National Professional Standards for Teachers

Illustration of Practice

Science

Professional Learning Workshop series 1: Outline
Developing a school program aligned to the Australian Curriculum: Science

Session 1 (1.5 hr) - Understanding the Australian Curriculum: Science

Part A: Presentation and discussion
Examining the main features of the curriculum

- Rational
- Aims
- Strands – Science Understanding, Science as a Human Endeavour, Science Inquiry Skills (FA 2.1)
- General capabilities
- Cross curricular priorities
- Inquiry based learning (FA 2.1)

Part B: Group work
Understanding conceptual progression within the strands
(Content statements from each of the Science understanding and Science inquiry skills strands have been cut up so there is one sub-strand on each piece of paper. Participants, working in small groups of 2 – 3 will be given an envelope which has copies of each of the separate sub-strand content statements from Year 8 -10.)

Task instructions

1. Arrange the statements into their strands and sub-strands
2. Organise the statements within each sub-strand into a conceptual progression for year 8 – 10
3. Compare your organisation with the Australian Curriculum – note any discrepancies and consider reasons for these

Part C: Implications of differences
Discuss where groups had organised their progression differently from that in the curriculum and what considerations/implications this could have for school curriculum programs.

Session 2 (1 hr): Mapping the school program to the Australian Curriculum: Science

Participants will be provided with a table (attached) which they will use to map the school Yr 10 science course to the Australian Curriculum.

Areas of commonality and gaps will be identified. This information will be used to inform the development of a new program which aligns with the Australian curriculum: Science.

Lead the development of learning and teaching programs that deliver on formal curriculum requirements

To enable teachers to implement the Australian Curriculum: Science the teacher has developed a Workshop series (1) which will be conducted over 2 sessions. The purpose of the first session is to familiarise teachers with the requirements of the Australian Curriculum: Science.

The second workshop session shows how to map a current program to the new requirements. Through this session teachers will recognise that while many aspects of the current program may still be valid new units may need to be developed.

Australian Curriculum: Science (Year 10)		*School Year 10 Science Course*
Science understanding	**Biological Sciences** The transmission of heritable characteristics from one generation to the next involves DNA and genes (ACSSU184) The theory of e volution by natural selection explains the diversity of living things and is supported by a range of scientific evidence (ACSSU185)	
	Chemical Sciences The atomic structure and properties of elements are used to organise them in the Periodic Table (ACSSU186) Different types of chemical reactions are used to produce a range of products and can occur at different rates (ACSSU187)	
	Earth and Space Sciences The universe contains features including galaxies, stars and solar systems and the Big Bang theory can be used to explain the origin th universe (ACSSU188) Global systems, including the carbon cycle, rely on interactions involving the biosphere, lithosphere, hydrosphere and atmosphere (ACSSU189)	
	Physical Sciences Energy conservation in a system can be explained by describing energy transfers and transformations (ACSSU190) The motion of objects can be described and predicted using the laws of physics (ACSSU229)	
Science inquiry skills	**Questioning and predicting** Formulate questions or hypotheses that can be investigated scientifically (ACSIS198)	
	Planning and conducting Plan, select and use appropriate investigation methods, including field work and laboratory experimentation, to collect reliable data; assess risk and address ethical issues associated with these methods (ACSIS199) Select and use appropriate equipment, including digital technologies, to systematically and accurately collect and record data (ACSIS200)	
	Processing and analysing data and information Analyse patterns and trends in data, including describing relationships between variables and identifying inconsistencies (ACSIS203) Use knowledge of scientific concepts to draw conclusions that are consistent with evidence (ACSIS204)	
	Evaluating Evaluate conclusions, including identifying sources of uncertainty and possible alternative explanations, and describe specific ways to improve the quality of the data (ACSIS205) Critically analyse the validity of	
Science as a human endeavour	**Nature and development of science** Scientific understanding, including models and theories, are contestable and are refined over time through a process of review by the scientific community (ACSHE191) Advances in scientific understanding often rely on developments in technology and technological advances are often linked to scientific discoveries (ACSHE192)	
	Use and influence of science People can use scientific knowledge to evaluate whether they should accept claims, explanations or predictions (ACSHE194) Advances in science and emerging sciences and technologies can significantly affect people's lives, including generating new career opportunities (ACSHE230) The values and needs of contemporary society can influence the focus of scientific research (ACSHE230)	

Professional Learning Workshop series 2: Outline – Assessment

Session 1 (1 hr) – Comparing content descriptors and achievement standards

1. Provide participants with a copy of the content descriptors and achievement standards for Yr 10
2. Explain the purpose of the achievement standard
3. Ask participants to match the statements in the achievement standard to the content descriptors.
4. Identify types of assessment task which would be most appropriate to allow students to demonstrate the different aspects of the achievement standard e.g. exam, assignment, investigation
5. Provide participant with an assessment task from the school program and ask them to analyse the task and identify what learning is being assessed.
6. Compare to achievement standard requirements.
7. Provide participants with assessment tasks from the school program and ask them to either rework the task or develop a new task to align with the content descriptors and achievement standard.

To be completed for discussion and feedback at the next session in 2 weeks.

Lead the development of assessment strategies that reflect the focus of curriculum programs

The leader will work through the achievement standards of the Australian Curriculum: Science with participants, to show how to identify where current assessment practice matches the requirements and where there may be gaps. The leader will model the interrogation of the given assessment task and consider alignment of curriculum, standards and appropriate assessment strategies. Participants will discuss how they could apply their professional learning in their own context.

Mentor colleagues to improve the use of assessment data in the development of learning and teaching programs that meet student needs

The workshop leader shows how assessment data, such as Year 9 NAPLAN, can be used to diagnose individual student learning difficulties and inform the development of science programs that meet particular needs. Based on the data supplied at the workshop, participants complete the supplied template to record information for each student and consider the implications of the identified weaknesses in literacy and numeracy for current teaching practice. The workshop leader will facilitate collaborative discussion about how to incorporate specific strategies to plan programs that address identified issues.

NAPLAN Individual Student Improvement Program			
Name		Class	Yr 9 Bands R W S LC N
Identified Areas for Improvement by NAPLAN Reading Writing Spelling Grammar and Punctuation Numeracy			
Identified Areas for Improvement by other sources			
Strategy			
Progress / Review			

NAPLAN Individual Student Improvement Plan

The Science requirements for NISIP are to investigate the student's literacy and numeracy weaknesses identified in their Year 9 NAPLAN test data.

- This will be completed using the NAPLAN data for individual students.

Task Description

1. Open the spread sheet containing the NAPLAN data for students you have been assigned to review.
2. Complete the data for the individual student improvement plan
3. Identify three broad areas of weakness that the students have demonstrated. **(You may not find three for some students)**
4. Consider the implications of these for Science.
   - What difficulties do you, as a teacher of science, see in addressing the student's areas of weakness?
   - What specific strategies could you use in your science teaching that would enable the student to improve his/her everyday and science specific literacy skills?
   - What specific strategies could you use in your science teaching that would enable the student to improve his/her everyday and science specific numeracy skills?