Mathematics Early Stage 1 – sample scope and sequence

**Connections** **within and across strands**

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## ****Tasks****

Examples of tasks that illustrate connections within and across syllabus strands.

### About how many paper clips

Videos:

* About how many paperclips 1 and 2 videos

**Syllabus content areas:**

* **Length**
* **Whole numbers**
* **Addition and subtraction**
* **Patterns and algebra**

**Some of the mathematics:**

* **You can measure the edge of the paper using different sized paper clips.**
* **The paper is 6 big paper clips long.**
* **The paper is 9 small paper clips long.**
* **For each group of 2 big paper clips, there are 3 smaller paper clips.**

### **Balancing numbers**

Videos:

* [Balancing numbers 3](https://sites.google.com/education.nsw.gov.au/get-mathematical-early-stage-1/targeted-teaching/balancing-numbers-3) **(Part 1, Part 2 and Part 3 should be watched sequentially)**

(These videos are inspired by the work of Dan Meyer and Graham Fletcher.)

**Syllabus content areas:**

* **Whole numbers**
* **Two-dimensional space**
* **Mass**
* **Area**

**Some of** the mathematics:

* **3** hexagons have the same mass as 6 trapeziums (they are equivalent in mass).
* 2 trapeziums have the same area as 1 hexagon (they are equivalent in area).
* **Shapes can be combined to form other shapes, for example, 2 trapeziums can be joined to form a hexagon.**
* **There are shapes ‘nesting inside’ other shapes, for example, a trapezium can be split into 3 triangles.**

For more rich tasks which connect understanding across content areas, go to the [Task catalogue](https://education.nsw.gov.au/teaching-and-learning/curriculum/key-learning-areas/primary/stage-1-resources/thinking-mathematically-resource).

## Possible connections across the year

To assist planning, the following activities are examples of ‘connections’ that may help students to transfer knowledge, understanding and skills between mathematical concepts.

### Example connections within Number and algebra

**Whole numbers and addition and subtraction:**

* Instantly recognise (subitise) small collections of objects
* Model counting with concrete materials to link with addition and subtraction
* Describe the number before as 'one less than' and the number after as 'one more than' a given number
* Count forwards by ones to add and backwards by ones to subtract
* Combine two or more groups of objects to model addition
* Compare two groups of objects to determine 'how many more'
* Record addition and subtraction informally using drawings, words and numerals

**Whole number and patterns and algebra:**

* Subitise different arrangements for the same number, for example, different representations of five
* Recognise dice and domino dot patterns

**Whole numbers, addition and subtraction and patterns and algebra:**

* Use 5 as a reference in forming numbers from 6 to 10, for example, 6 is 5 and 1 more
* Use 10 as a reference in forming numbers from 11 to 20, for example, thirteen is 1 ten and 3 ones
* Recognise that the last number name represents the total number in the collection when counting
* Create and recognise combinations for numbers to at least 10, for example, 'How many more make 10?'
* Look for the empty space in ten-frames to determine how many more to make 10

**Addition and subtraction and patterns and algebra:**

* Use visual representations of numbers to assist with addition and subtraction, for example, ten frames

**Multiplication and division and patterns and algebra:**

* Investigate and model equal groups

**Multiplication and division and fractions and decimals:**

* Recognise, describe and represent one-half as one of two equal parts of a whole
  + Use the term 'sharing' to describe the distribution of a collection of objects
  + Model division by sharing a collection equally into a given number of groups

### Example connections within Measurement and geometry

**Three-dimensional space and volume:**

* Sort and manipulate three-dimensional objects found in the environment and describe their capacity

**Three-dimensional space and two-dimensional space:**

* Describe the difference between three-dimensional objects and two-dimensional shapes using everyday language

