



EDCU13020 *Mathematics Curriculum*

Term 2 - 2022

Profile information current as at 10/04/2024 11:58 pm

All details in this unit profile for EDCU13020 have been officially approved by CQUUniversity and represent a learning partnership between the University and you (our student). The information will not be changed unless absolutely necessary and any change will be clearly indicated by an approved correction included in the profile.

General Information

Overview

In Mathematics Curriculum, you will build on the knowledge acquired in previous mathematics units to develop a deeper understanding of the structure, sequencing and connections between the critical concepts and skills in mathematical content across the year levels in the Australian Curriculum: Mathematics. You will learn to solve problems through transference of mathematical knowledge using acquired reasoning, logic, and analytical skills. You will be able to identify physical and digital resources and justify differing pedagogies used to teach the sub-strands of the Australian Curriculum: Mathematics to overcome barriers to learning mathematics for children of diverse backgrounds. Your personal competence and proficiency towards mathematics teaching is enhanced in this unit, you will learn to identify issues and challenges to mathematical understanding at key stages of the Australian Curriculum: Mathematics. The learning sequence of this unit supports your ability to develop, and use, a suitable range of appropriate and accurate assessment processes to evaluate the mathematics learnt.

Details

Career Level: *Undergraduate*

Unit Level: *Level 3*

Credit Points: 6

Student Contribution Band: 7

Fraction of Full-Time Student Load: 0.125

Pre-requisites or Co-requisites

Prerequisite:- Students must successfully complete the unit EDCU12038 prior to enrolling in this unit.

Important note: Students enrolled in a subsequent unit who failed their pre-requisite unit, should drop the subsequent unit before the census date or within 10 working days of Fail grade notification. Students who do not drop the unit in this timeframe cannot later drop the unit without academic and financial liability. See details in the [Assessment Policy and Procedure \(Higher Education Coursework\)](#).

Offerings For Term 2 - 2022

- Bundaberg
- Cairns
- Mackay
- Mixed Mode
- Online
- Rockhampton
- Townsville

Attendance Requirements

All on-campus students are expected to attend scheduled classes – in some units, these classes are identified as a mandatory (pass/fail) component and attendance is compulsory. International students, on a student visa, must maintain a full time study load and meet both attendance and academic progress requirements in each study period (satisfactory attendance for International students is defined as maintaining at least an 80% attendance record).

Website

[This unit has a website, within the Moodle system, which is available two weeks before the start of term. It is important that you visit your Moodle site throughout the term. Please visit Moodle for more information.](#)

Class and Assessment Overview

Recommended Student Time Commitment

Each 6-credit Undergraduate unit at CQUniversity requires an overall time commitment of an average of 12.5 hours of study per week, making a total of 150 hours for the unit.

Class Timetable

[Regional Campuses](#)

Bundaberg, Cairns, Emerald, Gladstone, Mackay, Rockhampton, Townsville

[Metropolitan Campuses](#)

Adelaide, Brisbane, Melbourne, Perth, Sydney

Assessment Overview

1. **Written Assessment**

Weighting: 45%

2. **Reflective Practice Assignment**

Weighting: 45%

3. **Peer assessment**

Weighting: 10%

Assessment Grading

This is a graded unit: your overall grade will be calculated from the marks or grades for each assessment task, based on the relative weightings shown in the table above. You must obtain an overall mark for the unit of at least 50%, or an overall grade of 'pass' in order to pass the unit. If any 'pass/fail' tasks are shown in the table above they must also be completed successfully ('pass' grade). You must also meet any minimum mark requirements specified for a particular assessment task, as detailed in the 'assessment task' section (note that in some instances, the minimum mark for a task may be greater than 50%). Consult the [University's Grades and Results Policy](#) for more details of interim results and final grades.

CQUniversity Policies

All University policies are available on the [CQUniversity Policy site](#).

