

Grade 2 Mathematics Big Ideas

Big Ideas – Priority 1

Supporting Ideas – Priority 2

Number Facts

[C] Communication

[PS] Problem Solving

[CN] Connections

[R] Reasoning

[ME] Mental Mathematics

[T] Technology and Estimation

[V] Visualization

Strand: <u>Number</u> General Outcome: Develop number sense.	
Specific Outcomes <i>It is expected that students will:</i>	Achievement Indicators <i>The following set of indicators may be used to determine whether students have met the corresponding specific outcome.</i>
1. Say the number sequence 0 to 100 by: <ul style="list-style-type: none"> • 2s, 5s and 10s, forward and backward, using starting points that are multiples of 2, 5 and 10 respectively • 10s, using starting points from 1 to 9 • 2s, starting from 1. [C, CN, ME, R]	<ul style="list-style-type: none"> ➤ Extend a given skip counting sequence (by 2s, 5s or 10s) forward and backward. ➤ Skip count by 10s, given any number from 1 to 9 as a starting point. ➤ Identify and correct errors and omissions in a given skip counting sequence. ➤ Count a given sum of money with pennies, nickels or dimes (to 100¢). ➤ Count quantity, using groups of 2, 5 or 10 and counting on.
2. Demonstrate if a number (up to 100) is even or odd. [C, CN, PS, R]	<ul style="list-style-type: none"> ➤ Use concrete materials or pictorial representations to determine if a given number is even or odd. ➤ Identify even and odd numbers in a given sequence, such as in a hundred chart. ➤ Sort a given set of numbers into even and odd.
3. Describe order or relative position, using ordinal numbers (up to tenth). [C, CN, R]	<ul style="list-style-type: none"> ➤ Indicate a position of a specific object in a sequence by using ordinal numbers up to tenth. ➤ Compare the ordinal position of a specific object in two different given sequences.

<p>4. Represent and describe numbers to 100, concretely, pictorially and symbolically. [C, CN, V]</p>	<ul style="list-style-type: none"> ➤ Represent a given number, using concrete materials such as ten frames and base ten materials. ➤ Represent a given number, using coins (pennies, nickels, dimes and quarters). ➤ Represent a given number, using tallies. ➤ Represent a given number pictorially. ➤ Represent a given number, using expressions; e.g., $24 + 6$, $15 + 15$, $40 - 10$. ➤ Read a given number (0–100) in symbolic or word form. ➤ Record a given number (0–20) in words.
<p>5. Compare and order numbers up to 100. [C, CN, ME, R, V]</p>	<ul style="list-style-type: none"> ➤ Order a given set of numbers in ascending or descending order, and verify the result, using a hundred chart, number line, ten frames or by making references to place value. ➤ Identify and explain errors in a given ordered sequence. ➤ Identify missing numbers in a given hundred chart. ➤ Identify errors in a given hundred chart.
<p>6. Estimate quantities to 100, using referents. [C, ME, PS, R]</p>	<ul style="list-style-type: none"> ➤ Estimate a given quantity by comparing it to a referent (known quantity). ➤ Estimate the number of groups of ten in a given quantity, using 10 as a referent. ➤ Select between two possible estimates for a given quantity, and explain the choice.
<p>7. Illustrate, concretely and pictorially, the meaning of place value for numerals to 100. [C, CN, R, V]</p>	<ul style="list-style-type: none"> ➤ Explain and show with counters the meaning of each digit for a given 2-digit numeral with both digits the same; e.g., for the numeral 22, the first digit represents two tens (twenty counters) and the second digit represents two ones (two counters). ➤ Count the number of objects in a given set, using groups of 10s and 1s, and record the result as a 2-digit numeral under the headings 10s and 1s. ➤ Describe a given 2-digit numeral in at least two ways; e.g., 24 as two 10s and four 1s, twenty and four, two groups of ten and four left over, and twenty-four ones. ➤ Illustrate, using ten frames and diagrams, that a given numeral consists of a certain number of groups of ten and a certain number of ones. ➤ Illustrate, using base 10 materials, that a given numeral consists of a certain number of tens and a certain number of ones. ➤ Explain why the value of a digit depends on its placement within a numeral.
<p>8. Demonstrate and explain the effect of adding zero to, or subtracting zero from, any number. [C, R]</p>	<ul style="list-style-type: none"> ➤ Add zero to a given number, and explain why the sum is the same as the given number. ➤ Subtract zero from a given number, and explain why the difference is the same as the given number.

