



## Mathematics Online Interview links with the Victorian Essential Learning Standards

### Domain: Mathematics

### Dimension: Number

Level	Standards and progression points	Interview questions
0.5	<p>At 0.5, the work of a student progressing towards the Number standard at Level 1 demonstrates, for example:</p> <ul style="list-style-type: none"> <li>• association of number names with numerals and models of numbers (counting or subitising)</li> <li>• use of drawn simple symbols in place of objects; for example, B for boy</li> <li>• ordering of objects and sets; for example, largest to smallest</li> <li>• placement of a variety of objects in order from first to third</li> <li>• use of one-to-one correspondence and numbers 1 to 10 when counting</li> </ul>	<p>Using the Mathematics Online Interview, when a student is successful on:</p> <ul style="list-style-type: none"> <li>• Question 1 <i>Estimate and count teddies scooped into a cup (to 10 teddies)</i></li> <li>• 'First year of schooling detour' Question II (f) <i>Ordinal number teddy task</i></li> <li>• 'First year of schooling detour' Question 111 (a), (b) <i>Recognise number of dots on cards and match each to the correct numeral</i></li> <li>• 'First year of schooling detour' Question 111 (e) <i>Show me 6 fingers</i></li> </ul> <p>this is indicative of a student having achieved <b>part</b> of this progression point.</p>
1.0 Standard	<p>At <b>Level 1</b>, students form small sets of objects from simple descriptions and make simple correspondences between those sets. They count the size of small sets using the numbers 0 to 20. They use one-to-one correspondence to identify when two sets are equal in size and when one set is larger than another. They form collections of sets of equal size. They use ordinal numbers to describe the position of elements in a set from first to tenth. They use materials to model addition and subtraction of subtraction by the aggregation (grouping together) and disaggregation (moving apart) of objects. They add and subtract by counting forward and backward using numbers from 0 to 20.</p>	<p>Using the Mathematics Online Interview, when a student is successful on:</p> <ul style="list-style-type: none"> <li>• Question 1 <i>Estimate and count teddies scooped into a cup that holds at least 20</i></li> <li>• 'First year of schooling detour' Question I <i>Select and count 4 yellow, 3 green and 5 blue teddies</i></li> <li>• 'First year of schooling detour' Question II (f) <i>Ordinal number teddy task</i></li> <li>• Question 2 (a) <i>Count by 1s to 20</i></li> <li>• Question 2 (e) <i>Count backwards by 1s from 10</i></li> <li>• Question 8 (b) (c) <i>Pick and read cards from 0-10, show 7 and get teddies</i></li> <li>• Question 18</li> </ul>

		<p><i>I have 9 teddies here and you have 4 teddies there, how many teddies do we have altogether? (by counting all)</i></p> <ul style="list-style-type: none"> <li>• Question 19 <i>Work out the number of biscuits left when s/he had 8 in lunch and ate 3 (by modelling all)</i></li> </ul> <p>this is indicative of a student having achieved <b>part</b> of this Standard.</p>
1.25	<p>At 1.25, the work of a student progressing towards the Number standard at Level 2 demonstrates, for example:</p> <ul style="list-style-type: none"> <li>• ordering of lists of small sets of numbers up to 20</li> <li>• counting forwards and backwards by 1 from starting points between 1 and 100</li> <li>• calculation of the next number when asked to add 1 or 2 to any natural number from 0 to 10</li> <li>• drawing of diagrams to show sharing of up to 20 items</li> <li>• drawing of diagrams to show subtraction activities</li> </ul>	<p>Using the Mathematics Online Interview, when a student is successful on:</p> <ul style="list-style-type: none"> <li>• Question 2 (a), (b) <i>Count by 1s starting from 1, then 53</i></li> <li>• Question 2 (d) <i>Count backwards by 1s from 24</i></li> <li>• Question 8 (a) (b) <i>1-digit numbers</i></li> <li>• Question 9 (a) (b) <i>Use calculator to 'record' and say 1-digit numbers</i></li> <li>• Question 10 (a) <i>Order 1 digit set of number cards</i></li> <li>• Question 18 <i>I have 9 teddies here and you have 4 teddies there, how many teddies do we have altogether? (by counting all)</i></li> <li>• Question 19 <i>Work out the number of biscuits left when s/he had 8 in lunch and ate 3 (by modelling all)</i></li> <li>• Question 20 <i>12 strawberries and eats 9 (by modelling all)</i></li> <li>• Question 27 <i>Place 2 teddies in each car and say how many teddies there are altogether (counting all by 1s)</i></li> </ul> <p>this is indicative of a student having achieved <b>part</b> of this progression point.</p>
1.5	<p>At 1.5, the work of a student progressing towards the Number standard at Level 2 demonstrates, for example:</p> <ul style="list-style-type: none"> <li>• ordering of money amounts in cents</li> <li>• counting by 2s, 5s and 10s from 0 to a given target, and</li> </ul>	<p>Using the Mathematics Online Interview, when a student is successful on:</p> <ul style="list-style-type: none"> <li>• Question 3 <i>Give numbers before and after 56</i></li> </ul>