You may wish to view these policies:

- Grades and Results Policy
- Assessment Policy and Procedure (Higher Education Coursework)
- Review of Grade Procedure
- Student Academic Integrity Policy and Procedure
- Monitoring Academic Progress (MAP) Policy and Procedure – Domestic Students
- Monitoring Academic Progress (MAP) Policy and Procedure – International Students
- Student Refund and Credit Balance Policy and Procedure
- Student Feedback – Compliments and Complaints Policy and Procedure
- Information and Communications Technology Acceptable Use Policy and Procedure

This list is not an exhaustive list of all University policies. The full list of University policies are available on the [CQUniversity Policy site](#).

Previous Student Feedback

Feedback, Recommendations and Responses

Every unit is reviewed for enhancement each year. At the most recent review, the following staff and student feedback items were identified and recommendations were made.

Feedback from Student feedback

Feedback

Assessment task descriptions to be clearer

Recommendation

A review of the assessment tasks to ensure students have a clear understanding of the task requirements.

Feedback from Student feedback

Feedback

Assessment tasks to align to the criteria grid

Recommendation

Assessment criteria will be reviewed.

Feedback from Student feedback

Feedback

Course content

Recommendation

Content to be contextualised to make it relevant to beginning teachers of mathematics.

Unit Learning Outcomes

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

1. Analyse the structure and organisation of content in the mathematics curriculum to identify key stages in concept development as a focus for assessing student learning
2. Assess students' understanding of the mathematical content to identify possible misconceptions or barriers to learning for diverse student groups
3. Distinguish evidence-based approaches to teaching and learning of mathematics that promote engagement, understanding and mathematical proficiency for students from diverse backgrounds including Aboriginal and Torres Strait Islander students
4. Design tools and guides for assessing students' knowledge and skills in Mathematics
5. Reflect on professional learning to describe processes and strategies that improve teaching practice and student learning
6. Justify the selection and use of resources that scaffold students' understanding of core mathematical concepts
7. Identify opportunities for students to use ICTs purposefully to gain mathematical knowledge and proficiency.

Successful completion of this unit provides opportunities for students to engage with the Australian Professional Standards for Teachers (Graduate Career Stage) focus areas of:

- 1.1 Physical, social and intellectual development and characteristics of students
- 1.2 Understand how students learn
- 1.3 Students with diverse linguistic, cultural, religious and socioeconomic backgrounds
- 1.4 Strategies for teaching Aboriginal and Torres Strait Islander students
- 2.1 Content and teaching strategies of the teaching area
- 2.5 Literacy and numeracy strategies
- 2.6 Information and Communication Technology (ICT)
- 3.4 Select and use resources
- 5.1 Assess student learning
- 6.2 Engage in professional learning and improve practice
- 6.4 Apply professional learning and improve student learning

Alignment of Learning Outcomes, Assessment and Graduate Attributes



Alignment of Assessment Tasks to Learning Outcomes

[illegible]

Textbooks and Resources

Textbooks

EDCU13020

Prescribed

Helping Children Learn Mathematics

Edition: 4 (2022)

Authors: Robert Reys, Anna Rogers, Leicha Bragg, Audrey Cooke, Melissa Fanshawe, Mark Gronow

Wiley

Milton, QLD, Australia

ISBN: 9780730391807

Binding: eBook

Additional Textbook Information

available from CQUniversity library as an eBook or purchased as hard copy or online.

[View textbooks at the CQUniversity Bookshop](#)

IT Resources

You will need access to the following IT resources:

- CQUniversity Student Email
- Internet
- Unit Website (Moodle)
- MS Teams

Referencing Style

All submissions for this unit must use the referencing style: [American Psychological Association 7th Edition \(APA 7th edition\)](#)

For further information, see the Assessment Tasks.