### Example connections across strands

**Measurement and geometry – Number and algebra:**

* Whole numbers and time
  + Tell time on the hour on digital and analog clocks
  + Recall that there are seven days in a week
  + Compare and order the duration of events using everyday language
* Whole numbers and length
  + Record lengths and distances by referring to the number and type of uniform informal unit used
* Whole number and mass
  + Record comparisons of mass informally using drawings, numerals and words
* Patterns and algebra and three-dimensional space
  + Sort, describe and name familiar three-dimensional objects in the environment
  + Sort three-dimensional objects and explain the attributes used to sort them, for example, colour, size, shape, function
* Patterns and algebra and two-dimensional space
  + Identify circles, triangles, squares and rectangles in pictures and the environment, including in Aboriginal art
  + Sort, manipulate, make and draw circles, squares, triangles and rectangles
  + Sort two-dimensional shapes according to features such as size and shape
  + Recognise, copy, continue and create repeating patterns using shapes, objects or pictures
* Fractions and decimals and two-dimensional space
  + Recognise that halves are two equal parts and that halves can be different shapes
* Fractions and decimals and length
  + Share an object by dividing it into two equal parts, for example, cutting a piece of ribbon into halves
* Fractions and decimals and area
  + Demonstrate how one surface is bigger than another by comparing directly
* Fractions and decimals and volume and capacity
  + Recognise when a container, such as a watering can, is nearly full, about half-full or empty
  + Compare the capacities of two containers indirectly by pouring their contents into two other identical containers and observing the level reached by each

**Number and algebra – Statistics and probability:**

* Whole numbers and data
  + Organise actual objects into data displays
  + Compare the sizes of groups of objects in data displays by quantifying

**Measurement and geometry – Statistics and probability:**

* Two-dimensional space and data
  + Group objects according to characteristics to form a simple data display, for example, ~~for example~~, sort blocks or counters according to colour or shape

## Early Term 1

Table 1 Early Term 1 outcomes

|  |  |  |
| --- | --- | --- |
| Strand | Substrands | Outcomes |
| Number and algebra | Whole number  Addition and subtraction  Patterns and algebra | MAe-4NA  MAe-5NA  MAe-8NA |
| Measurement and geometry | Length  Time  Two-dimensional space  Position | MAe-9MG  MAe-13MG  MAe-15MG  MAe-16MG |
| Statistics and probability | Data | MAe-17SP |

### Example connections within Number and algebra

**Whole numbers and addition and subtraction:**

* Model counting with concrete materials to link with addition and subtraction
* Describe the number before as 'one less than' and the number after as 'one more than' a given number
* Count forwards by ones to add and backwards by ones to subtract
* Combine two or more groups of objects to model addition
* Compare two groups of objects to determine 'how many more'
* Record addition and subtraction informally using drawings, words and numerals
* Describe the number before as 'one less than' and the number after as 'one more than' a given number

**Whole numbers, addition and subtraction and patterns and algebra:**

* Use 5 as a reference in forming numbers from 6 to 10, for example, 6 is 5 and 1 more
* Use 10 as a reference in forming numbers from 11 to 20, for example, thirteen is 1 ten and 3 ones
* Recognise that the last number name represents the total number in the collection when counting
* Create and recognise combinations for numbers to at least 10, for example, 'How many more make 10?'
* Look for the empty space in ten-frames to determine how many more to make 10
* Use visual representations of numbers to assist with addition and subtraction, for example, ten frames

**Whole numbers addition and subtraction, multiplication and division:**

* Use the term 'is the same as' to express equality of groups
* Count by twos, fives and tens using rhythmic counting and skip counting from zero

**Whole number and multiplication and division:**

* Use 10 as a reference in forming numbers from 11 to 20, for example, 'Thirteen is 1 group of ten and 3 ones'
* Model and use repeated addition as a strategy for multiplication

**Whole number and patterns and algebra:**

* Count forwards to 30 from a given number (counting sequences are a mathematical regularity)
* Count backwards from a given number in the range 0 to 20 (counting sequences are a mathematical regularity)
* Recognise dice and dot patterns

