



EDCU12038 *Teaching for Mathematical Proficiency*

Term 2 - 2024

Profile information current as at 29/07/2024 03:19 pm

All details in this unit profile for EDCU12038 have been officially approved by CQU University 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

Teaching for Mathematical Proficiency focuses on the development of professional knowledge that supports the teaching of Mathematics in primary schools in this unit. You will explore Mathematics content and experiment with pedagogical approaches for teaching mathematical reasoning and understanding. You will be introduced to mathematics content that recognises your own disposition towards mathematics and how your students may find learning mathematics difficult. You will evaluate ICTs and other resources, learning processes and teaching strategies on the development of mathematical proficiency. You will be introduced to the rationale, organisation and content of the Australian Curriculum: Mathematics and design plans for learning and teaching mathematical concepts and skills appropriate for specific year levels in the primary school. You will explain and justify approaches to promoting numeracy development through reference to authoritative sources and identify strategies for informing and involving parents and carers in the educative process. You will demonstrate effective pedagogy in Mathematics through role play of examples of classroom practice including the use of ICTs to support mathematical understanding. You will be introduced to the socioconstructivist approach to teaching mathematics through problem solving and inquiry based learning. you will be encouraged to facilitate your students' mathematical thinking.

Details

Career Level: *Undergraduate*

Unit Level: *Level 2*

Credit Points: 6

Student Contribution Band: 7

Fraction of Full-Time Student Load: 0.125

Pre-requisites or Co-requisites

There are no requisites for 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 - 2024

- Bundaberg
- Mackay
- Online
- Rockhampton

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 SUTE

Feedback

Support campus students

Recommendation

UC to make contact with campus students through drop in on campus tutorials.

Feedback from Unit evaluation data

Feedback

Clear unit guidelines

Recommendation

Review unit Course Outline clearly identify goals, restate these in first week of term. Identify requirements of the assessments.

Feedback from SUTE

Feedback

Learning Community Groups

Recommendation

Emphasise the significance of peer collaboration from a social and professional perspective. Encourage continual and ongoing support for all LCG members.

Unit Learning Outcomes

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

1. Reflect critically on approaches to teaching Mathematics to improve professional knowledge and practice
2. Apply research on effective practice to justify pedagogy that improves students' mathematical proficiency and understanding of core concepts
3. Recommend strategies, resources and learning activities that aid the transfer of mathematical understanding to real world contexts
4. Evaluate the content, skills and teaching strategies of the learning area to identify ICTs and other resources that enhance understanding, fluency, reasoning and problem solving in Mathematics
5. Design well-structured lessons that engage learners in actively applying key mathematical skills to understand the content
6. Use strategies that contribute to effective partnerships with parents/ carers in supporting students' numeracy development
7. Engage in opportunities for sharing and enhancing professional knowledge and practice through reflection and collaboration.

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

- 1.2 Understand how students learn
- 2.1 Content and teaching strategies of the teaching area
- 2.5 Literacy and numeracy strategies
- 2.6 Information and Communication Technology (ICT)
- 3.3 Use teaching strategies
- 3.4 Select and use resources
- 3.6 Evaluate and improve teaching programs
- 3.7 Engage parents/carers in the educative process
- 6.2 Engage in professional learning and improve practice
- 7.3 Engage with the parents/carers

Textbooks and Resources

Textbooks

EDCU12038

Prescribed

Helping Children Learn Mathematics

Edition: 4th (2021)

Authors: Robert Reys

Wiley & Sons

ISBN: ISBN : 0-7303-9182-5

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

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Schedule

Week 1 - 08 Jul 2024

Module/Topic	Chapter	Events and Submissions/Topic
Introduction to EDCU12038.	Reys. (2022). Helping Children Learn Mathematics, 4th Australian Edition. John Wiley & Sons, Incorporated. Chapter 1 School mathematics in a changing world.	
Mathematics in our world and learning mathematics.	1.1 What is mathematics? 1.2 What determines the mathematics being taught? 1.3 The role of the teacher. Chapter 2 Helping children learn mathematics with understanding. 2.2 Meaningful connections between procedural and conceptual knowledge. 2.3 How do children learn mathematics? 2.4 How can we help children make sense of mathematics.	