	<p>recognition of the associated number patterns; for example, 7, 9, 11 ...</p> <ul style="list-style-type: none"> <li>• use of <i>half</i> and <i>quarter</i> as a descriptor; for example, a quarter of a cake</li> <li>• addition and subtraction of two-digit multiples of ten by counting on and counting back</li> <li>• counting on from the larger of two collections to find their total</li> <li>• use of the number properties (commutative and associative) of addition in mental computation, and recognition of complements to ten; for example, <math>3 + 4 + 7 + 6 = 3 + 7 + 4 + 6 = 10 + 10 = 20</math></li> </ul>	<ul style="list-style-type: none"> <li>• Question 4 <i>Count by 10s, 5, 2s starting from 0</i></li> <li>• Question 10 (a), (b) <i>Order 2 digit set of number cards</i></li> <li>• Question 18 <i>I have 9 teddies here and you have 4 teddies there, how many teddies do we have altogether? (by counting on)</i></li> <li>• Question 19 <i>Work out the number of biscuits left when s/he had 8 in lunch and ate 3 (by counting back or down to or up from)</i></li> <li>• Question 20 <i>12 strawberries and eats 9 (by counting down to or up from)</i></li> <li>• Question 21 <i>Mentally solve addition and subtraction using count on, tens facts, count back, count up from, count down to</i></li> </ul> <p>this is indicative of a student having achieved <b>part</b> of this progression point.</p>
<p><b>1.75</b></p>	<p>At 1.75, the work of a student progressing towards the Number standard at Level 2 demonstrates, for example:</p> <ul style="list-style-type: none"> <li>• counting by 1s, 10s and 100s from 0 to 1000</li> <li>• grouping of coins of the same denomination in sets of \$1</li> <li>• development and use of a 'fact family' linking <math>25 + 5 = 30</math> to <math>5 + 25 = 30</math>, <math>30 - 5 = 25</math> and <math>30 - 25 = 5</math></li> <li>• addition and subtraction of numbers less than 10 through recall and use of number facts</li> <li>• identification of half of a set of objects, including recognition of the need for <math>1/2</math> when sharing an odd number of objects</li> </ul>	<p>Using the Mathematics Online Interview, when a student is successful on:</p> <ul style="list-style-type: none"> <li>• Question 8 (a) <i>1 and 2-digit numbers</i></li> <li>• Question 9 (a) (b) <i>Use calculator to 'record' and say numbers to 2-digit numbers</i></li> <li>• Question 19 <i>Work out the number of biscuits left when s/he had 8 in lunch and ate 3 (by known fact or fact family)</i></li> <li>• Question 20 <i>12 strawberries and eats 9 (by known fact or fact family)</i></li> <li>• Question 21 <i>Mentally solve addition and subtraction using known fact, fact family, doubles, build to next 10</i></li> </ul> <p>this is indicative of a student having achieved <b>part</b> of this progression point.</p>
<p><b>2.0 Standard</b></p>	<p>At <b>Level 2</b>, students model the place value of the natural numbers from 0 to 1000. They order numbers and count to 1000 by 1s, 10s and 100s. Students skip count by 2s, 4s and 5s from 0 to 100 starting from any natural number. They form patterns and sets of</p>	<p>Using the Mathematics Online Interview, when a student is successful on:</p> <ul style="list-style-type: none"> <li>• Question 5 <i>Count by 10s starting from 2-digit number</i></li> </ul>

