# LONG-RANGE PLAN

## Grade 4, Mathematics

# ORGANIZED BY QUESTIONS

## What is a long-range plan and why is it important?

A long-range plan outlines a year-long plan for learning mathematics. It is a living document that is revised as educators become increasingly aware of the abilities, strengths, needs, and interests of their students. A thoughtfully developed long-range plan:

- ensures that instruction is sequenced in a manner that aligns with research about learning mathematics;
- allocates the appropriate time for concepts and skills so that students have multiple opportunities to focus on the overall expectations within the grade;
- ensures that all specific expectations are addressed at least once within the school year; and
- recognizes that some expectations need to be revisited several times throughout the year.

**Note**: These sample long-range plans outline possible sequences of instruction for the school year. There are many ways to structure an effective plan for learning.

## How are these long-range plans structured?

Deep learning occurs when specific expectations are connected, are continuously expanded upon, and are revisited in a variety of contexts throughout the year.

This long-range plan is organized around ten unifying questions. Each question typically involves several strands and draws on big mathematical themes such as quantity, change, equivalence, dimension, pattern, and uncertainty. Often the same question spans several grades.

These ten questions can be sequenced throughout the year as ten blocks of time, as presented here in this long-range plan. Alternatively, the questions could be split into smaller, shorter blocks, with the embedded strands and topics serving as different contexts that would spiral the ten questions throughout the year.

While the long-range plan is presented as month-long blocks, this timing should be held loosely, and adjusted according to the learning readiness of students. The following are other considerations when using this long-range plan.

## Considerations

- Sample long-range plans for each grade level include all overall and specific expectations from strands B through F.
- The overall expectation from Strand A (Social-Emotional Learning Skills and the Mathematical Processes) is integrated and taught in connection with the other strands throughout the school year.
- In developing long-range and daily plans, consider opportunities to teach and reinforce social-emotional learning skills and mathematical processes, as well as transferable skills, in order to help students develop confidence, cope with challenges, think critically and creatively, and develop a positive identity as a math learner.
- Mathematical modelling (Algebra, C4) provides opportunities for students to authentically engage in learning with everyday situations that involve mathematics. Tasks that require the process of mathematical modelling can be strategically situated throughout the year to support students in making connections among mathematical concepts, strands, and disciplines, and to provide opportunities for assessing the integration and application of learning.
- Coding (Algebra, C3) can be used to solve problems and help deepen students' understanding of mathematical concepts; it should be strategically addressed and assessed throughout the year, as appropriate.
- Some concepts and skills require ongoing attention so that students can develop proficiency and deep, lasting learning. Number Talks, Number Strings, and other math talk prompts can be used at the beginning of math classes to reinforce and strengthen number relationships, spatial relationships, math facts, mental math strategies, and problem-solving skills.

## Reflective questions when planning

- What key concepts, models, and strategies do students need more time to develop?
- Does the long-range plan revisit expectations later? If not, how might I adjust the plan so it does? What prior learning is assumed in order for other expectations to be addressed?
- How can I create opportunities for students to continue to practise and consolidate learning when they are engaged in new learning?

# Long-Range Plan: Grade 4

- Each month is organized around a unifying question. Strands connected to each question are listed below. The Social-Emotional Learning (SEL) Skills and the Mathematical Processes are to be integrated throughout each of the topics below as appropriate.

