

7.2 Content for Early Stage 1



Consult

Mathematics • Early Stage 1

Number and Algebra

Whole Numbers

Outcomes

A student:

- ES 1.1 describes mathematical situations using everyday and mathematical language, concrete materials, imagery and informal recordings
- ES 1.2 explores problems using appropriate representations, actions, technology and/or trial and error
- ES 1.3 supports conclusions using appropriate reasoning
- ES 1.4 counts and represents numbers, combines, separates and groups collections of objects

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

- count forwards to 30 from a given number [N]
 - count rhythmically to identify number patterns, eg stressing every second number (Fluency, Understanding) [N]
 - pose problems involving the counting of numbers to at least 20, eg ‘How many pencils are in the tin?’ [N] [CCT]
- count backwards from a given number, in the range 0 to 20 [N]
- identify the number before and after a given number [N]
- 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

- read and write numbers to at least 20, including zero [L]
 - recognise numbers in a variety of contexts, eg classroom charts, a calculator, cash register, computer keyboard and telephone (Understanding)
 - communicate use of number through everyday language, actions, materials and informal recordings (Understanding) [L]
- represent numbers to at least 20 using numerals, words, symbols and objects (such as fingers) [N]
 - estimate the number of objects in a group of up to 20 objects, and count to check (Fluency, Problem Solving) [N]
- use 5 as a reference in forming numbers from 6 to 10, eg ‘Six is one more than five.’ [N]
- use 10 as a reference in forming numbers from 11 to 20, eg ‘Thirteen is three more than ten.’ [N]

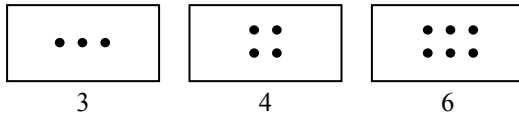
Mathematics • Early Stage 1

Number and Algebra

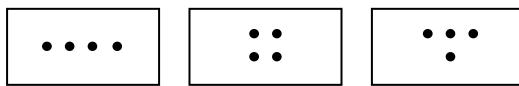
Whole Numbers

Subitise small collections of objects

- recognise a dot pattern instantly (subitising) for numbers up to seven [N]



- make and recognise different arrangements for the same number [N], eg different representations of four:



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

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

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. The teen numbers are often the most difficult for students. The oral language pattern of teen numbers is the reverse of the usual pattern of ‘tens first and then ones’.

Consequently some teachers prefer to teach the teen numbers after first teaching the numbers 0 to 10 and 20 to 30.

Subitising involves immediately recognising the number of objects in a small collection without having to count the objects.

Language:

Students may use incorrect terms since they are frequently used in everyday language, eg ‘How much did you get?’ rather than ‘How many did you get?’ when referring to a score in a game.

Mathematics • Early Stage 1

Number and Algebra

Addition and Subtraction

Outcomes

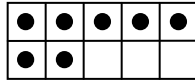
A student:

- ES 1.1 describes mathematical situations using everyday and mathematical language, concrete materials, imagery and informal recordings
- ES 1.3 supports conclusions using appropriate reasoning
- ES 1.4 counts and represents numbers, combines, separates and groups collections of objects

Students:

Represent practical situations to model addition and sharing

- combine two or more groups of objects to model addition [N]
- model subtraction by separating and taking away part of a group of objects [N]
- use concrete materials or fingers to model and solve simple addition and subtraction problems [N] [CCT]
- compare two groups of objects to determine ‘how many more’ [N]
- use visualisation of numbers to assist with addition and subtraction, eg ten frames [N] [CCT]
- create combinations for numbers to at least 10,



eg ‘How many more make ten?’ [N]

- describe the action of combining, separating or comparing using everyday language, eg makes, join, and, get, take away, how many more, altogether [L] [N]
 - explain or demonstrate how an answer was obtained (Understanding) [N]
 - apply strategies that have been demonstrated by other students (Fluency, Reasoning)
- count forwards by ones to add and backwards by ones to subtract [N]
- record addition and subtraction informally using drawings, numerals and words [L]

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, ‘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 is introduced at the next Stage.

Mathematics • Early Stage 1

Number and Algebra

Addition and Subtraction

Language:

Some students may need assistance when two tenses are used within 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. The word ‘left’ can be ambiguous, eg ‘There were five children in the room. Three went to lunch. How many left?’ Is the question asking how many children are remaining in the room or how many children went to lunch?