**Multiplication and division and fractions and decimals:**

* Use the term 'sharing' to describe the distribution of a collection of objects
* Describe how to make equal parts

### Example connections across strands

**Measurement and geometry – Number and algebra:**

* Whole numbers and time
  + Tell time on the hour on digital and analog clocks
  + Recall that there are seven days in a week
  + Compare and order the duration of events using everyday language
* Whole numbers and length
  + Use direct and indirect comparisons to decide which is longer, and explain their reasoning using everyday language
  + Record lengths and distances by referring to the number and type of uniform informal unit used

**Number and algebra – Statistics and probability:**

* Whole numbers and data
  + Organise actual objects into data displays
  + Compare the sizes of groups of objects in data displays by quantifying
  + Interpret information presented in a display of objects to answer questions, for example, 'How many children in our class have red pencil cases?’

**Measurement and geometry – Statistics and probability:**

* Two-dimensional space and data
  + Group objects according to characteristics to form a simple data display, for example, sort blocks or counters according to colour or shape
* Volume and capacity and fractions and decimals
  + Recognise when a container, such as a watering can, is nearly full, about half-full or empty
  + Record volume and capacity comparisons informally using drawings, numerals and words
* Mass and whole number
  + Record comparisons of mass informally using drawings, numerals and words
* Three-dimensional space and whole numbers
  + Sort three-dimensional objects and explain the attributes used to sort them, for example, colour, size, shape, function
* Two-dimensional space and whole numbers
  + Sort two-dimensional shapes according to features such as size and shape
  + Manipulate circles, triangles, squares and rectangles, and describe their features using everyday language, for example, 'A square has four sides.’
* Position and whole numbers
  + participate in movement games involving turning and direction
* Data and whole number and addition and subtraction
  + compare the sizes of groups of objects by counting

## Later Term 1

Table 2 Later Term 1 outcomes

|  |  |  |
| --- | --- | --- |
| Strand | Substrands | Outcomes |
| Number and algebra | Whole numbers  Addition and subtraction  Patterns and algebra  Factions and decimals | MAe-4NA  MAe-5NA  MAe-8NA  MAe-7NA |
| Measurement and geometry | Area  Time  Two-dimensional space  Position | MAe-10MG  MAe-13MG  MAe-15MG  MAe-16MG |

### Example connections within Number and algebra

**Whole numbers and addition and subtraction:**

* Instantly recognise (subitise) small collections of objects
* Model counting with concrete materials to link with addition and subtraction
* Describe the number before as 'one less than' and the number after as 'one more than' a given number
* Count forwards by ones to add and backwards by ones to subtract
* Combine two or more groups of objects to model addition
* Compare two groups of objects to determine 'how many more'
* Record addition and subtraction informally using drawings, words and numerals

**Whole number and patterns and algebra:**

* Subitise different arrangements for the same number, for example, different representations of five
* Recognise dice and domino dot patterns

**Whole numbers, addition and subtraction and patterns and algebra:**

* Use 5 as a reference in forming numbers from 6 to 10, for example, 6 is 5 and 1 more
* Use 10 as a reference in forming numbers from 11 to 20, for example, thirteen is 1 ten and 3 ones
* Recognise that the last number name represents the total number in the collection when counting
* Create and recognise combinations for numbers to at least 10, for example, 'How many more make 10?'
* Look for the empty space in ten-frames to determine how many more to make 10

**Addition and subtraction and patterns and algebra:**

* Use visual representations of numbers to assist with addition and subtraction, for example, ten frames

### Example connections across strands

**Measurement and geometry – Number and algebra:**

* Whole numbers and time
  + Tell time on the hour on digital and analog clocks
  + Recall that there are seven days in a week
  + Compare and order the duration of events using everyday language
* Patterns and algebra and two-dimensional space
  + Identify circles, triangles, squares and rectangles in pictures and the environment, including in Aboriginal art
  + Sort, manipulate, make and draw circles, squares, triangles and rectangles
  + Sort two-dimensional shapes according to features such as size and shape
  + Recognise, copy, continue and create repeating patterns using shapes, objects or pictures