| | Grade 4 | Grade 5 | Grade 6 |
|---|---|---|---|
| **Sep** | **How are things** changing**?**<br><br>Number, Algebra, Data, Spatial Sense | **How are things changing?**<br><br>Number, Algebra, Data, Spatial Sense | **How are things changing?**<br><br>Number, Algebra, Data, Spatial Sense |
| **Oct** | **How do things compare?**<br><br>Number, Data, Spatial Sense, Financial Literacy | **How do things compare?**<br><br>Number, Data, Spatial Sense, Financial Literacy | **How do things compare?**<br><br>Number, Data, Spatial Sense, Financial Literacy |
| **Nov** | **What's the story?**<br><br>Number, Data | **What's the story?**<br><br>Number, Data | **What's the story?**<br><br>Number, Data |
| **Dec** | **Equal groups: How much is that?**<br><br>Number, Algebra, Spatial Sense | **How much is that?**<br><br>Number, Algebra, Spatial Sense | **How much is that?**<br><br>Number, Algebra, Spatial Sense |
| **Jan** | **How can we describe the space around us?**<br><br>Number, Algebra, Spatial Sense | **How can we describe the space around us?**<br><br>Number, Algebra, Spatial Sense | **How can we describe the space around us?**<br><br>Number, Algebra, Spatial Sense |
| **Feb** | **When is addition and subtraction useful?** | **When are different operations useful?** | **When are different operations useful?** |

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| | Number, Algebra, Spatial Sense, Financial Literacy | Number, Algebra, Spatial Sense, Financial Literacy | Number, Algebra, Data, Spatial Sense |
| **Mar** | **How can we keep things in balance?**<br><br>Number, Algebra, Data, Financial Literacy | **How can we keep things in balance?**<br><br>Number, Algebra, Financial Literacy | **How can we keep things in balance?**<br><br>Number, Algebra, Spatial Sense, Financial Literacy |
| **Apr** | **Scaling & splitting: How much now?**<br><br>Number, Data, Spatial Sense | **Scaling & splitting: How much now?**<br><br>Number, Data, Spatial Sense, Financial Literacy | **Scaling & splitting: How much now?**<br><br>Number, Data |
| **May** | **How can we make predictions and decide?**<br><br>Number, Algebra, Data, Financial Literacy | **How can we make predictions and decide?**<br><br>Number, Algebra, Data, Financial Literacy | **How can we make predictions and decide?**<br><br>Number, Algebra, Data |
| **Jun** | **Is this statement true?**<br><br>Number, Algebra | **Is this statement true?**<br><br>Number, Algebra, Data | **Is this statement true?**<br><br>Number, Algebra, Data |

| Sept | QUESTION: How are things changing? | |
|---|---|---|
| | **Topics and Specific Expectations** | **Connecting the Learning** |
| | **C: Repeating & growing patterns**<br>**C1.1** identify and describe repeating and growing patterns, including patterns found in real-life contexts<br>**C1.2** create and translate repeating and growing patterns using various representations, including tables of values and graphs<br>**C1.3** determine pattern rules and use them to extend patterns, make and justify predictions, and identify missing elements in repeating and growing patterns<br>**C, D: Graphing patterns & data**<br>**D1.3** select from among a variety of graphs, including multiple-bar graphs, the type of graph best suited to represent various sets of data; display the data in the graphs with proper sources, titles, and labels, and appropriate scales; and justify their choice of graphs<br>**D1.6** analyse different sets of data presented in various ways, including in stem-and-leaf plots and multiple-bar graphs, by asking and answering questions about the data and drawing conclusions, then make convincing arguments and informed decisions<br>**C: Number relationships (whole numbers & decimal tenths)**<br>**C1.4** create and describe patterns to illustrate relationships among whole numbers and decimal tenths<br>**B: Place value (powers of 10)**<br>**B1.1** read, represent, compose, and decompose whole numbers up to and including 10 000, using appropriate tools and strategies, and describe various ways they are used in everyday life<br>**B1.2** compare and order whole numbers up to and including 10 000, in various context<br>**B1.7** read, represent, compare, and order decimal tenths, in various contexts<br>**B2.3** use mental math strategies to multiply whole numbers by 10, 100, and 1000, divide whole numbers by 10, and add and subtract decimal tenths, and explain the strategies used<br>**D: Stem & Leaf plots**<br>**D1.3** select from among a variety of graphs, including multiple-bar graphs, the type of graph best suited to represent various sets of data; display the data in the graphs with proper sources, titles, and labels, and appropriate scales; and justify their choice of graphs<br>**D1.6** analyse different sets of data presented in various ways, including in stem-and-leaf plots and multiple-bar graphs, by asking and answering questions about the data and drawing conclusions, then make convincing arguments and informed decision<br>**B: Equivalent rates (scaling)**<br>**B2.8** show simple multiplicative relationships involving whole number rates, using various tools and drawings<br>**E: Translations & reflections**<br>**E1.3** describe and perform translations and reflections on a grid, and predict the results of these transformations<br>---<br>**Number: B1.1; B1.2; B1.7; B2.3; B2.8**<br>**Algebra: C1.1; C1.2; C1.3; C1.4**<br>**Data: D1.3; D1.6**<br>**Spatial Sense: E1.3** | Students consider the different ways they can describe change. They look at repeating and growing patterns and use operations and pattern rules to describe change. They look at multiple-bar graphs showing how trends change over time and draw conclusions.<br><br>They look at place value relationships, describe how the value of a digit changes as it shifts from one column to the next, and use this to develop mental strategies when multiplying and dividing by powers of 10. They extend their place value work with whole numbers to consider decimal tenths.<br><br>They compare data presented in different ways (i.e., as multiple-bar graphs and stem and leaf plots) and describe how the presentation changes even though the amounts stay the same.<br><br>They look at situations involving equivalent rates and describe how the amounts change in relation to each other. And they look at designs involving translations and reflections and describe the spatial changes involved. |