Mathematics • Early Stage 1

Number and Algebra

Multiplication and Division

Outcomes

A student:

- ES 1.1 describes mathematical situations using everyday and mathematical language, concrete materials, imagery and informal recordings
- ES 1.2 explores problems using appropriate representations, actions, technology and/or trial and error
- ES 1.4 counts and represents numbers, combines, separates and groups collections of objects

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 or equal rows [N]
- recognise unequal groups or unequal rows [N]
- group and share using concrete materials to solve problems (Problem Solving) [N] [CCT]
 - explain or demonstrate how an answer was obtained (Understanding) [N]

Record grouping and sharing using informal methods

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

Background Information:

All activities should involve students manipulating concrete materials. The emphasis is on understanding the modelling of 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 shares to form one collection.

There are two forms of division:

Sharing – How many in each group?

eg ‘If twelve marbles are shared between three students, how many does each get?’

Grouping – How many groups are there?

eg ‘If I have twelve marbles and each child is to get four, how many children will get marbles?’

Finding the total number of objects that have been shared or grouped can be done incidentally; however, this is emphasised in Stage 1.

Mathematics • Early Stage 1

Number and Algebra

Multiplication and Division

Language:

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:

- ES 1.1 describes mathematical situations using everyday and mathematical language, concrete materials, imagery and informal recordings
- ES 1.3 supports conclusions using appropriate reasoning
- ES 1.5 describes two equal parts as halves

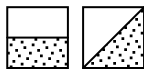
Students:

Establish understanding and the concept of one-half

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

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.

Language:

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:

- ES 1.1 describes mathematical situations using everyday and mathematical language, concrete materials, imagery and informal recordings
- ES 1.3 supports conclusions using appropriate reasoning
- ES 1.6 creates repeating geometric and number patterns that increase or decrease

Students:

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

- 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 [CCT]
 - explain the basis for their classification of objects (Reasoning) [L]

Repeating Patterns and Number Patterns

- recognise, copy and continue repeating patterns using sounds and/or actions [L]
- recognise, copy, continue and create repeating patterns using shapes, objects or pictures, eg $\blacklozenge, \square, \blacklozenge, \square, \blacklozenge, \square, \blacklozenge, \square, \dots$ [L]
 - create or continue a repeating pattern using simple computer graphics (Understanding) [L] [ICT]
 - recognise when an error occurs in a pattern and explain what is wrong (Reasoning) [L]
- 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] [N], eg $\blacklozenge, O, \blacklozenge, O, \blacklozenge, O, \dots$ is a ‘two’ pattern
 $\Delta, \nabla, O, \Delta, \nabla, O, \dots$ is a ‘three’ pattern
 B, B, X, B, B, X, \dots is a ‘three’ pattern
 - make connections between counting and repeating patterns (Understanding) [N]
- recognise, copy and continue simple number patterns that increase or decrease [N], eg 1, 2, 3, 4, ... or 20, 19, 18, 17, ... or 2, 4, 6, 8, ...
 - record patterns created by using the process of repeatedly adding the same number on a calculator (Understanding)

Number Relationships

- 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.’ (Understanding) [L] [N]

Mathematics • Early Stage 1

Number and Algebra

Patterns and Algebra

Background Information:

Early number learning is important to the development of algebraic thinking in later Stages.

Repeating Patterns and Number Patterns

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.

Number Relationships

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

Mathematics • Early Stage 1

Measurement and Geometry

Length

Outcomes

A student:

- ES 1.1 describes mathematical situations using everyday and mathematical language, concrete materials, imagery and informal recordings
- ES 1.3 supports conclusions using appropriate reasoning
- ES 1.7 describes and compares lengths, areas, volumes, capacities and masses

Students:

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

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

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 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:

- ES 1.1 describes mathematical situations using everyday and mathematical language, concrete materials, imagery and informal recordings
- ES 1.3 supports conclusions using appropriate reasoning
- ES 1.7 describes and compares lengths, areas, volumes, capacities and masses

Students:

