

Unit Outline (Higher Education)

Institute / School: Institute of Education, Arts & Community

Unit Title: SCIENCE CONTENT AND PEDAGOGY 2

Unit ID: EDMST6122

Credit Points: 15.00

Prerequisite(s): (EDMST6020)

Co-requisite(s): Nil

Exclusion(s): Nil

ASCED: 070301

Description of the Unit:

This is the second in a series of two units to help out-of-field non-specialist science teachers to develop knowledge and skills of the science curriculum to teach science in years 5-10. In this unit, students expand their knowledge of scientific disciplines to include chemical sciences and physical sciences. They consider how scientific discovery is happening at the margins of scientific disciplines in society and consider the educational possibilities that interdisciplinary science holds. Students examine how a concept-driven approach to science curriculum can facilitate middle-year students working with scientific knowledge in a developmentally appropriate manner. They develop assessment tasks that drive agentic science teaching and constructivist thinking within year 5-10 science. Students explore how learning science can be supported through experiences in and outside of the classroom.

Grade Scheme: Graded (HD, D, C, P, MF, F, XF)

Work Experience:

Not wholly work experience: Student is not undertaking work experience in industry or student is undertaking work experience in industry where learning and performance is directed by the provider.

Placement Component: No

Supplementary Assessment: Yes

Where supplementary assessment is available a student must have failed overall in the Unit but gained a final mark of 45 per cent or above, has completed all major assessment tasks (including all sub-components where a task has multiple parts) as specified in the Unit Description and is not eligible for any other form of supplementary assessment

Course Level:

Level of Unit in Course	AQF Level of Course					
	5	6	7	8	9	10
Introductory	■	■	■	■	■	■
Intermediate	■	■	■	■	■	■
Advanced	■	■	■	✓	■	■

Learning Outcomes:

(On successful completion of the course the students are expected to be able to):

Knowledge:

- K1.** Explore the interdisciplinary nature of science and consider how scientific discovery is often at the intersections of scientific disciplines.
- K2.** Examine the use of a concept-based approach to curriculum for teaching science in years 5-10.
- K3.** Consider how constructivist theories and other research inform middle-years science assessment tasks.
- K4.** Explore scientific understandings from the physical and chemical sciences curriculum.
- K5.** Evaluate different types of assessment tasks suitable for middle years science learners.
- K6.** Explore the roles of experiential and outdoor learning to teach middle years science.
- K7.** Explore ethical and safe practices to teach physical and chemical sciences.

Skills:

- S1.** Plan for interdisciplinary science teaching and learning through experiences for middle years learners.
- S2.** Analyse and apply concept-based curriculum, and experiential and outdoor learning theories.
- S3.** Evaluate and deploy constructivist learning theories for assessment.
- S4.** Demonstrate scientific ways of knowing that align with the physical and chemical sciences curriculum.
- S5.** Create safe and ethical learning opportunities for middle years science learners.
- S6.** Deploy outdoor and experiential learning theories to teach middle years science.

Application of knowledge and skills:

- A1.** Develop and evaluate assessment tasks that draw on contemporary learning theories and align to the year 5-10 science curriculum.
- A2.** Propose and justify interdisciplinary learning experiences for year 5-10 science students.

Unit Content:

Topics may include:

- Examining the interdisciplinary nature of science, including current scientific scientific discoveries.
- Constructivist learning theories and their influence on assessment practices.
- Assessing using a concept-based approach.
- Chemical and physical sciences curriculum.
- Safe and ethical teaching of chemical and physical sciences.
- Outdoor and experiential ways of teaching science in years 5-10.