<p>9. Demonstrate an understanding of addition (limited to 1- and 2-digit numerals) with answers to 100 and the corresponding subtraction by:</p> <ul style="list-style-type: none"> • using personal strategies for adding and subtracting with and without the support of manipulatives • creating and solving problems that involve addition and subtraction • using the commutative property of addition (the order in which numbers are added does not affect the sum) • using the associative property of addition (grouping a set of numbers in different ways does not affect the sum) • explaining that the order in which numbers are subtracted may affect the difference. <p>[C, CN, ME, PS, R, V]</p>	<p>(Students investigate a variety of strategies and become proficient in at least one appropriate and efficient strategy that they understand.)</p> <ul style="list-style-type: none"> ➤ Model addition and subtraction, using concrete materials or visual representations, and record the process symbolically. ➤ Create an addition or a subtraction number sentence and a story problem for a given solution. ➤ Solve a given problem involving a missing addend, and describe the strategy used. ➤ Solve a given problem involving a missing minuend or subtrahend, and describe the strategy used. ➤ Refine personal strategies to increase their efficiency. ➤ Match a number sentence to a given missing addend problem. ➤ Match a number sentence to a given missing subtrahend or minuend problem. ➤ Explain or demonstrate why $5 + 6 = 6 + 5$. ➤ Add a given set of numbers, using the associative property of addition, and explain why the sum is the same; e.g., $2 + 5 + 3 + 8 = (2 + 3) + 5 + 8$ or $5 + 3 + (8 + 2)$. ➤ Solve a given problem, using horizontal and vertical formats.
<p>10. Apply mental mathematics strategies, such as:</p> <ul style="list-style-type: none"> • using doubles • making 10 • one more, one less • two more, two less • building on a known double • thinking addition for subtraction <p>for basic addition facts and related subtraction facts to 18.</p> <p>[C, CN, ME, PS, R, V]</p> <p>Understand and apply strategies for addition and related subtraction facts to 18.</p> <p>Recall addition and related subtraction facts to 10.</p>	<ul style="list-style-type: none"> ➤ Explain or demonstrate the mental mathematics strategy that could be used to determine a basic fact, such as: <ul style="list-style-type: none"> • doubles; e.g., for $4 + 6$, think $5 + 5$ • doubles plus one; e.g., for $4 + 5$, think $4 + 4 + 1$ • doubles take away one; e.g., for $4 + 5$, think $5 + 5 - 1$ • doubles plus two; e.g., for $4 + 6$, think $4 + 4 + 2$ • doubles take away two; e.g., for $4 + 6$, think $6 + 6 - 2$ • making 10; e.g., for $7 + 5$, think $7 + 3 + 2$ • building on a known double; e.g., $6 + 6 = 12$, so $6 + 7 = 12 + 1 = 13$ • addition for subtraction; e.g., for $7 - 3$, think $3 + ? = 7$. ➤ Use and describe a mental mathematics strategy for determining a sum to 18 and the related subtraction facts. ➤ Refine mental mathematics strategies to increase their efficiency. ➤ Demonstrate understanding and application of strategies for addition and related subtraction facts to 18. ➤ Demonstrate recall/memorization of addition and related subtraction facts to 10.

Strand: Patterns and Relations (Patterns)

General Outcome: Use patterns to describe the world and to solve problems.

Specific Outcomes <i>It is expected that students will:</i>	Achievement Indicators <i>The following set of indicators may be used to determine whether students have met the corresponding specific outcome.</i>
1. Demonstrate an understanding of repeating patterns (three to five elements) by: <ul style="list-style-type: none">• describing• extending• comparing• creating patterns using manipulatives, diagrams, sounds and actions. [C, CN, PS, R, V]	<ul style="list-style-type: none">➤ Identify the core of a given repeating pattern.➤ Describe and extend a given double attribute pattern.➤ Explain the rule used to create a given repeating non-numerical pattern.➤ Predict an element in a given repeating pattern, using a variety of strategies.➤ Predict an element of a given repeating pattern, and extend the pattern to verify the prediction.➤ Compare two given repeating patterns, and describe how they are alike/different.➤ Create a repeating pattern where the core has three to five elements.
2. Demonstrate an understanding of increasing patterns by: <ul style="list-style-type: none">• describing• reproducing• extending• creating numerical (numbers to 100) and non-numerical patterns using manipulatives, diagrams, sounds and actions. [C, CN, PS, R, V]	<ul style="list-style-type: none">➤ Identify and describe increasing patterns in a variety of given contexts; e.g., hundred chart, number line, addition tables, calendar, tiling pattern or drawings.➤ Represent the relationship in a given increasing pattern, concretely and pictorially.➤ Identify errors in a given increasing pattern.➤ Explain the rule used to create a given increasing pattern.➤ Create an increasing pattern, and explain the pattern rule.➤ Represent a given increasing pattern, using another mode; e.g., colour to shape.➤ Solve a given problem, using increasing patterns.➤ Identify and describe increasing patterns in the environment; e.g., house/room numbers, book pages, calendar, pine cones, leap years.➤ Determine missing elements in a given concrete, pictorial or symbolic increasing pattern, and explain the reasoning.
3. Sort a set of objects, using two attributes, and explain the sorting rule. [C, CN, R, V]	<ul style="list-style-type: none">➤ Determine the differences between two given pre-sorted sets, and explain the sorting rule.➤ Identify and name two common attributes of items within a given sorted group.➤ Choose two attributes to sort a given set of objects, sort the set, and explain the sorting rule.

