

Links to draft Early Years Curriculum Guidelines

Early years learning areas

In the draft Early Years Curriculum Guidelines, learning occurs within five separate learning areas:

- Social and personal learning
- Health and physical learning
- Language development and communication
- Early mathematical understandings
- Active learning processes

The focus in Early mathematical understandings is on early numeracy and investigating, thinking and reasoning mathematically. This learning area has the strongest links to the Years 1 to 10 Mathematics Syllabus. In this learning area, children construct and communicate early mathematical understandings in patterns, number, space, measurement, and chance and data by:

- investigating and communicating about quantities and their representations, and attributes of objects and collections
- investigating and communicating about position, movement and direction
- investigating and communicating about order, sequence and pattern.

These dispositions and understandings lead to the development of the knowledge, procedures and strategies in the early levels of the Years 1 to 10 Mathematics Syllabus.

Early years learning area overviews

The learning statement for *Early mathematical understandings* describes aspects of thinking and working mathematically that link to the Years 1 to 10 Mathematics Syllabus (see Table 1).

Early mathematical understanding — Early Numeracy

Learning Statement

Children construct early mathematical understandings in patterns, number, space, measurement, and chance and data by:

- investigating and communicating about quantities and their representations, and attributes of objects and collections
- investigating and communicating about position, movement and direction
- investigating and communicating about order, sequence and pattern.

Suggestions for Planning

Teachers plan play, real-life situations, investigations, routines and transitions, and focused learning and teaching by drawing on the following examples or constructing experiences relevant to local settings.

Experiences may involve children:

- matching and describing characteristics, attributes and representations for patterns, objects, and collections
- sorting and classifying objects and describing a characteristic of the collection including number, shape, colour, texture, size and function
- patterning repeated sequences such as sequences in movements songs, games, dramatic and manipulative play, routines, stories and objects for decorations
- comparing attributes and quantities in collections using comparative language
- ordering and describing sequences of actions, events, patterns, routines and transitions, and numbers in manipulative play, songs and games
- representing and describing early mathematical ideas using objects, pictures, drawings, text, child-created symbols and numbers
- explaining mathematical thinking and reasoning for decision making and problem solving
- using information and communication technologies to explore quantities and their representations, position, movement, direction, order, sequence and pattern.

Suggestions for Interacting

Teachers select interactions drawing on the following examples or creating alternatives relevant to local settings.

Interactions include:

- discussing mathematical explorations, and thinking and reasoning collaboratively
- modelling mathematical language and ways to represent mathematical ideas
- developing and extending the language of mathematics
- making explicit strategies used for counting collections and identifying 'How many?'
- giving explicit prompts and support to assist the recall of beginning mathematical ideas
- making explicit the mathematics in everyday situations
- acknowledging effort, interest, learning and experimentation with mathematical ideas
- asking children what support they need
- discussing approximations of early mathematical ideas and modifying understandings, as required
- encouraging others to support mathematical thinking, reasoning and experimentation with ideas
- encouraging children to reflect on their mathematical thinking and reasoning in different situations and contexts
- questioning thinking and reasoning by asking 'why' and 'how' questions
- encouraging children to find ways of representing their mathematical ideas
- using teachable moments to draw children's attention to mathematical aspects of their activities
- reflecting on the situation/learning experience and deciding how to extend and deepen the learning.

Suggestions for Monitoring and Assessing

In relation to this learning statement, teachers may look for evidence that the child:

- counts small collections in different arrangements and from different starting points
- recognises familiar numbers
- identifies how many in a small collection
- identifies collections with exaggerated differences for 'more' or 'less'
- represents the quantities of small collections in different ways
- recognises parts of a whole
- imitates exchange processes as part of play
- identifies and describes attributes of objects as long, short, empty, full, heavy, light
- uses comparative language when comparing two objects or pictures
- sorts collections by single attributes such as shape, colour or size of objects
- identifies and describes attributes of objects according to shape
- uses familiar positional language to communicate own position, the position of others and objects
- with occasional prompts, uses a range of positional language in different contexts
- interprets familiar language of position to place or locate objects
- identifies the repeating element of a pattern and continues patterns, with support
- identifies patterns in the environment
- follows a sequence or pattern, in order
- represents sequences of familiar events
- identifies points in time, with prompts.

