This sample unit outline is provided by CHC for prospective and current students to assist with unit selection.

Elements of this outline which may change with subsequent offerings of the unit include Content, Required Texts, Recommended Readings and details of the Assessment Tasks.

Students who are currently enrolled in this unit should obtain the outline for the relevant semester from the unit lecturer.
# Unit Rationale

In a time when science and technology have and will continue to have an enormous impact on society, it is important that teaching and learning in Science keeps pace. It is becoming increasingly difficult to attract school students to take Science courses past the compulsory years of schooling and this decline in the uptake of Science is having an impact upon the level of scientific literacy found in the community. This is of particular significance to the teaching and learning of Science in the compulsory years as early years, primary and middle school teachers have become increasingly uncertain in their own scientific literacy and pedagogical content knowledge.

The aim of this core science education unit is to prepare preservice teachers to be teachers with broad discipline content knowledge with strong links to current best practice in science education. The unit focuses on providing opportunities for preservice teachers to engage with constructing their own scientific literacy and numeracy about the content and processes of science, confront their personal misconceptions about the core areas of the Science curriculum, and think meta-cognitively about teaching for learning in the Science key learning area.

## Learning Outcomes:

On completion of this unit, preservice teachers will have provided evidence that they have:

1. Constructed a sound knowledge base across all conceptual areas relevant to Science as a key learning area in the compulsory years of education.
2. Planned and presented scientific investigations that adhere to the core philosophical principles of a scientific approach to knowledge and discovery.
3. Understood key principles and demonstrated commitment to education for sustainability.
4. Understood alternative views, including a Christian perspective, of the nature of Science, scientific literacy and Science teaching and learning in relation to philosophical, cognitive and socio-cultural significance in contemporary educational contexts.
5. Identified the literate, numerate and digital demands expected of school students engaging in learning in the Science learning area.
6. Engaged with pedagogical strategies, tools and resources mediated through ICT technologies, relevant to the Science learning area.
7. Written at an appropriate tertiary standard (with special attention to correct grammar, punctuation, spelling, vocabulary, usage, sentence structure, logical relations, style, referencing and presentation).
## Content:

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td><strong>Introduction to Science</strong>  &lt;br&gt;- Conceptions and misconceptions about Science and scientific literacy  &lt;br&gt;- Literacy and numeracy in Science; reading and writing scientific texts  &lt;br&gt;- Science curriculum documentation</td>
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<td>2-4</td>
<td><strong>Key Concepts relating to Life and Living</strong>  &lt;br&gt;- Structural and behavioural needs, features and characteristics of living things  &lt;br&gt;- Ecosystems, habitats and stewardship  &lt;br&gt;- Scientific classifications of living organisms  &lt;br&gt;- Life systems; including body systems, cells and genetics</td>
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<td>5-7</td>
<td><strong>Key Concepts relating to Natural and Processed Materials</strong>  &lt;br&gt;- States of matter; solid, liquid, gas, plasma  &lt;br&gt;- Observable and measurable properties of materials  &lt;br&gt;- Physical and chemical changes  &lt;br&gt;- Matching forms and properties of materials to uses  &lt;br&gt;- Chemical properties and reactions  &lt;br&gt;- Sustainable uses of materials</td>
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<tr>
<td>8-10</td>
<td><strong>Key Concepts relating to Energy and Change</strong>  &lt;br&gt;- Force and motion  &lt;br&gt;- Forms of energy  &lt;br&gt;- Electricity and magnetism  &lt;br&gt;- Transferring and transforming energy  &lt;br&gt;- Energy and sustainability; renewable and non-renewable</td>
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<td>11-13</td>
<td><strong>Key Concepts relating to Earth and Beyond</strong>  &lt;br&gt;- Cycles on the earth; weather, water rock cycles  &lt;br&gt;- Geologic and atmospheric structures; changes and events  &lt;br&gt;- Sustainable relationships with the environment  &lt;br&gt;- Celestial relationships; sun, moon and the earth  &lt;br&gt;- The solar system and beyond; observable movements</td>
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<td>14</td>
<td><strong>Considering Science in school contexts</strong>  &lt;br&gt;- Thinking and working scientifically with school students  &lt;br&gt;- Thinking Christianly about Science; how Science and religion connect  &lt;br&gt;- Classroom practices for scientific teaching and learning</td>
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### Science Inquiry Skills
Will be established through teaching and learning of the key concepts. These include:
- Questioning and predicting
- Investigation methods
- Fair testing
- Using equipment
- Assessing and managing risks
- Observing and measuring
- Analysing results
- Developing explanations
- Communicating
- Reflecting on methods
- Evaluating evidence

### Set Text Requirements:


All state and national syllabus documentation, including:
- Early Years Curriculum Guide: Active learning processes; Investigating the natural world
- Year 1 Learning Statements: Active learning processes; Scientific inquiry
- Essential Learnings: Science
- Australian Curriculum: Science
**Recommended Readings:**


**Journals**

- The Australian Science Teachers' Journal
- Investigating - Australian Primary Science Journal
- School Science and Mathematics
- Science Activities
- School Science and Children
- School Science Review
- Science Teachers’ Association of Queensland Newsletter

**Assessment:**

<table>
<thead>
<tr>
<th>Assessment Item</th>
<th>Topic/s</th>
<th>Learning Outcomes assessed</th>
<th>Week Due</th>
<th>Weighting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scientific Investigation Report* (1500 words)</td>
<td>Explore a selected science topic by identifying, designing, performing and reporting on an experimental scientific investigation that clearly demonstrates the ‘Science Inquiry Skills’ as listed above.</td>
<td>1, 2, 4-6</td>
<td>Week 6</td>
<td>30%</td>
</tr>
<tr>
<td>Research Paper* (2000 words)</td>
<td>Research a contentious scientific topic providing an historical overview of the development of the area and a critique of at least two alternative perspectives. Discuss the contribution to and consequences of the issue in relation to human, environmental and economic sustainability.</td>
<td>1-7</td>
<td>Week 12</td>
<td>30%</td>
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</table>
Examination (3 hours) | Covering discipline content knowledge for all content components of the Science curriculum; earth and beyond, energy and change, life and living, natural and processed materials, science inquiry skills | 1-7 | Exam Week | 40%

* These tasks are to address two different conceptual strands as described in the content above.

Unit Overview:

This unit is a core science education unit for preservice teachers covering the discipline content knowledge for Early and Middle Years. Its aim is to prepare preservice teachers with appropriate levels of scientific literacy and numeracy and a broad knowledge of scientific content for the earth and beyond, energy and change, life and living, natural and processed materials and science inquiry skills components of the Science curriculum. Preservice teachers will also be encouraged to consider the Science as a construction of western sociocultural contexts and will be challenged to critique human responsibilities and actions as stewards of the natural environment.