Use direct and indirect comparisons to decide which 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 (Fluency) [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?’ (Understanding)
 - explain why the area of one surface is bigger or smaller than another (Reasoning) [CCT]
- estimate the larger of two areas by direct comparison, eg superimposing [N]
- use indirect comparison by copying the size of one of the objects [N] [CCT], eg superpositioning: aligning the edges of the two areas
- record area comparisons informally by drawing, tracing or cutting and pasting

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, 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:

Superimposing: is the comparison of area by placing one area on top of another. Superpositioning: is 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:

ES 1.1 describes mathematical situations using everyday and mathematical language, concrete materials, imagery and informal recordings

ES 1.7 describes and compares lengths, areas, volumes, capacities and masses

Students:

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

- identify the capacity of a container as the amount it 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 is nearly full, half-full or empty (Understanding) [N]
- compare the capacities of two containers directly by filling one and pouring into the other [N]
 - predict which container has the greater capacity (Reasoning) [CCT]
 - use drawings, numerals and words to record capacity comparisons informally (Fluency)
- identify the attribute of the volume of an object or substance as the amount of space it 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 [CCT], eg boxes
 - identify which three-dimensional objects pack and stack easily (Understanding) [N]
- compare the volume of two containers directly by packing materials from one container into the other [N]
- compare the volumes of two piles of material by filling two identical containers [N] [CCT], 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 directly observing the amount of space each occupies [N] [CCT], eg a garbage truck takes up more space than a car
- use drawings, numerals and words to record volume comparisons informally

Mathematics • Early Stage 1

Measurement and Geometry

Volume and Capacity

Background Information:

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.

Volume refers to the amount of space occupied by an object or substance and can be measured in cubic centimetres (cm^3) and/or cubic metres (m^3).

Capacity is a type of volume and refers to the amount a container can hold, usually measuring liquid, and can be measured in millilitres (mL) and/or litres (L). Capacity is only used in relation to containers.

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.

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.

Language:

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:

- ES 1.1 describes mathematical situations using everyday and mathematical language, concrete materials, imagery and informal recordings
- ES 1.3 supports conclusions using appropriate reasoning
- ES 1.7 describes and compares lengths, areas, volumes, capacities and masses

Students:

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

- 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) [N] [CCT]
 - give reasons why one object will be heavier than another (Reasoning) [CCT]
- compare and describe two masses by pushing or pulling
- compare two masses directly by hefting, eg ‘This toy feels heavier than that one.’
- use drawings and words to record mass comparisons informally [L]

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.

‘Hefting’ is the balancing of objects, holding one in each hand and deciding which is the heavier or lighter.

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 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.

When students realise that changing the shape of an object does not alter its mass they are said to *conserve* the property of mass.

Mathematics • Early Stage 1

Measurement and Geometry

Mass

Language:

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.

Mathematics • Early Stage 1

Measurement and Geometry

Time

Outcomes

A student:

ES 1.1 describes mathematical situations using everyday and mathematical language, concrete materials, imagery and informal recordings

ES 1.8 sequences events, describes duration of activities using everyday language and reads clocks on the hour

Students:

Compare and order the duration of events using the everyday language of time

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

Connect days of the week to familiar events and actions

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

Tell time on the hour on digital and analog clocks

- read hour time on a digital and an analog clock [N]
- 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 as well as 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 the first day of the calendar week. A week, however, may begin on any day, eg ‘The week beginning the fourth of May.’

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:

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 incorrectly used 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:

- ES 1.1 describes mathematical situations using everyday and mathematical language, concrete materials, imagery and informal recordings
- ES 1.3 supports conclusions using appropriate reasoning
- ES 1.9 represents three- and two-dimensional figures, describes position and follows simple directions

Students:

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

- describe the features of common three-dimensional objects using everyday language [L], eg flat, round, curved
 - describe the difference between three-dimensional objects and two-dimensional shapes using everyday language (Understanding) [L] [CCT]
- sort three-dimensional objects and explain the attribute used [N], eg colour, size, shape, function
 - recognise and explain how a group of objects has been sorted, eg ‘These objects are all pointy.’ (Understanding, Reasoning) [N]
- recognise and use informal names for three-dimensional objects, eg box, ball
- manipulate and describe a variety of objects found in the environment
 - manipulate and describe a hidden object using everyday language, eg describe an object hidden in a ‘mystery bag’ (Fluency, Understanding) [CCT]
- predict and describe the movement of objects [CCT], eg ‘This will roll because it is round.’
- 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.’

