EDCU20040 *Teaching Mathematics*
Term 2 - 2022

Profile information current as at 24/02/2026 03:35 am

General Information

Overview

In this unit, you will extend your professional knowledge about teaching and learning in numeracy and Mathematics 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. You will examine research to identify issues or challenges to the development of mathematical understanding in key stages of the learning progression as a guide for planning lesson sequences and developing and interpreting assessment for diagnostic purposes. You will use data from your research to design and justify differentiated teaching and learning activities for specific sub-strands of the curriculum that cater for students at a range of ability levels and overcome identified barriers to the development of mathematical proficiency and improve the transfer of mathematical reasoning, logic and analysis to problem-solving situations. Your personal numeracy competence will be further enhanced in this unit as you construct marking guides for diagnostic assessment using appropriate and accurate mathematical procedures and communication.

Details

Career Level: *Postgraduate*
Unit Level: *Level 9*
Credit Points: *6*
Student Contribution Band: *7*
Fraction of Full-Time Student Load: *0.125*

Pre-requisites or Co-requisites

Pre-requisite EDCU20037 Numeracy Learning
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

- Online

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 Postgraduate 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: 50%
2. **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 Moodle feedback

Feedback
Lecturer delivery and communication was exemplary

Recommendation
Maintain the same exemplary standard of teaching and communication

Feedback from Moodle feedback

Feedback
Relevant assessment tasks

Recommendation
Maintain relevance of assessment tasks to teacher work.

Feedback from Moodle feedback

Feedback
Embedded links in learning resources not working

Recommendation
Remove and move all embedded links to the eReading list and refer students to the list to ensure links to resources are active.

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 teaching, learning and assessment
2. Research and apply evidence-based pedagogical approaches that are responsive to misconceptions or barriers to learning in Mathematics for students from a range of ability levels, characteristics and experiential backgrounds
3. Propose and justify strategies and approaches to teaching Mathematics that promote the inclusive participation, understanding and mathematical proficiency of students from Aboriginal and Torres Strait Islander backgrounds and students with disability
4. Design assessment strategies and marking guides for collecting and interpreting data and reporting on students' progress and achievement of knowledge and skills in Mathematics
5. Justify teaching strategies and the selection and use of resources that scaffold students' understanding of core mathematical concepts
6. Identify opportunities for students to use ICTs for purposeful participation in learning experiences to gain mathematical knowledge and proficiency
7. Participate in moderation for the purpose of developing shared understanding of student learning needs and achievement.

Successful completion of this unit provides opportunities for students to demonstrate the Australian Professional Standards for Teachers focus areas of:
1.2 Understand how students learn
1.4 Strategies for teaching Aboriginal and Torres Strait Islander students
1.5 Differentiate teaching to meet the specific learning needs of students across the full range of abilities
1.6 Strategies to support full participation of students with disability
2.1 Content and teaching strategies of the teaching area
2.2 Content selection and organisation
2.3 Curriculum, assessment and reporting
2.6 Information and Communication Technology (ICT)
3.2 Plan, structure and sequence learning programs
3.3 Use teaching strategies
3.4 Select and use resources
4.1 Support student participation
5.1 Assess student learning
5.2 Provide feedback to students on their learning
5.3 Make consistent and comparable judgements
5.5 Report on student achievement

Alignment of Learning Outcomes, Assessment and Graduate Attributes

— N/A Level | ∘ Introductory Level | • Intermediate Level | • Graduate Level | ∘ Professional Level | ∘ Advanced Level

Alignment of Assessment Tasks to Learning Outcomes

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

Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes						
	1	2	3	4	5	6	7
1 - Knowledge	∘	∘	∘	∘	∘	∘	∘
2 - Communication				∘		∘	∘
3 - Cognitive, technical and creative skills	∘	∘				∘	
4 - Research	∘	∘	∘		∘		
5 - Self-management							∘
6 - Ethical and Professional Responsibility		∘	∘	∘	∘		∘
7 - Leadership							
8 - First Nations Knowledges							
9 - Aboriginal and Torres Strait Islander Cultures							

Textbooks and Resources

Textbooks

There are no required textbooks.

