

(Note: Professional development outcomes have been defined using an additive model that assumes all outcomes outlined in previous phase)

Organiser	TEACHER DEVELOPMENT CONTINUUM →			
	Foundational	Proficient	Highly Accomplished	Lead
	Knowledge and understanding of content and processes of numeracy			
Number	<ul style="list-style-type: none"> Identify and describe processes used to solve real world problems Know the structure of the number system and the characteristics of numbers, including complex numbers Select appropriate operations and strategies to solve problems Know about the nature of and contemporary practices regarding financial literacy and financial decision making Recognise the importance of knowledge of number as the basis for the development of a broad range of numeracy skills Acknowledge the operations performed by a range of ICT applications within common programs. 	<ul style="list-style-type: none"> Know advanced elements of the number system, including sophisticated representations of numbers and number structures Apply and integrate financial literacy to solve everyday problems Apply a range of operations and strategies to solve routine real world problems Recognise opportunities to integrate number concepts within other curriculum areas Explain the required knowledge of number needed to effectively use ICT applications, with a specific focus on spreadsheets. 	<ul style="list-style-type: none"> Apply operations and strategies to investigate non-routine real world problems, particularly proportional reasoning problems Know how to develop rich, real world mathematical problems which demand students to draw on their knowledge of number systems and operations, including financial maths, fractions and estimation Identify and apply the number and operation demands in other curriculum areas Identify and evaluate opportunities and strategies to use ICT applications to incorporate number concepts across curriculum areas. 	<ul style="list-style-type: none"> Draw on in-depth knowledge to identify, evaluate and apply a range of strategies related to number and operations for engaging colleagues in professional conversations Articulate the linkages between the study of number and operations and mathematics study at primary and secondary school level and the world of work Draw on in-depth knowledge to lead evaluations of existing and new whole-school approaches to teaching number and its application to real world problems.

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	Knowledge and understanding of content and processes of numeracy			
Algebra	<ul style="list-style-type: none"> Understand algebra as the language of change used to describe, generalise and predict relationships in a dynamic world. Understand the progressing complexity of algebraic reasoning across the year levels Know the purpose of algebra for solving a variety of real world problems Recognise the importance of algebraic thinking beginning in early years through understanding patterns and describing relationships. Know how to represent and manipulate simple algebraic expressions and equations Solve simple word problems Recognise that ICT applications can be used to apply algebraic relationships 	<ul style="list-style-type: none"> Know common algebraic representations (such as symbols, graphs and tables), properties (such as the laws of equivalence and order of operations), concepts (such as variables and equations); and informal applications of functions Apply algebraic reasoning (including use of properties, representations, concepts and informal applications of functions) to recognise, represent, simplify and solve routine problems involving linear relationships Identify and explain the algebra associated with a range of ICT applications Explain and apply a range of strategies for solving algebraic problems with a specific focus on word problems including real world, routine and non-routine problems Explain the application of algebra in other curriculum areas (e.g. graphically describing relationships between annual rainfall and wildlife populations) 	<ul style="list-style-type: none"> Recognise and apply an understanding of linear and non-linear relationships, including a combination of algebraic representations, properties, concepts and simple applications of functions, to model and make predictions about simple and challenging real world problems Know how to use ICT applications, particularly, spreadsheet and graphics applications, to model and solve algebraic problems and identify opportunities to apply these across all curriculum areas Explain how to develop a range of mathematical problems (real-world, routine and non-routine) which require students to draw on their algebraic reasoning Identify and evaluate strategies for developing algebraic reasoning 	<ul style="list-style-type: none"> Draw on in-depth knowledge to identify, evaluate and apply algebraic relationships, including representations, properties, concepts and functions to model routine and non-routine authentic problems Articulate the linkages between the study of algebra and mathematics study at primary and secondary school level and the world of work Draw on in-depth knowledge to lead evaluations of existing and new whole-school approaches to teaching algebra and its application to real-world problems

