



# EDCU13020 Mathematics Curriculum

## Term 2 - 2019

Profile information current as at 02/05/2024 04:25 pm

All details in this unit profile for EDCU13020 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

In Mathematics Curriculum, students build on the knowledge acquired in previous Mathematics units to develop deep understanding of the structure, sequencing and links between critical concepts and skills in content across the year levels in the Australian Curriculum: Mathematics. They apply this knowledge to identify issues or challenges to mathematical understanding and problem-solving in key stages of the learning sequence as a guide for developing diagnostic assessment tools. Students develop resources to prevent or overcome difficulties in the development of Mathematical knowledge and skills and design and justify approaches to using physical and digital resources to teach specific sub-strands of the curriculum to overcome barriers to learning and improve the transfer of mathematical reasoning, logic and analysis to problem-solving situations. Personal numeracy competence is enhanced in this unit as students develop suggested marking guides for diagnostic assessment using appropriate and accurate mathematical procedures and communication.

#### 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 - 2019

- Bundaberg
- Cairns
- 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. **Practical and Written Assessment**

Weighting: 50%

#### 2. **Presentation and Written Assessment**

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 Student feedback

##### **Feedback**

Unit content and assessment was relevant with a strong focus on practical application of the curriculum

##### **Recommendation**

Retain unit learning materials and the practical focus of the assessment tasks

#### Feedback from Student feedback

##### **Feedback**

Assessment task requirements

##### **Recommendation**

Assessment requirements will be clarified for students.

#### Feedback from Student feedback Unit coordinator's reflection

##### **Feedback**

Assessment Task 2 needs an individual component to distinguish between the achievements of group members

##### **Recommendation**

Assessment Task 2 will be adjusted to allow for an individual component

## 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 learning and diagnostic assessment
2. Appraise Mathematics content to identify possible misconceptions or barriers to learning for diverse student groups
3. Distinguish evidence-based approaches to teaching Mathematics that promote engagement, understanding and mathematical proficiency for students from diverse backgrounds including Aboriginal and Torres Strait Islander students
4. Design diagnostic tools and reliable 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

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

### Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes						
	1	2	3	4	5	6	7
1 - Communication				•	•		
2 - Problem Solving		•	•	•		•	
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 and Written Assessment - 50%	•	•	•	•		•		•		

## Textbooks and Resources

### Textbooks

EDCU13020

#### Prescribed

#### Teaching Mathematics: Foundations to Middle Years

Edition: 2nd (2015)

Authors: Siemon et al.

Oxford

South Melbourne , Victoria , Australia

ISBN: 9780195523829

Binding: Paperback

[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 6th Edition \(APA 6th edition\)](#)

For further information, see the Assessment Tasks.

## Teaching Contacts

**Hayley Griffin** Unit Coordinator

[h.griffin@cqu.edu.au](mailto:h.griffin@cqu.edu.au)

## Schedule

### Week 1 - 15 Jul 2019

Module/Topic	Chapter	Events and Submissions/Topic
Mathematics in the Primary Classroom Part 1 of 2	Chapter 1 - Understanding School Mathematics Chapter 10 – Developing a Sense of Number and Algebra	

### Week 2 - 22 Jul 2019

Module/Topic	Chapter	Events and Submissions/Topic
Mathematics in the Primary Classroom Part 2 of 2	Chapter 11 – Developing a Sense of Measurement and Geometry Chapter 12 - Developing a Sense of Statistics and Probability	

### Week 3 - 29 Jul 2019

Module/Topic	Chapter	Events and Submissions/Topic
Learner Diversity in Mathematics	Chapter 8 - Understanding Diversity Chapter 4 – Thinking Mathematically	

**Week 4 - 05 Aug 2019**

Module/Topic	Chapter	Events and Submissions/Topic
Diagnostic Assessment in Mathematics Part 1 of 2	Chapter 5 - Communicating Mathematically Chapter 6 - Representing Mathematically	