Week 2 - 15 Jul 2024

Module/Topic	Chapter	Events and Submissions/Topic
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Reys. (2022). Helping Children Learn Mathematics, 4th Australian Edition. John Wiley & Sons, Incorporated. Chapter 3 Planning and teaching
 3.1 Effective planning and preparation for teaching: using strategic questions to inform teaching practice.
 3.2 Planning for effective teaching.
 3.3 Levels of planning.
 3.4 Planning different types of lessons.

Week 3 - 22 Jul 2024

Module/Topic	Chapter	Events and Submissions/Topic
Problem solving.	Reys. (2022). Helping Children Learn Mathematics, 4th Australian Edition. John Wiley & Sons, Incorporated. Chapter 6 Helping children with problem solving 6.1 What is a problem and what is problem solving. 6.2 Teaching mathematics through problem solving. 6.3 Strategies for problem solving. 6.4 Looking back. 6.5 Helping students to solve problems.	

Week 4 - 29 Jul 2024

Module/Topic	Chapter	Events and Submissions/Topic
Counting and number sense.	Reys. (2022). Helping Children Learn Mathematics, 4th Australian Edition. John Wiley & Sons, Incorporated. Chapter 7 Counting and number sense in early childhood and primary years. 7.1 Developing number sense. 7.2 Counting principles. 7.3 Counting strategies. 7.4 Cardinal, ordinal and nominal numbers. 7.5 Writing numerals.	

Week 5 - 05 Aug 2024

Module/Topic	Chapter	Events and Submissions/Topic
Number sense and place value.	Reys. (2022). Helping Children Learn Mathematics, 4th Australian Edition. John Wiley & Sons, Incorporated. Chapter 8 Extending number sense: place value. 8.1 Our numeration system. 8.2 Nature of place value. 8.3 Beginning place value. 8.4 Consolidating place value. 8.5 Extending place value. 8.6 Reading and writing numbers. 8.7 Rounding.	Assessment Task 1 - Written Assessment (45%). Due 11:45pm (AEST) 9 August 2024. Research Investigation - Evaluation of practice and planning Due: Week 5 Friday (9 Aug 2024) 11:45 pm AEST

Break - 12 Aug 2024

Module/Topic	Chapter	Events and Submissions/Topic

Week 6 - 19 Aug 2024

Module/Topic	Chapter	Events and Submissions/Topic

Reflective practices and mathematical thinking.

Reys. (2022). Helping Children Learn Mathematics, 4th Australian Edition. John Wiley & Sons, Incorporated.
 Page 34 Encouraging reflection and the use of metacognition.
 Page 102 Self assessment and peer assessment.

Week 7 - 26 Aug 2024

Module/Topic	Chapter	Events and Submissions/Topic
The four operations.	Reys. (2022). Helping Children Learn Mathematics, 4th Australian Edition. John Wiley & Sons, Incorporated. Chapter 9 Operations: meanings and basic number facts. 9.1 Helping children develop number sense and computational fluency. 9.2 Developing meanings for the four operations. 9.3 Mathematical properties. 9.4 Overview of learning the basic facts. 9.5 Thinking strategies for basic number facts.	

Week 8 - 02 Sep 2024

Module/Topic	Chapter	Events and Submissions/Topic
Mental Computation, calculators and estimation.	Reys. (2022). Helping Children Learn Mathematics, 4th Australian Edition. John Wiley & Sons, Incorporated. Chapter 10 Mental computation, calculators and estimation. 10.1 Calculators. 10.2 Mental computation. 10.3 Estimation.	

Week 9 - 09 Sep 2024

Module/Topic	Chapter	Events and Submissions/Topic
Solving problems with written strategies.	Reys. (2022). Helping Children Learn Mathematics, 4th Australian Edition. John Wiley & Sons, Incorporated. Chapter 11 Solving problems with written strategies. 11.1 Emergent understanding and experiences. 11.2 Addition. 11.3 Subtraction. 11.4 Multiplication 11.5 Division. 11.6 Finding the balance between practice and proficiency.	