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	Knowledge and understanding of content and processes of numeracy			
Measurement	<ul style="list-style-type: none"> • Know the required attributes of measurement to perceive, compare and measure • Know about the need for and application of measurement concepts, including standard and non-standard measure units • Know different types and applications of units of measurement, metric and derived, and conversions between units • Recognise and use measurement instruments and the related concepts of precision and error, and estimation and limitations • Recognise measurement components of ICT applications • Acknowledge the real world applications of measurement. 	<ul style="list-style-type: none"> • Apply familiar measurement concepts to solve routine real world problems • Recognise and integrate measurement concepts within other organisers of mathematics to solve real world problems • Recognise and integrate measurement concepts within other curriculum areas to solve real world problems • Know and explain the demands of ICT applications that have measurement aspects. 	<ul style="list-style-type: none"> • Apply familiar and complex measurement concepts to investigate challenging real world problems • Apply basic trigonometry to investigate routine real world problems • Identify, create and negotiate non-standard measures, including qualitative features of phenomena • Identify and apply the measurement concepts required for a range of tools and instruments, including ICT applications, including the capacity to measure accurately. 	<ul style="list-style-type: none"> • Draw on in-depth knowledge to identify, evaluate and apply a range of strategies related to measurement concepts, including trigonometry to solve routine and non-routine authentic problems • Articulate the linkages between measurement and mathematics study at primary and secondary school level and the world of work • Draw on in-depth knowledge to lead evaluations of existing and new whole-school approaches to teaching measurement concepts, including trigonometry to solve routine and non-routine authentic problems.

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	Knowledge and understanding of content and processes of numeracy			
Geometry	<ul style="list-style-type: none"> Recognise basic properties and terminology associated with geometric 2D shapes and 3D objects Recognise applications and different types of transformations and symmetries Use plans and maps to communicate information about location, distance, and direction Explain the importance of a hands-on-approach for geometry where students use blocks and solids to explore flips, slides and turns; symmetry; and formation of nets Recognise the capacity of ICT applications for on-screen creation and manipulation of 2D shapes and 3D objects and other geometrical activities. 	<ul style="list-style-type: none"> Apply familiar geometry concepts to solve routine real world problems Recognise and integrate geometric concepts within other strands of mathematics to solve problems Recognise and integrate geometric concepts within other curriculum areas to solve problems Apply advanced mapping skills, including coordinates and scale conversions Know and explain a range of ICT applications offering strategies or capacity for geometric manipulations and construction of maps and plans. 	<ul style="list-style-type: none"> Apply familiar and complex geometry concepts to investigate challenging real world problems Investigate historical and contemporary applications of geometry including construction, deduction and indirect measurement Identify and evaluate strategies, including the use of ICT applications, to develop students' capacity to explore, classify, represent and manipulate 2D shapes and 3 D objects, and to construct and use plans and maps. 	<ul style="list-style-type: none"> Draw on in-depth knowledge to identify, evaluate and apply a range of strategies related to geometry concepts to solve routine and non-routine authentic problems Articulate the linkages between geometry and mathematics study at primary and secondary school level and the world of work Draw on in-depth knowledge to lead evaluations of existing and new whole-school approaches to teaching geometry to solve routine and non-routine authentic problems with a specific focus on hands-on approaches.


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	Developing	Proficient	Highly Accomplished	Lead
	Knowledge and understanding of content and processes of numeracy			
Statistics and probability	<ul style="list-style-type: none"> • Explain and use the basic statistical investigation cycle • Use the language of uncertainty in relation to statistics and probability • Recognise fundamental concepts of statistics, including sampling, informal inference, describing and representing data distributions • Recognise fundamental concepts of probability including sample space, quantifying probabilities, randomness, and the law of large numbers • Recognise how ICT applications can offer simulation of statistical experiments and the range of statistical analyses accessible in ICT applications. 	<ul style="list-style-type: none"> • Compare empirical and theoretical probabilities through hands-on simulations • Conduct statistical investigations to solve routine real world problems • Investigate situations of uncertainty using concepts of statistics • Investigate situations of uncertainty using concepts of probability • Use ICT applications, applets, data analysis software applications and databases to investigate non-routine real world statistics and probability problems. 	<ul style="list-style-type: none"> • Conduct statistical investigations to solve non-routine real world problems • Explain how to develop probability problems that draw on statistical analyses and manipulations, and include ICT use where appropriate • Identify, explain and evaluate the statistics and probability functions offered by a range of ICT applications. 	<ul style="list-style-type: none"> • Draw on in-depth knowledge to identify, evaluate and apply a range of strategies related to fundamental statistics and probability concepts, such as relationship between sample size and variability, and prediction and informal inference, to solve routine and non-routine authentic problems for engaging colleagues in professional conversations • Articulate the linkages between statistics and probability and mathematics study at primary and secondary school level and the world of work • Draw on in-depth knowledge to lead evaluations of existing and new whole-school approaches to teaching statistics and probability and real world applications of statistics and probability.