Strand: Patterns and Relations (Variables and Equations)

General Outcome: Represent algebraic expressions in multiple ways.

Specific Outcomes <i>It is expected that students will:</i>	Achievement Indicators <i>The following set of indicators may be used to determine whether students have met the corresponding specific outcome.</i>
4. Demonstrate and explain the meaning of equality and inequality, concretely and pictorially. [C, CN, R, V]	<ul style="list-style-type: none">➤ Determine whether two given quantities of the same object (same shape and mass) are equal by using a balance.➤ Construct and draw two unequal sets, using the same object (same shape and mass), and explain the reasoning.➤ Demonstrate how to change two given sets, equal in number, to create inequality.➤ Choose from three or more given sets the one that does not have a quantity equal to the others, and explain why.
5. Record equalities and inequalities symbolically, using the equal symbol or the not equal symbol. [C, CN, R, V]	<ul style="list-style-type: none">➤ Determine whether two sides of a given number sentence are equal (=) or not equal (\neq). Write the appropriate symbol and justify the answer.➤ Model equalities, using a variety of concrete representations, and record the equalities symbolically.➤ Model inequalities, using a variety of concrete representations, and record the inequalities symbolically.

Strand: Shape and Space (Measurement)

General Outcome: Use direct and indirect measurement to solve problems.

Specific Outcomes <i>It is expected that students will:</i>	Achievement Indicators <i>The following set of indicators may be used to determine whether students have met the corresponding specific outcome.</i>
1. Relate the number of days to a week and the number of months to a year in a problem-solving context. [C, CN, PS, R]	<ul style="list-style-type: none">➤ Read a date on a calendar.➤ Name and order the days of the week.➤ Identify the day of the week and the month of the year for an identified calendar date.➤ Communicate that there are seven days in a week and twelve months in a year.➤ Determine whether a given set of days is more or less than a week.➤ Identify yesterday's/tomorrow's date.➤ Identify the month that comes before and the month that comes after a given month.➤ Name and order the months of the year.➤ Solve a given problem involving time that is limited to the number of days in a week and the number of months in a year.
2. Relate the size of a unit of measure to the number of units (limited to nonstandard units) used to measure length and mass (weight). [C, CN, ME, R, V]	<ul style="list-style-type: none">➤ Explain why one of two given nonstandard units may be a better choice for measuring the length of an object.➤ Explain why one of two given nonstandard units may be a better choice for measuring the mass (weight) of an object.➤ Select a nonstandard unit for measuring the length or mass (weight) of an object, and explain why it was chosen.➤ Estimate the number of nonstandard units needed for a given measurement task.➤ Explain why the number of units of a measurement will vary depending upon the unit of measure used.
3. Compare and order objects by length, height, distance around and mass (weight), using nonstandard units, and make statements of comparison. [C, CN, ME, R, V]	<ul style="list-style-type: none">➤ Estimate, measure and record the length, height, distance around or mass (weight) of a given object, using nonstandard units.➤ Compare and order the measure of two or more objects in ascending or descending order, and explain the method of ordering.

