



# EDCU13020 *Mathematics Curriculum*

## Term 2 - 2017

Profile information current as at 07/05/2024 02:44 am

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.

### Corrections

#### Unit Profile Correction added on 29-05-17

##### Prescribed Textbooks

##### Teaching Mathematics: Foundations to Middle Years

<b>Author/s:</b>	Siemon et al.	<b>Year:</b>	<b>2015</b>
<b>Edition:</b>	<b>2nd</b>	<b>Publisher:</b>	Oxford
<b>City:</b>	South Melbourne	<b>State:</b>	Victoria
<b>Country:</b>	Australia		

## 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 - 2017

- Bundaberg
- Distance
- Mackay
- Noosa
- 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**

Criteria sheet did not reflect the assignment task

##### **Recommendation**

Review assessment correlation to the criteria sheet. Make changes if needed.

#### Feedback from Student feedback

##### **Feedback**

More resources on Moodle

##### **Recommendation**

Source future readings, videos etc that correlate to the content.

## 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 the unit 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, 2.6, 3.4, 5.1, 6.2 and 6.4. Assessment tasks for this unit may be included in a portfolio and used to demonstrate these standards at Graduate career stage with evidence specifically related to teaching and learning in Mathematics. Unit assessment also provides evidence of competence in meeting the ICT elaborations of these standards.

## 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: 1st (2011)

Authors: Siemon et al.

Oxford

South Melbourne , Victoria , Australia

ISBN: 9780195568455

Binding: Hardcover

[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

**Reyna Zipf** Unit Coordinator

[r.zipf@cqu.edu.au](mailto:r.zipf@cqu.edu.au)

## Schedule

### Week 1 - 10 Jul 2017

Module/Topic	Chapter	Events and Submissions/Topic
Teaching school mathematics	Chapter 1 Chapter 2 Chapter 3	

### Week 2 - 17 Jul 2017

Module/Topic	Chapter	Events and Submissions/Topic
Numeracy in the primary curriculum	Chapter 4 Chapter 5 Chapter 9	

### Week 3 - 24 Jul 2017

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

Diagnostic assessment in mathematics

Online resources:  
*The Australian Curriculum: mathematics* (ACARA, 2014)  
*First Steps in Mathematics* diagnostic tasks  
 Cognitive Diagnostic Assessment Tasks

#### Week 4 - 31 Jul 2017

Module/Topic	Chapter	Events and Submissions/Topic
Formative assessment in mathematics	Chapter 7	

#### Week 5 - 07 Aug 2017

Module/Topic	Chapter	Events and Submissions/Topic
Summative assessment in mathematics	Chapter 8	

#### Vacation Week - 14 Aug 2017

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

#### Week 6 - 21 Aug 2017

Module/Topic	Chapter	Events and Submissions/Topic
Big ideas in school mathematics - Number and algebra	Chapter 10 Chapter 13	<b>Planning and critiquing mathematics assessment tasks</b> Due: Week 6 Friday (25 Aug 2017) 11:45 pm AEST

#### Week 7 - 28 Aug 2017

Module/Topic	Chapter	Events and Submissions/Topic
Big ideas in school mathematics - Number and algebra	Chapter 25	

#### Week 8 - 04 Sep 2017

Module/Topic	Chapter	Events and Submissions/Topic
Big ideas in school mathematics - Measurement and geometry	Chapter 11 Chapter 19	

#### Week 9 - 11 Sep 2017

Module/Topic	Chapter	Events and Submissions/Topic
Big ideas in school mathematics - Measurement and geometry	Chapter 20	

#### Week 10 - 18 Sep 2017

Module/Topic	Chapter	Events and Submissions/Topic
Big ideas in school mathematics - Statistics and probability	Chapter 12 Chapter 21	

#### Week 11 - 25 Sep 2017

Module/Topic	Chapter	Events and Submissions/Topic
Big ideas in school mathematics- Statistics and probability	Chapter 28	

#### Week 12 - 02 Oct 2017

Module/Topic	Chapter	Events and Submissions/Topic
Becoming a professional teacher of mathematics	Chapter 29	<b>Mathematical engagement through instructional games: Group presentation, justification and reflection</b> Due: Week 12 Wednesday (4 Oct 2017) 11:45 pm AEST