Teaching Contacts

Mark Gronow Unit Coordinator

m.gronow@cqu.edu.au

Schedule

- 25 Oct 2021

Module/Topic	Chapter	Events and Submissions/Topic
--------------	---------	------------------------------

Week 1 - 11 Jul 2022

Module/Topic	Chapter	Events and Submissions/Topic
Introduction to EDCU13020 Mathematics Curriculum.	eReading list Cavanagh, H. & McMaster, H. (2017). A Specialist Professional Experience Learning Community for Primary Pre-service Teachers Focussed on Mathematical Problem Solving. Mathematics Teacher Education & Development, 19(1), 47-65.	

Week 2 - 18 Jul 2022

Module/Topic	Chapter	Events and Submissions/Topic
--------------	---------	------------------------------

Australian Curriculum: Mathematics,	View the Australian Curriculum: Mathematics (v 8.4) website
	1. Australian Curriculum: Mathematics 2. Mathematical Proficiency Strands 3. National Numeracy Learning Progression 4. General Capabilities: Critical and Creative thinking 5. Revised Australian Curriculum: Mathematics Reys. (2021). Helping Children Learn Mathematics, 4th Australian Edition. John Wiley & Sons, Incorporated Chapter 2 Helping children learn mathematics with understanding Recommendation 4: Use communication to encourage understanding, p37. Chapter 5 Process of doing mathematics 5.1 Understanding 5.2 Fluency 5.3 Problem solving 5.4 Reasoning 5.5 Communication 5.6 Representations

Week 3 - 25 Jul 2022

Module/Topic	Chapter	Events and Submissions/Topic
Assessment in Mathematics, Part A	Reys. (2021). Helping Children Learn Mathematics, 4th Australian Edition. John Wiley & Sons, Incorporated. Chapter 4 Enhancing learning and teaching through assessment and feedback 4.1 Enhancing learning and teaching 4.2 Gathering information on children's learning 4.3 Ways to assess children's learning and dispositions 4.4 Keeping records and communicating about assessments Miller, & Hudson, P. J. (2007). Using Evidence-Based Practices to Build Mathematics Competence Related to Conceptual, Procedural, and Declarative Knowledge. Learning Disabilities Research and Practice, 22(1), 47-57. https://doi.org/10.1111/j.1540-5826.2007.00230.x Read pages 49-54 Definitions of conceptual, procedural and declarative knowledge.	

Week 4 - 01 Aug 2022

Module/Topic	Chapter	Events and Submissions/Topic
Assessment in Mathematics, Part B	eReading Clements, D., et al. (1990) Constructivist learning and teaching Protheroe, N. (2007) What does good math instruction look like?	

Week 5 - 08 Aug 2022

Module/Topic	Chapter	Events and Submissions/Topic
--------------	---------	------------------------------

Mathematical Pedagogy	<p>Reys. (2021). Helping Children Learn Mathematics, 4th Australian Edition. John Wiley & Sons, Incorporated.</p> <p>Chapter 2 Helping children learn mathematics with understanding</p> <p>2.2 Meaningful connections between procedural and conceptual knowledge</p> <p>2.3 How do children learn mathematics</p> <p>2.4 How can we help children make sense of mathematics?</p> <p>eReading</p> <p>Boaler, J. et al. (2016) Seeing as Understanding: The importance of Visual Mathematics for our Brain and Learning</p>
-----------------------	---

Vacation Week - 15 Aug 2022

Module/Topic	Chapter	Events and Submissions/Topic
Week 6 - 22 Aug 2022		
Module/Topic	Chapter	Events and Submissions/Topic
Professional Learning and Reflective Practices	<p>Reys. (2021). Helping Children Learn Mathematics, 4th Australian Edition. John Wiley & Sons, Incorporated.</p> <p>Chapter 1 School mathematics in a changing world</p> <p>1.4 Where can you turn?</p> <p>eReading</p> <p>Lane, R., McMaster, H., Adnum, J., & Cavanagh, M. (2014). Quality reflective practice in teacher education: a journey towards shared understanding.</p>	<p>Assessment in Mathematics Due: Week 6 Friday (26 Aug 2022) 11:45 pm AEST</p>

