Unit Outline
EDEC2016 EDE272 Engaging Children in Science
OpenUnis SP 2, 2016

Unit study package code: EDEC2016
Mode of study: Area External
Credit Value: 25.0
Pre-requisite units: EDUC1011 (v.0) EDC171 Teachers Inquiring about the World or any previous version
OR
314933 (v.0) EDC171 Inquiring about the World or any previous version
Co-requisite units: Nil
Anti-requisite units: Nil
Result type: Grade/Mark
Approved incidental fees: Information about approved incidental fees can be obtained from our website. Visit fees.curtin.edu.au/incidental_fees.cfm for details.

Unit coordinator:
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Location: Building: Building: Off-campus - Room: Room: Off-Campus

Teaching Staff:

Administrative contact:
Name: Michelle Marshall
Phone: Off-Campus
Email: Michelle.Marshall@curtin.edu.au
Location: Building: Building: Off-campus - Room: Room: Off-Campus

Learning Management System: Blackboard (lms.curtin.edu.au)
Acknowledgement of Country

We respectfully acknowledge the Indigenous Elders, custodians, their descendants and kin of this land past and present.

Syllabus

This unit investigates ways to support young children’s inquiry into natural science including environmental education and sustainability by engaging their curiosity and desire to explore science content. The unit examines pedagogical approaches, theoretical perspectives, and research which assist educators to plan and implement teaching and learning programs which engage children (birth - 8 years) in authentic and meaningful science experiences.

Introduction

Young children are natural scientists. They bring an inquiring mind to the classroom. This unit supports you to develop confidence and positive attitudes towards science and teaching science through authentic, contextual, hands-on, minds-on learning experiences. Through this unit, you will be encouraged to develop your knowledge and skills of science, teaching, learning, and assessment capabilities, based on an inquiry approach to learning.

Related teaching and learning skills, strategies, and concepts will be developed through professional and personal knowledge of learning theories, science curriculum, the Early Years Learning Framework (EYLF) and pedagogy. These will be enhanced through the development of science lessons that provide links to sustainability and environment, questioning children for their scientific beliefs, and reflecting on your own personal change and growth as a science teacher. Ultimately, this unit aims to encourage you, as future early childhood science educators, to nurture children’s precious and developing curiosity.

Unit Learning Outcomes

All graduates of Curtin University achieve a set of nine graduate attributes during their course of study. These tell an employer that, through your studies, you have acquired discipline knowledge and a range of other skills and attributes which employers say would be useful in a professional setting. Each unit in your course addresses the graduate attributes through a clearly identified set of learning outcomes. They form a vital part in the process referred to as assurance of learning. The learning outcomes tell you what you are expected to know, understand or be able to do in order to be successful in this unit. Each assessment for this unit is carefully designed to test your achievement of one or more of the unit learning outcomes. On successfully completing all of the assessments you will have achieved all of these learning outcomes.

Your course has been designed so that on graduating we can say you will have achieved all of Curtin’s Graduate Attributes through the assurance of learning process in each unit.

<table>
<thead>
<tr>
<th>On successful completion of this unit students can:</th>
<th>Graduate Attributes addressed</th>
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<tbody>
<tr>
<td>1 Identify and explain science concepts and demonstrate science skills</td>
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<tr>
<td>2 Demonstrate knowledge and application of learning theories, teaching and learning approaches from current literature and relevant curriculum documents for birth to 8 years old children’s science learning and assessments</td>
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<tr>
<td>3 Design effective science learning experiences for birth to 8 year old children identifying language and scientific literacy</td>
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</tbody>
</table>
Curtin’s Graduate Attributes

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>Apply discipline knowledge</td>
<td>Use analytical skills to solve problems</td>
</tr>
<tr>
<td>Communication skills</td>
<td>(confidence to communicate)</td>
</tr>
<tr>
<td>Technology skills</td>
<td>Apply principles learnt to new situations</td>
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<tr>
<td>International perspective</td>
<td>(confidence to work independently and as a team)</td>
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<tr>
<td>Cultural understanding</td>
<td>(value the perspectives of others)</td>
</tr>
<tr>
<td>Learning how learn</td>
<td>(value the perspectives of others)</td>
</tr>
<tr>
<td>Professional Skills</td>
<td>(confidence to tackle unfamiliar problems)</td>
</tr>
</tbody>
</table>

Find out more about Curtin’s Graduate attributes at the Office of Teaching & Learning website: ctl.curtin.edu.au

Learning Activities

Refer to each week’s topic within the unit Blackboard LMS site for details regarding discussion board activities, reading material, additional resources such as video’s, websites and documents, as well as any other information pertinent to that topic.