	<p>numbers based on simple criteria such as odd and even numbers. They order money amounts in dollars and cents and carry out simple money calculations. They describe simple fractions such as one half, one third and one quarter in terms of equal sized parts of a whole object, such as a quarter of a pizza, and subsets such as half of a set of 20 coloured pencils. They add and subtract one- and two-digit numbers by counting on and counting back. They mentally compute simple addition and subtraction calculations involving one- or two-digit natural numbers, using number facts such as complement to 10, doubles and near doubles. They describe and calculate simple multiplication as repeated addition, such as <math>3 \times 5 = 5 + 5 + 5</math>; and division as sharing, such as 8 shared between 4. They use commutative and associative properties of addition and multiplication in mental computation (for example, <math>3 + 4 = 4 + 3</math> and <math>3 + 4 + 5</math> can be done as <math>7 + 5</math> or <math>3 + 9</math>)</p>	<ul style="list-style-type: none"> <li>• Question 11 <i>Make 36 using bundles of 10 sticks and single sticks</i></li> <li>• Question 12 <i>Identify missing number in 100 chart</i></li> <li>• Question 21 <i>Mentally solve addition and subtraction using <b>doubles, commutativity, tens fact, known fact, add 10</b></i></li> <li>• Question 27 <i>Place 2 teddies in each car and say how many teddies there are altogether <b>(by skip counting)</b></i></li> <li>• Question 28 <i>Sharing teddies on mats <b>(by sharing by 1s)</b></i></li> </ul> <p>this is indicative of a student having achieved <b>part</b> of this Standard.</p>
2.25	<p>At 2.25, the work of a student progressing towards the Number standard at Level 3 demonstrates, for example:</p> <ul style="list-style-type: none"> <li>• use of place value (as the idea that 'ten of these is one of those') to determine the size and order of whole numbers to hundreds</li> <li>• use of money as a model for grouping and unpacking lots of 10s</li> <li>• rounding of amounts of money up and down to the nearest dollar</li> <li>• use of written number sentences such as <math>20 \div 4 = 5</math> to summarise sharing (partition) and 'how many?' (quotition) processes</li> <li>• use of fractions with numerators other than one; for example, <math>\frac{3}{4}</math> of a block of chocolate</li> </ul>	<p>Using the Mathematics Online Interview, when a student is successful on:</p> <ul style="list-style-type: none"> <li>• Question 8 (a) <i>1, 2 and 3-digit numbers</i></li> <li>• Question 9 (a), (b) <i>Use calculator to 'record' and say numbers to 3-digit numbers</i></li> <li>• Question 10 (c) <i>Order 3-digit set of number cards</i></li> <li>• Question 13 <i>Identify missing number in 3-digit chart</i></li> </ul> <p>this is indicative of a student having achieved <b>part</b> of this progression point.</p>
2.5	<p>At 2.5, the work of a student progressing towards the Number standard at Level 3 demonstrates, for example:</p> <ul style="list-style-type: none"> <li>• addition and subtraction of amounts of money including calculation of change from \$10</li> <li>• automatic recall of number facts from 2, 5 and 10 multiplication tables</li> <li>• use of strategies such as 'near doubles', 'adding 9' and 'build to next 10' to solve addition and subtraction problems</li> </ul>	<p>Using the Mathematics Online Interview, when a student is successful on:</p> <ul style="list-style-type: none"> <li>• Question 7 <i>Counting money</i></li> <li>• Question 21 and Question 22 <i>Mentally solve addition and subtraction using <b>doubles, near doubles, known fact, commutativity, fact families, build to next 10</b></i></li> <li>• Question 27 <i>Place 2 teddies in each car and say how many teddies there are altogether</i></li> </ul>