Teachers monitor a child's learning in relation to the learning statements as they:

- observe and analyse what the child is doing
- listen to and reflect on what the child says and interact with the child
- record annotations
- communicate with partners including children, parents/carers and others.

Teachers gather evidence about a child's learning through a range of contexts that include play, real-life situations, investigations, routines and transitions, and focused learning and teaching.

Suggestions for Reflecting

In relation to this learning statement, adults and children might reflect on the following:

- What did you think when you came across a problem today?
- How did you make something work?
- How did you test/experiment and show your ideas?

Teachers also reflect on decision-making processes and key components to inform judgments about children's learning and future planning

Investigations

The draft Early Years Curriculum Guidelines says ‘investigations generally involve children in interacting with people, objects and representations, as they inquire, explore relationships and test ideas. Investigations in a preparatory classroom provide opportunities to explore ways to communicate, investigate social, natural and built environments, and experiment with artistic, scientific, technological and mathematical ideas and processes’ (2004, p. 41). Investigative skills and strategies develop in the Preparatory Year and assist children to establish early mathematical understandings.

The investigative approach has been used as a framework for support materials for the Years 1 to 10 Mathematics Syllabus. Investigations focus on a problem to be solved, a question to be answered, a significant task to be completed or an issue to be explored. The support materials illustrate how teachers can engage students in Years 1 to 10 in mathematical investigations relevant to a range and balance of situations from life-related to purely mathematical. Through investigations, students:

- see the mathematics in situations encountered
- plan, investigate, conjecture, justify, think critically, generalise, communicate and reflect on mathematical understandings and procedures
- select and use relevant mathematical knowledge, procedures, strategies and technologies to analyse and interpret information (see *Years 1 to 10 Mathematics Syllabus*, p. 1).

Descriptors

To support the draft Early Years Curriculum Guidelines, the Queensland Studies Authority has developed draft phase descriptors. These descriptors help teachers to make judgments about children’s learning. The descriptors illustrate and describe children’s learning in four phases and include the level of support children may need in each phase. The descriptors are not a checklist, but rather a guide to assist teachers when making judgments about children’s learning.

The phases are:

- Becoming aware — with explicit support
- Exploring — with support
- Making connections — with prompts
- Applying — independently.

Children learning in the ‘Applying’ phase may be in early Year 1. The ‘Applying’ phase leads to Level 1 of the Years 1 to 10 Mathematics Syllabus.

Table 2 shows the similarities between the key messages of the Early Years Curriculum Guidelines and the Years 1 to 10 Mathematics Syllabus.

Table 2: Key components of the draft Early Years Curriculum Guidelines and the Years 1 to 10 Mathematics Syllabus

| | Contexts for learning | Descriptions of learning | Numeracy | Pedagogical framework | Assessment |
|--|---|--|--|--|--|
| Draft Early Years Curriculum Guidelines | Play Real-life situations Investigations Routines and transitions Focused learning and teaching | Early years learning statement | Children build a sense of themselves as numerate and begin to understand the range of social situations in which numeracy is used purposefully in their daily lives. | Teachers use the five contexts for learning (see second column) to help learners develop understandings, capabilities and dispositions. | Teachers gather evidence about children's learning through a range of contexts. Assessment is an integral part of the teaching-learning process. |
| Years 1 to 10 Mathematics Syllabus | A range and balance of situations from the life-related to purely mathematical. | Level statements Core learning outcomes | Numeracy is the demonstration of practices and dispositions that meet the demands of everyday situations that involve number, patterns and algebra, measurement, chance and data, and space. | Support materials describe an investigative approach with a focus on 'thinking, reasoning and working mathematically' across the five strands of the syllabus. | Assessment informs decision making related to student learning. |

Preparatory phases linked to Years 1 to 10 Mathematics core learning outcomes

Early mathematical understandings

Learning Statement: Children construct and communicate early mathematical understandings in number, patterns and algebra, measurement, chance and data, and space by:

- investigating and communicating ideas about quantities and their representations, and attributes of objects and collections
- investigating and communicating ideas about position, movement and direction
- investigating and communicating ideas about order, sequence and pattern.