Each week, there are essential readings from the textbook Science in Early Childhood (second edition) and a range of recommended readings including articles from the journal Every Child, a journal from Early Childhood Australia. Many other readings are available via e-Reserve. Many resources are available via Blackboard. The activities each week are very practical, hands-on activities and may expect you to go outside. You will need to have the following items for the activities:

- An A3 sketchbook (rough paper not shiny like photocopy paper);
- A 2B pencil, eraser & sharpener;
- A notebook, pens, ruler;
- Oil pastel crayons (a box of 48 is a good investment needed for Visual and Media Arts in Early Childhood) or coloured pencils (Aquarelles are recommended); and
- A willingness to explore, work and share with your peers, and
- A sense of wonder.

Each week’s activity is described on the unit’s Blackboard site.

Learning Resources

Library Reserve

There are resources for this unit in the library Reserve collection. To access these resources, please click on the following link:


Essential texts

The required textbook(s) for this unit are:


Other resources

Online Resources


Other Resources


River Rangers Cadet Program http://www.riverguardians.com/education/river-rangers-cadet-program


### Assessment

#### Assessment schedule

<table>
<thead>
<tr>
<th>Task</th>
<th>Value %</th>
<th>Date Due</th>
<th>Unit Learning Outcome(s) Assessed</th>
</tr>
</thead>
</table>
| Case Study                | 50 percent | **Week:** Week 4  
**Day:** Sunday 26th  
**June 2016**  
**Time:** 9pm | 1,2,5                |
| Report Planning Document  | 50 percent | **Week:** Week 11  
**Day:** Sunday 14th  
**August 2016**  
**Time:** 9pm | 3,4,5                |

#### Detailed information on assessment tasks

1. **Assignment One: Case Study (1500 words + / - 10%)**
   
   Due date: Sunday 26th June by 23:59 WST

   This assignment is a case study of a child’s engagement, inquiry skills and understanding of physical or chemical science understandings. There are two parts to the assignment that build to the final case study report.

   **Part A**

   Design a science inquiry activity suitable for engaging a child with physical or chemical science understandings that uses ONE of the following materials.
   - Sand, or
   - Water, or
   - Blocks, balls and tubes

   The activity should be:
   - Suitable for a foundation, year one or year two child
   - Creative and original (Do not copy lessons from published resources)
   - Written up using the Early Childhood General Learning Experience Plan Template (see blackboard).

   Include this plan as Appendix 1 in your case study report

   Your report should include the following framing discussion for Part A.

   **Context**

   Explain the context for the activity e.g. where would the activity be conducted (learning environment).

   Describe the child’s profile and background, e.g. age, prior experiences and the understandings/skills you could reasonably expect the child to have at the start of the learning activity.

   **Curriculum links**

   Explain how the planned inquiry activity links to the Australian Curriculum and the Early Years Learning Framework.
Justification
Use references to explain and justify the learning theory that underpins the activity and the proposed teaching and learning approach.

Questioning
Prepare a set of 12 questions to frame and guide the child’s hands-on/minds-on engagement with the science activity. The questions should be appropriate for the following stages in the activity.

- Getting started
- During the body of the activity
- Debriefing at the end

Include these questions in your report as a table.

Part B
Identify a suitable child to engage with your science inquiry activity and attain signed consent from their parent/guardian. A consent letter and form is available on Blackboard in the assignment one folder.

Use the designed science inquiry activity and questions to facilitate the child’s engagement
Observe and record in writing the learning conversation and the child’s actions

Note:
- No images are to be taken of the child
- Don’t instruct but rather listen to the child’s ideas as they engage with the activity
- You may need to change or adjust your questions in response to comments or actions made by the child. Record any changes made and explain why the change occurred.
- Encourage the child to talk freely about the activity and their science ideas
- Include a transcription of the child’s learning conversation and actions as Appendix 2
- Scan and include the signed consent letter and form as Appendix 3
- Reflect on the child’s engagement, language, actions and learning
- What did the child know and learn?
- How do you know?
- What evidence do you have to support your assertions (Child’s comments, actions, drawing etc.)

