| LEVEL: Year 2 | CONTENT: Number & Algebra | FOCUS: Place Value |
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| **In the Classroom** | | |

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| **PURPOSE** | • Recognise important benchmarks on a number line<br>• Name the highest and lowest value on a number line<br>• Identify the midpoint<br>• Explain how the midpoint can be found<br>• Accurately place other numbers on the number line and give reasons<br>• Recognise and record two and three-digit numbers<br>• Use materials to model two and three-digit numbers<br>• Identify more or less than a chosen number |
| **WARM UP** | **See & Say**<br>This game is intended to help students with fluency. They will be shown a list of numbers and as the teacher claps a beat, students will need to say, not the number on the board but to follow instructions to say the correct number, for example, say the number that is one MORE than the number.<br>Show students a list of numbers not written in sequence<br>6, 4, 1, 2, 9, 10, 7, 5, 3, 8<br>Ask the students to say the numbers following the beat – start on the 3rd clap. Now ask student to say the number that is one more than the number they see:<br><br>| SEE | 6 | 4 | 1 | 2 | 9 | 10 | 7 | 5 | 3 | 8 |<br>| SAY | 7 | 5 | 2 | 3 | 10 | 11 | 8 | 6 | 4 | 9 |<br><br>Other ideas include saying the number that is one les, 10 more, the number you need to add to the number to make 10, double the number, etc. For different levels use different sequences of numbers. |
| **INTRODUCTION** | Brief introduction to Good Mathematicians – make a list and place on the board, include teamwork, asking questions, sharing ideas, recording ideas, explaining thinking, persistence, checking solutions and learning from mistakes. |
| **EXPLICIT TEACHING & LEARNING** | **Number Lines**<br>Draw 2 lines on the board, one long one and one really short. Label both lines as 0 to 10 ask 2 students to place 5 on each line and explain their reason. Introduce the terms benchmarks, starting number, ending number and midpoint. Repeat the two lines with 0 and 30, where would you place 2, 29, etc. Give students A4 blank paper; ask students to draw a line and show the benchmarks 0 - 20; now find the midpoint; Share what students have done; students may fold the paper; students could use the ruler, students could use knowledge of numbers, so midpoint between 0 and 20 is 10 as half of 20 is 10 or double 10 is 20. Students may use addition or subtraction or difference between. Students choose from 0 to 40; 0 to 80; 0 to 70; and draw up the number line; students can have a go at choosing own.<br>**Challenge**<br>Students choose one of the numbers on their number line – can they model this number using materials – show me 1 more/less; 10 more/less |
| **DISCUSSION/KEY QUESTIONS** | • What is the smallest number?<br>• What is the largest?<br>• What does midpoint mean?<br>• What does benchmarks mean?<br>• How do benchmarks help us?<br>• What is important to remember when we draw a number line?<br>• How can we use our knowledge of numbers to help us?<br>• Can you use materials to model your number?<br>• Can you describe the number using place value language to describe the number?<br>• What is more/less than your chosen number? |
| **DELIBERATIVE PRACTICE** | The focus of this activity is to discover if students can identify the key features of the number line. Number lines are another way to represent numbers. Goal, as a class, is to develop an anchor chart for the important features of a number line. |
| **REFLECTION** | Reflect on the key features of a number line and how to identify them. Also reflect on being a good mathematician. |
| **RESOURCES** | Paper to record number lines; rulers; Counting charts |

## Curriculum Connections

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| **CONTENT** | **VICTORIAN F-10 CURRICULUM**<br>**Number & Algebra**<br>Investigate number sequences, initially those increasing and decreasing by twos, threes, fives and ten from any starting point, then moving to other sequences (VCMNA103)<br>  • developing fluency and confidence with numbers and calculations by saying number sequences<br>  • recognising that the natural numbers with zero form an ordered infinite set {0, 1, 2, 3 … } with a first element but no last element<br>  • recognising patterns in number sequences, such as adding 10 always results in the same final digit<br>Recognise, model, represent and order numbers to at least 1000 (VCMNA104)<br>  • recognising there are different ways of representing numbers and identifying patterns going beyond 100<br>  • developing fluency with writing numbers in meaningful contexts<br>Group, partition and rearrange collections up to 1000 in hundreds, tens and ones to facilitate more efficient counting (VCMNA105)<br>  • using an abacus to model and represent numbers<br>  • understanding three-digit numbers as comprised of hundreds, tens and ones/units<br>  • demonstrating and using models such as linking blocks, sticks in bundles, place-value blocks and Aboriginal bead strings and explaining reasoning<br>Describe patterns with numbers and identify missing elements (VCMNA112)<br>  • describing a pattern created by skip counting and representing the pattern on a number line<br>  • investigating features of number patterns resulting from adding twos, fives or 10s |
| **WHAT CAME BEFORE** | Students will often be able to read, write and make numbers using materials, but may need further help on representing numbers on a number line, particularly an empty number line or a number line that only contains the start and end numbers. |
| **WHAT COMES NEXT** | Number lines are a building block for measurement, they are also found in graphs, clocks and other measuring tools. Number lines are also part of cartesian planes that is now a part of the Year 6 maths curriculum. |
| **VOCABULARY** | Number line, empty number line, halving, doubling, start point, midpoint, end point, place value, more, less, before, after, partition |
| **MISCONCEPTIONS** | Some students may think that the length of the line determines the benchmarks. Encourage students to use their knowledge of the number sequence to help them determine the benchmarks. Also encourage the use of doubling and halving. |
| **WHAT PROFICIENCIES ARE TO BE UTILISED?**<br><br>**Understanding**<br>**Fluency**<br>**Problem Solving**<br>**Reasoning**<br>**Communicating (NSW)**<br>**Justifying (NSW)** | **Year 2 (Australian Curriculum)**<br>**Understanding** includes connecting number calculations with counting sequences, partitioning and combining numbers flexibly and identifying and describing the relationship between addition and subtraction and between multiplication and division<br>**Fluency** includes readily counting numbers in sequences, using informal units iteratively to compare measurements, using the language of chance to describe outcomes of familiar chance events and describing and comparing time durations<br>**Problem-solving** includes formulating problems from authentic situations, making models and using number sentences that represent problem situations, and matching transformations with their original shape<br>**Reasoning** includes using known facts to derive strategies for unfamiliar calculations, comparing and contrasting related models of operations and creating and interpreting simple representations of data. |
| **ASSESSMENT** | Give all students the number line 0 – 200; what is the midpoint? Show me where 150 belongs. |