| October | QUESTION: How do these compare? | |
|---|---|---|
| | **Topics and Specific Expectations** | **Connecting the Learning** |
| | **B: Amounts to 10 000, including decimals amounts to tenths**<br>**B1.1** read, represent, compose, and decompose whole numbers up to and including 10 000, using appropriate tools and strategies, and describe various ways they are used in everyday life<br>**B1.2** compare and order whole numbers up to and including 10 000, in various contexts<br>**B: Rounding**<br>**B1.3** round whole numbers to the nearest ten, hundred, or thousand, in various contexts<br>**B: Fractions, decimal tenths, & whole numbers**<br>**B1.4** represent fractions from halves to tenths using drawings, tools, and standard fractional notation, and explain the meanings of the denominator and the numerator<br>**B1.5** use drawings and models to represent, compare, and order fractions representing the individual portions that result from two different fair-share scenarios involving any combination of 2, 3, 4, 5, 6, 8, and 10 sharers<br>**B1.6** count to 10 by halves, thirds, fourths, fifths, sixths, eighths, and tenths, with and without the use of tools<br>**B1.7** read, represent, compare, and order decimal tenths, in various contexts<br>**B1.8** round decimal numbers to the nearest whole number, in various contexts<br>**B: Additive/multiplicative comparisons**<br>**B1.9** describe relationships and show equivalences among fractions and decimal tenths, in various context<br>**D: Types of graphs & data**<br>**D1.1** describe the difference between qualitative and quantitative data, and describe situations where each would be used<br>**D1.2** collect data from different primary and secondary sources to answer questions of interest that involve comparing two or more sets of data, and organize the data in frequency tables and stem-and leaf plots<br>**D1.6** analyse different sets of data presented in various ways, including in stem-and-leaf plots and multiple-bar graphs, by asking and answering questions about the data and drawing conclusions, then make convincing arguments and informed decisions<br>**E: Relationships among SI prefixes**<br>**E2.2** use metric prefixes to describe the relative size of different metric units, and choose appropriate units and tools to measure length, mass, and capacity<br>**E: Measure mass, capacity, & length**<br>**E2.1** explain the relationships between grams and kilograms as metric units of mass, and between litres and millilitres as metric units of capacity, and use benchmarks for these units to estimate mass and capacity<br>**E: Compare angles**<br>**E2.4** identify angles and classify them as right, straight, acute, or obtuse<br>**F: Reasonableness of costs**<br>**F1.5** describe some ways of determining whether something is reasonably priced and therefore a good purchase<br>---<br>**Number: B1.1; B1.2; B1.3; B1.4; B1.5; B1.6; B1.7; B1.8; B1.9**<br>**Data: D1.1; D1.2; D1.6**<br>**Spatial Sense: E2.1; E2.2; E2.4**<br>**Financial Literacy: F1.5** | Students build on their work with change to make comparisons involving numbers, graphs, and measurement. They compare length, mass and capacity of different objects and use units to quantify the comparisons. They compare numerical amounts using addition and subtraction (e.g., this is 200 more) as well as multiplication and division (e.g., this is twice as much). They make additive and multiplicative comparisons when describing amounts to 10 000 and decimal amounts to tenths.<br><br>They compare fractions, decimals, and whole numbers on number lines and round quantities to nearby intervals. They compare prices and decide whether something is reasonably priced.<br><br>They compare metric (SI) units of measurement and use multiplication and division to describe the relationships between them. They compare angles and classify them as acute, obtuse, straight, or right. They come to see that comparisons can be qualitative or quantitative, and that quantitative comparisons can involve addition-subtraction or multiplication-division. |