Table 3 below describes a continuum of learning throughout the early phase of learning. Links to the key indicators of the Year 2 Diagnostic Net (1995) are bracketed in bold.

Table 3: Links between preparatory phases and the Years 1 to 10 Mathematics core learning outcomes

| <i>With explicit support, the child participates in discussions about early mathematical ideas and sometimes uses modelled practices.</i> | <i>With support, the child investigates early mathematical ideas by experimenting with objects, representations and modelled strategies to solve problems of personal interest.</i> | <i>With prompts, the child investigates own and shared mathematical problems using familiar objects and representations, sometimes suggesting strategies needed to proceed.</i> | <i>The child identifies and uses strategies to solve early mathematical problems and communicates about number, patterns and algebra, measurement, chance and data and space.</i> | <i>Identify, distinguish between and use relevant mathematical knowledge, procedures and strategies in life-related situations at Level 1.</i> | <i>Identify, distinguish between and use relevant mathematical knowledge, procedures and strategies in life-related situations at Level 2.</i> |
|--|--|--|--|---|---|
| Becoming aware | Exploring | Making connections | Applying | Links to KLAs at Level 1 | Links to KLAs at Level 2 |
| Investigating and communicating ideas about number | | | | Mathematics: <i>Number Patterns and Algebra</i> | Mathematics: <i>Number Patterns and Algebra</i> |
| <ul style="list-style-type: none"> • Mimics counting (e.g. <i>One, four, seven, five</i>). • Randomly assigns familiar numbers to collections. • Plays randomly with materials and resources available. (A6) | <ul style="list-style-type: none"> • Recites number names to at least 5 by rote. (N B5) • Counts small collections to approximately 3. • Makes and rearranges collections and assigns numbers at random. • Experiments with combining objects and parts to make a whole (e.g. a jigsaw, a mobilo truck) | <ul style="list-style-type: none"> • Counts small collections in different arrangements and from different starting points. • Recognises familiar numbers (e.g. <i>That's 5 like me</i>). (N B7) • Identifies 'how many' in a small collection, to at least 5 objects. • Recognises the required number of items needed to complete a planned task. • Recognises parts of a whole (e.g. a slice of cake, a bit of an apple, parts of a construction, parts of the body). | <ul style="list-style-type: none"> • Counts consistently using the standard counting sequence. (N B1) • Counts objects to 10 with 1 to 1 correspondence. (N B2) • With support, counts to identify the next number in a counting sequence. • Uses knowledge of a whole and its parts to put together and take apart objects (e.g. construction, puzzles, patterns, sequences in routines). | <p>N 1.1 Students identify, compare and order small whole numbers, make and match representations of these numbers and identify coins, notes and their uses.</p> | <p>N 2.1 Students compare and order whole numbers to 999, make and match different representations and combinations of whole numbers and of equivalent amounts of money, and identify simple fractions of objects and collections.</p> |

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|--|--|---|--|--|---|
| <ul style="list-style-type: none"> • Responds to suggestions about having/needing 'more'. | <ul style="list-style-type: none"> • Recognises a need for 'more' items without knowing exactly how many. (N B9) | <ul style="list-style-type: none"> • Identifies collections with exaggerated differences for 'more' or 'less' (e.g. compares collections of 50 to collections of 2 or 3). (N B6) • Represents the quantities of small collections in different ways (e.g. makes 5 play dough snakes; finds 5 things to eat for lunch). • Shares a collection of objects as part of play or routines and identifies same and different sized groups. | <ul style="list-style-type: none"> • Makes collections of different quantities and identifies the number of objects. (N B4) • Compares small collections to identify which has 'more' or 'less' using 1 to1 correspondence. (N B8) • Identifies the quantity of a collection and represents it in different ways (e.g. drawing, labelling using numerals or words, making different collections of the same quantity). • Shares a collection of objects equally as part of play or routines and identifies the number in each group. | <p>N 1.2 Students identify and solve addition and subtraction problems involving small whole numbers.</p> <p>PA 1.2 Students compare and describe arrangements of objects and combinations of numbers to 10 using the language of equivalence.</p> <p>N 1.3 Students identify and describe equal groups and equal sharing within everyday situations.</p> | <p>N 2.2 Students identify and solve addition and subtraction problems involving whole numbers by selecting from a range of computation methods, strategies and known number facts.</p> <p>PA 2.2 Students represent and describe equivalence in equations that involve addition and subtraction.</p> <p>N 2.3 Students identify and solve multiplication and division problems involving whole numbers by selecting from a range of computation methods, strategies and known number facts.</p> |
|--|--|---|--|--|---|