Week 7 - 29 Aug 2022

Module/Topic	Chapter	Events and Submissions/Topic
Learner Diversity in Mathematics	<p>Reys. (2021). Helping Children Learn Mathematics, 4th Australian Edition. John Wiley & Sons, Incorporated.</p> <p>Chapter 2 Helping children learn mathematics with understanding</p> <p>2.1 How can we support diverse learners in our classroom</p> <p>Chapter 3 Planning and teaching</p> <p>3.5 Meeting the needs of all children</p> <p>eReading</p> <p>Jorgensen, R. (2015) Language, Culture and Access to Mathematics: a Case of one Remote Aboriginal Community</p>	

Week 8 - 05 Sep 2022

Module/Topic	Chapter	Events and Submissions/Topic
Developing Mathematical Understanding	<p>eReading</p> <p>Small, M. (2017) Good Questions: Great ways to differentiate instruction the standards-based classroom.</p> <p>Attard, C. & Northcote, M. (2011) Mathematics on the move: Using mobile technologies to support student learning.</p>	

Week 9 - 12 Sep 2022

Module/Topic	Chapter	Events and Submissions/Topic
Learner Engagement in Mathematics	eReading: Attard, C. (2012) Engagement with mathematics: What does it mean and what does it look like? Boaler, J. et al. (2015) Mathematical Mindsets	

Week 10 - 19 Sep 2022

Module/Topic	Chapter	Events and Submissions/Topic
Numeracy in Mathematics	eReading: Goos, M., et al. (2012) Numeracy across the curriculum Breed, M (2012) Using the scaffolding numeracy in the middle years materials to support students learning.	

Week 11 - 26 Sep 2022

Module/Topic	Chapter	Events and Submissions/Topic
Games and Mathematical Thinking	eReading: Gough, J., (1999) Playing mathematical games: When is a game not a game? Buchheister, K., et al. (2017) Maths games: A universal design approach to mathematical reasoning Bragg, L. (2003) Children's perspectives on mathematics and game playing.	

Week 12 - 03 Oct 2022

Module/Topic	Chapter	Events and Submissions/Topic
ICTs and Digital Technologies in Mathematics	eReading Sutherland. (2006). Teaching for Learning Mathematics. Berkshire: McGraw-Hill Education.	Engaging Students in Learning Mathematics Due: Week 12 Friday (7 Oct 2022) 11:45 pm AEST

Review/Exam Week - 10 Oct 2022

Module/Topic	Chapter	Events and Submissions/Topic
		Peer assessment Due: Review/Exam Week Friday (14 Oct 2022) 10:45 pm AEST

Assessment Tasks

1 Assessment in Mathematics

Assessment Type

Written Assessment

Task Description

This task requires students to examine the relationship between curriculum, pedagogy and assessment. Students will research and apply knowledge and understanding of mathematics curriculum, pedagogy and assessment to demonstrate their understanding of how students' learn mathematics.

In this task, students are to create an authentic mathematical activity that embeds student assessment. In the activity, students' will choose **one mathematical concept chosen from a** content descriptor of the Year 2 Number and Algebra strand of the Australian Curriculum: Mathematics. The mathematical activity will consist of a pedagogical strategy that engages students in their learning and embeds assessment as, for, and of learning in the activity, and a diagnostic assessment component to identify students' entry level to the mathematical concept. The pedagogical strategy used in the activity **must** acknowledge the Australian Curriculum's mathematical proficiencies and the general

capabilities component of critical and creative thinking.