<p>4. Measure length to the nearest nonstandard unit by:</p> <ul style="list-style-type: none"> • using multiple copies of a unit • using a single copy of a unit (iteration process). <p>[C, ME, R, V]</p>	<ul style="list-style-type: none"> ➤ Explain why overlapping or leaving gaps does not result in accurate measures. ➤ Count the number of nonstandard units required to measure the length of a given object, using a single copy or multiple copies of a unit. ➤ Estimate and measure a given object, using multiple copies of a nonstandard unit and using a single copy of the same unit many times, and explain the results. ➤ Estimate and measure, using nonstandard units, a given length that is not a straight line.
<p>5. Demonstrate that changing the orientation of an object does not alter the measurements of its attributes.</p> <p>[C, R, V]</p>	<ul style="list-style-type: none"> ➤ Measure a given object, change the orientation, re-measure, and explain the results.

Strand: Shape and Space (3-D Objects and 2-D Shapes)

General Outcome: Describe the characteristics of 3-D objects and 2-D shapes, and analyze the relationships among them.

<p style="text-align: center;">Specific Outcomes</p> <p><i>It is expected that students will:</i></p>	<p style="text-align: center;">Achievement Indicators</p> <p><i>The following set of indicators may be used to determine whether students have met the corresponding specific outcome.</i></p>
<p>6. Sort 2-D shapes and 3-D objects, using two attributes, and explain the sorting rule.</p> <p>[C, CN, R, V]</p>	<ul style="list-style-type: none"> ➤ Determine the differences between two given pre-sorted sets, and explain the sorting rule. ➤ Identify and name two common attributes of items within a given sorted group. ➤ Sort a given set of 2-D shapes (regular and irregular), according to two attributes, and explain the sorting rule. ➤ Sort a given set of 3-D objects, according to two attributes, and explain the sorting rule.

<p>7. Describe, compare and construct 3-D objects, including:</p> <ul style="list-style-type: none"> • cubes • spheres • cones • cylinders • pyramids. <p>[C, CN, R, V]</p>	<ul style="list-style-type: none"> ➤ Sort a given set of 3-D objects, and explain the sorting rule. ➤ Identify common attributes of cubes, spheres, cones, cylinders and pyramids from given sets of the same 3-D objects. ➤ Identify and describe given 3-D objects with different dimensions. ➤ Identify and describe given 3-D objects with different orientations. ➤ Create and describe a representation of a given 3-D object, using materials such as modelling clay. ➤ Identify examples of cubes, spheres, cones, cylinders and pyramids found in the environment.
<p>8. Describe, compare and construct 2-D shapes, including:</p> <ul style="list-style-type: none"> • triangles • squares • rectangles • circles. <p>[C, CN, R, V]</p>	<ul style="list-style-type: none"> ➤ Sort a given set of 2-D shapes, and explain the sorting rule. ➤ Identify common attributes of triangles, squares, rectangles and circles from given sets of the same 2-D shapes. ➤ Identify given 2-D shapes with different dimensions. ➤ Identify given 2-D shapes with different orientations. ➤ Create a model to represent a given 2-D shape. ➤ Create a pictorial representation of a given 2-D shape.
<p>9. Identify 2-D shapes as parts of 3-D objects in the environment.</p> <p>[C, CN, R, V]</p>	<ul style="list-style-type: none"> ➤ Compare and match a given 2-D shape, such as a triangle, square, rectangle or circle, to the faces of 3-D objects in the environment. ➤ Name the 2-D faces of a given 3-D object.

Strand: Statistics and Probability (Data Analysis)

General Outcome: Collect, display and analyze data to solve problems.

Specific Outcomes <i>It is expected that students will:</i>	Achievement Indicators <i>The following set of indicators may be used to determine whether students have met the corresponding specific outcome.</i>
1. Gather and record data about self and others to answer questions. [C, CN, PS, V] [ICT: C4–1.3, C7–1.1]	<ul style="list-style-type: none">➤ Formulate a question that can be answered by gathering information about self and others.➤ Organize data as it is collected, using concrete objects, tallies, check marks, charts or lists.➤ Answer questions, using collected data.
2. Construct and interpret concrete graphs and pictographs to solve problems. [C, CN, PS, R, V] [ICT: C7–1.3]	<ul style="list-style-type: none">➤ Determine the common attributes of concrete graphs by comparing a given set of concrete graphs.➤ Determine the common attributes of pictographs by comparing a given set of pictographs.➤ Answer questions pertaining to a given concrete graph or pictograph.➤ Create a concrete graph to display a given set of data, and draw conclusions.➤ Create a pictograph to represent a given set of data, using one-to-one correspondence.➤ Solve a given problem by constructing and interpreting a concrete graph or pictograph.