## Early Term 2

Table 3 Early Term 2 outcomes

|  |  |  |
| --- | --- | --- |
| Strand | Substrand | Outcomes |
| Number and algebra | Whole number  Addition and subtraction | MAe-4NA  MAe-5NA |
| Measurement and geometry | Volume and capacity  Time  Three-dimensional space  Position | MAe-11MG  MAe-13MG  MAe-14MG  MAe-16MG |
| Statistics and probability | Data | MAe-17SP |

### Example connections within Number and algebra

**Whole numbers and addition and subtraction:**

* Instantly recognise (subitise) small collections of objects
* Model counting with concrete materials to link with addition and subtraction
* Describe the number before as 'one less than' and the number after as 'one more than' a given number
* Count forwards by ones to add and backwards by ones to subtract
* Combine two or more groups of objects to model addition
* Compare two groups of objects to determine 'how many more'
* Record addition and subtraction informally using drawings, words and numerals

**Whole numbers, addition and subtraction and patterns and algebra:**

* Use 5 as a reference in forming numbers from 6 to 10, for example, 6 is 5 and 1 more
* Use 10 as a reference in forming numbers from 11 to 20, for example, thirteen is 1 ten and 3 ones
* Recognise that the last number name represents the total number in the collection when counting
* Create and recognise combinations for numbers to at least 10, for example, 'How many more make 10?'
* Look for the empty space in ten-frames to determine how many more to make 10

### Example connections within Measurement and geometry

**Three-dimensional space and volume:**

* Sort and manipulate three-dimensional objects found in the environment and describe their capacity

### Example connections across strands

**Measurement and geometry – Number and algebra**

* Whole numbers and time
  + Tell time on the hour on digital and analog clocks
  + Recall that there are seven days in a week
  + Compare and order the duration of events using everyday language

**Number and algebra – Statistics and probability**

* Whole numbers and data
  + Organise actual objects into data displays
  + Compare the sizes of groups of objects in data displays by quantifying

## Later Term 2

Table 4 Later Term 2 outcomes

|  |  |  |
| --- | --- | --- |
| Strand | Substrands | Outcomes |
| Number and algebra | Whole numbers  Multiplication and division  Fractions and decimals  Patterns and algebra | MAe-4NA  MAe-6NA  MAe-7NA  MAe-8NA |
| Measurement and geometry | Mass  Time  Three-dimensional space | MAe-12MG  MAe-13MG  MAe-14MG |

### Example connections within Number and algebra

**Whole number and patterns and algebra:**

* Subitise different arrangements for the same number, for example, different representations of five
* Recognise dice and domino dot patterns

**Multiplication and division and patterns and algebra:**

* Investigate and model equal groups

**Multiplication and division and fractions and decimals:**

* Recognise, describe and represent one-half as one of two equal parts of a whole
* Use the term 'sharing' to describe the distribution of a collection of objects
* Model division by sharing a collection equally into a given number of groups

### Example connections across strands

**Measurement and geometry – Number and algebra:**

* Whole numbers and time
  + Tell time on the hour on digital and analog clocks
  + Recall that there are seven days in a week
  + Compare and order the duration of events using everyday language
* Whole number and mass
  + Record comparisons of mass informally using drawings, numerals and words
* Patterns and algebra and three-dimensional space
  + Sort, describe and name familiar three-dimensional objects in the environment
  + Sort three-dimensional objects and explain the attributes used to sort them, for example, colour, size, shape, function

## Early Term 3

Table 5 Early Term 3 outcomes

|  |  |  |
| --- | --- | --- |
| Strand | Substrands | Outcomes |
| Number and algebra | Whole numbers  Addition and subtraction | MAe-4NA  MAe-5NA |
| Measurement and geometry | Length  Time  Two-dimensional space  Position | MAe-9MG  MAe-13MG  MAe-15MG  MAe-16MG |
| Statistics and probability | Data | MAe-17SP |