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

Sandra Wass Unit Coordinator
s.j.wass@cqu.edu.au

Schedule

Week 1 - 11 Jul 2022

Module/Topic	Chapter	Events and Submissions/Topic
Australian Curriculum: Mathematics and the National Numeracy Learning Progression Understanding primary school Mathematics	*The Australian Curriculum: Mathematics* (ACARA, 2014)	

Week 2 - 18 Jul 2022

Module/Topic	Chapter	Events and Submissions/Topic
Developing number sense and algebraic thinking - Planning for thinking: Open-ended problems		

Week 3 - 25 Jul 2022

Module/Topic	Chapter	Events and Submissions/Topic
Measurement and Geometry	Chapter 8 & 9	

Week 4 - 01 Aug 2022

Module/Topic	Chapter	Events and Submissions/Topic
Statistics and probability	Chapter 10	

Week 5 - 08 Aug 2022

Module/Topic	Chapter	Events and Submissions/Topic
Learner diversity in Mathematics	Harrison, N. & Sellwood, J. (2016). Learning and teaching in Aboriginal and Torres Strait Islander education. (3rd ed.). Oxford. (Chapter 4 – Strategies for teaching Aboriginal and Torres Strait Islander students) Bradley S. Witzel, M., & Little, E.. (2016).Teaching Elementary Mathematics to Struggling Learners. The Guilford Press. (Chapter 2 - The critical importance of instruction)	

Vacation Week - 15 Aug 2022

Module/Topic	Chapter	Events and Submissions/Topic
		Planning for effective teaching and learning in Mathematics Due: Vacation Week Monday (15 Aug 2022) 12:00 am AEST

Week 6 - 22 Aug 2022

Module/Topic	Chapter	Events and Submissions/Topic

Diagnostic assessment in mathematics	Ryan, J., & Williams, J. (2007). Children's Mathematics 4-15, McGraw-Hill Education, Chapter 2 Learning from errors and misconceptions.	

Week 7 - 29 Aug 2022

Module/Topic	Chapter	Events and Submissions/Topic
Common misconceptions in mathematical thinking		

Week 8 - 05 Sep 2022

Module/Topic	Chapter	Events and Submissions/Topic
Resources for developing mathematical reasoning		

Week 9 - 12 Sep 2022

Module/Topic	Chapter	Events and Submissions/Topic
Using ICTs to expand learning opportunities Inclusive learning and catering for students with disability	Chapter 1 & 11	

Week 10 - 19 Sep 2022

Module/Topic	Chapter	Events and Submissions/Topic
Learner engagement and meeting the needs of students with diverse backgrounds Review and reflection - Putting theory into practice.		

Week 11 - 26 Sep 2022

Module/Topic	Chapter	Events and Submissions/Topic
		Assessment for and of student learning in Mathematics Due: Week 11 Monday (26 Sept 2022) 12:00 am AEST

Week 12 - 03 Oct 2022

Module/Topic	Chapter	Events and Submissions/Topic

Review/Exam Week - 10 Oct 2022

Module/Topic	Chapter	Events and Submissions/Topic

Exam Week - 17 Oct 2022

Module/Topic	Chapter	Events and Submissions/Topic

Assessment Tasks

1 Planning for effective teaching and learning in Mathematics

Assessment Type
Written Assessment

Task Description
Task Description
You are to develop a teaching plan for four weeks for mathematics for a designated primary school year level and term (e.g. Year 2, Term 1). The plan must use the Australian Curriculum: Mathematics (ACARA, 2014) and focus on content descriptions from Number and Algebra and one other Content Strand (i.e. Measurement and Geometry or Statistics and Probability).
The plan must show alignment between curriculum intent, teaching and learning and assessment. It must be

comprehensive and include details of content, key learning experiences, resources and formative and summative assessment. You need to prepare to teach the planned topic/s by researching common learning misconceptions and gathering resources including digital resources/ICTs that promote engagement with and understanding of the core mathematical concepts for learners from a range of ability levels. Your research should consider approaches and technological aids that support the inclusive participation of students with Aboriginal and Torres Strait Islander backgrounds and students with disability.
The assessment task submission should use a presentation-style appropriate for a primary school curriculum planning document (e.g. Prep to Year 10 Unit Overview: Mathematics Template available from QCAA website)
You are NOT permitted to submit a planning document from a school or C2C units.