Assessment Due Date

Week 6 Friday (26 Aug 2022) 11:45 pm AEST

Submit as one word document on the Moodle AT1 submission site

Return Date to Students

Week 9 Friday (16 Sept 2022)

Manuscript returned with tracked changes and the completed criteria sheet

Weighting

45%

Assessment Criteria

1. Knowledge and understanding of mathematical content, mathematical proficiencies and general capabilities in the Australian Curriculum: Mathematics.
2. Ability to create a mathematical activity that employs a pedagogical strategy that engages students in learning mathematical content.
3. Ability to embed assessment as, for, and of learning mathematical content, including a diagnostic assessment component in a mathematical activity.
4. Reflective practice demonstrating professional learning of mathematical content and pedagogical knowledge.
5. Write a clear and coherent narrative with attention to spelling, punctuation, and grammar, in an academic style using APA7 format and referencing procedures..

Referencing Style

- [American Psychological Association 7th Edition \(APA 7th edition\)](#)

Submission

No submission method provided.

Learning Outcomes Assessed

- Analyse the structure and organisation of content in the mathematics curriculum to identify key stages in concept development as a focus for assessing student learning
- Assess students' understanding of the mathematical content to identify possible misconceptions or barriers to learning for diverse student groups
- Distinguish evidence-based approaches to teaching and learning of mathematics that promote engagement, understanding and mathematical proficiency for students from diverse backgrounds including Aboriginal and Torres Strait Islander students
- Design tools and guides for assessing students' knowledge and skills in Mathematics
- Justify the selection and use of resources that scaffold students' understanding of core mathematical concepts
- Identify opportunities for students to use ICTs purposefully to gain mathematical knowledge and proficiency.

2 Engaging Students in Learning Mathematics

Assessment Type

Reflective Practice Assignment

Task Description

This task aims to enhance the students knowledge of the Australian Curriculum: Mathematics, and demonstrate their understanding and disposition of teaching and learning mathematics.

This task requires the student to investigate and address the barriers and misconceptions relating to a mathematical concept chosen from a content descriptor in the year 3 Measurement and Geometry strand of the Australian Curriculum: Mathematics. The student will create an authentic pedagogical strategy, including an ICT resource, aimed at a particular group of students from a diverse backgrounds that overcomes the identified barriers and misconceptions. The results of the investigation will be showcased through a professional learning report presented to the Learning Community Group.

All Learning Community Group members critique each other's report and give feedback to the presenting student. The feedback evaluation completed by each Learning Community Group member is given to each presenter after the report is given. The presenter will also review the recording of their presentation as a self-reflection. You will use the feedback from your peers and your self-reflection to adjust your written submission.

The written component of this assessment, submitted for marking, will consist of written report, in an academic style of

writing, of the chosen mathematical concept in their presentation. Students will critique the research evidence and respond to the feedback received in the Learning Community Group that framed their understanding and disposition of teaching and learning mathematics that addresses the misconceptions and barriers of the chosen mathematical concept.

Assessment Due Date

Week 12 Friday (7 Oct 2022) 11:45 pm AEST

Submit as one word document on the Moodle AT2 submission site

Return Date to Students**Weighting**

45%

Assessment Criteria

1. Demonstrates knowledge of the Australian Curriculum and understanding and disposition towards teaching mathematics.
2. Investigates mathematical misconceptions and barriers relating to learning mathematical content that addresses the needs of students, particularly those from diverse backgrounds.
3. Develops a pedagogical strategy that promotes engagement, understanding and mathematical proficiency for students, particularly those from diverse backgrounds.
4. Designs an appropriate pedagogical strategy that includes an ICT resource that engage students in learning mathematics.
5. Describes the reflective practice experience to support professional learning experiences that improve teaching practice and student learning.
6. Write a clear and coherent narrative with attention to spelling, punctuation, and grammar, in an academic style using APA7 format and referencing procedures.

Referencing Style

- [American Psychological Association 7th Edition \(APA 7th edition\)](#)

Submission

No submission method provided.