**Week 5 - 12 Aug 2019**

Module/Topic	Chapter	Events and Submissions/Topic
Diagnostic Assessment in Mathematics Part 2 of 2		

**Vacation Week - 19 Aug 2019**

Module/Topic	Chapter	Events and Submissions/Topic
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**Week 6 - 26 Aug 2019**

Module/Topic	Chapter	Events and Submissions/Topic
Learning Mathematics and Teaching Mathematics	Chapter 2 - Learning Mathematics Chapter 3 - Teaching Mathematics Chapter 29 - Becoming a Professional Teacher of Maths	<b>Assessment 'for' Learning: Creating Diagnostic Tools</b> Due: Week 6 Friday (30 Aug 2019) 11:45 pm AEST

**Week 7 - 02 Sep 2019**

Module/Topic	Chapter	Events and Submissions/Topic
Instructional Resources for Developing Mathematical Understanding Part 1 of 2	Chapter 14 - Number Ideas and Strategies F - 4 Chapter 15 - Place Value F - 4 Chapter 22 - Number: Fractions, Decimals and Reals 5 - 9	

**Week 8 - 09 Sep 2019**

Module/Topic	Chapter	Events and Submissions/Topic
Instructional Resources for Developing Mathematical Understanding Part 2 of 2	Chapter 13 - Algebraic Thinking F - 4 Chapter 25 - Algebraic Thinking 5 - 9	

**Week 9 - 16 Sep 2019**

Module/Topic	Chapter	Events and Submissions/Topic
Numeracy in the Primary Classroom	Chapter 9 - Numeracy in the Curriculum Chapter 19 - Measurement concepts and strategies F - 4 Chapter 26 - Measurement concepts and strategies 5 - 9	

**Week 10 - 23 Sep 2019**

Module/Topic	Chapter	Events and Submissions/Topic
Learning Engagement: Meeting the Needs of Students from Diverse Backgrounds	Chapter 20 - Geometric Thinking F - 4 Chapter 27 - Geometric Thinking 5 - 9	

**Week 11 - 30 Sep 2019**

Module/Topic	Chapter	Events and Submissions/Topic
Professional Learning for Teachers of Mathematics	Chapter 21 - Early Statistics and Probability Chapter 28 - Statistics and Probability 5 - 9	

**Week 12 - 07 Oct 2019**

Module/Topic	Chapter	Events and Submissions/Topic
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Presentation component of Assessment Task 2 to be completed during scheduled tutorials in Week 12.

Review and Conclusion

**Mathematical engagement through instructional games: Group presentation, justification and reflection** Due: Week 12 Friday (11 Oct 2019) 11:45 pm AEST

#### Review/Exam Week - 14 Oct 2019

Module/Topic	Chapter	Events and Submissions/Topic
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#### Exam Week - 21 Oct 2019

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

### 1 Assessment 'for' Learning: Creating Diagnostic Tools

#### Assessment Type

Practical and Written Assessment

#### Task Description

This task requires you to examine the relationship between curriculum, pedagogy and assessment and apply your knowledge and understanding to develop and enhance assessment practices and teaching in mathematics.

To complete the task you will need to:

1. Peruse the Number and Algebra content strand of the Australian Curriculum: Mathematics (ACARA, 2014) from Years 3, 4 and 5.
2. Select one content description from one of these year levels for deep analysis e.g. Describe patterns with numbers and identify missing elements (ACMNA035) from the Year 2 curriculum. In a graphic organiser, examine and record the progression and development of declarative and procedural knowledge in relation to this content description. (Refer to the relevant knowledge element in the Number Sense and Algebra section of the National Numeracy Learning Progression to support your understanding of the numeracy development associated with the content descriptor.)
3. Create a diagnostic assessment instrument to determine the students' prior knowledge and readiness to learn the content for a planned sequence of learning that will focus on the selected content description. Your diagnostic tool should reflect the development of declarative and procedural knowledge you have analysed in the graphic organiser, and facilitate opportunities to identify the level of knowledge currently achieved by students, and any misconceptions or inefficiencies in learning to determine students' readiness to learn the content.
4. Develop a diagnostic marking guide to accompany the diagnostic assessment tool you have created. It should clearly show all required calculations and anticipated student responses to the questions, exercises or problems you have designed. Anticipated responses may include possible misconceptions or gaps in knowledge.
5. In a written response of approximately 1000 words,
  - a. Describe the nature and origin of possible challenges or issues for teaching and learning for the identified content description. This analysis should address barriers to learning in terms of factors that may impact on the learners' experience of the conceptual understanding associated with the content description. Refer to the relevant knowledge element within National Numeracy Learning Progression to prompt your understanding of the conceptual understanding associated with the content description. Be sure to consider learners with differing levels of prior knowledge from diverse backgrounds, including individuals from various linguistic, cultural, religious, educational and socioeconomic backgrounds, and students who identify as Aboriginal and/or Torres Strait Islander.
  - b. Propose and discuss pedagogical responses to the barriers you have described, and consider how the proficiency strands (Understanding, Fluency, Problem-solving, Reasoning) may be reflected in the teaching and learning responses. Be sure to justify your discussion with professional literature.

To conclude your written response with approximately 500 words,

6. Reflect on how this assessment task provided a context for your professional learning, and why opportunities for professional learning are significant in terms of professional practice.

**Assessment Due Date**

Week 6 Friday (30 Aug 2019) 11:45 pm AEST

**Return Date to Students**

Assessment tasks will be returned following moderation and in sufficient time for feedback to inform Assessment Task 2 in the unit.

**Weighting**

50%

**Assessment Criteria**

Knowledge and understanding of the concepts, substance and structure of the content in the Mathematics curriculum (APST 2.1)

Knowledge and understanding of barriers to mathematical proficiency and appropriate pedagogical responses to differentiate for diverse learning needs (APST 1.1, 1.2, 1.3, 1.4, 2.5)

Ability to create and modify appropriate assessment tools that determine students' prior knowledge and achievement and understanding of mathematical concepts (APST 5.1)

Demonstrated understanding of the relationship between professional learning for teachers and improved student outcomes (APST 6.2, 6.4)

Application of academic writing conventions and adherence to APA style and referencing

Successful completion of Assessment Task 1 in Mathematics Curriculum provides opportunities for students to demonstrate the Australian Professional Standards for Teachers focus areas of 1.1, 1.2, 1.3, 1.4, 2.1, 2.5, 5.1, 6.2 and 6.4.

**Referencing Style**

- [American Psychological Association 6th Edition \(APA 6th edition\)](#)

**Submission**

Online

**Submission Instructions**

Submit as one word document with your name in the file name e.g. EDCU13020\_Task1\_SURNAME\_First name

**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 learning and diagnostic assessment
- Appraise Mathematics content to identify possible misconceptions or barriers to learning for diverse student groups
- Distinguish evidence-based approaches to teaching Mathematics that promote engagement, understanding and mathematical proficiency for students from diverse backgrounds including Aboriginal and Torres Strait Islander students
- Design diagnostic tools and reliable 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

**Graduate Attributes**

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy
- Team Work
- Cross Cultural Competence

2 Mathematical engagement through instructional games: Group presentation, justification and reflection

**Assessment Type**

Presentation and Written Assessment



### **Task Description**

This task comprises a written and a presentation component. The task should be completed in groups of three people. Your group will create a package of resources that includes three mathematics games plus three other resources that support teaching and learning in an area of Mathematics in the Australian Curriculum. The games and resources can address different areas of mathematics or the same area; the choice is up to your group.

