



# EDCU12038 *Teaching for Mathematical Proficiency*

## Term 2 - 2021

Profile information current as at 25/04/2024 07:24 pm

All details in this unit profile for EDCU12038 have been officially approved by CQUniversity 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. Students explore Mathematics content and experiment with pedagogical approaches for teaching mathematical reasoning and understanding. They evaluate the effect of ICTs and a range of resources, learning processes and teaching strategies on the development of mathematical proficiency. Students are 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. They 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. Students demonstrate effective pedagogy in Mathematics through role play of examples of classroom practice including the use of ICTs to support mathematical understanding.

### 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 - 2021

- Bundaberg
- Cairns
- Gladstone
- Mackay City
- 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. **Practical and Written Assessment**

Weighting: 50%

#### 2. **Presentation**

Weighting: 50%

### 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 Moodle feedback

**Feedback**

Moodle site

**Recommendation**

Refine the moodle site

#### Feedback from Moodle feedback

**Feedback**

Assessment tasks

**Recommendation**

Assessment tasks need to align with the course content and be clear for students to complete

#### Feedback from Moodle feedback

**Feedback**

Distance students one hour tutorial

**Recommendation**

Distance students tutorial to be extended to two hours

#### Feedback from Moodle feedback

**Feedback**

Students' assignment questions during tutorials

**Recommendation**

Set up online forums and discussion pages for students to ask questions and to discuss course content and assignments

## 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 and reasoning 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

## Alignment of Learning Outcomes, Assessment and Graduate Attributes



### Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes						
	1	2	3	4	5	6	7
<b>1 - Practical and Written Assessment - 50%</b>	•	•		•	•		•
<b>2 - Presentation - 50%</b>		•	•	•		•	•

### Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes						
	1	2	3	4	5	6	7
<b>1 - Communication</b>	•	•				•	•
<b>2 - Problem Solving</b>			•	•	•	•	

Graduate Attributes	Learning Outcomes						
	1	2	3	4	5	6	7
3 - Critical Thinking	•	•	•	•	•	•	•
4 - Information Literacy		•		•			
5 - Team Work				•		•	•
6 - Information Technology Competence				•		•	•
7 - Cross Cultural Competence						•	
8 - Ethical practice							
9 - Social Innovation							
10 - Aboriginal and Torres Strait Islander Cultures							

## Alignment of Assessment Tasks to Graduate Attributes

Assessment Tasks	Graduate Attributes									
	1	2	3	4	5	6	7	8	9	10
1 - Practical and Written Assessment - 50%	•	•	•	•		•				
2 - Presentation - 50%	•	•	•	•	•	•				

## Textbooks and Resources

### Textbooks

EDCU12038

#### Prescribed

#### Helping children learn mathematics

3rd Australian Edition (2020)

Authors: Robert E Reys; Anna Rogers; Sue Bennett; Audrey Cooke; Kyley Robson; Bronwyn Ewing; John West  
Wiley

Milton, QLD, Australia

ISBN: 9780730369288

Binding: eBook

#### Additional Textbook Information

Both paper and eBook versions can be purchased through the CQUni Bookshop here: <http://bookshop.cqu.edu.au> (search on the Unit code)

[View textbooks at the CQUniversity Bookshop](#)

### IT Resources

You will need access to the following IT resources:

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

## 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 - 12 Jul 2021

Module/Topic	Chapter	Events and Submissions/Topic
1. Introduction to EDCU12038 2. Mathematics in our world 3. Learning mathematics	Chapter 1 1. What is mathematics (Section 1.1) 2. Mathematics taught (Section 1.2) 3. Where you can get support (Section 1.3) Chapter 2 1. Supporting diverse learners (Section 2.1) 2. Procedural and conceptual knowledge (Section 2.2) 3. How do children learn mathematics (Section 2.3) 4. How to help children make sense of mathematics (Section 2.4)	

### Week 2 - 19 Jul 2021

Module/Topic	Chapter	Events and Submissions/Topic
1. Planning and teaching mathematics 2. Assessment and feedback	Chapter 3 1. Effective planning and preparation (Section 3.1) 2. Planning for effective teaching (Section 3.2) 3. Levels of planning (Section 3.3) 4. Planning different lessons (Section 3.4) 5. Needs of students (Section 3.5) 6. Assessment of planning (Section 3.6) Chapter 4 1. Enhancing learning and teaching (Section 4.1) 2. Information on student learning (Section 4.2) 3. Assessing students' learning (Section 4.3) 4. Record keeping and communicating assessment (Section 4.4)	