	<ul style="list-style-type: none"> <li>• use of written methods for whole number problems of addition and subtraction involving numbers up to 99</li> <li>• development and use of fraction notation and recognition of equivalent fractions such as <math>\frac{1}{2} = \frac{4}{8}</math>, including the ordering of fractions using physical models</li> </ul>	<p><b>(by known fact or skip counting)</b></p> <p>this is indicative of a student having achieved <b>part</b> of this progression point.</p>
2.75	<p>At 2.75, the work of a student progressing towards the Number standard at Level 3 demonstrates, for example:</p> <ul style="list-style-type: none"> <li>• use of place value (as the idea that 'ten of these is one of those') to determine the size and order of decimals to hundredths</li> <li>• use of algorithms for the addition and subtraction of numbers to two decimal places</li> <li>• representation of multiplication as a rectangular array and as the area of a rectangle</li> <li>• use of fact families (<math>5 \times 7 = 35</math>, <math>35 \div 7 = 5</math>) to solve division problems</li> </ul>	<p>Using the Mathematics Online Interview, when a student is successful on:</p> <ul style="list-style-type: none"> <li>• Question 28 <i>Sharing teddies on mats (by sharing using known fact)</i></li> <li>• Question 29 <i>Tennis balls (by known fact or skip counting)</i></li> <li>• Question 30 <i>Dots array partly hidden (by known fact or skip counting)</i></li> <li>• Question 31 <i>Teddies at the movies (by known fact or skip counting)</i></li> </ul> <p>this is indicative of a student having achieved <b>part</b> of this progression point.</p>
3.0 Standard	<p>At <b>Level 3</b>, students use place value (as the idea that 'ten of these is one of those') to determine the size and order of whole numbers to tens of thousands, and decimals to hundredths. They round numbers up and down to the nearest unit, ten, hundred, or thousand. They develop fraction notation and compare simple common fractions such as <math>\frac{3}{4} &gt; \frac{2}{3}</math> using physical models. They skip count forwards and backwards, from various starting points using multiples of 2, 3, 4, 5, 10 and 100.</p> <p>They estimate the results of computations and recognise whether these are likely to be over-estimates or under-estimates. They compute with numbers up to 30 using all four operations. They provide automatic recall of multiplication facts up to <math>10 \times 10</math>.</p> <p>They devise and use written methods for:</p> <ul style="list-style-type: none"> <li>• whole number problems of addition and subtraction involving numbers up to 999</li> <li>• multiplication by single digits (using recall of multiplication tables) and multiples and powers of ten (for example, <math>5 \times 100</math>, <math>5 \times 70</math>)</li> <li>• division by a single-digit divisor (based on inverse relations in multiplication tables).</li> </ul> <p>They devise and use algorithms for the addition and subtraction of</p>	<p>Using the Mathematics Online Interview, when a student is successful on:</p> <ul style="list-style-type: none"> <li>• Question 5 (b) <i>Count from 24 by 5s</i></li> <li>• Question 8 (a) <i>1, 2, 3 and 4-digit numbers</i></li> <li>• Question 9 (a), (b) <i>Use calculator to 'record' and say numbers to 4-digit numbers</i></li> <li>• Question 10 (d) <i>Order 4-digit set of number cards</i></li> <li>• Question 22 <i>Mentally solve addition and subtraction using commutativity, build to next 10, known fact, fact families, add 10 take 1</i></li> <li>• Question 32 <i>Mentally solve multiplication problems</i></li> </ul> <p>this is indicative of a student having achieved <b>part</b> of this Standard.</p>

