



# EDCU12038 *Teaching for Mathematical Proficiency*

## Term 2 - 2022

Profile information current as at 26/04/2024 06:59 am

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 - 2022

- Bundaberg

- Cairns
- Mackay
- 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**

Clarity in assessment tasks

**Recommendation**

Assessment task description and clear guidelines for completion.

#### Feedback from student feedback

**Feedback**

Assessment tasks need to reflect the course content

**Recommendation**

Assessment tasks will be reviewed to reflect course content.

## 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: 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

The paper textbook includes an eBook and can be purchased at the CQUniversity Bookshop here: <http://bookshop.cqu.edu.au> You can also access a read only copy at the CQUniversity Library through ProQuest eBook Central.

[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](mailto:m.gronow@cqu.edu.au)

## Schedule

### Week 1 - 11 Jul 2022

Module/Topic	Chapter	Events and Submissions/Topic
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Introduction to EDCU12038  
Mathematics in our world  
and learning mathematics

Reys. (2021). Helping  
Children Learn  
Mathematics, 4th Australian  
Edition. John Wiley & Sons,  
Incorporated.  
Chapter 1 School  
mathematics in a changing  
world  
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 - 18 Jul 2022

Module/Topic	Chapter	Events and Submissions/Topic
Planning and teaching mathematics	Reys. (2021). 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 - 25 Jul 2022

Module/Topic	Chapter	Events and Submissions/Topic
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Reys. (2021). Helping Children Learn Mathematics, 4th Australian Edition. John Wiley & Sons, Incorporated.

Problem solving  
 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 - 01 Aug 2022**

Module/Topic	Chapter	Events and Submissions/Topic
Counting and number sense	Reys et al., (2022) 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 - 08 Aug 2022**

Module/Topic	Chapter	Events and Submissions/Topic
Number sense and place value	Reys et al., (2022) 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	

**Break - 15 Aug 2022**

Module/Topic	Chapter	Events and Submissions/Topic
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**Week 6 - 22 Aug 2022**

Module/Topic	Chapter	Events and Submissions/Topic
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Reflective practices and mathematical thinking	Reys et al., (2022) page 34 Encouraging reflection and the use of metacognition page 102 Self assessment and peer assessment	<b>Research Investigation - Evaluation of practice and planning</b> Due: Week 6 Friday (26 Aug 2022) 11:45 pm AEST
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**Week 7 - 29 Aug 2022**

Module/Topic	Chapter	Events and Submissions/Topic
The four operations	Reys et al., (2022) 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 - 05 Sep 2022**

Module/Topic	Chapter	Events and Submissions/Topic
Mental Computation, calculators and estimation	Reys et al., (2022) Chapter 10 Mental computation, calculators and estimation 10.1 Calculators 10.2 Mental computation 10.3 Estimation	

**Week 9 - 12 Sep 2022**

Module/Topic	Chapter	Events and Submissions/Topic
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Solving problems with written strategies

Reys et al., (2022)  
 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 - 19 Sep 2022**

Module/Topic	Chapter	Events and Submissions/Topic
Fractions and decimals	Reys et al., (2022) 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	

**Week 11 - 26 Sep 2022**

Module/Topic	Chapter	Events and Submissions/Topic
Number theory	Reys et al., (2022) 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 theory topics	

**Week 12 - 03 Oct 2022**

Module/Topic	Chapter	Events and Submissions/Topic
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Pattern and algebraic thinking	Reys et al., (2022) 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	<b>Group report and written reflective practice</b> Due: Week 12 Friday (7 Oct 2022) 11:45 pm AEST
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**Review/Exam Week - 10 Oct 2022**

Module/Topic	Chapter	Events and Submissions/Topic
		<b>Peer Assessment</b> Due: Review/Exam Week Friday (14 Oct 2022) 11:45 pm AEST

## Assessment Tasks

### 1 Research Investigation - Evaluation of practice and planning

**Assessment Type**

Written Assessment

**Task Description**

In this assessment task students will explore a mathematical concept through one content descriptor of the Australian Curriculum: Mathematics. Students will investigate current research in the teaching and learning of the concept. Students will develop strategies to develop a mathematical learning sequence based on the chosen content description that reflects the research in the teaching and learning of the mathematical concept chosen. Students will write a self-reflection on your disposition towards teaching and learning of mathematics at the beginning of your written submission and a self-reflection on your professional learning gained at the conclusion of the task.

**Assessment Due Date**

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

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

**Return Date to Students**

Week 9 Friday (16 Sept 2022)

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

No submission method provided.

### 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 topic. 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' conceptual understanding and proficiency 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.

### Assessment Due Date

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

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

### Return Date to Students

### 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. Select and use resources
6. Engage in professional learning and improve practice
7. 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.

### 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 participation in the LCG during the term and the feedback given on AT2.

### Assessment Due Date

Review/Exam Week Friday (14 Oct 2022) 11:45 pm AEST

Submission completed on Feedback Fruits activity

### 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.

### 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