The final submission should be in the form of a written report with the following sections:
● Introduction- brief outline of the context and key considerations for planning mathematics units and lessons. (approx. 200-250 words)
● Planning document for the mathematics (NOT counted in word limit)
● Discussion of the research on common learning misconceptions, the experiential backgrounds of Aboriginal and Torres Strait Islander students and the needs of students with disability that have informed your pedagogical decision-making and understanding about 54
how students learn in ONE of the mathematics areas in the plan (e.g. measurement) (approx. 500 words)
● Discussion of the ways that digital resources and tools could be used to complement teaching strategies and promote deep learning of, and engagement with, the content of the chosen mathematics topic area/s of students with diverse needs and backgrounds for the weekly lessons. (approx. 200-250 words)
● Justification of the pedagogy and resources chosen to develop the identified content and skills for the topic/s and planned assessment of student learning in the chosen year level (approx. 400-450 words)
● References (NOT counted in word limit)
● Appendices - Resources (or evidence of) to support learning in the plan (NOT counted in word limit)
Word count: 1400 words maximum

Learning Outcomes Assessed
1. Analyse the structure and organisation of content in the mathematics curriculum to identify key stages in concept development as a focus for teaching, learning and assessment
2. Research and apply evidence-based pedagogical approaches that are responsive to misconceptions or barriers to learning in Mathematics for students from a range of ability levels, characteristics and experiential backgrounds
3. Propose and justify strategies and approaches to teaching Mathematics that promote the inclusive participation, understanding and mathematical proficiency of students from Aboriginal and Torres Strait Islander backgrounds and students with disability
4. Design assessment strategies and marking guides for collecting and interpreting data and reporting on students' progress and achievement of knowledge and skills in mathematics
5. Justify teaching strategies and the selection and use of resources that scaffold students' understanding of core mathematical concepts
6. Identify opportunities for students to use ICTs for purposeful participation in learning experiences to gain mathematical knowledge and proficiency 55

Australian Professional Standards for Teachers addressed in this task
1.2, 1.4, 1.6, 2.1, 2.2, 2.3, 2.6, 3.2, 3.3, 3.4, 4.1

Assessment Due Date
Vacation Week Monday (15 Aug 2022) 12:00 am AEST

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

Return Date to Students
Week 7 Monday (29 Aug 2022)

Assignments will be returned after the moderation process has been completed.

Weighting
50%

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

Assessment will be marked against the following criteria:
● Knowledge of the content, substance and structure, and teaching strategies for implementing the Australian Curriculum: Mathematics
● Planning that aligns curriculum, teaching and learning, and assessment using knowledge of student learning and effective teaching and assessment strategies

● Use and justification of strategies and resources including ICTs to support the learning and engagement of students with disability and Aboriginal and Torres Strait Islander students
● Justification of pedagogical decision-making, content organisation, and resource selection for overcoming common misconceptions in the way students learn Mathematics
● Design of assessment strategies and techniques for providing feedback, making judgements and reporting on student work
● Use of language conventions, clarity and conciseness of communication, and compliance with the APA Style Guide.

Referencing Style

- American Psychological Association 7th Edition (APA 7th edition)

Submission
Online

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

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
- Examine mathematics content and current literature to identify possible approaches to teaching mathematics and 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
- 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

- Knowledge
- Communication
- Cognitive, technical and creative skills
- Research
- Self-management
- Ethical and Professional Responsibility

2 Assessment for and of student learning in Mathematics

Assessment Type
Written Assessment

Task Description
Task Description
Assessment tasks for diagnostic purposes require an understanding of how students learn mathematics, the hierarchical nature of mathematical concepts and the sequence for developing understanding in a topic area.
The task requires you to determine the sequence of learning for numeration and two of the four mathematical operations in the Australian Curriculum: Mathematics.
You will identify specific content descriptions for these topics at a chosen year level and determine the expected prior knowledge and future learning in numeration and your selected operations to inform the development of a diagnostic assessment tool and accompanying marking guide that will assist you to determine the learner's current level of understanding and skill development in relation to future expected performance on a summative assessment task. Early Childhood students will focus on the Foundation Level and will therefore consider the prior knowledge children might be expected to have in the Foundation Level. This means that early childhood students will make reference back to the Early Years Learning Framework. The diagnostic and summative assessment tasks and marking guide should be referenced to the Australian Curriculum: Mathematics achievement standards and content descriptions (ACARA, 2014) and be structured to include sample items that identify students working at, above or below the expected year level to provide a focus for planning differentiated teaching and learning for students across the full range of ability levels.
The design of assessment must be justified through reference to curriculum documents and other relevant sources and show evidence of professional knowledge of the sequence for developing conceptual understanding of the focus topics. The marking guide should include responses to the assessment items that use accurate mathematical procedures and communication for making reliable judgements on students' responses and include examples of common errors or misconceptions that would assist a user in establishing learning goals for students of varying abilities and characteristics