Report Structure: Case Study
Use the following subheadings to structure your 1500 word report.
Introduction
Activity Design (Appendix 1)
Context
Curriculum links
Justification
Questions (table)
Discussion

Use the following questions to inform your analysis and discussion of the child’s engagement with the science inquiry activity.

- How did the child engage with the activity?
- What key actions and conversations provide evidence of the child’s physical or chemical understanding and inquiry skills targeted in the activity.
- What prior knowledge did the child bring to the activity? How did you know?
- How did they demonstrate scientific reasoning?
- What did they learn from the activity? How do you know?

Conclusion
Use the following questions to inform your conclusion.

- What worked well, what didn’t and what would you change if you were to use the activity in the future?
- What did you learn from this case study about how young children learn science?

References

Appendix

2. Assignment Two: Report Planning Document (1500 words +/- 10%)
Due date: Sunday 29 May by 23:59 WST

This assignment involves establishing and documenting the growth of a ‘3 plant’ garden and creating 3 original lessons that relate to the garden. The constructivist science learning journey created in the lesson sequence will be suitable for engaging a small group of children (3 to 8 years of age) with biological understandings, inquiry skills and promote an appreciation for sustainability.

Part A
Grow a garden with 3 plants.
Note:
- One plant must be a bean grown from seed to offspring.
- The other two plants may also start as seeds or alternatively from cuttings or seedlings.
- The garden may be grown in a container(s) or in the ground.
- Justify the choice of plant and growing conditions.

Record, and explain your observations, inquiry and learning in detail using both of the following.
- KWLH table (Know, Want to know, Learned, How you Learned)
- POE chart (Predict, Observe, Explain)

Your recordings should be multimodal (words, numbers, drawings and photos) and clearly document establishing the garden and plant growth.

Relate your experience, skills and understandings to the Australian Curriculum (F to 3) and the EYLF. These documents will assist in focussing your own thinking and actions on key biological science understandings, inquiry skills and sustainability

Part B
Design three original and sequential science inquiry lessons that are based on a constructivist teaching and learning approach.
Note:
- Use the EC lesson plan template to structure and present the 3 lessons (see Blackboard)
- Remember to provide opportunities for children to Explore before Explain
- You do not have to use the 5E’s model
- All lessons must involve hands-on and minds-on garden related activities
- Nominate the year level of the children and make appropriate links to the EYLF and the Australian Curriculum

Report Structure: Planning Document
Use the following subheadings to structure your 1500 word report.
- Introduction
- Growing a Garden
- KWLH Table
- POE Chart
- Lesson Plans (3)
- References
Pass requirements
In order to pass this unit, all assessment tasks must be submitted and an overall mark of 50% or more must be achieved. Assessments are not considered as submitted if any required sections are incomplete, or if the electronic file is unreadable. It is a student’s responsibility to ensure that assessments are complete and have been successfully uploaded in a readable format.

A student who has received a Fail Grade (less than 50%) for an assessment, but achieves at least 40% of the possible mark for an assessment that was handed in on time, will be offered the opportunity to resubmit. The maximum mark that can be awarded is 50% of the possible mark and only one assessment resubmission per unit is possible. The resubmitted work must be received by the due date.

Fair assessment through moderation
Moderation describes a quality assurance process to ensure that assessments are appropriate to the learning outcomes, and that student work is evaluated consistently by assessors. Minimum standards for the moderation of assessment are described in the Assessment and Student Progression Manual, available from policies.curtin.edu.au/policies/teachingandlearning.cfm

Late assessment policy
This ensures that the requirements for submission of assignments and other work to be assessed are fair, transparent, equitable, and that penalties are consistently applied.

1. All assessments students are required to submit will have a due date and time specified on this Unit Outline.
2. Students will be penalised by a deduction of ten percent per calendar day for a late assessment submission (eg a mark equivalent to 10% of the total allocated for the assessment will be deducted from the marked value for every day that the assessment is late). This means that an assessment worth 20 marks will have two marks deducted per calendar day late. Hence if it was handed in three calendar days late and given a mark of 16/20, the student would receive 10/20. An assessment more than seven calendar days overdue will not be marked and will receive a mark of 0.

Assessment extension
A student unable to complete an assessment task by/on the original published date/time (eg examinations, tests) or due date/time (eg assignments) must apply for an assessment extension using the Assessment Extension form (available from the Forms page at students.curtin.edu.au/administration/) as prescribed by the Academic Registrar. It is the responsibility of the student to demonstrate and provide evidence for exceptional circumstances beyond the student’s control that prevent them from completing/submitting the assessment task.

