EDUC109

Science: Today and Tomorrow

S2 Day 2016

Dept of Education

Contents

General Information

Unit convenor and teaching staff
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Credit points
3

Prerequisites

Corequisites

Co-badged status

Unit description
This unit provides students with opportunities to challenge their views about the nature of Science, to engage with Science in its many facets and to communicate ideas about Science. Students are exposed to Science enthusiasts and are encouraged to actively participate in hands-on practical work both inside and beyond the Science laboratory. Learning and assessment strategies are designed to maximise student involvement and to build capacity in more collaborative approaches to increasing science understandings. The unit supports students to make the transition from passive to active learners and to take a more self-directed role in communicating Science to a range of learners.

Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at https://www.mq.edu.au/study/calendar-of-dates

Learning Outcomes

On successful completion of this unit, you will be able to:

1. demonstrate understanding of essential science concepts across the four sciences
2. reflect on your own science knowledge and understanding and how this was acquired
3. engage with and safely perform laboratory tasks and conduct practical work
4. gather, process and present scientific information to solve problems analyse and prepare science reports
5. demonstrate your understanding of content covered in lectures and tutorials

Assessment Tasks

Name	Weighting	Due	Groupwork/Individual	Short Extension	AI assisted?
Images of science & scientists	10%	Week 3		No	
Reporting Science	40%	Week 9/14 Oct		No	
Examination	50%	Examination Period		No	

Images of science & scientists

Due: **Week 3**
Weighting: **10%**
Groupwork/Individual:
Short extension [3]: No
AI assisted?:

In the first week of this unit, you were asked to draw a scientist, to compare your drawing with that of others in the lecture and to reflect on the images of scientists portrayed in those drawings compared to scientists' living and working today.

The purpose of this assignment is to gather information from your family/friends about their understanding/image of science and scientists and to reflect on these representations.

On successful completion you will be able to:

- 2. reflect on your own science knowledge and understanding and how this was acquired

Reporting Science

Due: **Week 9/14 Oct**
Weighting: **40%**
Groupwork/Individual:
Short extension [3]: No
AI assisted?:

The way in which science is communicated depends on the topic, its context and the engagement with the audience. What is important is that science is communicated accurately and that readers/listeners can make sense of scientific information.

As part of this unit you will be conducting fieldwork in the local environment. The field work aims to consolidate and extend your growing knowledge of local plants and animals as well as assist you to identify and respond to environmental issues on campus. Your field observations may be incorporated into on-going environmental monitoring programs being conducted at the University.

This assignment provides an opportunity for you to formalise your field work experience in the form of two reports that will communicate your identification of an issue that needs to be addressed as part of on-campus sustainable management practice at the university in particular (Field Report: Part A 25%) and in the general community (Media article: Part B 15%).

The purpose of this assignment is two-fold: First, to produce a field report assessing human impact on the natural environment at Macquarie University (Part A) and second, the use the findings from Part A along with recent related media reports to write a media article about the environment at Macquarie University of relevance to the local community (Part B).

On successful completion you will be able to:

- 3. engage with and safely perform laboratory tasks and conduct practical work
- 4. gather, process and present scientific information to solve problems analyse and prepare science reports
- 5. demonstrate your understanding of content covered in lectures and tutorials

Examination

Due: **Examination Period**
Weighting: **50%**
Groupwork/Individual:
Short extension [3]: No
AI assisted?:

The examination for this unit is compulsory and will be held during the examination period.

Weighting: **50%**

Length: **2hours 30 minutes plus 10 minutes reading time.**

The examination questions will be drawn from the entire unit. Students are expected to demonstrate mastery of the content of the unit including material covered in the lectures and in the tutorials. It is essential that you have a strong understanding of the key science concepts in each of the major themes covered in this unit.

Weekly reading and a wider reading of science content material will enhance your understanding of these key science concepts. You are strongly advised to update and consolidate your understanding of basic science concepts by reading some of the science textbooks located in the Curriculum section of the library.

You are expected to present yourself for examination at the time and place designated in the University Examination Timetable. The timetable is available in draft form approximately eight

weeks before the commencement of the examinations and in final form approximately four weeks before the commencement of the examinations.

On successful completion you will be able to:

- 1. demonstrate understanding of essential science concepts across the four sciences

Delivery and Resources

Unit Delivery

This unit is taught in both lecture and tutorial modes. Copies of the lecture notes and tutorial worksheets will be made available at the beginning of each week from iLearn for EDUC109. Students are expected to bring a copy of relevant slides/notes to lectures and tutorials. Students are expected to have read the weekly material in advance and to be ready to participate in lectures, group work and in whole class discussion in order to complete tasks and activities. Attendance at lectures is strongly advised and a roll will be taken at each session.