### Example connections within Number and algebra

**Whole numbers and addition and subtraction:**

* Instantly recognise (subitise) small collections of objects
* Model counting with concrete materials to link with addition and subtraction
* Describe the number before as 'one less than' and the number after as 'one more than' a given number
* Count forwards by ones to add and backwards by ones to subtract
* Combine two or more groups of objects to model addition
* Compare two groups of objects to determine 'how many more'
* Record addition and subtraction informally using drawings, words and numerals

**Whole numbers, addition and subtraction and patterns and algebra:**

* Use 5 as a reference in forming numbers from 6 to 10, for example, 6 is 5 and 1 more
* Use 10 as a reference in forming numbers from 11 to 20, for example, thirteen is 1 ten and 3 ones
* Recognise that the last number name represents the total number in the collection when counting
* Create and recognise combinations for numbers to at least 10, for example, 'How many more make 10?'
* Look for the empty space in ten-frames to determine how many more to make 10

### Example connections across strands

**Measurement and geometry – Number and algebra:**

* Whole numbers and time
  + Tell time on the hour on digital and analog clocks
  + Recall that there are seven days in a week
  + Compare and order the duration of events using everyday language
* Whole numbers and length
  + Record lengths and distances by referring to the number and type of uniform informal unit used

**Number and algebra – Statistics and probability:**

* Whole numbers and data
  + Organise actual objects into data displays
  + Compare the sizes of groups of objects in data displays by quantifying

**Measurement and geometry – Statistics and probability:**

* Two-dimensional space and data
  + Group objects according to characteristics to form a simple data display, for example, sort blocks or counters according to colour or shape

## Later Term 3

Table 6 Later Term 3 outcomes

|  |  |  |
| --- | --- | --- |
| Strand | Substrands | Outcomes |
| Number and algebra | Whole numbers  Addition and subtraction  Patterns and algebra | MAe-4NA  MAe-5NA  MAe-8NA |
| Measurement and geometry | Area  Time  Two-dimensional space | MAe-10MG  MAe-13MG  MAe-15MG |

### Example connections within Number and algebra

**Whole numbers and addition and subtraction:**

* Instantly recognise (subitise) small collections of objects
* Model counting with concrete materials to link with addition and subtraction
* Describe the number before as 'one less than' and the number after as 'one more than' a given number
* Count forwards by ones to add and backwards by ones to subtract
* Combine two or more groups of objects to model addition
* Compare two groups of objects to determine 'how many more'
* Record addition and subtraction informally using drawings, words and numerals

**Whole number and patterns and algebra:**

* Subitise different arrangements for the same number, for example, different representations of five
* Recognise dice and domino dot patterns

**Whole numbers, addition and subtraction and patterns and algebra:**

* Use 5 as a reference in forming numbers from 6 to 10, for example, 6 is 5 and 1 more
* Use 10 as a reference in forming numbers from 11 to 20, for example, thirteen is 1 ten and 3 ones
* Recognise that the last number name represents the total number in the collection when counting
* Create and recognise combinations for numbers to at least 10, for example, 'How many more make 10?'
* Look for the empty space in ten-frames to determine how many more to make 10

**Addition and subtraction and patterns and algebra:**

* Use visual representations of numbers to assist with addition and subtraction, for example, ten frames

### Example connections across strands

**Measurement and geometry – Number and algebra:**

* Whole numbers and time
  + Tell time on the hour on digital and analog clocks
  + Recall that there are seven days in a week
  + Compare and order the duration of events using everyday language
* Patterns and algebra and two-dimensional space
  + Identify circles, triangles, squares and rectangles in pictures and the environment, including in Aboriginal art
  + Sort, manipulate, make and draw circles, squares, triangles and rectangles
  + Sort two-dimensional shapes according to features such as size and shape
  + Recognise, copy, continue and create repeating patterns using shapes, objects or pictures

