## 7.2 Content for Early Stage 1

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# **Mathematics** • Early Stage 1

**Number and Algebra**
Whole Numbers

**Outcomes**
A student:

- describes mathematical situations using everyday language, actions, materials and informal recordings MAe-1WM
- uses objects, actions, technology and/or trial and error to explore mathematical problems MAe-2WM
- uses concrete materials and/or pictorial representations to support conclusions MAe-3WM
- counts to 30, and orders, reads and represents numbers in the range 0 to 20 MAe-4NA

Students:

Establish understanding of the language and processes of counting by naming numbers in sequences, initially to and from 20, moving from any starting point (ACMNA001)

- count forwards to 30 from a given number
    - count rhythmically to identify number patterns, eg stressing every second number (Communicating)
- count backwards from a given number, in the range 0 to 20
- identify the number before and after a given number
- read and use the ordinal names to at least 'tenth' [L]

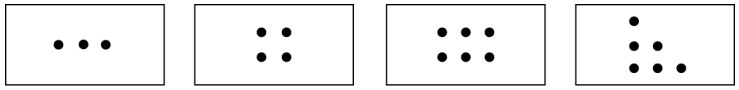
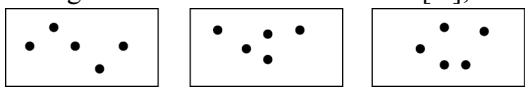
Connect number names, numerals and quantities, including zero, initially up to 10 and then beyond (ACMNA002)

- read numbers to at least 20, including zero, and represent these using objects, pictures, words and numerals (such as fingers) [L]
    - recognise numbers in a variety of contexts, eg classroom charts, cash register, computer keyboard and telephone (Communicating) [ICT]
    - communicate use of number through everyday language, actions, materials and informal recordings (Communicating) [L, N]
    - estimate the number of objects in a group of up to 20 objects, and count to check (Reasoning)
- use the terms 'tens' and 'ones' to demonstrate partitioning and an understanding of place value [L]
- use 5 as a reference in forming numbers from 6 to 10, eg 'Six is one more than five.'
- use 10 as a reference in forming numbers from 11 to 20, eg 'Thirteen is one group of ten and three ones.'

# **Mathematics** • Early Stage 1

## Number and Algebra
Whole Numbers

Subitise small collections of objects (ACMNA003)

- recognise a pattern of objects or dots instantly,
  eg 
  3 4 6 6
  - recognise standard dice and domino dot patterns (Communicating) [N],
    eg 
    dice dot patterns domino dot patterns
- instantly recognise (subitise) different arrangements for the same number [N],
  eg different representations of five: 
  - recognise that the way objects are arranged affects how easy it is to subitise (Reasoning) [CCT]

Compare, order and make correspondences between collections, initially to 20, and explain reasoning (ACMNA289)

- count with one-to-one correspondence
- make correspondences between collections, eg 'I have four counters, you have seven counters. So you have more counters than me.'
- compare and order numbers or groups of objects
  - apply counting strategies to solve simple everyday problems and justify answers (Problem Solving, Reasoning) [N, CCT]

Use the language of money

- use the language of money in everyday contexts, eg coins, notes, cents and dollars [L, N, WE]
- recognise that there are different coins and notes in our monetary system [WE]
  - exchange money for goods in a play situation (Problem Solving) [N, PSC, WE]

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**Background information**

At this stage, the expectation is that students count to 30. Many classes have between 20 and 30 students and it is a common activity to count the number of students. Students will also encounter numbers up to 31 in calendars.

Counting is an important component of number and the early learning of operations. There is a distinction between counting by rote and counting with understanding. Regularly counting forwards and backwards from a given number will familiarise students with the sequence. Counting with understanding involves counting with one-to-one correspondence and developing a sense of the size of numbers, their order and relationships. Representing numbers in a variety of ways is essential for developing number sense.

Subitising involves immediately recognising the number of objects in a small collection without having to count the objects. The word subitise is derived from the Latin 'to arrive suddenly'.