The student will be expected to lodge the form and supporting documentation with the unit coordinator before the assessment date/time or due date/time. An application may be accepted up to five working days after the date or due date of the assessment task where the student is able to provide an acceptable explanation as to why he or she was not able to submit the application prior to the assessment date. An application for an assessment extension will not be accepted after the date of the Board of Examiners’ meeting.

Deferred assessments
If your results show that you have been granted a deferred assessment you should immediately check OASIS for details.

Supplementary assessments
Supplementary assessments are not available in this unit.
Reasonable adjustments for students with disabilities/health circumstances likely to impact on studies

A Curtin Access Plan (CAP) is a document that outlines the type and level of support required by a student with a disability or health condition to have equitable access to their studies at Curtin. This support can include alternative exam or test arrangements, study materials in accessible formats, access to Curtin’s facilities and services or other support as discussed with an advisor from Disability Services (disability.curtin.edu.au). Documentation is required from your treating Health Professional to confirm your health circumstances.

If you think you may be eligible for a CAP, please contact Disability Services. If you already have a CAP please provide it to the Unit Coordinator at the beginning of each semester.

Referencing style

The referencing style for this unit is APA 6th Ed.

More information can be found on this style from the Library web site: http://libguides.library.curtin.edu.au/referencing.

Copyright

© Curtin University. The course material for this unit is provided to you for your own research and study only. It is subject to copyright. It is a copyright infringement to make this material available on third party websites.

Academic Integrity (including plagiarism and cheating)

Any conduct by a student that is dishonest or unfair in connection with any academic work is considered to be academic misconduct. Plagiarism and cheating are serious offences that will be investigated and may result in penalties such as reduced or zero grades, annulled units or even termination from the course.

Plagiarism occurs when work or property of another person is presented as one’s own, without appropriate acknowledgement or referencing. Submitting work which has been produced by someone else (e.g. allowing or contracting another person to do the work for which you claim authorship) is also plagiarism. Submitted work is subjected to a plagiarism detection process, which may include the use of text matching systems or interviews with students to determine authorship.

Cheating includes (but is not limited to) asking or paying someone to complete an assessment task for you or any use of unauthorised materials or assistance during an examination or test.

From Semester 1, 2016, all incoming coursework students are required to complete Curtin’s Academic Integrity Program (AIP). If a student does not pass the program by the end of their first study period of enrolment at Curtin, their marks will be withheld until they pass. More information about the AIP can be found at: https://academicintegrity.curtin.edu.au/students/AIP.cfm

Refer to the Academic Integrity tab in Blackboard or academicintegrity.curtin.edu.au for more information, including student guidelines for avoiding plagiarism.

Information and Communications Technology (ICT) Expectations

Curtin students are expected to have reliable internet access in order to connect to OASIS email and learning systems such as Blackboard and Library Services.

You may also require a computer or mobile device for preparing and submitting your work.

For general ICT assistance, in the first instance please contact OASIS Student Support: oasisapps.curtin.edu.au/help/general/support.cfm

For specific assistance with any of the items listed below, please contact The Learning Centre: life.curtin.edu.au/learning-support/learning_centre.htm

- Using Blackboard, the I Drive and Back-Up files
- Introduction to PowerPoint, Word and Excel
Additional information

Enrolment
It is your responsibility to ensure that your enrolment is correct - you can check your enrolment through the eStudent option on OASIS, where you can also print an Enrolment Advice.

Student Rights and Responsibilities
It is the responsibility of every student to be aware of all relevant legislation, policies and procedures relating to their rights and responsibilities as a student. These include:

- the Student Charter
- the University’s Guiding Ethical Principles
- the University’s policy and statements on plagiarism and academic integrity
- copyright principles and responsibilities
- the University’s policies on appropriate use of software and computer facilities

Information on all these things is available through the University’s “Student Rights and Responsibilities” website at: students.curtin.edu.au/rights.

Student Equity
There are a number of factors that might disadvantage some students from participating in their studies or assessments to the best of their ability, under standard conditions. These factors may include a disability or medical condition (e.g. mental illness, chronic illness, physical or sensory disability, learning disability), significant family responsibilities, pregnancy, religious practices, living in a remote location or another reason.