| November | QUESTION: What's the story? | |
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| | **Topics and Specific Expectations** | **Connecting the Learning** |
| | **D: Identify & use types of data**<br>**D1.1** describe the difference between qualitative and quantitative data, and describe situations where each would be used<br>**D1.4** create an infographic about a data set, representing the data in appropriate ways, including in frequency tables, stem-and-leaf plots, and multiple-bar graphs, and incorporating any other relevant information that helps to tell a story about the data<br>**D2.2** make and test predictions about the likelihood that the mean, median, and mode(s) of a data set will be the same for data collected from different populations<br>**D: Collect, organize, visualize data (frequency tables; stem & leaf; multiple-bar graph)**<br>**D1.2** collect data from different primary and secondary sources to answer questions of interest that involve comparing two or more sets of data, and organize the data in frequency tables and stem-andleaf plots<br>**D: Select type of graph**<br>**D1.3** select from among a variety of graphs, including multiple-bar graphs, the type of graph best suited to represent various sets of data; display the data in the graphs with proper sources, titles, and labels, and appropriate scales; and justify their choice of graphs<br>**B: Compare & describe frequencies**<br>**B1.2** compare and order whole numbers up to and including 10 000, in various contexts<br>**B2.4** represent and solve problems involving the addition and subtraction of whole numbers that add up to no more than 10 000 and of decimal tenths, using appropriate tools and strategies, including algorithms<br>**B2.6** represent and solve problems involving the division of two- or three-digit whole numbers by one-digit whole numbers, expressing any remainder as a fraction when appropriate, using appropriate tools, including arrays<br>**D, B: Mean, median, mode**<br>**D1.5** determine the mean and the median and identify the mode(s), if any, for various data sets involving whole numbers, and explain what each of these measures indicates about the data<br>**D: Tell data story (infographic)**<br>**D1.6** analyse different sets of data presented in various ways, including in stem-and-leaf plots and multiple-bar graphs, by asking and answering questions about the data and drawing conclusions, then make convincing arguments and informed decision<br>**D: Describe likelihood**<br>**D2.1** use mathematical language, including the terms "impossible", "unlikely", "equally likely", "likely", and "certain", to describe the likelihood of events happening, represent this likelihood on a probability line, and use it to make predictions and informed decisions<br>---<br>**Number: B1.2; B2.4; B2.6**<br>**Data: D1.1; D1.2; D1.3; D1.4; D1.5; D1.6; D2.1; D2.2** | Students ask questions and gather information about areas of interest. They gather qualitative and quantitative data, from both primary and secondary sources, and organize the data in a variety of ways. They select appropriate graphs and compare frequencies using additive and (approximate) multiplicative comparisons. They determine the mean, median, and mode for the data they collected and describe what each indicates. They take a point of view as they create an infographic to share their findings. They discuss whether these results would likely be replicated with a different population and, as appropriate, plot this likelihood on a probability line. |