# **Mathematics** • Early Stage 1

**Number and Algebra**
Addition and Subtraction

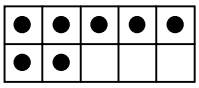
**Outcomes**
A student:

- describes mathematical situations using everyday language, actions, materials and informal recordings MAe-1WM
- uses objects, actions, technology and/or trial and error to explore mathematical problems MAe-2WM
- uses concrete materials and/or pictorial representations to support conclusions MAe-3WM
- combines, separates and compares collections of objects, describes using everyday language and records using informal methods MAe-5NA

Students:

Represent practical situations to model addition and sharing (ACMNA004)

- combine two or more groups of objects to model addition
- model subtraction by separating and taking away part of a group of objects
- use concrete materials or fingers to model and solve simple addition and subtraction problems
- compare two groups of objects to determine 'how many more'
- use visual representations of numbers to assist with addition and subtraction, eg ten frames
- create combinations for numbers to at least 10,
  eg 'How many more make ten?'



- describe the action of combining, separating or comparing using everyday language,
  eg makes, joins, combines with, and, get, take away, how many more, all together [L]
  - explain or demonstrate how an answer was obtained (Communicating, Reasoning) [N]
  - apply strategies that have been demonstrated by other students (Reasoning)
  - investigate different methods of adding and subtracting used in different cultures,
    eg Aboriginal and Torres Strait Islander methods involving spatial patterns and reasoning or Asian counting tools such as the abacus (Communicating, Problem Solving) [N, AHC, A]
- count forwards by ones to add and backwards by ones to subtract
- record addition and subtraction informally using drawings, words and numerals [L]

# **Mathematics** • Early Stage 1

## Number and Algebra
Addition and Subtraction

### Background information

Addition and Subtraction should move from counting and combining perceptual objects, to using numbers as replacements for completed counts with mental strategies, to recordings that support mental strategies (such as jump or split, partitioning or compensation).

At this stage, addition and subtraction problems should be related to real-life experiences that involve the manipulation of objects.

Subtraction typically covers two different situations: 'taking away' from a group and 'comparing' two groups (ie finding 'how many more'). Students should be confident with taking away from a group before being introduced to 'comparing' two groups. Students should be able to compare groups of objects by using one-to-one correspondence before being asked to find out how many more or how many less there are in a group.

Modelling, drawing and writing mathematical problems should be encouraged at this stage. Formal writing of number sentences, including the use of the symbols +, − and =, is introduced at the next stage.

Addition and Subtraction should be taught in conjunction with each other as the foundation for conceptual understanding of their inverse relationship.

### Language

Students should be able to communicate using the following language: count forwards, count backwards, combined with, join, all together, take away, how many more, makes.

Some students may need assistance when two tenses are used in the one problem, eg 'I had six beans and took away four. How many do I have?'

The word 'difference' has a specific meaning in this context, referring to the numeric value of the group. In everyday language it can refer to any attribute.

# **Mathematics** • Early Stage 1

**Number and Algebra**
Multiplication and Division

**Outcomes**
A student:

- describes mathematical situations using everyday language, actions, materials and informal recordings MAe-1WM
- uses objects, actions, technology and/or trial and error to explore mathematical problems MAe-2WM
- groups, shares and counts collections of objects, describes using everyday language and records using informal methods MAe-6NA

Students:

Investigate and model equal groups

- use the term 'group' to describe a collection of objects [L]
- use the term 'sharing' to describe the distribution of a collection of objects [L]
- model equal groups
- recognise unequal groups
- group and share concrete materials to solve problems [CCT]
    - explain or demonstrate how an answer was obtained (Communicating, Reasoning) [N]

Record grouping and sharing using informal methods

- label the number of objects in a group
- record grouping and sharing informally using pictures, words and numerals [L]

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**Background information**

All activities should involve students manipulating concrete materials. The emphasis is on modelling groups of the same size and describing them. Students need to acquire the concept that fair sharing means all shares are equal. After students have shared objects equally, the process can be reversed to begin to develop the link between division and multiplication. This can be done by students first sharing a group of objects and then putting back together all of the shared objects to form one collection.

There are two forms of division:

*Sharing (partitive)* – How many in each group?
eg 'If twelve marbles are shared between three students, how many does each get?'

*Grouping (quotitive)* – How many groups are there?
eg 'If I have twelve marbles and each child is to get four, how many children will get marbles?'

While the total number of objects that have been shared or grouped can be found incidentally, strategies for doing this are addressed in Stage 1.

Multiplication and Division should be taught in conjunction with each other as the foundation for conceptual understanding of their inverse relationships.

# **Mathematics** • Early Stage 1

**Number and Algebra**
Multiplication and Division

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**Language**

Students should be able to communicate using the following language: groups of, all together, share, how many, the same, not the same, equal, not equal, more, less.

