# Mathematics Early Stage 1 learning sequence b

**Learning sequence description**

This sequence of lessons provides opportunities to deepen critical aspects of early number knowledge through tight, targeted teaching and opportunities to apply skills (contexts for enriching learning such as games and investigations). Students will explore the flexibility of numbers and operations whilst also exploring patterns and aspects of measurement. These tasks are designed to support learning in these areas through Working Mathematically.

## Syllabus outcomes and content

**MAe-1WM** – describes mathematical situations using everyday language, actions, materials and informal recordings

**MAe-2WM** – uses objects, actions, technology and/or trial and error to explore mathematical problems

**MAe – 3WM** – uses concrete materials and/or pictorial representations to support conclusions

**MAe - 4NA** – counts to 30, and orders, reads and represents numbers in the range 0 to 20

**MAe – 5NA** – combines, separates and compares collections of objects, describes using everyday language, and records using informal methods

**MAe – 6NA** – groups, shares and counts collections of objects, describes using everyday language, and records using informal methods

**MAe – 8NA** – recognises, describes and continues repeating patterns

**MAe – 9MG** – describes and compares lengths and distances using everyday language

**MAe – 15MG** – manipulates, sorts and describes representations of two-dimensional shapes, including circles, triangles, squares and rectangles, using everyday language

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## What’s (some of) the mathematics? (The purpose/learning intention)

* Numbers can be represented in many different ways. You can use things like pictures, words, symbols and concrete materials
* Mathematicians use a range of representations to communicate ideas
* Usually, you can solve problems in many different ways
* Different people see and think about numbers and problems in different ways. Listening to other people’s thinking helps us become more flexible in our thinking too.
* Numbers can be broken up into smaller parts (part-part-whole)
* Numbers can be related to other numbers in many different ways
  1. Some important mathematical relationships that students explore through this sequence include developing confidence with:
     1. the number before (also 1 less than, taking 1 away)
     2. 2 less than
     3. the number after (also 1 more than, adding 1)
     4. How many less/more are needed to reach the nearest multiple of 5
     5. How many less/more are needed to reach the nearest multiple of 10
     6. More, less, same
* You can work out how many there are in a collection (you can quantify a collection) in different ways. You can use skills in subitising and visual recognition of structures like ten-frames and dice (for example), or you can use counting. You might also use these skills together.
* A pattern is called a pattern because it has an element (a repeating core) that repeats over and over and over again.
* The repeating core of a pattern can be the same but look different (like an AB pattern made using biscuits and sultanas and an AB pattern made using a long pencil and a short pencil).
* There are different kinds of patterns, such as repeating patterns (like AB, AAB, ABC, etc.), growing and shrinking patterns (like the counting sequences…10, 9, 8, 7 where you take away 1 each time), patterns like ten-frames and dice patterns have a particular structure that always represents a particular quantity, patterns in combinations, like numbers that combine to make 10. With whole numbers, 7 and 3 is a pattern because when I have 7 of something and I join it with 3 of something, I will have 10 of something. It’s a mathematical regularity.
* You can move elements of a pattern around to help you determine what the repeating core is, and to determine missing elements.
* You can use your imagination to help you solve problems
* Counting involves:
  1. Matching the words we say to objects that are real or imagined
  2. Knowing the counting sequences both forwards and backwards
  3. Determining the number after and the number before
  4. Starting the count from any number
  5. Knowing the last number word tells you how many there are in a collection
  6. You can play around with what the collection looks like and so long as you don’t add any more things or take things away so there are fewer objects, the quantity will remain the same
  7. You can count a collection in any order and the quantity will be the same
* Determining the number before is the same as taking 1 away from a collection
* You can count the same collection in different ways – you can count by ones and in composite units (like twos or fives, for example)
* We can subitise small collections, up to about 3 or 4 things
* Once collections get better than 3 or 4, we can subitise by combining our knowledge of part-part-whole and structures like ten-frames and dice, to help us determine how many there are in a collection
* One way of noticing a multiplicative situation is identifying ‘for each’ relationship. For example, 4 each fork, there are 4 prongs.
* You can use direct comparison to work out important relationships like more, less, longer, shorter, etc.
* We can compare lengths directly by placing objects side-by-side and aligning the ends
* Bigger shapes can be made up of smaller shapes
* We can draw shapes by tracing around the outside of 3D objects

There are numerous skills you might observe from students as they participate in these learning experiences. Teachers are encouraged to use the understandings and skills identified above to form the basis of their assessment focus as well as provide focal points for intentional teaching, reflection and feedback.