	numbers to two decimal places, including situations involving money. They add and subtract simple common fractions with the assistance of physical models.	
3.25	<p>At 3.25, the work of a student progressing towards the Number standard at Level 4 demonstrates, for example:</p> <ul style="list-style-type: none"> <li>• use of large number multiples of ten to approximate common quantities; for example, 100 000 people in a major sports venue</li> <li>• representation of square numbers using a power of 2; for example, <math>9 = 3^2</math></li> <li>• use of ratios to describe relative sizes</li> <li>• appropriate selection and use of mental and written algorithms to add, subtract, multiply and divide (by single digits) natural numbers</li> <li>• multiplication of fractions by fractions through use of the rectangle area model (grid)</li> <li>• use of brackets to determine order of operations</li> </ul>	<p>Using the Mathematics Online Interview, when a student is successful on:</p> <ul style="list-style-type: none"> <li>• Question 9 (b) <i>Use calculator to 'record' and say numbers beyond 4-digits</i></li> <li>• Question 14 <i>Ten more than 2791</i></li> <li>• Question 15 <i>One hundred less than 3027</i></li> <li>• Question 23 <i>Mentally add and subtract and explain method used</i></li> <li>• Question 24 <i>More or less than 1000</i></li> <li>• Question 33 <i>Division problems</i></li> </ul> <p>this is indicative of a student having achieved <b>part</b> of this progression point.</p>
3.5	<p>At 3.5, the work of a student progressing towards the Number standard at Level 4 demonstrates, for example:</p> <ul style="list-style-type: none"> <li>• listing of objects and their size, where size varies from thousandths to thousands of a unit</li> <li>• addition, subtraction and multiplication of fractions and decimals (to one decimal place) using approximations such as whole number estimates and technology to confirm accuracy</li> <li>• representation of simple ratios as percentages, fractions and decimals</li> <li>• identification of calculation errors resulting in unreasonable results</li> <li>• ordering of integers (for example, positive and negative temperatures), positive fractions and decimals</li> </ul>	
3.75	<p>At 3.75, the work of a student progressing towards the Number standard at Level 4 demonstrates, for example:</p> <ul style="list-style-type: none"> <li>• multiplication by increasing and decreasing by a factor of two; for example,</li> </ul>	

	$24 \times 16 = 48 \times 8$ $= 96 \times 4 = 192 \times 2$ $= 384 \times 1 = 384$ <ul style="list-style-type: none"> <li>• recognition of equivalent rates expressed as percentages, fractions and decimals</li> <li>• recognition that multiplication can either enlarge or reduce the magnitude of a number (multiplication by fractions or decimals)</li> <li>• use of inverse relationship between multiplication and division to validate calculations</li> <li>• creation of sets of multiples of numbers and their representation in index form; for example, 3, 9, 27 written as <math>3^1</math>, <math>3^2</math>, <math>3^3</math> respectively</li> </ul>	
<p><b>4.0 Standard</b></p>	<p>At <b>Level 4</b>, students comprehend the size and order of small numbers (to thousandths) and large numbers (to millions). They model integers (positive and negative whole numbers and zero), common fractions and decimals. They place integers, decimals and common fractions on a number line. They create sets of number multiples to find the lowest common multiple of the numbers. They interpret numbers and their factors in terms of the area and dimensions of rectangular arrays (for example, the factors of 12 can be found by making rectangles of dimensions <math>1 \times 12</math>, <math>2 \times 6</math>, and <math>3 \times 4</math>).</p> <p>Students identify square, prime and composite numbers. They create factor sets (for example, using factor trees) and identify the highest common factor of two or more numbers. They recognise and calculate simple powers of whole numbers (for example, <math>2^4 = 16</math>).</p> <p>Students use decimals, ratios and percentages to find equivalent representations of common fractions (for example, <math>3/4 = 9/12 = 0.75 = 75\% = 3 : 4 = 6 : 8</math>). They explain and use mental and written algorithms for the addition, subtraction, multiplication and division of natural numbers (positive whole numbers). They add, subtract, and multiply fractions and decimals (to two decimal places) and apply these operations in practical contexts, including the use of money. They use estimates for computations and apply criteria to determine if estimates are reasonable or not.</p>	<p>Using the Mathematics Online Interview, when a student is successful on:</p> <ul style="list-style-type: none"> <li>• Question 16 <i>Sorting populations of Capital cities</i></li> <li>• Question 17 <i>Estimate numbers on number lines</i></li> <li>• Question 25 <i>Estimate and calculate addition</i></li> <li>• Question 26 <i>Estimate and calculate subtraction</i></li> <li>• Question 34 <i>Off to the circus</i></li> <li>• Question 35 <i>Share money</i></li> <li>• Question 36 <i>23 x 4 in your head and explain method</i></li> <li>• Question 37 <i>Find missing numbers in multiplication and explain</i></li> </ul> <p>this is indicative of a student having achieved <b>part</b> of this Standard.</p>