*Sharing* – relates to distributing items one at a time into a set number of groups, eg the student has a number of pop sticks and three cups and shares out the pop sticks into the cups one at a time.

*Grouping* – relates to distributing the same number of items into an unknown number of groups, eg the student has 12 pop sticks and wants to make groups of four, so places four pop sticks down, then another four and so on…

# **Mathematics** • Early Stage 1

**Number and Algebra**
Fractions and Decimals

**Outcomes**
A student:

- describes mathematical situations using everyday language, actions, materials and informal recordings MAe-1WM
- uses concrete materials and/or pictorial representations to support conclusions MAe-3WM
- describes two equal parts as halves MAe-7NA

Students:

Establish the concept of one-half

- share an object by dividing it into two equal parts, eg cutting a piece of ribbon into halves
  - describe how to make equal parts (Communicating)
- recognise that halves are two equal parts
  - explain the reason for dividing an object in a particular way (Communicating, Reasoning) [N]
- recognise when two parts are not halves of the one whole
- use the term 'half' accurately in everyday situations [L, N]
- record fractions of objects using drawings [N]

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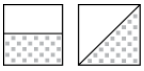
**Background information**

The focus on halves at this stage is only a guide. Some students will be able to describe other fractions from everyday contexts. At this stage, the emphasis is on dividing one whole object into two equal parts. Fairness in making equal parts is the focus.

Halves can be different shapes: 

Halves of different objects can be different sizes, eg half of a sheet of art paper is larger than half of a serviette. Fractions refer to the relationship of the equal parts to the whole unit.

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**Language**

Students should be able to communicate using the following language: whole, one-half, half, part, equal parts, two equal parts.

In everyday use, the term 'half' is sometimes used to mean one of two parts and not necessarily two equal parts, eg 'I'll have the biggest half.' It is important to model and reinforce the language 'two equal parts' when describing half.

# **Mathematics** • Early Stage 1

**Number and Algebra**
Patterns and Algebra

**Outcomes**
A student:

- describes mathematical situations using everyday language, actions, materials and informal recordings MAe-1WM
- uses objects, actions, technology and/or trial and error to explore mathematical problems MAe-2WM
- uses concrete materials and/or pictorial representations to support conclusions MAe-3WM
- recognises, describes and continues repeating patterns and number patterns that increase or decrease MAe-8NA

Students:

Sort and classify familiar objects and explain the basis for these classifications. Copy, continue and create patterns with objects and drawings (ACMNA005)

- sort and classify a group of familiar objects into smaller groups [L]
- recognise that a group of objects can be sorted and classified in different ways
  - explain the basis for their classification of objects (Communicating, Reasoning) [L, N]
- recognise, copy and continue repeating patterns using sounds and/or actions
- recognise, copy, continue and create repeating patterns using shapes, objects or pictures,
  eg ♦, □, ♦, □, ♦, □, ♦, □, …
  - create or continue a repeating pattern using simple computer graphics (Problem Solving) [ICT]
  - recognise when an error occurs in a pattern and explain what is wrong (Reasoning) [CCT]
- describe a repeating pattern made from shapes by referring to distinguishing features,
  eg 'I have made my pattern from squares. The colours repeat. They go red, blue, red, blue, …' [L]
- describe a repeating pattern in terms of a 'number' pattern, [L]
  eg ♦, O, ♦, O, ♦, O, … is a 'two' pattern
  Δ, ∇, O, Δ, ∇, O, … is a 'three' pattern
  B, B, X, B, B, X, … is a 'three' pattern
  - make connections between counting and repeating patterns (Communicating, Reasoning) [N]
- recognise, copy and continue simple number patterns that increase or decrease,
  eg 1, 2, 3, 4, … or 2, 4, 6, 8, …
- use the term 'is the same as' to express equality of groups [L]
  - determine whether two groups have the same number of objects and describe the equality, eg 'The number of objects here is the same as the number there'(Communicating, Reasoning) [L]

# **Mathematics** • Early Stage 1

**Number and Algebra**
Patterns and Algebra

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**Background information**

Early number learning (including additive and multiplicative thinking) is important to the development of algebraic thinking in later stages.

At this stage, repeating patterns can be created using sounds, actions, shapes, objects, stamps, pictures and other materials. Describing and labelling these patterns using numbers is important.

Repeating patterns are described using numbers that indicate the number of elements that repeat, eg 'A, B, C, A, B, C, …' has three elements that repeat and is referred to as a 'three' pattern.