### Week 3 - 26 Jul 2021

Module/Topic	Chapter	Events and Submissions/Topic
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- 1. Doing mathematics
  - 2. Problem solving
- Chapter 5
1. Understanding (Section 5.1)
  2. Fluency (Section 5.2)
  3. Problem solving (Section 5.3)
  4. Reasoning and Proof (Section 5.4)
  5. Communication (Section 5.5)
  6. Connections (Section 5.6)
  7. Representations (Section 5.7)
- Chapter 6
1. What is problem solving (Section 6.1)
  2. Teaching through problem solving (Section 6.2)
  3. Strategies for problem solving (Section 6.3)
  4. Looking back (Section 6.4)
  5. Helping students to solve problems (Section 6.5)

#### Week 4 - 02 Aug 2021

Module/Topic	Chapter	Events and Submissions/Topic
1. Counting and number sense	Chapter 7 1. Developing number sense (Section 7.1) 2. Counting principles (Section 7.2) 3. Counting strategies (Section 7.3) 4. Cardinal, ordinal and nominal numbers (Section 7.4) 5. Writing numbers (Section 7.5)	

#### Week 5 - 09 Aug 2021

Module/Topic	Chapter	Events and Submissions/Topic
1. Place value and number sense	Chapter 8 1. Our number system (Section 8.1) 2. Nature of place value (Section 8.2) 3. Beginning place value (Section 8.3) 4. Consolidating place value (Section 8.4) 5. Extending place value (Section 8.5) 6. Reading and writing numbers (Section 8.6) 7. Rounding (Section 8.7)	

#### Break - 16 Aug 2021

Module/Topic	Chapter	Events and Submissions/Topic
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#### Week 6 - 23 Aug 2021

Module/Topic	Chapter	Events and Submissions/Topic
1. The four operations	Chapter 9 1. Number sense and computational fluency (Section 9.1) 2. Meaning of the four operations (Section 9.2) 3. Mathematical properties (Section 9.3) 4. Overview of basic facts (Section 9.4) 5. Thinking strategies (Section 9.5)	<b>Assessment Task 1</b> Due: Week 6, Thursday, 26 Aug 2021, 11:45 pm AEST  <b>Research Investigation (Evaluation of practice and planning)</b> Due: Week 6 Thursday (26 Aug 2021) 11:45 pm AEST

#### Week 7 - 30 Aug 2021

Module/Topic	Chapter	Events and Submissions/Topic
1. Mental Computation, calculators and estimation	Chapter 10 1. Calculators (Section 10.1) 2. Mental computation (Section 10.2) 3. Estimation (Section 10.3)	

**Week 8 - 06 Sep 2021**

Module/Topic	Chapter	Events and Submissions/Topic
1. Solving problems with written strategies	Chapter 11 1. Emergent understanding and experiences (Section 11.1) 2. Addition (Section 11.2) 3. Subtraction (Section 11.3) 4. Multiplication (Section 11.4) 5. Division (Section 11.5) 6. Finding the balance between practice and proficiency (Section 11.6)	

**Week 9 - 13 Sep 2021**

Module/Topic	Chapter	Events and Submissions/Topic
1. Fractions and decimals	Chapter 12 1. Concept of a fraction (Section 12.1) 2. Operation with fractions (Section 12.2) 3. Concept of a decimal (Section 12.3) 4. Operation with decimals (Section 12.4)	

**Week 10 - 20 Sep 2021**

Module/Topic	Chapter	Events and Submissions/Topic
1. Number theory	Chapter 14 1. Number theory in primary mathematics (Section 14.1) 2. Number theory topics for primary mathematics (Section 14.2) 3. Other number number theory topics (Section 14.3)	

**Week 11 - 27 Sep 2021**

Module/Topic	Chapter	Events and Submissions/Topic
1. Pattern and algebraic thinking	Chapter 15 1. Problems, patterns and relations (Section 15.1) 2. Language and symbols of algebra (Section 15.2) 3. Modelling, generalising and justifying (Section 15.3)	

**Week 12 - 04 Oct 2021**

Module/Topic	Chapter	Events and Submissions/Topic
<b>Group presentations</b> - Strategies for teaching numeracy		<b>Assessment Task 2</b> Due: Week 12, Thursday, 7 Oct 2021, 11:45 pm AEST  <b>Group Presentation - Justifying a pedagogical approach</b> Due: Week 12 Friday (8 Oct 2021) 11:45 pm AEST

**Review/Exam Week - 11 Oct 2021**

Module/Topic	Chapter	Events and Submissions/Topic
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**Exam Week - 18 Oct 2021**

Module/Topic	Chapter	Events and Submissions/Topic
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## Assessment Tasks



# 1 Research Investigation (Evaluation of practice and planning)

## Assessment Type

Practical and Written Assessment

## Task Description

In this assessment task you will explore one content description of the Australian Curriculum: Mathematics. You will reflect on your disposition to the mathematical concept of the content description and investigate the current research in the teaching and learning of the concept. You will develop your own mathematics lesson based on the chosen content description and reflect on your improved professional understanding of mathematics teaching and learning.