Learning Outcomes Assessed

- Analyse the structure and organisation of content in the mathematics curriculum to identify key stages in concept development as a focus for assessing student learning
- Assess students' understanding of the mathematical content to identify possible misconceptions or barriers to learning for diverse student groups
- Distinguish evidence-based approaches to teaching and learning of mathematics that promote engagement, understanding and mathematical proficiency for students from diverse backgrounds including Aboriginal and Torres Strait Islander students
- Design tools and guides for assessing students' knowledge and skills in Mathematics
- Reflect on professional learning to describe processes and strategies that improve teaching practice and student learning
- Justify the selection and use of resources that scaffold students' understanding of core mathematical concepts
- Identify opportunities for students to use ICTs purposefully to gain mathematical knowledge and proficiency.

3 Peer assessment

Assessment Type

Peer assessment

Task Description

This assessment task involves each student assessing other members of their Learning Community Group (LCG) members based on their participation in the LCG during the term and the feedback given on AT2.

Assessment Due Date

Review/Exam Week Friday (14 Oct 2022) 10:45 pm AEST

Complete peer evaluation online.

Return Date to Students**Weighting**

10%

Assessment Criteria**The ten criteria questions are:**

1. Was regular in attending Learning Community Group meetings.
2. Contributed positively to Learning Community Group discussions.
3. Completed shared work on time or made alternative arrangements.
4. Helped others with their work when needed.
5. Did work accurately and completely.
6. Met time deadlines decided by the Learning Community Group.
7. Worked well with other Learning Community Group members.
8. Overall was a valuable member of the Learning Community Group.
9. Gave productive feedback in Assessment Task 2.
10. Gave feedback to Assessment Task 2 in a timely manner.

Referencing Style

- [American Psychological Association 7th Edition \(APA 7th edition\)](#)

Submission

No submission method provided.

Learning Outcomes Assessed

- Analyse the structure and organisation of content in the mathematics curriculum to identify key stages in concept development as a focus for assessing student learning
- Assess students' understanding of the mathematical content to identify possible misconceptions or barriers to learning for diverse student groups
- Reflect on professional learning to describe processes and strategies that improve teaching practice and student learning

Academic Integrity Statement

As a CQUniversity student you are expected to act honestly in all aspects of your academic work.

Any assessable work undertaken or submitted for review or assessment must be your own work. Assessable work is any type of work you do to meet the assessment requirements in the unit, including draft work submitted for review and feedback and final work to be assessed.

When you use the ideas, words or data of others in your assessment, you must thoroughly and clearly acknowledge the source of this information by using the correct referencing style for your unit. Using others' work without proper acknowledgement may be considered a form of intellectual dishonesty.

Participating honestly, respectfully, responsibly, and fairly in your university study ensures the CQUniversity qualification you earn will be valued as a true indication of your individual academic achievement and will continue to receive the respect and recognition it deserves.

As a student, you are responsible for reading and following CQUniversity's policies, including the [Student Academic Integrity Policy and Procedure](#). This policy sets out CQUniversity's expectations of you to act with integrity, examples of academic integrity breaches to avoid, the processes used to address alleged breaches of academic integrity, and potential penalties.

What is a breach of academic integrity?

A breach of academic integrity includes but is not limited to plagiarism, self-plagiarism, collusion, cheating, contract cheating, and academic misconduct. The Student Academic Integrity Policy and Procedure defines what these terms mean and gives examples.

Why is academic integrity important?

A breach of academic integrity may result in one or more penalties, including suspension or even expulsion from the University. It can also have negative implications for student visas and future enrolment at CQUniversity or elsewhere. Students who engage in contract cheating also risk being blackmailed by contract cheating services.

Where can I get assistance?

For academic advice and guidance, the [Academic Learning Centre \(ALC\)](#) can support you in becoming confident in completing assessments with integrity and of high standard.

What can you do to act with integrity?



Be Honest

If your assessment task is done by someone else, it would be dishonest of you to claim it as your own



Seek Help

If you are not sure about how to cite or reference in essays, reports etc, then seek help from your lecturer, the library or the Academic Learning Centre (ALC)



Produce Original Work

Originality comes from your ability to read widely, think critically, and apply your gained knowledge to address a question or problem