At this stage, forming groups of objects that have the same number of elements helps to develop the concept of equality.

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**Language**

Students should be able to communicate using the following language: pattern, is the same as, group.

To represent equality of groups, the terms 'is the same as' or 'is equal to' should be used. At this stage, the term 'is the same as' is emphasised as more appropriate for students' level of conceptual understanding. Use of the word 'equals' may suggest that the right side of an equation contains 'the answer', rather than a value equivalent to that on the left.

# **Mathematics** • Early Stage 1

## Measurement and Geometry

### Length

**Outcomes**

A student:

- describes mathematical situations using everyday language, actions, materials and informal recordings MAe-1WM
- uses concrete materials and/or pictorial representations to support conclusions MAe-3WM
- describes and compares lengths and distances using everyday language MAe-9MG

Students:

Use direct and indirect comparisons to decide which is longer, heavier or holds more, and explain reasoning in everyday language (ACMMG006)

- identify length as the measure of an object from end to end
- make and sort long and short constructions from concrete materials
- use everyday language to describe length, eg long, short, high, tall, low [L]
- use comparative language to describe length, eg longer, higher, taller than, shorter than, lower than, the same as [L]
  - identify an object that is longer or shorter than another, eg ‘Find an object longer than this pencil’ (Communicating)
  - predict whether an object will be longer or shorter than another object and explain the reasons for this prediction (Communicating, Reasoning)
- describe distance using terms such as near, far, nearer, further, closer [L]
- conduct direct comparison of lengths by placing objects side-by-side and aligning the ends
  - explain why the length of a piece of string remains unchanged whether placed in a straight line or a curve (Communicating, Reasoning) [CCT]
- conduct indirect comparison by copying a length, eg using the same strip of paper to compare lengths
- record length comparisons informally by drawing, tracing, or cutting and pasting

# **Mathematics** • Early Stage 1

## Measurement and Geometry

Length

### Background information

At this stage, students develop an awareness of what length is and some of the language used to describe length.

Students develop an awareness of the attribute of length as comparisons of lengths are made.

This stage focuses on one-to-one comparisons and the importance of accurately aligning one end of the objects to be compared.

When students are asked to compare the lengths of two objects of equal length and can consistently say that the objects are equal in length though their relative positions have been altered, they are conserving length.

This is an important concept and develops over time.

When students can compare two lengths they should then be given the opportunity to order three or more lengths. This process requires students to understand that if A is longer than B and B is longer than C, then A is longer than C.

Distance and length are two distinct concepts. Activities should focus on concepts of length and distance.

### Language

Students should be able to communicate using the following language: long, longer than, short, shorter than, high, higher than, tall, taller than, low, lower than, the same as, near, nearer, far, further, closer.

Students may need to be given practice with the language of length in a variety of contexts. Students may know the word ‘fat’ but not the word ‘thick’. Students may be using the general terms ‘big’ or ‘long’ for attributes such as height, width, depth, length and thickness.

Young students often confuse concepts such as big, tall, long and high. It is important to engage students in activities that help them differentiate between these concepts.

# **Mathematics** • Early Stage 1

**Measurement and Geometry**

Area

**Outcomes**

A student:

- describes mathematical situations using everyday language, actions, materials and informal recordings MAe-1WM
- uses concrete materials and/or pictorial representations to support conclusions MAe-3WM
- describes and compares areas using everyday language MAe-10MG

Students:

Use direct comparison to decide which shape has larger area and explain reasoning in everyday language

- identify the attribute of area as the measure of the amount of surface
- cover surfaces completely with smaller shapes
- make closed shapes and describe the area of the shape
  - use computer software to draw a closed shape, colouring in the area (Communicating) [ICT]
- use everyday language to describe area, eg surface, inside, outside [L]
- use comparative language to describe area, eg bigger than, smaller than, the same as [L]
  - ask questions about area in everyday situations, eg 'Which book cover is bigger?' (Communicating) [L, CCT]
  - explain why the area of one surface is bigger or smaller than another (Communicating, Reasoning) [CCT]
- estimate the larger of two areas and compare by direct comparison, eg superimposing or superpositioning
  - demonstrate how one area is bigger than another by copying the size of one of the areas and comparing directly (Reasoning) [CCT]
- record area comparisons informally by drawing, tracing or cutting and pasting

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**Background information**

At this stage, students develop an awareness of what area is and some of the language used to describe area. Area is the measure of the amount of surface. Surface refers to the outer faces or outside of an object. A surface may be flat or curved.