To complete the task, your group will need to complete the following steps:

1. Research practical approaches to engaging children in mathematics and investigate what elements or principles support quality classroom mathematics games.
2. Design, innovate or select three mathematics games that will engage children in mathematics learning and support the development of the proficiency strands. Consider the inclusion of at least one game available through ICT. If you innovate or select a game you must acknowledge that it has been adapted from, or is from, another source (reference).
3. Select or innovate three mathematics resources which could be used to differentiate learning. These flexible resources should support learners, with a range of mathematical knowledge, to engage with the learning content. Consider the inclusion of at least one mathematical resource available through ICT. If you innovate or select a resource you must acknowledge that it has been adapted from, or is from, another source (reference).
4. Compile a written response which uses professional literature to justify the use of mathematical games and resources in developing mathematical understanding, fluency, problem-solving and reasoning.
5. Share the three mathematics games and three mathematics resources in a presentation to your peers

### **Submission Approach**

To complete the written response component, your group will need to:

1. Justify the value of games and resources for developing mathematical proficiency through research that addresses effective elements of practical approaches for engaging children in mathematics. Consider how learning can be facilitated by the use of classroom mathematics games which are responsive to the learning strengths and needs of students from diverse linguistic, cultural, religious and socioeconomic backgrounds. (Approximately 400 – 500 words)
2. In a table, describe the three mathematics games and identify the relevant curriculum links, possible learning opportunities to develop the proficiency strands, and possible adjustments that may address the learning needs of the students. In the table, the three mathematics resources your group has selected should also be identified and possible learning opportunities should be described in terms of how the resource can be used to differentiate learning.
3. Reflect, as an individual, on how this task has engaged you in professional learning and facilitated professional interactions which contribute to improved practice. (Approximately 300 – 400 words)

### **Presentation**

To complete the presentation component, your group will need to:

Present one of the featured games to play during the tutorial in Week 12. Your group should explain the game, the relevant curriculum links and possible learning opportunities, and play the game in small groups where practicable. (For on-campus students)

Submit a link (to the Distance Assessment 2 Forum) of a short video recording (saved to CloudStor), which includes one member of the group explaining the game, and the relevant curriculum links and possible learning opportunities. (For distance students)

### **Assessment Due Date**

Week 12 Friday (11 Oct 2019) 11:45 pm AEST

Presentations will occur during scheduled tutorials throughout Week 12. Written component to be uploaded by the due date.

### **Return Date to Students**

Assessment tasks will be returned following moderation, in preparation for Certification of Grades.

### **Weighting**

50%

**Assessment Criteria**

Use of research to explain, justify and inform the selection of resources to support mathematical proficiency and engage learners in developing mathematical understanding (APST 1.1)

Knowledge and selection of appropriate resources (including ICTs) that engage students in learning mathematics and expand learning opportunities (APST 2.6, 3.4)

Knowledge and understanding of the concepts, substance and structure of the content in the Mathematics curriculum (APST 2.1)

Demonstrated understanding of teaching strategies used to support students' personal numeracy and mathematical proficiency (APST 2.5)

Demonstrated understanding of the relationship between professional learning for teachers and improved student outcomes (APST 6.2)

Application of academic writing conventions and adherence to APA style and referencing

Successful completion of Assessment Task 2 in Mathematics Curriculum provides opportunities for students to demonstrate the Australian Professional Standards for Teachers focus areas of 1.1, 2.1, 2.5, 2.6, 3.4 and 6.2 .

**Referencing Style**

- [American Psychological Association 6th Edition \(APA 6th edition\)](#)

**Submission**

Online

**Submission Instructions**

Each member of the group should submit their individual reflection component, uploaded with a cover page that lists the participants in the group and clearly identifies the group member responsible for uploading the group assessment component. One member of the presentation group should upload the group component of the assessment.

**Learning Outcomes Assessed**

- Appraise Mathematics content to identify possible misconceptions or barriers to learning for diverse student groups
- 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.

**Graduate Attributes**

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy
- Information Technology Competence
- Ethical practice

## 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