** Key indicators of the *Year 2 Diagnostic Net* (1995) are bracketed in bold.

| Becoming aware | Exploring | Making connections | Applying | Links to KLAs at Level 1 | Links to KLAs at Level 2 |
|---|---|---|--|---|--|
| Investigating and communicating ideas about money | | | | Links to N 1.1 | Links to N 2.1 |
| <ul style="list-style-type: none"> • Observes other children pretending to exchange money in play. | <ul style="list-style-type: none"> • With prompts, gives money to people in play situations, for the exchange of goods and services. | <ul style="list-style-type: none"> • Imitates exchange processes as part of play. | <ul style="list-style-type: none"> • Identifies a random monetary cost for the exchange of goods or services. (B10) • Recognises the difference between coins and notes. (B10) | | |
| Investigating and communicating ideas about attributes of objects and collections | | | | Mathematics: Measurement Space | Mathematics: Measurement Space |
| <ul style="list-style-type: none"> • Responds to familiar language of experientially based measurement attributes (e.g. big, full, high, small). | <ul style="list-style-type: none"> • Uses personal understandings of everyday measurement language during play and interactions (e.g. lifting a bucket and saying <i>This is big!</i> meaning 'heavy'). (N A3) • Self-corrects and imitates modelled language. | <ul style="list-style-type: none"> • Identifies and describes attributes of objects as long, short, empty, full, heavy, light. • Uses comparative language when comparing two objects or pictures (e.g. <i>The red balloon is bigger than the blue balloon.</i>) • Sorts collections by single attributes such as shape, colour or size of objects. • Identifies and describes attributes of objects according to shape. • Identifies and describes shapes as having straight or curved sides. | <ul style="list-style-type: none"> • Links each attribute with the appropriate measuring processes (eg. When finding 'how long' knows to measure between two designated points. When finding out 'how heavy' knows to compare weight in two hands or on a scale). • Identifies and describes similar characteristics and attributes including shapes when matching. (N B4) • Identifies categories, including shapes, for sorting collections. (N B4) | <p>M 1.1 Students select the appropriate attribute to compare and order the size of objects and measure with non-standard units.</p> <p>S 1.1 Students identify everyday shapes and objects using geometric names and make and describe simple representations of them.</p> | <p>M 2.1 Students use non-standard and standard units to estimate, measure and order the size of objects.</p> <p>S 2.1 Students describe and sort 3D shapes and objects and 2D shapes according to geometric properties and identify shapes and objects from different viewpoints or orientations.</p> |

