AND ASSESSMENT PLAN

Stage 2 Mathematical Studies

School: Eastern Fleurieu School
Contact Teacher: Linda Wang

Other schools using this plan: None

<table>
<thead>
<tr>
<th>SACE School Code</th>
<th>Year</th>
<th>Enrolment Code</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2013</td>
<td>2 M D S 20</td>
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</tbody>
</table>

COHORT/CONTEXT DESCRIPTION

This should describe:
- the cohort of students (e.g. student background and learning needs)

This class consists of 6 students, all of whom completed double 10-credit programs of Stage 1 Mathematics. Each student is aiming to continue to tertiary study next year.

PROGRAM DESIGN

This should describe:
- how the program has been designed to engage the range of students in the cohort described above
- the intended delivery of the program (e.g. students will undertake elements of the program off-campus, program delivered in single and block lessons across a 5-day cycle)
- topic choices (e.g. option topics) and give details of negotiated topics.

The program is delivered through 1 55-minute lesson, 1 50-minute lesson and 1 105-minute lesson each week. Students have access to their own graphics calculators and have access to computers at school and at home when required. Computer-based objects are used in the teaching of the course (e.g. applets to assist with visualisation). The teaching program places mathematics in a context, using ideas from the considerations for developing teaching and learning strategies. Students use the key ideas to study, model, and interpret social, biological, and physical phenomena.

The skills and applications tasks are designed to master accessible-sized parts of the curriculum while providing a sound preparation for the examination. Skills and applications tasks consist of a range of questions, some focusing on knowledge and routine skills and applications, and others on analysis and interpretation. Students prepare a single, one-sided A5 page of notes for each skills and applications task and these form the basis for their two, two-sided pages of notes for the examination.

Through folio tasks, students investigate mathematical relationships, concepts, and solve problems. Students are supported in the first parts of each investigation with clear, sequential directions. However, an ‘open’ part(s) is provided at the end in order to allow students to demonstrate the quality of their thinking when unsupported.

CAPABILITIES, LITERACY AND NUMERACY OPPORTUNITIES

This should explain:
- how the program provides opportunities for students to develop their capabilities and their literacy and numeracy skills (e.g. strategies and resources)

Capabilities

Students develop their capability for communication by communicating mathematical reasoning and ideas using a range of representations, including symbols, equations, tables, and graphs. The problems-based approach of the program provides opportunities for students to develop aspects of citizenship and personal development. Students gain knowledge and understanding on how mathematics can be used to support an argument or point of view and make decisions informed by mathematical reasoning.
Literacy and Numeracy skills
Students have opportunities to develop their mathematical literacy skills through reading, writing, and talking about situations involving a range of mathematical ideas. Students shift between verbal, graphical, numerical, and symbolic forms of representing solutions to a range of familiar and unfamiliar problems.

The problems-based approach of the program provides opportunities for students to enhance their numeracy skills through ongoing development of mathematical knowledge, skills, concepts, and technologies in a range of contexts. Students who gain a ‘C’ grade or better for this program meets the numeracy requirement of the SACE.
**ASSESSMENT OVERVIEW**

Complete the table below to demonstrate how the set of assessments addresses all of the learning requirements and assessment design criteria.

<table>
<thead>
<tr>
<th>Weighting of Assessment Types</th>
<th>Name of Assessment (as described in the assessment details following)</th>
<th>Learning Requirements (Indicate the Learning Requirements addressed)</th>
<th>Assessment Design Criteria (Indicate the Assessment Design Criteria addressed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessment Type</td>
<td>Weighting (%)</td>
<td></td>
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<tr>
<td>Skills and applications tasks</td>
<td>45</td>
<td>Test: Differentiation</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Test: Applications of differentiation</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Test: Functions</td>
<td>✓</td>
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<tr>
<td></td>
<td></td>
<td>Test: Statistics</td>
<td>✓</td>
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<tr>
<td></td>
<td></td>
<td>Test: Integration</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Test: Linear Equations</td>
<td>✓</td>
</tr>
<tr>
<td>Folio</td>
<td>25</td>
<td>Calculus Investigation</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Statistics Investigation</td>
<td>✓</td>
</tr>
<tr>
<td>External component</td>
<td>30</td>
<td>Examination</td>
<td></td>
</tr>
</tbody>
</table>

Please refer to the Mathematics Learning Area Manual for details. **Nine to twelve assessments.** Please refer to the Mathematical Studies Subject Outline. (Note: to record any changes to the assessment outline, please use the Addendum to Learning and Assessment Plan attached.)
### ASSESSMENT DETAILS
Use the table below to provide details of the assessments designed to provide opportunities for the range of students in the cohort to show evidence of their learning against the performance standards.