Prescribed texts (Resource)

American Association for the Advancement of Science. (2001). Atlas of science literacy / Project 2061. Washington DC: AAAS. Available as an online reference at http://strandmaps.nsdl.org

Skamp, K. (Ed.) (2015). Teaching primary science constructively (5th ed.). Melbourne: Thomson.

Primary teacher education students may choose to purchase this text which will support their work in science and technology throughout the degree and beyond.

Sydney Morning Herald. Daily Newspaper. For regular science-based articles.

Background readings in science

Bryson, B. (2004). A short history of nearly everything. London: Black Swan.

Carson, R. (1962). Silent spring. Boston Mariner Books.

Darwin, C. (1859). The origin of species. London: Penguin.

Dawkins, R. (1991). The blind watchmaker. London: Penguin.

Dennett, D. (1995). Darwin’s dangerous idea: Evolution and the meanings of life. London: Penguin.

Halvorsen, R. (2007). The truth about vaccines. London: Gibson Square.

Hawking, S. (2008). A brief history of time. Chatham: Bantam Press.

Horsfall, M. (2008). Creating your eco-friendly garden. Collingwood: CSIRO Publishing.

Lindenmayer, D. (2008). On borrowed time: Australia’s environmental crisis and what we must do about it. Camberwell, Victoria: CSIRO/Penguin.

Rosser, S. (2008). The A-Z of global warming. London Schmall World Publishing.

Sobel, D. (2005). The planets. London: Fourth Estate.

Trefil, J. (2008). Why science? New York: Teachers College Press.

Background readings in science for schools

Australian Academy of Science. (2005). Primary Connections: Linking science with literacy. Canberra: Australian Academy of Science.

Many titles available from www.science.org.au/primaryconnections

Board of Studies, Teaching and Educational Standards. All NSW science syllabi and related documents are available from http://www.boardofstudies.nsw.edu.au/

Dawson, V., & Venville, G. (Eds.) (2007). The art of teaching primary science. Crows Nest: Allen and Unwin.

Devereux, J. (2007). Science in the primary and early years. London: Sage/Open University Press.

Gillespie, H. (2007). Science for primary school teachers. Maidenhead: McGraw Hill/Open University Press.

Gillespie, H. (2007). Learning and teaching with virtual learning environments. Exeter: Learning Matters.

Harlen, W. & Aualter, A. (2004). The teaching science in primary schools. London: David Fulton.

Kalantzis, M., & Cope, B. (2008). New learning: Elements of a science of education. Melbourne: Cambridge University Press.

Rosebery, A.& Warren, B. (Eds.) (2008). Teaching Science to English Language Learners. Ohio: NSTA.

Tytler, R. (2007). Re-imaging science education, Australian Education Review, Australian Council of Educational Research. Australian Education Review, 51. Melbourne: ACER. Retrieved January 10, 2011, from http://www.acer.edu.au/research_reports/AER.html

Venville, G., & Dawson, V. (Eds.) (2012). The art of teaching science for middle and secondary school. Crows Nest: Allen & Unwin.

Ward, H., Roden, J., Hewlett, C., & Foreman, J. (2008). Teaching science in the primary classroom: A practical guide. London: Sage

Policies and Procedures

Macquarie University policies and procedures are accessible from Policy Central. Students should be aware of the following policies in particular with regard to Learning and Teaching:

Academic Honesty Policy http://mq.edu.au/policy/docs/academic_honesty/policy.html

New Assessment Policy in effect from Session 2 2016 http://mq.edu.au/policy/docs/assessm

ent/policy_2016.html. For more information visit http://students.mq.edu.au/events/2016/07/19/new_assessment_policy_in_place_from_session_2/

Assessment Policy prior to Session 2 2016 http://mq.edu.au/policy/docs/assessment/policy.html

Grading Policy prior to Session 2 2016 http://mq.edu.au/policy/docs/grading/policy.html

Grade Appeal Policy http://mq.edu.au/policy/docs/gradeappeal/policy.html

Complaint Management Procedure for Students and Members of the Public http://www.mq.edu.au/policy/docs/complaint_management/procedure.html

Disruption to Studies Policy http://www.mq.edu.au/policy/docs/disruption_studies/policy.html *The Disruption to Studies Policy is effective from March 3 2014 and replaces the Special Consideration Policy.*

In addition, a number of other policies can be found in the Learning and Teaching Category of Policy Central.

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: https://students.mq.edu.au/support/student_conduct/

Results

Results shown in *iLearn*, or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in eStudent. For more information visit ask.mq.edu.au.