| December | QUESTION: Equal groups: How much is that? | |
|---|---|---|
| | **Topics and Specific Expectations** | **Connecting the Learning** |
| | **B: Count by fractions and decimal tenths**<br>**B1.6** count to 10 by halves, thirds, fourths, fifths, sixths, eighths, and tenths, with and without the use of tools<br>**B1.7** read, represent, compare, and order decimal tenths, in various contexts<br>**B1.9** describe relationships and show equivalences among fractions and decimal tenths, in various contexts<br>**E: Arrays**<br>**E2.5** use the row and column structure of an array to measure the areas of rectangles and to show that the area of any rectangle can be found by multiplying its side lengths<br>**E: Area of rectangles**<br>**E2.6** apply the formula for the area of a rectangle to find the unknown measurement when given two of the three<br>**B: Multiplication as an array**<br>**B2.5** represent and solve problems involving the multiplication of two- or three-digit whole numbers by one-digit whole numbers and by 10, 100, and 1000, using appropriate tools, including arrays<br>**B: Distributive property**<br>**B2.1** use the properties of operations, and the relationships between addition, subtraction, multiplication, and division, to solve problems involving whole numbers, including those requiring more than one operation, and check calculations<br>**B: Division & remainders**<br>**B2.6** represent and solve problems involving the division of two- or three-digit whole numbers by one-digit whole numbers, expressing any remainder as a fraction when appropriate, using appropriate tools, including array<br>**B: Math facts (×/÷)**<br>**B2.2** recall and demonstrate multiplication facts for 1 × 1 to 10 × 10, and related division facts<br>**B: Multiplication as repeated addition of unit fractions**<br>**B2.7** represent the relationship between the repeated addition of a unit fraction and the multiplication of that unit fraction by a whole number, using tools, drawings, and standard fractional notation<br>**C: Solve equations**<br>**C2.1** identify and use symbols as variables in expressions and equations<br>**C2.2** solve equations that involve whole numbers up to 50 in various contexts, and verify solutions<br>**C2.3** solve inequalities that involve addition and subtraction of whole numbers up to 20, and verify and graph the solutions<br>---<br>**Number: B1.6; B1.7; B1.9; B2.1; B2.2; B2.5; B2.6; B2.7**<br>**Algebra: C2.1; C2.2; C2.3**<br>**Spatial Sense: E2.5; E2.6** | Students work with repeated equal groups to understand types of numbers and the operations of multiplication and division. Students count by fractions to understand the meaning of the numerator and denominator. They count by decimal tenths to see their connection to fractions and their relationship to whole numbers.<br>Students determine the area of a rectangle by using the row and column structure of an array to organize the count of units. They connect the repeating equal groups (columns or rows) to multiplication, and use this to determine the formula for the area of a rectangle.<br>Students use the array to model the distributive property which they use to understand and recall multiplication and division facts and the relationship between the two operations. They also use the array and the distributive property to solve multiplication and division problems involving larger numbers, and they use their understanding of fractions when considering how to deal with remainders when dividing. They also recognize that any repeated group, including repeated fractional amounts, can be represented with multiplication. |