## Assessment Due Date

Week 6 Thursday (26 Aug 2021) 11:45 pm AEST

Please submit the task as one document with your name in the file name it is saved under.

## Return Date to Students

Feedback on this assessment response will be provided in sufficient time to allow for academic support and advice as necessary for students' preparation for the next task.

## Weighting

50%

## Assessment Criteria

### 1.2 Understand how students learn

Demonstrate knowledge and understanding of research into how students learn and the implications for teaching.

### 2.1 Content and teaching strategies of the teaching area

Demonstrate knowledge and understanding of the concepts, substance and structure of the content and teaching strategies of the teaching area.

### 3.3 Use teaching strategies

Include a range of teaching strategies.

### 3.4 Select and use resources

Demonstrate knowledge of a range of resources, including ICT, that engage students in their learning.

### 3.7 Engage parents/ carers in the educative process

Describe a broad range of strategies for involving parents/carers in the educative process.

### 6.2 Engage in professional learning and improve practice

Understand the relevant and appropriate sources of professional learning for teachers.

## Referencing Style

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

## Submission

Online

## Submission Instructions

Upload your submission to the Moodle page with the file name SURNAME\_First name\_StudentNumber\_EDCU12038\_AT1 eg SMITH\_Max\_1234567\_EDCU12038\_AT1

## 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
- Evaluate the content, skills and teaching strategies of the learning area to identify ICTs and other resources that enhance understanding, fluency and reasoning 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.

## Graduate Attributes

- Communication
- Problem Solving

- Critical Thinking
- Information Literacy
- Information Technology Competence

## 2 Group Presentation - Justifying a pedagogical approach

### Assessment Type

Presentation

### Task Description

This assessment task provides an opportunity for you to work collaboratively with your peers to demonstrate your shared knowledge of teaching and learning mathematics that supports students' conceptual understanding and proficiency in learning mathematics. By accessing the content from this unit, you will be required demonstrate appropriate pedagogical approaches and develop strategies for engaging students in learning mathematics. Finally, you will demonstrate your own conceptual understanding proficiency in mathematics, through a presentation to be given to the school community, which could include colleagues, parents, carers and others.

### Assessment Due Date

Week 12 Friday (8 Oct 2021) 11:45 pm AEST

Presentations will occur during scheduled tutorial and Zoom sessions or as negotiated with tutor. Each student must upload the group participation sheet, word doc of presentation resources, and reference list by due date above irrespective of the date of the presentation.

### Return Date to Students

Feedback on the final assessment task will be provided following moderation and prior to the date of certification of grades for the term.

### Weighting

50%

### Assessment Criteria

*The full rubric for this assessment task can be downloaded from the Moodle site for this unit.*

#### Assessment criteria

#### 1.2 Understand how students learn

Demonstrate knowledge and understanding of research into how students learn and the implications for teaching.

#### 2.1 Content and teaching strategies of the teaching area

Demonstrate knowledge and understanding of the concepts, substance and structure of the content and teaching strategies of the teaching area.

#### 3.3 Use teaching strategies

Include a range of teaching strategies.

#### 3.4 Select and use resources

Demonstrate knowledge of a range of resources, including ICT, that engage students in their learning.

#### 3.7 Engage parents/ carers in the educative process

Describe a broad range of strategies for involving parents/carers in the educative process.

#### 7.3 Engage with the parents/carers

Understand strategies for working effectively, sensitively and confidentially with parents/carers.

### Referencing Style

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

### Submission

Online

### Submission Instructions

Upload your submission to the Moodle page as two documents written with the file name SURNAME\_First name\_StudentNumber\_EDCU12038\_AT2 eg SMITH\_Max\_1234567\_EDCU12038\_AT2 (The files will be read as a word document and pdf, so they will not be identified as the same document)

### Learning Outcomes Assessed

- 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 and reasoning in Mathematics
- Use strategies that contribute to effective partnerships with parents/ carers in supporting students' numeracy development
- Engage in opportunities for sharing and enhancing professional knowledge and practice through reflection and collaboration.

#### **Graduate Attributes**

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy
- Team Work
- Information Technology Competence

## 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