It is important to note that for each task, it is highly likely that there are a number of mathematical goals (learning intentions) you may like to draw student’s attention to. Teachers should make decisions based on their knowledge of their students.

## Day 1

|  |  |  |  |
| --- | --- | --- | --- |
| Item | Learning experiences | Differentiation strategies and/or adjustments | Resources |
| 1.1 | Sorting |  | Device to watch video  [Sorting video](https://sites.google.com/education.nsw.gov.au/get-mathematical-early-stage-1/targeted-teaching/sorting)  A collection of items to sort |
| 1.2 | Subitising dice patterns 1-6 |  | Device to watch video  [Subitising dice patterns 1-6](https://sites.google.com/education.nsw.gov.au/get-mathematical-early-stage-1/targeted-teaching/subitising-dice-patterns-1-6) video  A pencil and some paper |
| 1.3 | Ducks Away reading |  | Device to watch video  [Ducks Away reading](https://iview.abc.net.au/show/play-school-story-time/series/0/video/CK1612H002S00)  A collection of items to sort |
| 1.4 | Ducks Away follow-up |  | Device to watch video  [Ducks Away follow-up video](https://sites.google.com/education.nsw.gov.au/get-mathematical-early-stage-1/targeted-teaching/ducks-away-follow-up)  A pencil and some paper |
| 1.5 | Optional: Play pinch a ten |  | Device to watch video  [Pinch a ten video](https://sites.google.com/education.nsw.gov.au/get-mathematical-early-stage-1/contexts-for-practise/pinch-a-ten)  A pencil and some paper |
| 1.6 | **Opportunity for monitoring student learning**  There are numerous skills you might observe from students as they participate in these learning experiences. Teachers are encouraged to use the understandings and skills identified above to form the basis of their assessment focus as well as provide focal points for intentional teaching, reflection and feedback.  It is important to note that for each task, it is highly likely that there are a number of mathematical goals (learning intentions) you may like to draw student’s attention to. Teachers should make decisions based on their knowledge of their students.   * (to be determined by teachers using the mathematical purposes identified at the beginning of the document) * To be determined * To be determined |  |  |

## Day 2

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| Item | Learning experiences | Differentiation strategies and/or adjustments | Resources |
| 2.1 | Sorting part 2 |  | Device to watch video  [Sorting part 2 video](https://sites.google.com/education.nsw.gov.au/get-mathematical-early-stage-1/targeted-teaching/sorting-part-2)  A collection of items to sort |
| 2.2 | Dice patterns A (1-4) |  | Device to watch video  [Dice patterns A (1-4) video](https://sites.google.com/education.nsw.gov.au/get-mathematical-early-stage-1/targeted-teaching/dice-patterns-a-1-4)  A pencil and some paper |
| 2.3 | Subitising - match my collection |  | Device to watch video  [Subitising - match my collection video](https://sites.google.com/education.nsw.gov.au/get-mathematical-early-stage-1/targeted-teaching/subitising-match-my-collection)  Dried pasta, counters or blocks |
| 2.4 | Play Dotty 6 |  | Device to watch video  [Dotty 6 video](https://sites.google.com/education.nsw.gov.au/get-mathematical-early-stage-1/contexts-for-practise/dotty-six)  A pencil and some paper |
| 2.5 | **Opportunity for monitoring student learning**   * (to be determined by teachers using the mathematical purposes identified at the beginning of the document) * To be determined * To be determined |  |  |

## Day 3

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| Item | Learning experiences | Differentiation strategies and/or adjustments | Resources |
| 3.1 | Counting with understanding - 12 |  | Device to watch video  [Counting with understanding – 12 video](https://sites.google.com/education.nsw.gov.au/get-mathematical-early-stage-1/targeted-teaching/counting-with-understanding-12) |
| 3.2 | Patterning 1 |  | Device to watch video  [Patterning 1 video](https://sites.google.com/education.nsw.gov.au/get-mathematical-early-stage-1/targeted-teaching/patterning-1)  A collection of items to make patterns with |
| 3.3 | Dice patterns B (5 and 6) |  | Device to watch video  [Dice patterns B (5 and 6) video](https://sites.google.com/education.nsw.gov.au/get-mathematical-early-stage-1/targeted-teaching/dice-patterns-b-5-and-6)  A pencil and some paper |
| 3.4 | Optional: Play Dotty 6 |  | Device to watch video  [Dotty 6 video](https://sites.google.com/education.nsw.gov.au/get-mathematical-early-stage-1/contexts-for-practise/dotty-six)  A pencil and some paper |
| 3.5 | **Opportunity for monitoring student learning**   * (to be determined by teachers using the mathematical purposes identified at the beginning of the document) * To be determined * To be determined |  |  |