| January | QUESTION: How can we describe the space around us? | |
|---|---|---|
| | **Topics and Specific Expectations** | **Connecting the Learning** |
| | **E: Symmetries (translations & reflections)**<br>**E1.3** describe and perform translations and reflections on a grid, and predict the results of these transformations<br>**C: Natural & human-made patterns**<br>**C1.1** identify and describe repeating and growing patterns, including patterns found in real-life contexts<br>**E: Location & movement on Cartesian plane (Q1)**<br>**E1.2** plot and read coordinates in the first quadrant of a Cartesian plane, and describe the translations that move a point from one coordinate to another<br>**E: Measure objects**<br>**E2.1** explain the relationships between grams and kilograms as metric units of mass, and between litres and millilitres as metric units of capacity, and use benchmarks for these units to estimate mass and capacity<br>**E2.2** use metric prefixes to describe the relative size of different metric units, and choose appropriate units and tools to measure length, mass, and capacity<br>**E: Rectangles, squares & non-rectangles**<br>**E1.1** identify geometric properties of rectangles, including the number of right angles, parallel and perpendicular sides, and lines of symmetry<br>**C: Nested relationships**<br>**C3.1** solve problems and create computational representations of mathematical situations by writing and executing code, including code that involves sequential, concurrent, repeating, and nested events<br>**E: Types of angles**<br>**E2.4** identify angles and classify them as right, straight, acute, or obtuse<br>**E, B: Area of rectangles**<br>**E2.5** use the row and column structure of an array to measure the areas of rectangles and to show that the area of any rectangle can be found by multiplying its side lengths<br>**E2.6** apply the formula for the area of a rectangle to find the unknown measurement when given two of the three<br>**B2.1** use the properties of operations, and the relationships between addition, subtraction, multiplication, and division, to solve problems involving whole numbers, including those requiring more than one operation, and check calculations<br>**B2.2** recall and demonstrate multiplication facts for 1 × 1 to 10 × 10, and related division facts<br>**C: Solve equations**<br>**C2.1** identify and use symbols as variables in expressions and equations<br>**C2.2** solve equations that involve whole numbers up to 50 in various contexts, and verify solutions<br>**C: Write & alter code**<br>**C3.1** solve problems and create computational representations of mathematical situations by writing and executing code, including code that involves sequential, concurrent, repeating, and nested events<br>**C3.2** read and alter existing code, including code that involves sequential, concurrent, repeating, and nested events, and describe how changes to the code affect the outcomes<br>---<br>**Number: B2.1; B2.2**<br>**Algebra: C1.1; C2.1; C2.2; C3.1; C3.2**<br>**Spatial Sense: E1.1; E1.2; E1.3; E2.1; E2.2; E2.4; E2.5; E2.6** | Students compare, describe, identify and measure shapes, and objects in space. They identify translations and reflections in natural and human-made patterns. They translate and reflect objects, describe the actions involved, and recognize that these actions leave the object unchanged. They overlay the first quadrant of a Cartesian plane on a space and use coordinates to describe the location of an object and the movement needed to get from one location to another. They generate code, written in different ways, to describe this movement.<br><br>Students choose appropriate tools and metric units to estimate, measure and compare different objects. They use the formula for the area of a rectangle to find a rectangle's area or unknown side lengths, and they represent these situations with multiplication or division.<br><br>Students also recognize the role that rectangles play in constructing the world around them. They describe the properties of rectangles and use nested diagrams to describe relationships between rectangles, squares and non-rectangles. |