Students develop an awareness of the attribute of area through covering activities, through colouring in and as comparisons of area are made.

Students should be given opportunities to compare two similar shapes of different size where one fits inside the boundary of the other, two different-shaped objects where one can be placed on top of the other and two shapes where one shape could be cut up and pasted onto the other.

When students can compare two areas they should then be given the opportunity to order three or more areas. This process requires students to understand that if A is larger than B and B is larger than C, then A is larger than C.

# **Mathematics** • Early Stage 1

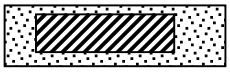
**Measurement and Geometry**

Area

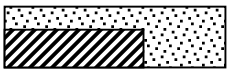
**Language**

Students should be able to communicate using the following language: surface, shape, closed shape, inside, outside, bigger than, smaller than, compare.

*Superimposing* – the comparison of area by placing one area on top of another.



*Superpositioning* – the comparison of areas by aligning the edges (or corner) of one area when placed on top of another.



# **Mathematics** • Early Stage 1

**Measurement and Geometry**

Volume and Capacity

**Outcomes**

A student:

- describes mathematical situations using everyday language, actions, materials and informal recordings MAe-1WM
- describes and compares the capacities of containers and the volumes of objects or substances using everyday language MAe-11MG

Students:

Use direct and indirect comparisons to decide which is longer, heavier or holds more, and explain reasoning in everyday language (ACMMG006)

- identify the attribute of capacity as the amount of liquid a container can hold
- fill and empty containers using materials such as water and sand
- use the terms ‘full’, ‘empty’ and ‘about half-full’ [L]
  - recognise when a container, such as a watering can, is nearly full, half-full or empty (Reasoning) [SE]
- compare the capacities of two containers directly by filling one and pouring into the other
  - predict which container has the greater capacity, eg plant pots (Reasoning) [CCT, SE]
  - use drawings, numerals and words to record capacity comparisons informally (Communicating) [L]
- identify the attribute of volume as the amount of space an object or substance occupies
- use comparative language to describe volume, eg has more, has less, will hold more, will hold less [L]
- stack and pack blocks into defined spaces, eg boxes
  - identify which three-dimensional objects pack and stack easily (Reasoning)
- compare the volumes of two containers directly by packing materials from one container into the other
- compare the volumes of two piles of material by filling two identical containers, eg ‘This pile of rice has a larger volume as it takes up more space in the container’
- compare the volumes of two objects by observing the amount of space each occupies, eg a garbage truck takes up more space than a car
- use drawings, numerals and words to record volume comparisons informally [L]

# **Mathematics** • Early Stage 1

**Measurement and Geometry**

Volume and Capacity

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**Background information**

The order in which capacity and volume appear in the content is not indicative of the order in which they should be taught.

Volume and capacity relate to the measurement of three-dimensional space, in the same way that area relates to the measurement of two-dimensional space.

The attribute of volume is the amount of space occupied by an object or substance. Capacity is only used in relation to containers and generally refers to liquid measurement. It is not necessary to refer to these definitions with students (capacity is not taught as a separate concept to volume until Stage 4).

At this stage, comparisons are made directly using methods such as pouring or packing the contents of one container into another. Early experiences often lead students to the conclusion that taller containers 'hold more'. To develop beyond this, students need to directly compare containers that are: short and hold more; tall and hold less, short and hold less; tall and hold more; short and hold the same as a tall container, etc.

Many opportunities to emphasise volume (stacking, packing and making models) and capacity (pouring and filling) concepts occur when students pack toys or objects into cupboards, or in play situations, eg sand pit, water play.

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**Language**

Students should be able to communicate using the following language: full, nearly full, empty, nearly empty, half-full, nearly half-full, compare, capacity, container, liquid, volume, hold, holds more than, holds less than.

The word 'volume' has different meanings in everyday contexts, eg volume in relation to sound levels, a volume of a book.

Students need meaningful practice in using the general word 'container' to include bottles, jars, tubs and other everyday containers.

The term 'big' is often used by students to describe a variety of attributes. Depending on the context, it could mean long, tall, heavy, etc. It is important to model more precise language with students to describe volume or capacity.

