**This Learning Progression begins at Level Foundation of the Victorian Curriculum and concludes at Level 9. Nine progressions are provided in this span.**

*Description:* This Learning Progression describes how a student becomes increasingly able to identify a pattern as something that is a discernible regularity in a group of numbers or shapes. Figuring out how a pattern works brings predictability and allows the making of generalisations. As students become increasingly able to connect patterns with the structure of numbers, they create a foundation for algebraic thinking (that is, thinking about generalised quantities). Number patterns are evident in house numbers on opposite sides of streets. Algebra enables the ‘generalisation’ of patterns from one situation to another. Algebraic thinking is also used to capture the relationship between quantities such as F=ma or force equals mass multiplied by acceleration.

*Details of progression provide nuanced and detailed descriptions of student learning – what students can say, do, make or write. Examples of student learning in each step are not hierarchical, nor are they to be used as a checklist.*

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| **Victorian Curriculum Foundation Level** | |  | | | | | | **Victorian Curriculum Level 9** | | |
| **Identifying patterns**  The student:   * recognises simple patterns in everyday contexts * copies simple patterns. | **Identifying and creating patterns**  The student:   * identifies standard patterns (dice or domino) without counting individual items. * creates repeating patterns with numbers and shapes (circle, square, circle, square or 1,2,3 1,2,3 1,2,3). | | **Identifying repeating patterns**  The student:   * identifies the pattern unit within a simple repeating pattern (continues a simple pattern) * identifies standard patterns up to 10 (patterns in ten frames, finger patterns, playing cards) * finds the missing element in a pattern involving shapes or objects. | **Continuing number patterns**  The student:   * continues patterns where the difference between each term is the same number (2, 4, 6, 8, 10 …) * describes rules for continuing patterns where the difference between each term is the same number (to find the next number in the pattern 3, 6, 9, 12 … you add 3) * sequences numbers to identify a pattern or rule. | **Generalising patterns**  The student:   * identifies elements, including missing elements, in a one-operation number pattern. | **Generalising patterns**  The student:   * identifies a single operation rule in numerical patterns and records it as a numerical expression (2, 4, 6, 8, 10 … is n + 2, or 2, 6, 18, 54 … is 3n) * predicts a higher term of a pattern using the pattern’s rule. | **Representing unknowns**  The student:   * uses words or symbols (including letters) to express relationships involving unknown values * finds the value of formulae or algebraic expressions by substituting * creates algebraic expressions from word problems involving one operation. | | **Algebraic expressions**  The student:   * creates and identifies algebraic expressions from word problems involving two operations and one unknown. * recognises equivalent algebraic expressions. | **Algebraic relationships**  The student:   * interprets and uses formulae and algebraic representations that describe relationships in various contexts (Body Mass Index – BMI). * creates an algebraic expression in two unknowns to represent a formula or relationship (Anna has 6 times as many stickers as Carol). |
| **Introducing number sentences**  The student:   * recognises the equals sign as meaning ‘is equivalent to’ or ‘is the same as’ not just ‘makes’ (recognises that 5 + 3 = 6 + 2) * They find missing values in a number sentence (5 + ? = 6 + 2). | **Number sentences**  The student:   * uses equivalent number sentences involving addition or subtraction to find an unknown (527 + 96 = ? is the same as 527 + 100 – 4 = ?) * applies knowledge of factors associated with the row and column structure of arrays to explain the commutative property of multiplication (3 x 4 = 4 x 3). | **Number properties**    The student:   * creates and interprets number sentences demonstrating the inverse relationship between multiplication and division * balances number sentences involving one or more operations following conventions of order of operations (5 x 2 + 4 = 4 x 2 + ?, 5 + 2 x 3 = 11) * recognises that any number multiplied by 0 equals 0 which means that one of the factors is 0 (3 x ? = 0). |

Student learning in numeracy has links beyond Mathematics in the Victorian Curriculum F–10. Teachers are encouraged to identify links within their teaching and learning plans.