



# ECHE2340

## Teaching and Learning Mathematics, Science and Technology 2

Session 2, Special circumstance 2020

*Macquarie School of Education*

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#### Disclaimer

Macquarie University has taken all reasonable measures to ensure the information in this publication is accurate and up-to-date. However, the information may change or become out-dated as a result of change in University policies, procedures or rules. The University reserves the right to make changes to any information in this publication without notice. Users of this publication are advised to check the website version of this publication [or the relevant faculty or department] before acting on any information in this publication.

#### Notice

As part of [Phase 3 of our return to campus plan](#), most units will now run tutorials, seminars and other small group learning activities on campus for the second half-year, while keeping an online version available for those students unable to return or those who choose to continue their studies online.

To check the availability of face-to-face and online activities for your unit, please go to [timetable viewer](#). To check detailed information on unit assessments visit your unit's iLearn space or consult your unit convenor.

## General Information

Unit convenor and teaching staff

Convenor and Lecturer

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Convenor and Lecturer

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Credit points

10

Prerequisites

ECH232 or ECHE2320

Corequisites

Co-badged status

Unit description

This unit has a particular focus on the Statistics and Probability, Measurement and Geometry and Number strategies for K-6 students. The unit also addresses the strands of made environments and natural environments and focuses on the sub strands physical world, material world, built environments, products, information and material world. Here the importance of environmental education and sustainability for the future is also addressed, as well as effective technology integration. The unit builds on knowledge gained in ECH2320 and continues to develop students' understanding of the processes of learning, teaching and assessing mathematics, science and technology. This unit is the second in a series of core units across these KLAs.

## 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:

**ULO1:** Continue to develop an understanding of the major theoretical developments in early childhood mathematics, science and technology education.

**ULO2:** Continue to develop skills in designing, implementing and evaluating lesson sequences using knowledge of the NSW Curriculum Framework, NESA syllabuses and other curriculum requirements of the Education Act.

**ULO3:** Demonstrate knowledge of mathematical concepts and processes in the area of patterns and algebra, and space and geometry.

**ULO5:** Develop an ethical stance on environmental education and assume responsibility for influencing the direction of early childhood practice in order to ensure sustainability for the future.

**ULO4:** Demonstrate knowledge of scientific concepts and processes related to the natural environment and physical and material worlds.

**ULO6:** Demonstrate research-based knowledge of the models of pedagogy for teaching and assessing mathematics and science and technology.

**ULO7:** Develop skills in integrating information and communication technologies (ICT) within effective teaching and learning strategies to expand opportunities for students in mathematics and science learning.

## General Assessment Information

### Assignment extensions

Applications for extensions must be made via AskMQ at <https://ask.mq.edu.au> as a Special Consideration request before the submission date. Students who experience a disruption to their studies through ill-health or misadventure are able to apply for this request. Extensions can only be granted if they meet the Special Considerations policy and are submitted via <https://ask.mq.edu.au/>. This will ensure consistency in the consideration of such requests is maintained. In general, there should be no need for extensions except through illness or misadventure that would be categorised as unavoidable disruption according to the University definition of same, see: <http://students.mq.edu.au/study/my-study-program/special-consideration>

### Late Assessment Penalty

Unless a Special Consideration request has been submitted and approved, (a) a penalty for lateness will apply – two (2) marks out of 100 will be deducted per day for assignments submitted after the due date – and (b) no assignment will be accepted more than seven (7) days (incl. weekends) after the original submission deadline. No late submissions will be accepted for timed assessments – e.g. quizzes, online tests.

No assessable work will be accepted after the return/release of marked work on the same topic. If a student is still permitted to submit on the basis of unavoidable disruption, an alternative topic may be set.

Students should keep an electronic file of all assessments. Claims regarding "lost" assessments cannot be made if the file cannot be produced. It is also advisable to keep an electronic file of all drafts and the final submission on a USB untouched/unopened after submission. This can be used to demonstrate easily that the assessment has not been amended after the submission date.

### **Requesting a remark of an assignment**

If you have evidence that your task has been incorrectly assessed against the grade descriptors you can request a re-mark. To request a re-mark you need to contact the unit convenor within 7 days of the date of return of the assignment and provide a detailed assessment of your script against the task criteria. Evidence from your assignment must be provided to support your judgements.

Note: Failed assessments can not be re-submitted as they are all double-marked as a part of the moderation process. Please note: The outcome of a re-mark may be a higher/lower or unchanged grade. Grades are standards referenced and effort is NOT a criterion.

### **Units with Quiz Assessments**

Online quizzes are an individual assessment task and **MUST BE COMPLETED** by each student individually. Similarities in responses between students will be checked and investigated for possible collusion. Please see the Academic Honesty Handbook for more information.