Student Support

Macquarie University provides a range of support services for students. For details, visit http://students.mq.edu.au/support/

Learning Skills

Learning Skills (mq.edu.au/learningskills) provides academic writing resources and study strategies to improve your marks and take control of your study.

- Workshops
- StudyWise
- Academic Integrity Module for Students
- Ask a Learning Adviser

Student Services and Support

Students with a disability are encouraged to contact the Disability Service who can provide appropriate help with any issues that arise during their studies.

Student Enquiries

For all student enquiries, visit Student Connect at ask.mq.edu.au

IT Help

For help with University computer systems and technology, visit http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/.

When using the University's IT, you must adhere to the Acceptable Use of IT Resources Policy. The policy applies to all who connect to the MQ network including students.

Graduate Capabilities

Creative and Innovative

Our graduates will also be capable of creative thinking and of creating knowledge. They will be imaginative and open to experience and capable of innovation at work and in the community. We want them to be engaged in applying their critical, creative thinking.

This graduate capability is supported by:

Learning outcome

- 4. gather, process and present scientific information to solve problems analyse and prepare science reports

Assessment task

- Reporting Science

Discipline Specific Knowledge and Skills

Our graduates will take with them the intellectual development, depth and breadth of knowledge, scholarly understanding, and specific subject content in their chosen fields to make them competent and confident in their subject or profession. They will be able to demonstrate, where relevant, professional technical competence and meet professional standards. They will be able to articulate the structure of knowledge of their discipline, be able to adapt discipline-specific knowledge to novel situations, and be able to contribute from their discipline to inter-disciplinary solutions to problems.

This graduate capability is supported by:

Learning outcomes

- 1. demonstrate understanding of essential science concepts across the four sciences
- 2. reflect on your own science knowledge and understanding and how this was acquired
- 5. demonstrate your understanding of content covered in lectures and tutorials

Assessment tasks

- Images of science & scientists
- Examination

Critical, Analytical and Integrative Thinking

We want our graduates to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments; to be able to critique constraints, assumptions and limitations; to be able to think independently and systemically in relation to scholarly activity, in the workplace, and in the world. We want them to have a level of scientific and information technology literacy.

This graduate capability is supported by:

Learning outcomes

- 1. demonstrate understanding of essential science concepts across the four sciences
- 2. reflect on your own science knowledge and understanding and how this was acquired
- 3. engage with and safely perform laboratory tasks and conduct practical work
- 5. demonstrate your understanding of content covered in lectures and tutorials

Assessment tasks

- Images of science & scientists
- Examination

Problem Solving and Research Capability

Our graduates should be capable of researching; of analysing, and interpreting and assessing data and information in various forms; of drawing connections across fields of knowledge; and they should be able to relate their knowledge to complex situations at work or in the world, in order to diagnose and solve problems. We want them to have the confidence to take the initiative in doing so, within an awareness of their own limitations.

This graduate capability is supported by:

Learning outcomes

- 3. engage with and safely perform laboratory tasks and conduct practical work
- 4. gather, process and present scientific information to solve problems analyse and prepare science reports

Assessment tasks

- Images of science & scientists
- Reporting Science

Effective Communication

We want to develop in our students the ability to communicate and convey their views in forms effective with different audiences. We want our graduates to take with them the capability to read, listen, question, gather and evaluate information resources in a variety of formats, assess, write clearly, speak effectively, and to use visual communication and communication technologies as appropriate.

This graduate capability is supported by:

Learning outcomes

- 1. demonstrate understanding of essential science concepts across the four sciences
- 2. reflect on your own science knowledge and understanding and how this was acquired
- 4. gather, process and present scientific information to solve problems analyse and prepare science reports
- 5. demonstrate your understanding of content covered in lectures and tutorials

Assessment tasks

- Reporting Science
- Examination

Engaged and Ethical Local and Global citizens

As local citizens our graduates will be aware of indigenous perspectives and of the nation's historical context. They will be engaged with the challenges of contemporary society and with knowledge and ideas. We want our graduates to have respect for diversity, to be open-minded, sensitive to others and inclusive, and to be open to other cultures and perspectives: they should have a level of cultural literacy. Our graduates should be aware of disadvantage and social justice, and be willing to participate to help create a wiser and better society.

This graduate capability is supported by:

Assessment task

- Reporting Science

Socially and Environmentally Active and Responsible

We want our graduates to be aware of and have respect for self and others; to be able to work with others as a leader and a team player; to have a sense of connectedness with others and country; and to have a sense of mutual obligation. Our graduates should be informed and active participants in moving society towards sustainability.

This graduate capability is supported by:

Learning outcome

- 4. gather, process and present scientific information to solve problems analyse and

prepare science reports

Assessment task

- Reporting Science