## Review/Exam Week - 09 Oct 2017

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

## Exam Week - 16 Oct 2017

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

## Assessment Tasks

### 1 Planning and critiquing mathematics assessment tasks

#### Assessment Type

Practical and Written Assessment

#### Task Description

##### Task rationale:

This assessment task builds professional knowledge and understanding of the structure, sequencing and links between critical concepts and skills in content across the year levels in the *Australian Curriculum: Mathematics* (ACARA, 2014). The curriculum and how it is delivered informs assessment. To develop high quality assessment tasks, teachers require a deep knowledge of the mathematics content to be assessed and how it develops in learners. Identifying issues or challenges to student learning is critical to providing for a balance of question type. Quality assessment in Mathematics must also reflect the **Key Ideas** (Understanding, Fluency, Problem-Solving and Reasoning). To make judgements about student learning, teachers need an understanding of the curriculum, the standard statements that describe student achievement and a shared knowledge of what constitutes evidence of learning.

##### Task description:

This task requires you to examine the relationship between curriculum, pedagogy and assessment and apply your knowledge and understanding to develop, critique and enhance assessment tasks. The task comprises **two** parts. **Both** Part A and B **must** be completed.

#### PART A

To complete Part A, you will need to:

1. **Peruse** the Number and Algebra content strand of the Australian Curriculum, Mathematics from Foundation to Year 9.
2. **Select** one content description from one year level for deeper analysis, eg. *Describe patterns with numbers and identify missing elements (ACMNA035)* from the Year 2 curriculum. In a graphic organiser, record the progression and development of declarative and procedural knowledge in relation to this content description. In your analysis of the featured content description, explain how the four key ideas of the *Australian Curriculum: Mathematics* (Understanding, Fluency, Problem-solving, Reasoning) are reflected in teaching and learning.
3. For the identified content description, **describe** the nature and origin of possible challenges or issues for teaching and learning. This analysis should consider barriers to learning for all students including students with Aboriginal and Torres Strait Islander backgrounds and students with diverse socio-economic backgrounds.
4. **Create** a diagnostic assessment instrument to determine the readiness of students for a planned sequence of learning that will focus on the selected content description. Your diagnostic should reflect the development of declarative and procedural knowledge. The completed diagnostic tool will assist teachers in identifying misconceptions and inefficiencies in student learning.
5. **Develop** a diagnostic marking guide (not an A-E Standards marking guide) to accompany the diagnostic tool you have made. It should clearly show all required calculations and anticipated student responses to questions, exercises or problems you have designed. Make links from some anticipated responses to learning issues or challenges described earlier in your work.
6. **Propose and discuss** pedagogical responses to the challenges or issues identified in step 3 and **justify** using professional literature.

#### PART B

To complete Part B you will need to:

1. **Critically analyse** the summative assessment task available on the Unit Moodle site Assessment Task 1



link. Use the appropriate Standards Elaborations document from QCAA (Queensland Curriculum and Assessment Authority) to frame your analysis. Terms of the critique should include the following: appropriate alignment to the Australian Curriculum, suitable range and balance of question types, appropriate language and context for the intended learners, clear alignment of the marking guide (criteria sheet).

2. Using your critique, **make modifications** to the summative task and **justify** each modification. Modifications can take the form of changes, omissions or inclusions.

3. **Design** an A-E Standards marking guide (criteria sheet) with which to judge standards for the adjusted summative task.

#### **Your response should include:**

Title page

Contents page

Introduction - Brief outline of assessment in primary schools or middle schools.

Part A - discussion of numbers 3 and 6 above.

Part B - discussion of 1, 2 above

Conclusion - Reflection on assessment in primary school.