### **Assessment Presentation & Submission Guidelines**

Please follow these guidelines when you submit each assignment:

- Allow a left and right-hand margin of at least 2cm in all assignments.
- Please type all assignments using 12-point font and 1.5 spacing.
- All assessments must be submitted through Turnitin in .doc or .pdf format
- It is the onus of the student to ensure that all assessments are successfully submitted through Turnitin.
- Faculty assignment cover sheets are NOT required.

### **Draft Submissions & Turnitin Originality Reports**

- Students may use Turnitin's Originality Report as a learning tool to improve their academic writing if this option is made available in the unit.
- Students are strongly encouraged to upload a draft copy of each assessment to Turnitin at least one week prior to the due date to obtain an Originality Report.
- The Originality Report provides students with a similarity index that may indicate if plagiarism has occurred.

- Students will be able to make amendments to their drafts prior to their final submission on the due date.
- Generally, one Originality Report is generated every 24 hours up to the due date.

**Please note:**

- Students should regularly save a copy of all assignments before submission,
- Unless there are exceptional circumstances, no assessment will be accepted after the date that the assessment has been returned to other students.
- Students are responsible for checking that their submission has been successful and has been submitted by the due date and time.

**University policy on grading**

Criteria for awarding grades for assessment tasks

Assignments will be awarded grades ranging from HD to F according to guidelines set out in the University's Grading Policy. The following descriptive criteria are included for your information.

Descriptive Criteria for awarding grades in the unit

In order to meet the unit outcomes and successfully pass this unit, students must make a genuine attempt at all assessment tasks. Where any submitted assessment task is considered to be unsatisfactory in this regard, the highest possible final grade that can be awarded for the unit will be 45.

Students will be awarded grades ranging from HD to F according to guidelines set out in the policy: <https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policies/assessment-in-effect-from-session-2-2016>

The following generic grade descriptors provide university-wide standards for awarding final grades.

<b>HD</b> (High Distinction)	Provides consistent evidence of deep and critical understanding in relation to the learning outcomes. There is substantial originality and insight in identifying, generating and communicating competing arguments, perspectives or problem solving approaches; critical evaluation of problems, their solutions and their implications; creativity in application as appropriate to the discipline.
<b>D</b> (Distinction)	Provides evidence of integration and evaluation of critical ideas, principles and theories, distinctive insight and ability in applying relevant skills and concepts in relation to learning outcomes. There is demonstration of frequent originality in defining and analysing issues or problems and providing solutions; and the use of means of communication appropriate to the discipline and the audience.
<b>Cr</b> (Credit)	Provides evidence of learning that goes beyond replication of content knowledge or skills relevant to the learning outcomes. There is demonstration of substantial understanding of fundamental concepts in the field of study and the ability to apply these concepts in a variety of contexts; convincing argumentation with appropriate coherent justification; communication of ideas fluently and clearly in terms of the conventions of the discipline.

P (Pass).	Provides sufficient evidence of the achievement of learning outcomes. There is demonstration of understanding and application of fundamental concepts of the field of study; routine argumentation with acceptable justification; communication of information and ideas adequately in terms of the conventions of the discipline. The learning attainment is considered satisfactory or adequate or competent or capable in relation to the specified outcomes
F (Fail)	Does not provide evidence of attainment of learning outcomes. There is missing or partial or superficial or faulty understanding and application of the fundamental concepts in the field of study; missing, undeveloped, inappropriate or confusing argumentation; incomplete, confusing or lacking communication of ideas in ways that give little attention to the conventions of the discipline.

### **Withdrawing from this UG Unit**

Note: *If you fail a unit with a professional experience component the fail grade will be on your transcript irrespective of the timing of the placement.*

If you are considering withdrawing from this unit, please seek academic advice via <https://ask.mq.edu.au> before doing so as this unit may be a co-requisite or prerequisite for units in the following sessions and may impact on your progression through the degree.

## **Assessment Tasks**

Name	Weighting	Hurdle	Due
<a href="#"><u>– Mathematics across the curriculum: Using literacy as a tool in mathematics (1800 words)</u></a>	35%	No	10/9/2020
<a href="#"><u>Science and Technology unit: 5 sequential learning experiences</u></a>	55%	No	15/10/2020
<a href="#"><u>Online Quiz</u></a>	10%	No	5/11/2020

### **– Mathematics across the curriculum: Using literacy as a tool in mathematics (1800 words)**

Assessment Type <sup>1</sup>: Literature review

Indicative Time on Task <sup>2</sup>: 35 hours

Due: **10/9/2020**

Weighting: **35%**

For this assessment task you are required to select a high-quality children’s story book that has the potential to enhance children’s mathematical learning and development in a Stage 2 or Stage 3 setting.

