

Unit overview

Week 1	The Professional STEM Educator <ul style="list-style-type: none"> • AITSL & Accountability • AC & STEM Education • Diagnostic Assessment 	Primary teachers' insecurity about mathematics	1 pp3	
		Mathematics in the primary curriculum	2 pp13	
		Learning how to learn mathematics	3 pp23	
Week 2	Road Blocks or Road Building <ul style="list-style-type: none"> • Understanding Students & Learning • Mathematics Anxiety • Mathematical Language 			
Week 3	Number Sense & Fluency <ul style="list-style-type: none"> • Number Sense • Addition & Subtraction Structures • Integers on the Number Line 	Numbers and place value	6 pp65	001-033 pp65
		Addition and subtraction structures	7 pp87	034-070 pp87
		Mental strategies for addition & subtraction	8 pp103	071-110 pp103
		Written methods for addition & subtraction	9 pp117	111-133 pp117
		Integers: positive and negative	14 pp197	240-264 pp197
Week 4	Multiplicative Thinking <ul style="list-style-type: none"> • Multiplication Structures • Factors & Multiples • Primes & Composites 	Multiplication and division structures	10 pp134	134-156 pp134
		Mental strategies for multiplication & division	11 pp150	157-184 pp150
		Written methods for multiplication & division	12 pp165	185-207 pp165
		Multiples, factors and primes	13 pp187	208-237 pp187
Week 5	The Real Number System <ul style="list-style-type: none"> • Division Structures • Fractions & Decimals • Percentages & Ratios 	Fractions & ratios	15 pp204	265-296 pp204
		Decimal numbers & rounding	16 pp222	297-338 pp222
		Calculations with decimals	17 pp242	339-367 pp242
		Proportionality & percentages	18 pp260	368-395 pp260
Week 6	Assessment & Reporting <ul style="list-style-type: none"> • Assessment Strategies • Open-Ended Tasks & Investigations • Formative Assessment 	Squares, cubes & number shapes	19 pp273	396-418 pp273
Week 7	Problem Solving, Proof & Reasoning <ul style="list-style-type: none"> • Problem Solving Strategies • Mathematical & Algebraic Reasoning • Conjectures & Proof 	Key processes in mathematical reasoning	4 pp37	
		Modelling and problem solving	5 pp52	
		Algebraic reasoning	20 pp289	419-458 pp289
		Coordinates & linear relationships	21 pp309	459-492 pp309
Week 8	Measurement Across the Curriculum <ul style="list-style-type: none"> • Indirect Measurement • Rates 	Concepts & principles of measurement	22 pp325	493-523 pp325
		Perimeter, area & volume	23 pp346	524-553 pp346
Week 9	Geometry Across the Curriculum <ul style="list-style-type: none"> • Dynamic Geometry • Geometric Reasoning 	Angle	24 pp363	554-577 pp363
		Transformations & symmetry	25 pp372	578-610 pp372
		Classifying shapes	26 pp384	611-644 pp384
Week 10	Statistics & Probability Across the Curriculum <ul style="list-style-type: none"> • Handling & Interpreting data • Exploring Chance 	Handling data	27 pp401	645-666 pp401
		Comparing sets of data	28 pp418	667-699 pp418
		Probability	29 pp436	700-734 pp436

Week 1 - The Professional STEM educator

Important Points

- Good questions and tasks provoke students to show us what they know and understand
- Students do misunderstand, but it is seldom because they cannot understand, most often it is because they understand something else.

Reflection

STEM stands for science, technology, engineering and mathematics. Education in STEM is required for economic growth and develops the capabilities in students to function in a technological society. They are skills required for successful participation in society. Many students can experience Maths anxiety which can stem from a fear of being incorrect. And diagnostic assessment is crucial to successfully meet the needs of all students. In most classrooms there will be 4-5 maths ability levels which need to be catered for. Maths is important in everyday life and society and increases a learner's intellectual development.

STEM

- Science
- Technology
- Engineering
- maths

Increased Teacher Accountability

In recent years, teachers have been held increasingly accountable for the learning outcomes achieved by their students. We regularly see newspaper headings dealing with:

- Performed-based pay
- Teacher negligence
- 'Dumbing down' in teacher education
- Poor teacher content knowledge

Teacher influence

Research suggests that the teacher is the single most important factor influencing student learning. As an aspiring teacher, you should consider:

- **Need to be able to explain maths, not just do it**
- **Things can resonate with students for a long time**
- How your **personal disposition** toward mathematics and your **beliefs** about who can learn mathematics affects your teaching.
- The difference between **helping students learn** and merely **disseminating information**
- The difference between **doing mathematics** and **teaching mathematics**.

Evidence-Based Teaching

There is increasing pressure on teachers to gather evidence to document the effectiveness of their teaching.

In part, this pressure may be due to:

- High-stakes national testing (such as NAPLAN)
- A lack of access to quality professional learning (PL)
- Lack of resources,
- Poor knowledge, understanding or availability of diagnostic assessments

There is pressure on teachers to:

- Know their content knowledge and how to teach it (AITSL Standard 2)
- Assess, provide feedback and report on student learning (Standard 5)

About:

- **Covering yourself**
- **Documenting what students learn**

Optimising STEM Education in WA Schools

In 2013, the WA Department of Commerce commissioned a study of STEM Education in WA Schools.

- The purpose of the report was to:
 - identify the status of STEM education in WA schools;
 - identify challenges in STEM education and the needs of students and teachers;
 - to identify the range of organisations supporting STEM education;
 - to make recommendations for optimising STEM education in WA schools.