# **Mathematics** • Early Stage 1

## Measurement and Geometry

Mass

**Outcomes**

A student:

- describes mathematical situations using everyday language, actions, materials and informal recordings MAe-1WM
- uses concrete materials and/or pictorial representations to support conclusions MAe-3WM
- describes and compares masses of objects using everyday language MAe-12MG

Students:

Use direct and indirect comparisons to decide which is longer, heavier or holds more, and explain reasoning in everyday language (ACMMG006)

- identify the attribute of mass as the amount of matter in an object
- describe objects in terms of their mass, eg heavy, light, hard to push, hard to pull [L]
- use comparative language to describe mass, eg heavier, lighter, heaviest, lightest [L]
  - predict which object would be heavier than, lighter than or have about the same mass as another object (Reasoning)
  - give reasons why one object would be heavier than another (Communicating, Reasoning) [CCT]
- compare and describe two masses, such as by pushing or pulling
- compare two masses directly by hefting, eg 'This toy feels heavier than that one'
  - investigate the use of hefting in practical situations, eg the use by Aboriginal people to determine the sex of ducks by hefting duck eggs (Problem Solving) [AHC]
- use drawings and words to record mass comparisons informally [L]

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**Background information**

At this stage, students develop an awareness of the attribute of mass and some of the language used to describe mass. Opportunities to explore mass concepts and understand the action of an equal arm balance occur in play situations, such as a seesaw in a children's playground.

At this stage students should be comparing only two objects that are quite different in mass. Early experiences often lead students to the conclusion that large things are heavier than small things and that if two things are the same size and shape then they will have the same mass. To develop beyond this, students need to have experiences with objects that are light and large, heavy and large, light and small, heavy and small, large but lighter than a smaller object.

Aboriginal communities were traditionally able to determine the sex of ducks by hefting duck eggs, as well as by considering other factors such as size, shape and temperature. Female eggs are heavier.

# **Mathematics** • Early Stage 1

## Measurement and Geometry

Mass

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**Language**

Students should be able to communicate using the following language: mass, matter, heavy, heavier, heaviest, heaver than, light, lighter, lightest, lighter than, about the same, push, pull.

As the terms ‘weigh’ and ‘weight’ are common in everyday usage, they can be accepted in student language should they arise. Weight is a force which changes with gravity, while mass remains constant.

‘Hefting’ is testing the weight of an object by lifting and balancing it. Where possible students can compare the weights of two objects by using their bodies to balance each object, eg holding one object in each hand or balancing an object on each arm or leg.

# **Mathematics** • Early Stage 1

**Measurement and Geometry**

Time

**Outcomes**

A student:

- describes mathematical situations using everyday language, actions, materials and informal recordings MAe-1WM
- sequences events, using everyday language to describe the durations of activities, and reads hour time on clocks MAe-13MG

Students:

Compare and order the duration of events using the everyday language of time (ACMMG007)

- use and understand terms such as daytime, night-time, yesterday, today, tomorrow, before, after, next, morning and afternoon [L]
- sequence events in time
- compare the duration of two events using everyday language, eg 'It takes me longer to eat my lunch than it does to clean my teeth' [L]
    - describe events that take 'a long time' and events that take 'a short time' (Communicating) [L]

Connect days of the week to familiar events and actions (ACMMG008)

- recall that there are seven days in a week
- name and order the days of the week [L]
- classify weekdays and weekend days
- relate events to a particular day or time of day, eg 'Assembly is on Tuesday', 'We come to school in the morning' [N]
    - identify events that occur every day, eg 'We have news every day' (Communicating) [N]

Tell time on the hour on digital and analog clocks

- read hour time on a digital and an analog clock
- use the term 'o'clock' [L]
- describe the position of the hands on an analog clock when reading hour time [L]

# **Mathematics** • Early Stage 1

**Measurement and Geometry**

Time

**Background information**

The focus on hour time at this stage is only a guide. Some students will be able to read other times.

*Duration*

At this stage, students begin to develop an understanding of the duration of time and learn to identify moments in time. An understanding of duration is introduced through ideas such as 'before', 'after', 'how long' and 'how soon'. It should be noted that time spans at this stage are personal judgements. Moments in time include ideas such as 'daytime', 'today', days of the week and seasons. Sunday is commonly the first day of the calendar week. A week, however, may also mean a period of seven days beginning on any day, eg 'One week starting from Thursday'.

Teachers should be aware of the multicultural nature of our society and of the significant times in the year for different cultural groups. These could include religious festival days, national days, sporting events and anniversaries.

*Telling Time*

At this stage, 'telling time' focuses on reading the hour on both analog and digital clocks.