## Day 4

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| Item | Learning experiences | Differentiation strategies and/or adjustments | Resources |
| 4.1 | About how many rectangles? |  | Device to watch video  [About how many rectangles? video](https://sites.google.com/education.nsw.gov.au/get-mathematical-early-stage-1/targeted-teaching/math-imagination-warm-up-1-about-how-many-rectangles) |
| 4.2 | Patterning 2 |  | Device to watch video  [Patterning 2 video](https://sites.google.com/education.nsw.gov.au/get-mathematical-early-stage-1/targeted-teaching/patterning-2)  A collection of items to make patterns with |
| 4.3 | Patterning 3 |  | Device to watch video  [Patterning 3 video](https://sites.google.com/education.nsw.gov.au/get-mathematical-early-stage-1/targeted-teaching/patterning-3)  A collection of items to make patterns with |
| 4.4 | Pirates 1 |  | Device to watch video  [10 Pirates- 1 video](https://sites.google.com/education.nsw.gov.au/get-mathematical-early-stage-1/targeted-teaching/10-pirates-1) |
| 4.5 | **Opportunity for monitoring student learning**   * (to be determined by teachers using the mathematical purposes identified at the beginning of the document) * To be determined * To be determined |  |  |

## Day 5

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| Item | Learning experiences | Differentiation strategies and/or adjustments | Resources |
| 5.1 | About how many rectangles? Part 2 |  | Device to watch video  [About how many rectangles? Part 2 video](https://sites.google.com/education.nsw.gov.au/get-mathematical-early-stage-1/targeted-teaching/mathematical-imagination-warm-up-2-about-how-many-rectangles-part-2) |
| 5.2 | Counting with understanding – up to 20 |  | Device to watch video  [Counting with understanding – up to 20 video](https://sites.google.com/education.nsw.gov.au/get-mathematical-early-stage-1/targeted-teaching/counting-with-understanding-up-to-20) |
| 5.3 | Investigating ten-frames |  | Device to watch video  [Investigating ten-frames video](https://sites.google.com/education.nsw.gov.au/get-mathematical-early-stage-1/targeted-teaching/investigating-ten-frames)  A pencil and some paper |
| 5.4 | 10 Pirates 2 |  | Device to watch video  10 [Pirates 2 video](https://sites.google.com/education.nsw.gov.au/get-mathematical-early-stage-1/targeted-teaching/10-pirates-2-number-before)  A pencil and some paper |
| 5.5 | **Opportunity for monitoring student learning**   * (to be determined by teachers using the mathematical purposes identified at the beginning of the document) * To be determined * To be determined |  |  |

## Day 6

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| Item | Learning experiences | Differentiation strategies and/or adjustments | Resources |
| 6.1 | Subitising - 5 |  | Device to watch video  [Subitising - 5 video](https://sites.google.com/education.nsw.gov.au/get-mathematical-early-stage-1/targeted-teaching/subitising-5) |
| 6.2 | youcubed number visuals |  | Device to watch video  y[oucubed number visuals video](https://sites.google.com/education.nsw.gov.au/get-mathematical-early-stage-1/targeted-teaching/youcubed-visualisations)  youcubed number visual worksheet  Coloured pencils |
| 6.3 | Go fish: Relationships |  | Device to watch video  [Go fish: relationships video](https://sites.google.com/education.nsw.gov.au/get-mathematical-early-stage-1/contexts-for-practise/go-fish-relationships)  Playing cards |
| 6.4 | Optional: play Race to write |  | Device to watch video  Race to write instructions (in [Race to write](https://sites.google.com/education.nsw.gov.au/get-mathematical-early-stage-1/contexts-for-practise/race-to-write) page)  Race to write worksheet  A pencil  A dice or spinner |
| 6.5 | **Opportunity for monitoring student learning**   * (to be determined by teachers using the mathematical purposes identified at the beginning of the document) * To be determined * To be determined |  |  |