If you believe you may be unfairly disadvantaged on these or other grounds please contact Student Equity at eesj@curtin.edu.au or go to http://eesj.curtin.edu.au/student_equity/index.cfm for more information.

You can also contact Counselling and Disability services: http://www.disability.curtin.edu.au or the Multi-faith services: http://life.curtin.edu.au/health-and-wellbeing/about_multifaith_services.htm for further information.

It is important to note that the staff of the university may not be able to meet your needs if they are not informed of your individual circumstances so please get in touch with the appropriate service if you require assistance. For general wellbeing concerns or advice please contact Curtin's Student Wellbeing Advisory Service at: http://life.curtin.edu.au/health-and-wellbeing/student_wellbeing_service.htm

Recent unit changes
Students are encouraged to provide unit feedback through eVALUate, Curtin’s online student feedback system. For more information about eVALUate, please refer to evaluate.curtin.edu.au/info/.

To view previous student feedback about this unit, search for the Unit Summary Report at https://evaluate.curtin.edu.au/student/unit_search.cfm. See https://evaluate.curtin.edu.au/info/dates.cfm to find out when you can eVALUate this unit.

Recent changes to this unit include:
Assessment schedule changed to;
1. Case Study (50%)
2. Report (50%)
## Program calendar

<table>
<thead>
<tr>
<th>Week</th>
<th>Begin Date</th>
<th>Topic</th>
<th>Assessment Due</th>
</tr>
</thead>
</table>
| 1.   | 30/05/2016 | What does learning Science in ECE look like?  
- Oblec | Campbell et al., (2015)  
Chapter 1  
Blackboard: recommended readings and activities |
| 2.   | 6/06/2016  | The Australian Science Curriculum and science in the EYLF  
- Gardens | Campbell et al., (2015)  
Chapter 2 & 3  
Blackboard: recommended readings and activities |
| 3.   | 13/06/2016 | Science inquiry: Process skills and investigating  
- talking science and effective questioning  
- making butter | Campbell et al., (2015)  
Chapter 5  
Blackboard: recommended readings and activities |
| 4.   | 20/06/2016 | Science Inquiry Skills  
- constructivism  
- Primary Connections and the 5E model  
- sociocultural perspectives | Campbell et al., (2015)  
Chapter 4  
Blackboard: recommended readings and activities  
Ass 1 (50%)  
Case Study  
DD: Sunday  
26th June  
11.59 WST |
| 5.   | 27/06/2016 | Conceptual development and biological understandings  
- mini beasts | Blackboard: recommended readings and activities |
| 6.   | 04/07/2016 | Managing science and chemical understandings  
- materials and physical changes | Blackboard: recommended readings and activities |
| 7.   | 11/07/2016 | Reasoning scientifically and multimodal representations: Physical science understandings  
- helicopters | Blackboard: recommended readings and activities |
| 8.   | 18/07/2016 | Cross curricular priorities applied in science: Exploring Earth & Space understandings  
- sustainability  
- indigenous science  
- numeracy in science | Blackboard: recommended readings and activities |
| 9.   | 25/07/2016 | Planning constructively: Backwards planning of a science learning journey  
- assessment in science | Campbell et al., (2015)  
Chapter 11 & 12  
Blackboard: recommended readings and activities |
| 10.  | 01/08/2016 | Enhancing young children's learning of science  
- olav pedaooav | Campbell et al., (2015)  
Chapter 6 & 7  
Blackboard: |
<table>
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<tr>
<th></th>
<th>Date</th>
<th>Activity</th>
<th>Recommended Readings and Activities</th>
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<tr>
<td>11</td>
<td>08/08/2016</td>
<td>Science learning environments</td>
<td>- Campbell et al., (2015) Chapter 8, 9 &amp; 10&lt;br&gt;- Blackboard: recommended readings and activities</td>
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<td></td>
<td></td>
<td>- informal contexts, home and community</td>
<td>Ass 2 (50%)&lt;br&gt;- Report: Planning Document&lt;br&gt;- DD: Sunday 14th August 11.59 WST</td>
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<td>- natural play spaces</td>
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<tr>
<td>12</td>
<td>15/08/2016</td>
<td>Sharing science resources and reflection</td>
<td>Blackboard: recommended readings and activities</td>
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<tr>
<td>13</td>
<td>22/08/2016</td>
<td>Unit reflection and Evaluation</td>
<td>E-Valuate</td>
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