**Language**

Students should be able to communicate using the following language: daytime, night-time, yesterday, today, tomorrow, before, after, next, how long, how soon, a long time, a short time, week, weekday, weekend day, time, morning, afternoon, hour, o'clock, clock.

The words 'long' and 'short' can be confusing to students who have only experienced these words in terms of length measurement. Students will need experience with these words in both length and time contexts.

References to time are often used inaccurately in everyday language, eg 'I'll be a second', 'back in a minute'.

# **Mathematics** • Early Stage 1

## Measurement and Geometry

Three-Dimensional Space

**Outcomes**

A student:

- describes mathematical situations using everyday language, actions, materials and informal recordings MAe-1WM
- uses concrete materials and/or pictorial representations to support conclusions MAe-3WM
- manipulates, sorts and represents three-dimensional objects and describes them using everyday language MAe-14MG

Students:

Sort, describe and name familiar two-dimensional shapes and three-dimensional objects in the environment

- describe the features of common three-dimensional objects usingeveryday language, such as local landmarks including Aboriginal landmarks, eg flat, round, curved [L, AHC]
  - describe the difference between three-dimensional objects and two-dimensional shapes using everyday language (Communicating) [L, N, CCT]
- sort three-dimensional objects and explain the attributes used to sort them, eg colour, size, shape, function
  - recognise and explain how a group of objects has been sorted, eg ‘These objects are all pointy’ (Communicating, Reasoning)
- recognise and use informal names for three-dimensional objects, eg box, ball [L]
- manipulate and describe a variety of objects found in the environment
  - manipulate and describe an object hidden from view using everyday language, eg describe an object hidden in a ‘mystery bag’ (Communicating) [L]
- predict and describe the movement of objects, eg ‘This will roll because it is round’ [CCT]
  - use a plank or board to find out which objects roll and which objects slide (Problem Solving) [CCT]
- make models using a variety of three-dimensional objects and describe the models, eg ‘I made a model of a person using a ball and some blocks’
  - predict the building and stacking capabilities of various three-dimensional objects (Reasoning) [CCT]

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**Background information**

At this stage, the emphasis is on students handling, describing, sorting and representing the many objects around them. It is important that students are encouraged to use their own language to discuss and describe these objects.

Manipulation of a variety of real objects and shapes is crucial to the development of appropriate levels of imagery, language and representation.

Local landmarks include buildings, rivers, rock formations and bridges, as well as Aboriginal landmarks. Aboriginal landmarks may include contemporary landmarks and local points of interest. Local Aboriginal communities and education consultants can provide examples.

# **Mathematics** • Early Stage 1

**Measurement and Geometry**

Three-Dimensional Space

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**Language**

Students should be able to communicate using the following language: flat, round, curved, sort, colour, size, shape, pointy, roll, slide, model, block, stack, object.

Teachers can model mathematical language while still accepting and encouraging students' informal terms.

Shape: the term 'shape' refers to a two-dimensional figure

Object: the term 'object' refers to a three-dimensional figure

# **Mathematics** • Early Stage 1

**Measurement and Geometry**

Two-Dimensional Space

**Outcomes**

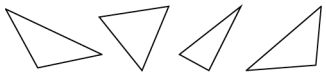
A student:

- describes mathematical situations using everyday language, actions, materials and informal recordings MAe-1WM
- manipulates, sorts and describes representations of two-dimensional shapes using everyday language MAe-15MG

Students:

Sort, describe and name familiar two-dimensional shapes and three-dimensional objects in the environment (ACMMG009)

- identify and draw straight and curved lines
- compare and describe closed shapes and open lines [L]
- sort two-dimensional shapes according to features including size and shape [N]
  - recognise and explain how a group of two-dimensional shapes have been sorted (Communicating, Reasoning) [N, CCT]
- identify, represent and name circles, triangles, squares and rectangles presented in different orientations [L],

  eg 
  - identify circles, squares, triangles and rectangles in pictures and the environment, including in Aboriginal art (Problem Solving) [CCT, AHC]
  - ask and respond to questions that help identify a particular shape (Communicating, Problem Solving) [L, N, CCT]

Manipulate and make familiar two-dimensional shapes

- manipulate circles, squares, triangles and rectangles, and describe features using everyday language [L]
  - make pictures and designs using a selection of shapes, eg make a house from a square and a triangle (Communicating)
  - turn two-dimensional shapes to fit into or match a given space (Problem Solving)
- make representations of two-dimensional shapes using a variety of materials, including paint, paper, body movements and computer drawing tools [ICT]
- draw a two-dimensional shape by tracing around one face of a three-dimensional object