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TEACHER DEVELOPMENT CONTINUUM →			
Developing	Proficient	Highly Accomplished	Lead
Pedagogical content knowledge - numeracy			
<ul style="list-style-type: none"> Identify and implement relevant system and school level curriculum and policy documents related to numeracy Establish learning goals in relation to numeracy at whole class, small group and individual level recognising the progression of increasing numeracy demands across year levels Implement numeracy plan in the classroom Identify and explicitly teach numeracy in other curriculum areas Identify and use appropriate numeracy teaching resources in a range of media [print, electronic, digital etc] and modes [written, spoken, visual, aural, tactile and multimodal] Know about the language and literacy demands of teaching numeracy Plan and implement strategies that take account of students' backgrounds and characteristics including abilities and particular support needs 	<ul style="list-style-type: none"> Identify, explain and apply relevant system and school level curriculum and policy documents related to numeracy Develop, implement and monitor learning goals for numeracy at whole class, groups and individual level Develop, implement and monitor a flexible approach to developing students' numeracy Apply a balanced and flexible approach to the teaching of numeracy Identify, evaluate and apply an extended range of teaching strategies relevant to numeracy Design and implement flexible routines, structures and processes in classrooms to facilitate numeracy development Identify and assess numeracy teaching resources in a range of media and modes Plan for a range and balance of instructional groups, including whole class, small group and individual instruction Identify numeracy demands across the curriculum 	<ul style="list-style-type: none"> Apply in-depth knowledge of relevant system and school level curriculum and policy documents related to numeracy Plan year and class level numeracy outcomes Access and evaluate professional networks and sources of professional advice and disseminate information to members of the school community Apply a range of intervention strategies to support the diverse learning needs of students including those with learning difficulties in relation to numeracy Adopt flexible approaches to the teaching of numeracy in response to learner needs and school and system priorities Identify, evaluate and explain current research related to students' numeracy development, including the use of ICT applications Research, evaluate and apply strategies to develop students' numeracy across all curriculum areas. 	<ul style="list-style-type: none"> Mentor and coach other teachers to use in-depth knowledge of relevant system and school level numeracy curriculum and policy documents and their relationship to contemporary research in numeracy development Identify and share information about linkages between numeracy at primary, secondary and tertiary level and application in real life situations and communicate these to colleagues, students and their families Identify and communicate information on best practice and contemporary research in numeracy teaching and facilitate uptake of best practice Identify and apply a range of strategies at group, class and school level for trialling and evaluating new approaches to the teaching of algebra Draw on in-depth knowledge to lead planning of integrated whole school, year, class and individual level development of numeracy skills

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Pedagogical content knowledge - numeracy			
<ul style="list-style-type: none"> Establish and plan for a range of numeracy outcomes using a variety of instructional groups, including whole class, small group and individual instruction Monitor effectiveness of own teaching and identify areas for improvement Know strategies for developing meta-cognitive behaviours in learners Know about the range of research related to the teaching of numeracy Recognise the value of ICT use in the context of numeracy across the curriculum. 	<ul style="list-style-type: none"> Employ an extended range of strategies to monitor effectiveness of own teaching and identify areas for improvement Employ an extended range of strategies for developing meta-cognitive behaviours in learners Draw on current research findings to underpin strategies for to used in classroom to develop students' numeracy Identify strategies for incorporating ICT use to support development of students' numeracy skills. 		<ul style="list-style-type: none"> Identify and apply current research findings to support planning at school level and to support the professional learning of teachers in relation to developing students' numeracy skills Facilitate professional conversations related to identifying and diagnosing patterns of student needs in numeracy at individual, class, year level and whole school level Facilitate appropriate forum to support teacher's learning about the use of ICT applications to support development of numeracy for students Model lessons that make explicit the strategies for developing mathematical concepts and developing numeracy across the curriculum.