** Key indicators of the Year 2 Diagnostic Net (1995) are bracketed in bold.

| Becoming aware | Exploring | Making connections | Applying | Links to KLAs at Level 1 | Links to KLAs at Level 2 |
|--|--|---|---|--|---|
| Investigating and communicating ideas about movement, position and direction | | | | Mathematics: Space | Mathematics: Space |
| <ul style="list-style-type: none"> Imitates the placement of objects or self in different positions (e.g. <i>in, on, under, up, down, over</i>). Imitates movement/s (e.g. <i>follow the leader</i> and <i>music games</i>). | <ul style="list-style-type: none"> Responds with support to directions involving positional language (e.g. <i>Stand on the plank, put the cup in the sink</i>). Uses some positional language in play (e.g. in sand play, <i>The truck goes under the bridge</i>). | <ul style="list-style-type: none"> Uses familiar positional language to describe own position, the position of others and objects. Interprets familiar language of position, to place or locate self, others or objects. With support, interprets less familiar positional language. | <ul style="list-style-type: none"> Combines positional language to describe positions and locations of self, others or objects (e.g. <i>It's on the shelf next to the truck</i>). Interprets combinations of positional language to locate others, or objects in different contexts (e.g. <i>Your lunchbox is over there on the top shelf</i>). | <p>S 1.2 Students follow and give simple directions to move through familiar environments and locate and place objects in those environments.</p> | <p>S 2.2 Students interpret and create simple maps, plans and grids to follow and give directions, and to locate or arrange places or objects.</p> |
| Investigating and communicating about order, sequence and pattern. | | | | Mathematics: Patterns and Algebra Measurement Chance and Data | Mathematics: Patterns and Algebra Measurement Chance and Data |
| <ul style="list-style-type: none"> Makes designs, random patterns and sequences as part of play. | <ul style="list-style-type: none"> With support, copies patterns, identifying the order of items within the repeating elements. (N A5) Enjoys repetition of actions and movements. (N A1) | <ul style="list-style-type: none"> Identifies the repeating element of a pattern and continues patterns, with support. (N B3) Identifies patterns in the environment (e.g. roof tiles; clothing). Follows the sequence or pattern, in order (e.g. a simple routine; threading beads). | <ul style="list-style-type: none"> Creates and describes own patterns or designs as part of play. (N C4) | <p>PA 1.1 Students identify, describe and create patterns and change based on simple rules.</p> | <p>PA 2.1 Students create and explain patterns, identify and describe relationships using rules and use backtracking to reverse the effects of rules involving addition and subtraction.</p> |

** Key indicators of the *Year 2 Diagnostic Net* (1995) are bracketed in bold.

| Becoming aware | Exploring | Making connections | Applying | Links to KLAs at Level 1 | Links to KLAs at Level 2 |
|---|---|---|--|--|---|
| <ul style="list-style-type: none"> Asks when events will happen or when changes in routines are likely to occur. | <ul style="list-style-type: none"> Follows simple routines with support. Anticipates when an event will occur, from prior experiences of familiar routines (e.g. <i>We're tidying up. Is it music now?</i>) (N A2) | <ul style="list-style-type: none"> Represents sequences of familiar events. Identifies points in time with prompts. | <ul style="list-style-type: none"> Explains the sequences of familiar events within a session or activity. Creates and demonstrates alternative routine sequences in familiar contexts (e.g. Suggests re-routing the obstacle course through the sandpit). Identifies familiar points in time such as lunchtime, going home time, before, after, first, last, next. | <p>M 1.2 Students sequence familiar events related to days and weeks, and directly compare the duration of events.</p> | <p>M 2.2 Students use a calendar to locate and sequence events, read and interpret key times on 12-hour displays and measure and compare durations of time.</p> |
| <ul style="list-style-type: none"> Seeks information with no intention to use the data. | <ul style="list-style-type: none"> Seeks information for personal purposes and represents information gathered in a personally meaningful way. | <ul style="list-style-type: none"> With support, sometimes identifies that an event might or might not happen. Identifies ways of collecting data to confirm assumptions and answer own questions (e.g. Child says, <i>We all hate spiders or I never get a turn</i> and collects data to see if this is so). | <ul style="list-style-type: none"> In familiar situations, identifies that an event might or might not happen. Discusses collected data for an investigation and represents it in meaningful ways. | <p>CD 1.1 Students use everyday language when commenting on aspects of chance in practical activities and familiar events.</p> <p>CD 1.2 Students collect and classify data to investigate particular situations and create and interpret simple displays.</p> | <p>CD 2.1 Students identify and classify familiar events according to the likelihood of occurrence.</p> <p>CD 2.2 Students collect and organise data, create and interpret a variety of displays to investigate their own and others' questions, and identify elements of the displays.</p> |

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