# **Mathematics** • Early Stage 1

## Measurement and Geometry

Two-Dimensional Space

### Background information

Experiences with shapes, even from this stage, should not be limited. It is important that students experience shapes that are represented in a variety of ways, eg 'tall skinny' triangles, 'short fat' triangles, right-angled triangles presented in different orientations and different sizes, and represented using a variety of materials, eg paint, images on the computer, string. Manipulation of a variety of real objects and shapes is crucial to the development of appropriate levels of language and representation.

At this stage, teachers should be careful to present both regular and irregular shapes (regular shapes have all sides and angles equal) to students. However, it is not expected that students use the terms 'regular' or 'irregular' themselves.

Students should be given time to explore materials and represent shapes by tearing, painting, drawing, writing, or cutting and pasting.

### Language

Students should be able to communicate using the following language: sort, shape, straight line, curved line, closed shape, size, sides, circle, square, rectangle, triangle, turn, fit.

Shape: the term 'shape' refers to a two-dimensional figure

Object: the term 'object' refers to a three-dimensional figure

# **Mathematics** • Early Stage 1

## Measurement and Geometry

### Position

**Outcomes**

A student:

- describes mathematical situations using everyday language, actions, materials and informal recordings MAe-1WM
- describes position and gives and follows simple directions using everyday language MAe-16MG

Students:

Describe position and movement (ACMMG010)

- give and follow simple directions to position an object or themselves, eg 'Put the blue teddy in the circle' [L]
  - follow directions to a point or place including in mazes and games (Reasoning) [L]
  - direct simple computer-controlled toys and equipment to follow a path (Communicating) [ICT]
- use everyday language to describe the position of an object in relation to themselves and/or another object using words such as 'between', 'next to', 'behind' or 'inside', eg 'The table is behind me', 'The book is inside the box' [L]
- use the terms 'left' and 'right' to describe the position of objects in relation to themselves, eg 'The tree is on my right' [L]
  - use the terms 'left' and 'right' when referring to familiar tasks, eg 'I hold my pencil in my right hand' (Communicating) [L]
  - participate in movement games involving turning and direction (Reasoning) [EU]

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**Background information**

There are two main ideas for students at this stage: following an instruction to position an object or themselves, and describing the relative position of an object or themselves. Many students may be able to describe the position of an object in relation to themselves, but not in relation to another object.

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**Language**

Students should be able to communicate using the following language: direction, give, follow, object, point, place, path, between, next to, behind, in front of, inside, outside, left, right, turn.

# **Mathematics** • Early Stage 1

## Statistics and Probability

Data

**Outcomes**

A student:

- describes mathematical situations using everyday language, actions, materials and informal recordings MAe–1WM
- uses concrete materials and/or pictorial representations to support conclusions MAe–3WM
- represents data and interprets data displays made from objects and pictures MAe–17SP

Students:

Answer yes/no questions to collect information (ACMSP011)

- collect information about themselves and their environment, including by answering yes/no questions [SE]
    - pose and answer questions about situations using everyday language, eg 'Do you have any brothers or sisters?', 'What is the favourite colour of most people in our class?' (Communicating) [L]

Represent and use simple data displays

- group objects according to characteristics, eg sort blocks/counters according to colour
- arrange objects in rows to aid comparisons eg organise blocks/counters/lunch boxes into rows according to colour
    - compare groups by counting (Reasoning)
    - give reasons why a row of three objects may look bigger than a row of five objects (Communicating, Reasoning) [N, CCT]
- organise actual objects or pictures of the objects in a data display [L]
- interpret information presented in a data display to answer questions eg 'Most children in our class have brown eyes' [L, N, CCT]
    - interpret and discuss classroom data displays, eg weather charts, behaviour charts (Communicating)
    - explain interpretations of information presented in data displays, eg 'More children like dogs because there are more dog pictures than cat pictures.' (Communicating, Reasoning) [N]

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**Background information**

At this Stage, students collect information about themselves and their environment with teacher assistance. Students use actual objects or pictures of the objects as data. They organise and present the data in groups or in rows. The notion of representing an object with a different object is abstract and often difficult for students. It is therefore not introduced until the next stage.

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**Language**

Students should be able to communicate using the following language: information, display, picture, sort, groups.