Week 10 - 16 Sep 2024

Module/Topic	Chapter	Events and Submissions/Topic
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Fractions and decimals.	Reys. (2022). Helping Children Learn Mathematics, 4th Australian Edition. John Wiley & Sons, Incorporated. Chapter 12 Fractions and decimals: meanings and operations. 12.1 Conceptual development of fractions. 12.2 Understanding equivalence and ordering fractions. 12.3 Operations with fractions. 12.4 Conceptual development of decimals. 12.5 Operations with decimals.
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Week 11 - 23 Sep 2024

Module/Topic	Chapter	Events and Submissions/Topic
Number theory.	Reys. (2022). Helping Children Learn Mathematics, 4th Australian Edition. John Wiley & Sons, Incorporated. Chapter 14 Extending children with number theory. 14.1 Number theory in primary school mathematics. 14.2 Number theory topics for primary school children. 14.3 Other number number theory topics.	

Week 12 - 30 Sep 2024

Module/Topic	Chapter	Events and Submissions/Topic
Pattern and algebraic thinking.	Reys. (2022). Helping Children Learn Mathematics, 4th Australian Edition. John Wiley & Sons, Incorporated. Chapter 15 Pattern and algebraic thinking. 15.1 Problems, patterns and relations. 15.2 Language and symbols of algebra. 15.3 Modelling, generalising and justifying.	Assessment Task 2 - Reflective Practice Assessment (45%). Due 11:45pm (AEST) and the 4 October 2024. Group report and written reflective practice Due: Week 12 Friday (4 Oct 2024) 11:45 pm AEST

Review/Exam Week - 07 Oct 2024

Module/Topic	Chapter	Events and Submissions/Topic
		Assessment Task 3 - Peer Assessment (10%). Due 11:45pm (AEST) 11 October 2024. Peer Assessment Due: Review/Exam Week Friday (11 Oct 2024) 11:45 pm AEST

Exam Week - 14 Oct 2024

Module/Topic	Chapter	Events and Submissions/Topic

Term Specific Information

Students in the unit will be enrolled in Learning Community Groups (LCG). These groups will operate on the MSTEAMS platform. Students are expected to engage with their LCG members through online chats. Assessment Task 2 is group task that requires students to work in the LCGs to support each other in their assessment task development and present a report to the LCG members which is reviewed and evaluated. Assessment Task 3 is a peer-evaluation completed by each LCG member of other LCG members engagement in the LCG throughout the term.

Assessment Tasks

1 Research Investigation - Evaluation of practice and planning

Assessment Type

Written Assessment

Task Description

In this assessment task you will explore a mathematical concept through a given content description from the Australian Curriculum: Mathematics (v9). You will investigate current research in the teaching and learning of the mathematical concept. You will then develop a learning sequence based on the mathematical concept that reflects the research in the teaching and learning of the mathematical concept. You will write a self-reflection on your disposition towards teaching and learning of mathematics at the beginning of your written submission and a reflective paragraph on the professional learning gained from working in your Learning Community Group to complete the task.

Within this assessment, the use of Generative Artificial Intelligence agents (Gen AI) agents is as follows:

- Gen AI content is used to generate ideas and general structures.
- Gen AI can be used for content editing.
- Gen AI content generation for you to critique and review.

Assessment Due Date

Week 5 Friday (9 Aug 2024) 11:45 pm AEST

Task is submitted as a single word document through the Moodle submission process.

Return Date to Students

Week 7 Friday (30 Aug 2024)

Return to students as marked word document with tracked changes with a separate marking guide.

Weighting

45%

Assessment Criteria

1. Investigation of a mathematical concept.
2. Understand how students learn.
3. Content and teaching strategies of the teaching area.
4. Use teaching strategies.
5. Engage in professional learning and improve practice.
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

Online

Submission Instructions

Student submit a single word document on Moodle Assessment Task 1 site.