and determining next steps teaching.
In addition, you need to share the design of your assessment and expected learner responses with either a peer or a practising teacher to initiate a moderation conversation. From this professional conversation, report whether your marking guide and proposed diagnosis of learning needs would be supportive of teachers in planning for differentiated instruction and making consistent and comparable judgements on student learning. For this part of the task, you should respond specifically to the three questions outlined below:
(a) Where interpretation of the sample learner responses differed between you and your teaching peer/colleague, what was the basis for that difference (e.g. particular expectations for mathematical communication, parts of the response that affected the award of full marks, gaps in prior knowledge, etc)?
(b) What feedback could you report to students at each ability level (working at, above and below expected level) and their parents/carers about their current progress and achievement in this aspect of the Mathematics curriculum?
(c) How useful was your marking guide for the purpose of establishing learning goals and planning differentiated instruction for students across the full range of ability levels? 56
(d) What did you learn about the assessment and interpretation of student work as a result of your participation in the moderation process?

Your submission should include:

● An overview outlining topic area, year level, Australian Curriculum: Mathematics (ACARA, 2014) learning statements, sequence for developing understanding of the topic area, a copy of the proposed summative assessment, and any other information you believe is relevant to the design of the diagnostic assessment.
● A diagnostic task, marking guide and sample responses for students at a range of ability levels for the topic area and year level.
● Justification of the items included on the diagnostic task as the basis for establishing learning goals and planning differentiated instruction for students at the full range of ability levels.
● Samples of feedback that could be provided to students and parents/carers to report on their current progress and achievement in relation to the chosen topic/s
● A summary of the moderation process including responses to the four questions, an evaluation of the effectiveness of the diagnostic task and any changes you would make to it following moderation.
● Appropriate terminology and references to authoritative sources.

Learning Outcomes Assessed

1. Analyse the structure and organisation of content in the mathematics curriculum to identify key stages in concept development as a focus for teaching, learning and assessment
4. Design assessment strategies and marking guides for collecting and interpreting data and reporting on students' progress and achievement of knowledge and skills in Mathematics
7. Participate in moderation for the purpose of developing shared understanding of student learning needs and achievement

Australian Professional Standards for Teachers addressed in this task

1.2, 1.5, 2.1, 5.1, 5.2, 5.3, 5.5

Assessment Due Date

Week 11 Monday (26 Sept 2022) 12:00 am AEST

Submit the task as one document with your surname in the file name.

Return Date to Students

Review/Exam Week Monday (10 Oct 2022)

Assignments will be returned once moderation has been completed.

Weighting

50%

Assessment Criteria

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

Assessment will be marked against the following criteria:

● Knowledge and understanding of how students learn Mathematics and the learning progression for the chosen topic
● Design and justification of assessment strategies tools for making reliable judgements on students' understanding and Mathematical proficiency for the purposes of giving feedback, differentiating instruction and reporting on student learning
● Understanding of the purpose of assessment moderation for making comparable and consistent judgements on students' work samples
● Application of knowledge of the content, stages of conceptual understanding and processes for communicating Mathematical thinkingAssessment will be marked against the following criteria:

● Knowledge and understanding of how students learn Mathematics and the learning progression for the chosen topic
● Design and justification of assessment strategies tools for making reliable judgements on students' understanding and Mathematical proficiency for the purposes of giving feedback, differentiating instruction and reporting on student learning
● Understanding of the purpose of assessment moderation for making comparable and consistent judgements on students' work samples
● Application of knowledge of the content, stages of conceptual understanding and processes for communicating Mathematical thinking

Referencing Style

- American Psychological Association 7th Edition (APA 7th edition)

Submission
Online

Submission Instructions
Submit the task as one document with your surname in the file name.

Learning Outcomes Assessed

- Examine mathematics content and current literature to identify possible approaches to teaching mathematics and misconceptions or barriers to learning for diverse student groups
- Design diagnostic tools and reliable guides for assessing students' knowledge and skills in mathematics
- Gather and use information on learners' numeracy skills for planning learning experiences
- Justify the selection and use of resources that scaffold students' understanding of core mathematical concepts

Graduate Attributes

- Knowledge
- Communication
- Cognitive, technical and creative skills
- Research
- Self-management
- Ethical and Professional Responsibility

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