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.

Language:

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

Mathematics • Early Stage 1

Measurement and Geometry

Two-Dimensional Space

Outcomes

A student:

- ES 1.1 describes mathematical situations using everyday and mathematical language, concrete materials, imagery and informal recordings
- ES 1.9 represents three- and two-dimensional figures, describes position and follows simple directions

Students:

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

- compare and describe closed shapes and open lines
 - ask and respond to questions that help identify a particular shape (Understanding) [CCT]
- 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 (Understanding, Reasoning) [N] [CCT]
- identify, represent and name circles, squares, triangles and rectangles presented in different orientations,



- identify circles, squares, triangles and rectangles in pictures and the environment
- identify and draw straight and curved lines

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 a house from a square and a triangle (Fluency) [CCT]
 - turn two-dimensional shapes to fit into or match a given space (Understanding)
- make representations of two-dimensional shapes using a variety of materials, including paint, paper, body movements and computer drawing tools [ICT] [CCT]
- 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.

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

Mathematics • Early Stage 1

Measurement and Geometry

Position

Outcomes

A student:

- ES 1.1 describes mathematical situations using everyday and mathematical language, concrete materials, imagery and informal recordings
- ES 1.9 represents three- and two-dimensional figures, describes position and follows simple directions

Students:

Describe position and movement

- give and follow simple directions to position an object or themselves [PSC],
eg ‘Put the blue teddy in the circle.’
 - participate in movement games involving turning and direction (Understanding)
 - follow directions to a point or place including in mazes, games and computer applications (Understanding) [ICT] [PSC]
 - direct simple computer-controlled toys and equipment to follow a path (Fluency) [ICT]
- use everyday language to describe the position of an object in relation to themselves,
eg ‘The table is behind me.’ [L]
- use everyday language to describe the position of an object in relation to another object,
eg ‘The book is inside the box.’ [L]

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.

Mathematics • Early Stage 1

Statistics and Probability

Data

Outcomes

A student:

- ES 1.1 describes mathematical situations using everyday and mathematical language, concrete materials, imagery and informal recordings
- ES 1.3 supports conclusions using appropriate reasoning
- ES 1.10 represents and interprets data displays made from objects and pictures

Students:

Answer yes/no questions to collect information

- collect data about themselves and their environment
 - 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?’ (Understanding)
- group objects according to characteristics [N],
eg sort lunch boxes according to colour

Represent and use simple data displays

- organise groups of objects to aid comparisons [N],
eg organise sorted lunch boxes into rows
 - give reasons why a column of three objects may look bigger than a column of five objects (Reasoning) [CCT]
- compare groups represented in a data display by counting [N]
- organise objects or use pictures to represent objects in a data display [L]
- interpret information presented in a data display to answer questions [L] [CCT],
eg ‘Most children in our class have brown eyes.’
 - interpret classroom data displays, eg weather charts, behaviour charts (Understanding) [L]
 - explain interpretations of information presented in data displays, eg ‘More children like dogs because there are more dog pictures than cat pictures.’ (Understanding, Reasoning) [L]

Background Information:

At this Stage, students collect data 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 and is introduced in the next Stage.

Mathematics • Early Stage 1

Statistics and Probability

Chance

Outcomes

A student:

ES 1.1 describes mathematical situations using everyday and mathematical language, concrete materials, imagery and informal recordings

ES 1.11 recognises and labels the elements of chance in familiar activities

Students:

Identify outcomes of familiar events involving chance and describe them using everyday language such as ‘will happen’, ‘won’t happen’ or ‘might happen’

- use familiar language to describe chance events, eg might, certain, probably, likely, unlikely [L]
- recognise and describe the element of chance in familiar activities [N],
eg ‘I might play with my friend after school.’
 - predict what might occur during the next lesson or in the near future, eg ‘How many people might come to your party?’, ‘How likely is it to rain if there are no clouds in the sky?’ (Reasoning) [CCT]

Background Information:

Students should be encouraged to recognise that, because of the element of chance, their predictions will not always be proven true. When discussing certainty, there are two extremes: events that are certain to happen and those that are certain not to happen. Words such as ‘might’, ‘may’, ‘possible’ are between these two extremes.

Language:

The meaning of ‘uncertain’ is ‘not certain’ – it does not mean ‘impossible’.