## Early Term 4

Table 7 Early Term 4 outcomes

|  |  |  |
| --- | --- | --- |
| Strand | Substrands | Outcomes |
| Number and algebra | Whole numbers  Addition and subtraction  Fractions and decimals | MAe-4NA, MAe-5NA, MAe-7NA |
| Measurement and geometry | Volume and capacity  Time  Three-dimensional space | MAe-11MG, MAe-13MG, MAe-14MG |
| Statistics and probability | Data | MAe-17SP |

### Example connections within Number and algebra

**Whole numbers and addition and subtraction:**

* Instantly recognise (subitise) small collections of objects
* Model counting with concrete materials to link with addition and subtraction
* Describe the number before as 'one less than' and the number after as 'one more than' a given number
* Count forwards by ones to add and backwards by ones to subtract
* Combine two or more groups of objects to model addition
* Compare two groups of objects to determine 'how many more'
* Record addition and subtraction informally using drawings, words and numerals

**Whole numbers, addition and subtraction and patterns and algebra:**

* Use 5 as a reference in forming numbers from 6 to 10, for example, 6 is 5 and 1 more
* Use 10 as a reference in forming numbers from 11 to 20, for example, thirteen is 1 ten and 3 ones
* Recognise that the last number name represents the total number in the collection when counting
* Create and recognise combinations for numbers to at least 10, for example, 'How many more make 10?'
* Look for the empty space in ten-frames to determine how many more to make 10

### Example connections within Measurement and geometry

Three-dimensional space and volume

* Sort and manipulate three-dimensional objects found in the environment and describe their capacity

### Example connections across strands

**Measurement and geometry – Number and algebra:**

* Whole numbers and time
  + Tell time on the hour on digital and analog clocks
  + Recall that there are seven days in a week
* Fractions and decimals and volume and capacity
  + Recognise when a container, such as a watering can, is nearly full, about half-full or empty
  + Compare the capacities of two containers indirectly by pouring their contents into two other identical containers and observing the level reached by each

**Number and algebra – Statistics and probability:**

* Whole numbers and data
  + Organise actual objects into data displays
  + Compare the sizes of groups of objects in data displays by quantifying

## Later Term 4

Table 8 Later Term 4 outcomes

|  |  |  |
| --- | --- | --- |
| Strand | Substrands | Outcomes |
| Number and algebra | Whole numbers  Multiplication and division  Patterns and algebra | MAe-4NA  MAe-6NA  MAe-8NA |
| Measurement and geometry | Mass  Time  Position | MAe-12MG  MAe-13MG  MAe-16MG |

### Example connections within Number and algebra

**Whole number and patterns and algebra:**

* Subitise different arrangements for the same number, for example, different representations of five
* Recognise dice and domino dot patterns

**Whole numbers, addition and subtraction and patterns and algebra:**

* Use 5 as a reference in forming numbers from 6 to 10, for example, 6 is 5 and 1 more
* Use 10 as a reference in forming numbers from 11 to 20, for example, thirteen is 1 ten and 3 ones
* Recognise that the last number name represents the total number in the collection when counting
* Create and recognise combinations for numbers to at least 10, for example, 'How many more make 10?'
* Look for the empty space in ten-frames to determine how many more to make 10

**Multiplication and division and patterns and algebra:**

* Investigate and model equal groups

**Multiplication and division and fractions and decimals:**

* Recognise, describe and represent one-half as one of two equal parts of a whole
* Use the term 'sharing' to describe the distribution of a collection of objects
* Model division by sharing a collection equally into a given number of groups

### Example connections across strands

**Measurement and geometry – Number and algebra:**

* Whole numbers and time
  + Tell time on the hour on digital and analog clocks
  + Recall that there are seven days in a week
  + Compare and order the duration of events using everyday language
* Whole number and mass
  + Record comparisons of mass informally using drawings, numerals and words