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Developing	Proficient	Highly Accomplished	Lead
Assessment specific professional development learning outcomes			
<ul style="list-style-type: none"> Recognise the range of strategies and tools available to identify and diagnose student numeracy needs Identify appropriate assessment techniques and processes suitable for their own classroom context Apply diagnostic tools and processes to assess learners' current understandings, misconceptions and levels of attainment of learning outcomes and use this information as the starting point for teaching Know and apply a range of strategies to monitor and assess learner progress against specified learning outcomes Provide feedback to learners and their families based on analysis of assessment evidence Participate in assessment moderation processes Collect and use assessment data to inform the teaching and learning cycle at the individual and class level Maintain student assessment data Prepare students for national/state testing programs Check pre-prepared assessment resources for relevance against curriculum documents. 	<ul style="list-style-type: none"> Identify and evaluate diagnostics tools and strategies to identify students needs Assess the multiple purposes and different forms of assessment Know and apply an extended range of effective assessment techniques related to numeracy Provide high level feedback to learners and their families based on assessment data Make judgements about learners' progress against specified learning outcomes Know and apply a range of assessment moderation processes Collect, analyse and use assessment data to inform the teaching and learning cycle at the individual and class level Manage and organise student assessment data Prepare students to participate in national testing programs and consider outcomes to inform program planning Evaluate pre-prepared assessment resources and determine suitability for use with groups and individuals. 	<ul style="list-style-type: none"> Collect and analyse student assessment data at individual, class and year level Use a comprehensive range of assessment data to inform curriculum planning at year level Advise on the selection, management and use of assessment resources at the relevant year level Design and apply flexible assessment techniques that reflect the diverse needs of learners, the purpose of the assessment and the curriculum goals Collect, analyse and use assessment data for diagnostic purposes and provide comprehensive feedback to learners and their families on learner performance Lead assessment moderation processes Analyse outcomes of national testing programs and apply to numeracy planning. 	<ul style="list-style-type: none"> Evaluate and reflect on school numeracy approaches to review existing plans and improve outcomes Contribute to evaluations of systemic numeracy approaches and related programs Collect and monitor trends in student performance at individual, class, year and whole school level Collect, analyse and use assessment data to inform curriculum planning in relation to numeracy at year and whole school level Advise on the selection and use of commercial assessment and testing materials at year and whole school level Contribute to the development of whole school policy and procedures in relation to the assessment of numeracy Coordinate assessment moderation procedures and processes, across school years, within and across schools Evaluate outcomes of national testing programs and apply to whole school numeracy planning.

Curriculum frameworks, and reference and advisory documents

Knowledge and understanding of content area
<p>Queensland Studies Authority (QSA) http://www.qsa.qld.edu.au/learning.html</p> <ul style="list-style-type: none"> • Early Years Curriculum Guidelines • Year 1 Learning Statements • Years 3, 5, 7, 9 Essential Learnings (Mathematics) • P— 9 Literacy and Numeracy Indicators • Year 10 Guidelines Mathematics <p>Australian Curriculum Assessment and Reporting Framework (ACARA) http://www.acara.edu.au/publications.html</p> <ul style="list-style-type: none"> • Shape of the Australian Curriculum: Mathematics (May 2009) • Framing Paper Consultation Report: Mathematics (May 2009)
Pedagogical content knowledge
<p>Queensland Studies Authority (QSA) http://www.qsa.qld.edu.au/learning.html</p> <ul style="list-style-type: none"> • Early Years Curriculum Guidelines • Years 1-7 Essential Learnings Mathematics • P— 9 Literacy and Numeracy Indicators • Year 10 Guidelines Mathematics <p>Australian Curriculum Assessment and Reporting Framework (ACARA) http://www.acara.edu.au/publications.html</p> <ul style="list-style-type: none"> • Shape of the Australian Curriculum: Mathematics (May 2009) • Framing Paper Consultation Report: Mathematics (May 2009)
Personal numeracy skills
<ul style="list-style-type: none"> • Australian Core Skills Framework (DEEWR) - Numeracy