## Day 7

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| Item | Learning experiences | Differentiation strategies and/or adjustments | Resources |
| 7.1 | Subitising – more, less, same |  | Device to watch video  [Subitising – more, less, same video](https://sites.google.com/education.nsw.gov.au/get-mathematical-early-stage-1/targeted-teaching/subitising-more-lesssame) |
| 7.2 | MathXplosion - 7 feet tall |  | Device to watch video [MathXplosion – Most people are seven feet tall](https://education.abc.net.au/home#!/media/2941801/most-people-are-seven-feet-tall) |
| 7.3 | MathXplosion follow up - 7 feet tall follow up |  | Device to watch video  [MathXplosion follow up video](https://sites.google.com/education.nsw.gov.au/get-mathematical-early-stage-1/targeted-teaching/mathxplosion-7-feet-follow-up)  Cardboard  Marker  Safe scissors  Things to measure |
| 7.4 | **Opportunity for monitoring student learning**   * (to be determined by teachers using the mathematical purposes identified at the beginning of the document) * To be determined * To be determined |  |  |

## Day 8

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| Item | Learning experiences | Differentiation strategies and/or adjustments | Resources |
| 8.1 | Subitising – more, less, same |  | Device to watch video  [Subitising 6- one less than](https://sites.google.com/education.nsw.gov.au/get-mathematical-early-stage-1/targeted-teaching/subitising-6-one-less-than) video |
| 8.2 | 6 is |  | Device to watch video  [6 is video](https://sites.google.com/education.nsw.gov.au/get-mathematical-early-stage-1/targeted-teaching/6-is)  A pencil and some paper |
| 8.3 | Numberblocks: Stampolines |  | Device to watch video  [Numberblocks: Stampolines](https://www.youtube.com/watch?v=rsg6NCdu5FA) |
| 8.4 | Numberblocks: Stampolines follow up |  | Device to watch video  [Numberblocks: Stampolines follow up video](https://sites.google.com/education.nsw.gov.au/get-mathematical-early-stage-1/targeted-teaching/numberblocks-stampolines-follow-up)  Some markers  Paper  6 blocks |
| 8.5 | **Opportunity for monitoring student learning**   * (to be determined by teachers using the mathematical purposes identified at the beginning of the document) * To be determined * To be determined |  |  |

## Day 9

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| Item | Learning experiences | Differentiation strategies and/or adjustments | Resources |
| 9.1 | About how many paperclips? |  | Device to watch video  [About how many paperclips videos](https://sites.google.com/education.nsw.gov.au/get-mathematical-early-stage-1/targeted-teaching/about-how-many-paper-clips)  A pencil and some paper |
| 9.2 | Each orange had 8 slices |  | Device to watch video  [Each orange had 8 slices video](https://sites.google.com/education.nsw.gov.au/get-mathematical-early-stage-1/targeted-teaching/each-orange-had-8) |
| 9.3 | Each orange had 8 slices – follow up |  | Device to watch video  [Each orange had 8 slices – follow up video](https://sites.google.com/education.nsw.gov.au/get-mathematical-early-stage-1/targeted-teaching/each-orange-had-8)  [A counting book](https://sites.google.com/education.nsw.gov.au/es1-math-digital-resource-1/counting-book?authuser=0) (if you want to know how to make one) |
| 9.4 | **Opportunity for monitoring student learning**   * (to be determined by teachers using the mathematical purposes identified at the beginning of the document) * To be determined * To be determined |  |  |

## Day 10

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| Item | Learning experiences | Differentiation strategies and/or adjustments | Resources |
| 10.1 | Quantifying collections – paddlepop sticks 1 |  | Device to watch video  [Quantifying collections – paddlepop sticks 1](https://sites.google.com/education.nsw.gov.au/get-mathematical-early-stage-1/targeted-teaching/paddlepop-sticks-1)  video |
| 10.2 | None the Number |  | Device to watch video  [Reading of 'None the Number' video](https://sites.google.com/education.nsw.gov.au/get-mathematical-early-stage-1/targeted-teaching/none-the-number)  Some pencils  ThinkBoard worksheet |
| 10.3 | Numberblocks: The zero song |  | Device to watch video  View video - [‘Numberblocks - The Zero Song’](https://youtu.be/MeRIpU4Ibo4). |
| 10.4 | **Opportunity for monitoring student learning**   * (to be determined by teachers using the mathematical purposes identified at the beginning of the document) * To be determined * To be determined |  |  |

**Reflection and evaluation**

These simple questions may help you reflect on your students’ learning and plan for next steps.

What worked well and why?

What didn’t work and why?

What might I do differently next time?

What are the next steps for student learning based on the evidence gathered?