<table>
<thead>
<tr>
<th>Name of Assessment (Assessment Type)</th>
<th>Description of Assessment (a description of the flexible, and where appropriate, negotiable, ways in which students show evidence that demonstrates their learning against the performance standards, including to the highest standard)</th>
<th>Assessment conditions as appropriate (e.g. task type, word length, time allocated, supervision)</th>
</tr>
</thead>
</table>
| Test: Differentiation (Skills and applications test) | Provides the opportunity for students to demonstrate their skills in understanding and appropriate use of the mathematical concepts, processes, and strategies in subtopics 2.6 to 2.7. Students communicate mathematical ideas and reasoning using appropriate notation, representations, and terminology. Use of electronic technology as required. | Written: supervised  
Time: 50 minutes  
One side of an A5 page of handwritten notes permitted.  
Use of electronic technology where appropriate. |
| Test: Application of Differentiation (Skills and applications test) | Provides the opportunity for students to demonstrate their skills in understanding and appropriate use of the mathematical concepts, processes, and strategies in subtopic 2.8. Students communicate mathematical ideas and reasoning using appropriate notation, representations, and terminology. Use of electronic technology is required. | Written: supervised  
Time: 50 minutes  
One side of an A5 page of handwritten notes permitted.  
Use of electronic technology where appropriate. |
| Test: Functions (Skills and applications test) | Students demonstrate mathematical knowledge and skills related to key questions and key ideas within subtopics 2.9 to 2.12. A range of routine and some complex questions require the students to apply their knowledge and skills gained through their study. Clear and logical communication of solutions and correct use of notation and terminology are required. | Written: supervised  
Time: 50 minutes  
One side of an A5 page of handwritten notes permitted.  
Use of electronic technology where appropriate. |
| Test: Statistics (Skills and applications test) | Students demonstrate mathematical knowledge and skills related to key questions and key ideas within subtopics 1.1 to 1.7. A range of routine and some complex questions require the students to apply their knowledge and skills gained through their study. Clear and logical communication of solutions and correct use of notation and terminology are required. | Written: supervised  
Time: 100 minutes  
One side of an A5 page of handwritten notes permitted.  
Use of electronic technology where appropriate. |
| Test: Integration (Skills and applications test) | Provides the opportunity for students to demonstrate their skills in understanding and appropriate use of the mathematical concepts, processes, and strategies within subtopics 2.2 to 2.3 as well as those in subtopics 2.13 and 2.14. Students communicate mathematical ideas and reasoning using appropriate notation, representations, and terminology. Use of electronic technology as required. | Written: supervised  
Time: 100 minutes  
One side of an A5 page of handwritten notes permitted.  
Use of electronic technology where appropriate. |
| Test: Linear Equations (Skills and applications test) | Provides the opportunity for students to demonstrate their skills in understanding and appropriate use of the mathematical concepts, processes, and strategies in subtopics 3.1 and 3.4. Students communicate mathematical ideas and reasoning using appropriate notation, representations, and terminology. Use of electronic technology as required. | Written: supervised  
Time: 100 minutes  
One side of an A5 page of hand-written notes permitted.  
Use of electronic technology where appropriate. |
|---|---|---|
| Calculus Investigation (Folio) | Students investigate a family of functions and the area of a triangle formed by the Cartesian axes and a tangent for any given member of the family of functions. There are five sequential directed tasks that begin with opportunities for students to demonstrate knowledge and understanding as they use mathematical algorithms to find solutions in a theoretical context. Students develop and prove an initial conjecture, leading to further conjectures of their own making. | Written: mostly unsupervised  
Time: 1 week  
Use of electronic technology where appropriate. |
| Statistics Investigation (Folio) | Students, as a member of a group, investigate a specific scenario involving statistics. They make conjectures and attempt to prove them. Students interpret the results of their investigation. Clear and logical communication of solutions and correct use of notation and terminology are required. | Written: mostly unsupervised  
Time: 2 weeks  
Use of electronic technology where appropriate.  
Folio format as described in the Mathematical Studies subject outline.  
Group Task |
| Examination (External component) | Students undertake an examination based on the key questions and key ideas outlined in the three topics and their subtopics. The examination consists of a range of questions/problems, some focusing on knowledge and routine skills and applications, and others on analysis and interpretation. Some questions/problems may require students to interrelate their knowledge, skills, and understanding in more than one topic. The skills and understanding developed through investigations are also assessed in the examination. | 3-hour external examination  
Access to approved electronic technology required.  
Students may refer to two unfolded A4 sheets (four sides) of hand-written notes. |
Addendum to:

LEARNING AND ASSESSMENT PLAN
Stage 2 Mathematical Studies

<table>
<thead>
<tr>
<th>SACE School Code</th>
<th>Year</th>
<th>Enrolment Code</th>
<th>Program Variant Code</th>
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<tbody>
<tr>
<td></td>
<td>2011</td>
<td>2 M D S 20</td>
<td>(A–W)</td>
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CHANGES MADE TO THE LEARNING AND ASSESSMENT PLAN

Describe any changes made to the 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 individuals within the student group.

The group element of the statistics folio assignment was removed and added to the matrices test, which in turn was changed into a group task. The rationale was that the assignment was to be worked on during the holidays and geographical factors made it difficult to for students to readily meet.

PRINCIPAL ENDORSEMENT
The changes made to the Learning and Assessment Plan support student achievement of the performance standards and retain alignment with the subject outline.

Signature of Principal or nominee _________________________________ Date ___________