On successful completion you will be able to:

- Continue to develop an understanding of the major theoretical developments in early childhood mathematics, science and technology education.
- Continue to develop skills in designing, implementing and evaluating lesson sequences using knowledge of the NSW Curriculum Framework, NESA syllabuses and other curriculum requirements of the Education Act.
- Demonstrate knowledge of mathematical concepts and processes in the area of patterns and algebra, and space and geometry.
- Demonstrate knowledge of scientific concepts and processes related to the natural environment and physical and material worlds.

## Science and Technology unit: 5 sequential learning experiences

Assessment Type <sup>1</sup>: Lesson plan

Indicative Time on Task <sup>2</sup>: 55 hours

Due: **15/10/2020**

Weighting: **55%**

This assessment evaluates pre-service teachers' capabilities to critically review, select, plan for and utilise app/s and/or science-related online resources to support students as they develop, represent and communicate/share their understandings within a science-focused unit. (2500 words)

On successful completion you will be able to:

- Continue to develop an understanding of the major theoretical developments in early childhood mathematics, science and technology education.
- Demonstrate knowledge of mathematical concepts and processes in the area of patterns and algebra, and space and geometry.
- Demonstrate knowledge of scientific concepts and processes related to the natural environment and physical and material worlds.
- Develop an ethical stance on environmental education and assume responsibility for influencing the direction of early childhood practice in order to ensure sustainability for the future.
- Demonstrate research-based knowledge of the models of pedagogy for teaching and assessing mathematics and science and technology.
- Develop skills in integrating information and communication technologies (ICT) within effective teaching and learning strategies to expand opportunities for students in mathematics and science learning.

## Online Quiz

Assessment Type <sup>1</sup>: Quiz/Test

Indicative Time on Task <sup>2</sup>: 10 hours

Due: **5/11/2020**

Weighting: **10%**

10 multiple choice questions.

On successful completion you will be able to:

- Continue to develop an understanding of the major theoretical developments in early childhood mathematics, science and technology education.
- Demonstrate knowledge of mathematical concepts and processes in the area of patterns and algebra, and space and geometry.
- Demonstrate knowledge of scientific concepts and processes related to the natural environment and physical and material worlds.

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<sup>1</sup> If you need help with your assignment, please contact:

- the academic teaching staff in your unit for guidance in understanding or completing this type of assessment
- the [Writing Centre](#) for academic skills support.

<sup>2</sup> Indicative time-on-task is an estimate of the time required for completion of the assessment task and is subject to individual variation

## Delivery and Resources

ECHE234 comprises three modules (mathematics, science and technology), each running for three weeks. All lectures are online.

Textbooks

Siemon, D., Beswick, K., Brady, K., Clark, J., Faragher, R., & Warren, E. (2017). Teaching mathematics: Foundation to middle years (2nd ed.) (We also use this text for ECH431, so it is an important investment).

Fleer, M. (2015). Science for children. Cambridge

## Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central \(https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central\)](https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central). Students should be aware of the following policies in particular with regard to Learning and Teaching:



- [Academic Appeals Policy](#)
- [Academic Integrity Policy](#)
- [Academic Progression Policy](#)
- [Assessment Policy](#)
- [Fitness to Practice Procedure](#)
- [Grade Appeal Policy](#)
- [Complaint Management Procedure for Students and Members of the Public](#)
- [Special Consideration Policy](#) (**Note:** *The Special Consideration Policy is effective from 4 December 2017 and replaces the Disruption to Studies Policy.*)

Students seeking more policy resources can visit the [Student Policy Gateway](https://students.mq.edu.au/support/study/student-policy-gateway) (<https://students.mq.edu.au/support/study/student-policy-gateway>). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

If you would like to see all the policies relevant to Learning and Teaching visit [Policy Central](http://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central) (<http://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/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/study/getting-started/student-conduct>

## Results

Results published on platform other than [eStudent](#), (eg. iLearn, Coursera etc.) 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](http://ask.mq.edu.au) or if you are a Global MBA student contact [globalmba.support@mq.edu.au](mailto:globalmba.support@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](http://mq.edu.au/learningskills)) provides academic writing resources and study strategies to help you improve your marks and take control of your study.

- [Getting help with your assignment](#)
- [Workshops](#)
- [StudyWise](#)
- [Academic Integrity Module](#)

The Library provides online and face to face support to help you find and use relevant information resources.

- [Subject and Research Guides](#)
- [Ask a Librarian](#)

## 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](http://ask.mq.edu.au)

If you are a Global MBA student contact [globalmba.support@mq.edu.au](mailto:globalmba.support@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/](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.