Learning Outcomes Assessed

- Reflect critically on approaches to teaching Mathematics to improve professional knowledge and practice
- Apply research on effective practice to justify pedagogy that improves students' mathematical proficiency and understanding of core concepts
- Recommend strategies, resources and learning activities that aid the transfer of mathematical understanding to real world contexts
- Evaluate the content, skills and teaching strategies of the learning area to identify ICTs and other resources that enhance understanding, fluency, reasoning and problem solving in Mathematics
- Design well-structured lessons that engage learners in actively applying key mathematical skills to understand the content
- Use strategies that contribute to effective partnerships with parents/ carers in supporting students' numeracy development

2 Group report and written reflective practice

Assessment Type

Reflective Practice Assignment

Task Description

This assessment task requires students to work collaboratively in a Learning Community Group (LCG) sharing their mathematical knowledge and understanding of a chosen scenario in preparation for a report to be presented to the LCG members..

Each LCG member creates and presents a report on a chosen topic that demonstrates their knowledge and understanding of how to teach mathematics to support students' learning and disposition in mathematics. By accessing the content from this unit and their wider reading, students will be required demonstrate their mathematical knowledge and understanding of the pedagogical approaches and develop strategies for engaging students in learning mathematics.

All Learning Community Group members critique, give feedback and evaluate the presenting student's report. The feedback received from the LCG is to be used in the *written submission*.

The report presentation is not submitted for marking.

The *written submission* of this assessment will consist of written reflection report, in an academic style of writing.

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 address the components of the task description from the Moodle site.

Within this assessment, the use of Generative Artificial Intelligence agents (Gen AI) agents is as follows:

- Gen AI content is used to generate ideas and general structures.
- Gen AI can be used for content editing.
- Gen AI content generation for you to critique and review.

Assessment Due Date

Week 12 Friday (4 Oct 2024) 11:45 pm AEST

Task is submitted as a single word document through the Moodle submission process.

Return Date to Students

Marked assessment tasks will be returned with annotation on manuscript and completed criteria grading sheet with comments. Submissions over the 1500 word limit may not receive feedback.

Weighting

45%

Assessment Criteria

1. Investigation of the scenario.
2. Developing an understanding of the scenario.
3. Understand how students' learn the mathematics in scenario.
4. Teaching strategies used to engage students.
5. Teaching resources used to engage students.
6. Engage in reflective practice to develop professional learning.
7. Write a clear and coherent narrative with attention to spelling, punctuation and grammar, in an academic style using APA7 format and referencing procedure.

Referencing Style

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

Submission

No submission method provided.

Submission Instructions

Submit as one word document file.

Learning Outcomes Assessed

- Reflect critically on approaches to teaching Mathematics to improve professional knowledge and practice
- Apply research on effective practice to justify pedagogy that improves students' mathematical proficiency and understanding of core concepts
- Recommend strategies, resources and learning activities that aid the transfer of mathematical understanding to real world contexts
- Evaluate the content, skills and teaching strategies of the learning area to identify ICTs and other resources that

- enhance understanding, fluency, reasoning and problem solving in Mathematics
- Design well-structured lessons that engage learners in actively applying key mathematical skills to understand the content
- Engage in opportunities for sharing and enhancing professional knowledge and practice through reflection and collaboration.

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 engagement in the LCG during the term and AT2.

Assessment Due Date

Review/Exam Week Friday (11 Oct 2024) 11:45 pm AEST

Submission completed on Self and Peer Assessment (SPA) application.

Return Date to Students

Weighting

10%

Assessment Criteria

The ten criteria questions are:

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

Referencing Style

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

Submission

No submission method provided.

Submission Instructions

Students complete the given questions on the SPA application

Learning Outcomes Assessed

- Reflect critically on approaches to teaching Mathematics to improve professional knowledge and practice
- Recommend strategies, resources and learning activities that aid the transfer of mathematical understanding to real world contexts
- Design well-structured lessons that engage learners in actively applying key mathematical skills to understand the content
- Engage in opportunities for sharing and enhancing professional knowledge and practice through reflection and collaboration.

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