References - APA style

Appendix 1 - Graphic organiser for **one** content description of **one** year level (selected from the **Number and Algebra** content strand of the *Australian Curriculum: Mathematics*)

Appendix 2 - Diagnostic assessment instrument

Appendix 3 - Diagnostic marking guide

Appendix 4 - Modified summative assessment task

Appendix 5 - Standards (A-E) marking guide (criteria sheet)

#### **Assessment Due Date**

Week 6 Friday (25 Aug 2017) 11:45 pm AEST

#### **Return Date to Students**

Week 8 Friday (8 Sept 2017)

#### **Weighting**

50%

#### **Assessment Criteria**

##### **Criteria and descriptors**

##### **1.2 Understand how students learn**

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

##### **1.3 Students with diverse linguistic, cultural, religious and socioeconomic backgrounds**

Demonstrate knowledge of teaching strategies that are responsive to the learning strengths and needs of students from diverse linguistic, cultural, religious and socioeconomic backgrounds.

##### **1.4 Strategies for teaching Aboriginal and Torres Strait Islander students**

Demonstrate broad knowledge and understanding of the impact of culture, cultural identity and linguistic background on the education of students from Aboriginal and Torres Strait Islander backgrounds.

**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

##### **5.1 Assess student learning**

Demonstrate understanding of assessment strategies, including informal and formal, diagnostic, formative and summative approaches to assess student learning.

##### **6.2 Engage in professional learning and improve practice**

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

**6.4 Apply professional learning and improve student learning** Demonstrate an understanding of the rationale for continued professional learning and the implications for improved student learning.

#### **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

#### Task rationale:

The way in which we teach mathematics is a defining factor determining children's attitudes to, and persistence with, mathematics throughout their schooling years. Developing a positive disposition to mathematics is critical to engaging learners. Instructional games provide one approach to engaging children positively in mathematics.

#### Task description:

This task comprises a written and a presentation component. The task can 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: Mathematics* (ACARA, 2014). The games and resources can address different areas of mathematics or the same area; the choice is up to your group.

### WRITTEN COMPONENT

To complete the written component of this task, your group will need to:

1. **Research** approaches to engaging children in mathematics, including what makes great classroom mathematics games.
2. **Select or design** three mathematics games and three discretely different mathematics resources that will engage children positively in mathematics learning and contribute to deeper understanding and increased procedural fluency.
3. **Outline** the curriculum content focus and links to the Key Ideas (Understanding, Fluency, Problem-Solving and Reasoning) for each of the featured games and resources. Provide a series of learning opportunities that support each game and resource.
4. **Identify** the formative assessment opportunities for each game and resource.
5. **Discuss** how the games and resources could be adjusted to differentiate for learners.
6. As a group **reflect** on how this task has engaged you in professional learning and potentially improved practice.
7. Compile **ONE group report** addressing each of 1 to 6 above.
8. **Each group member must submit the report to Moodle Assessment.**

### PRESENTATION COMPONENT

1. **On-campus students** will present **one** of the games to the tutorial group in the Week 12 scheduled tutorial. **Distance students** will submit a **link to a video** recording (saved to CloudStor) of one member of the group presenting the game to the **Distance only T2 forum**.
2. Each group will **upload a word document** to the **TASK 2 Forum** on Moodle outlining their games,

resources and other relevant information for implementation in a classroom.

**Assessment Due Date**

Week 12 Wednesday (4 Oct 2017) 11:45 pm AEST

Presentations will occur during scheduled tutorials. Written component must be uploaded by the due date.

**Return Date to Students**

Exam Week Wednesday (18 Oct 2017)

**Weighting**

50%

**Assessment Criteria**

The full criteria and standards matrix is available on the Unit Moodle site.

**1.2 Understand how students learn**

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

**1.3 Students with diverse linguistic, cultural, religious and socioeconomic backgrounds**

Demonstrate knowledge of teaching strategies that are responsive to the learning strengths and needs of students from diverse linguistic, cultural, religious and socioeconomic backgrounds.

**1.5 Differentiate teaching to meet the specific learning needs of students across the full range of abilities**

Demonstrate knowledge and understanding of strategies for differentiating teaching to meet the specific learning needs of students across the full range of abilities.

**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

**3.4 Select and use resources**

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

**4.1 Support student participation**

Identify strategies to support inclusive student participation and engagement in classroom activities.

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

**Submission**

Online

**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