FEDTASKS

Federation University Federation recognises that students require key transferable employability skills to prepare them for their future workplace and society. FEDTASKS (**T**ransferable **A**tttributes **S**kills and **K**nowledge) provide a targeted focus on five key transferable Attributes, Skills, and Knowledge that are embedded within curriculum, developed gradually towards successful measures and interlinked with cross-discipline and Co-operative Learning opportunities. *One or more FEDTASK, transferable Attributes, Skills or Knowledge must be evident in the specified learning outcomes and assessment for each FedUni Unit, and all must be directly assessed in each Course.*

FEDTASK attribute and descriptor		Development and acquisition of FEDTASKS in the Unit	
		Learning Outcomes (KSA)	Assessment task (AT#)
FEDTASK 1 Interpersonal	<p>Students will demonstrate high-level skills to effectively communicate, interact and work with others both individually and in groups.</p> <p>Students will be required to display (in person and/or online) high-level skills in-person and/or online in:</p> <ul style="list-style-type: none"> • Effective verbal and non-verbal communication via a range of synchronous and asynchronous methods • Active listening for meaning and influencing • High-level empathy for others • Negotiating and demonstrating extended conflict resolution skills • Working respectfully in cross-cultural and diverse teams 	NA	NA
FEDTASK 2 Leadership	<p>Students will demonstrate the ability to apply leadership skills and behaviours</p> <p>Students will be required to display skills in:</p> <ul style="list-style-type: none"> • Creating, contributing to, and enabling collegial environments • Showing self-awareness and the ability to self-reflect for personal growth • Inspiring and enabling others • Making informed and evidence-based decisions through consultation with others • Displaying initiative and ability to solve problems 	NA	NA

FEDTASK attribute and descriptor		Development and acquisition of FEDTASKS in the Unit	
		Learning Outcomes (KSA)	Assessment task (AT#)
FEDTASK 3 Critical Thinking and Creativity	<p>Students will demonstrate an ability to work in complex and ambiguous environments, using their imagination to create new ideas.</p> <p>Students will be required to display skills in:</p> <ul style="list-style-type: none"> • Reflecting critically on complex problems • Synthesising, evaluating ideas, concepts and information • Proposing alternative perspectives to refine ideas • Challenging conventional thinking to clarify concepts through deep inquiry • Proposing creative solutions in problem solving 	K3, K6, S1, S6, A2.	AT2
FEDTASK 4 Digital Literacy	<p>Students will demonstrate the ability to work proficiently across a range of tools, platforms and applications to achieve a range of tasks</p> <p>Students will be required to display high-level skills in:</p> <ul style="list-style-type: none"> • Finding, accessing, collating, evaluating, managing, curating, organising and appropriately and securely sharing complex digital information at a high-level • Receiving and responding to messages in a range of digital media • Using digital tools appropriately to conduct research • Contributing proficiently to digital teams and working groups • Participating in and utilising digital learning opportunities 	NA	NA

FEDTASK attribute and descriptor		Development and acquisition of FEDTASKS in the Unit	
		Learning Outcomes (KSA)	Assessment task (AT#)
FEDTASK 5 Sustainable and Ethical Mindset	<p>Students will demonstrate the ability to think ethically and sustainably.</p> <p>Students will be required to display (in person and/or online) high-level skills in-person and/or online in:</p> <ul style="list-style-type: none"> • The responsible conduct of research • Making informed judgments that consider the impact of devising solutions in multiple global economic environmental and societal contexts • Demonstrating commitment to social responsibility as a professional and a citizen • Generating research solutions which are sustainable, ethical, socially responsible and/or sustainable • Extending lifelong, life-wide and life-deep learning to be open to diverse others • Demonstrate extended actions to foster sustainability in their professional and personal life. 	K5, K7, S3, S5, A1.	AT1

Learning Task and Assessment:

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
K2, K3, K4, K5, K7, S2, S3, S4, S5, A1.	Development and evaluation of a series of assessment tasks and a developmental rubric that can be used within the science classroom. Assessment tasks are to align with the chemical or physical sciences curriculum. Assessment tools are to be accompanied by a written evaluation report.	Development of assessment tasks and a written evaluation	50-70%
K1, K6, S1, S5, S6, A2.	Development of a proposal for a interdisciplinary science experience for middle-year science learners that aligns with the curriculum and relevant theories, including the documentation for the proposed experience.	Proposal and planning documentation	30-50%

Adopted Reference Style:

APA

Refer to the [library website](#) for more information

Fed Cite - [referencing tool](#)