| February | QUESTION: When is addition and subtraction useful? | |
|---|---|---|
| | **Topics and Specific Expectations** | **Connecting the Learning** |
| | **B: Represent change, combine, compare situations; add & subtract whole numbers & decimal tenths**<br>**B2.3** use mental math strategies to multiply whole numbers by 10, 100, and 1000, divide whole numbers by 10, and add and subtract decimal tenths, and explain the strategies used<br>**B2.4** represent and solve problems involving the addition and subtraction of whole numbers that add up to no more than 10 000 and of decimal tenths, using appropriate tools and strategies, including algorithms<br>**F: Calculate costs & change**<br>**F1.2** estimate and calculate the cost of transactions involving multiple items priced in whole-dollar amounts, not including sales tax, and the amount of change needed when payment is made in cash, using mental math<br>**C: Write & solve equations**<br>**C2.1** identify and use symbols as variables in expressions and equations<br>**C2.2** solve equations that involve whole numbers up to 50 in various contexts, and verify solutions<br>**C: Code (including nested)**<br>**C3.1** solve problems and create computational representations of mathematical situations by writing and executing code, including code that involves sequential, concurrent, repeating, and nested events<br>**C3.2** read and alter existing code, including code that involves sequential, concurrent, repeating, and nested events, and describe how changes to the code affect the outcomes<br>**E: Elapsed time & timelines**<br>**E2.3** solve problems involving elapsed time by applying the relationships between different units of time<br>**E: Translations on Cartesian plane (Q1)**<br>**E1.2** plot and read coordinates in the first quadrant of a Cartesian plane, and describe the translations that move a point from one coordinate to another<br>---<br>**Number: B2.3; B2.4**<br>**Algebra: C2.1; C2.2; C3.1; c3.2**<br>**Spatial Sense: E1.2; E2.3**<br>**Financial Literacy: F1.2** | Students represent and solve addition and subtraction problems where amounts are joined, separated, combined, and compared. They add and subtract whole numbers to 10 000 as well as numbers involving decimal tenths, and they use mental strategies and algorithms to solve these equations. They use addition or subtraction to calculate total costs and to determine the correct change when amounts are paid for in cash. They use addition when writing code, for example, to describe perimeter as the combined side lengths of a rectangle. They use timelines to track elapsed time, and then use addition to combine the times or subtraction to find the difference. They also notice that they can use addition and subtraction to determine distances when one point is translated to another point. |

| March | QUESTION: How can we keep things in balance? | |
|---|---|---|
| | **Topics and Specific Expectations** | **Connecting the Learning** |
| | **B: Relationships between operations**<br>**B2.1** use the properties of operations, and the relationships between addition, subtraction, multiplication, and division, to solve problems involving whole numbers, including those requiring more than one operation, and check calculations<br>**F: Concepts of spending, saving, investing & donating**<br>**F1.1** identify various methods of payment that can be used to purchase goods and services<br>**F1.3** explain the concepts of spending, saving, earning, investing, and donating, and identify key factors to consider when making basic decisions related to each<br>**F1.4** explain the relationship between spending and saving, and describe how spending and saving behaviours may differ from one person to another<br>**C: Represent (translate) equivalent representations**<br>**C1.1** identify and describe repeating and growing patterns, including patterns found in real-life contexts<br>**C1.2** create and translate repeating and growing patterns using various representations, including tables of values and graphs<br>**C1.3** determine pattern rules and use them to extend patterns, make and justify predictions, and identify missing elements in repeating and growing patterns<br>**C3.1** solve problems and create computational representations of mathematical situations by writing and executing code, including code that involves sequential, concurrent, repeating, and nested events<br>**C3.2** read and alter existing code, including code that involves sequential, concurrent, repeating, and nested events, and describe how changes to the code affect the outcomes<br>**C: Equations & variables**<br>**C2.1** identify and use symbols as variables in expressions and equations<br>**C2.2** solve equations that involve whole numbers up to 50 in various contexts, and verify solutions<br>**D: Mean vs median vs mode**<br>**D1.5** determine the mean and the median and identify the mode(s), if any, for various data sets involving whole numbers, and explain what each of these measures indicates about the data<br>---<br>**Number: B2.1**<br>**Algebra: C1.1; C1.2; C1.3; C2.1; C2.2; C3.1; C3.2**<br>**Data: D1.5**<br>**Financial Literacy: F1.1; F1.3; F1.4** | Students describe ways to keep things in balance and equal. They create equivalent expressions using different operations and use these expressions to describe the relationship between the operations. They use variables to generalize these relationships and properties. They consider the concepts of spending, saving, investing and donating, and identify key factors when making decisions and keeping amounts balanced.<br><br>They represent patterns in different ways and explain how the two patterns are equal. They create equivalent codes and show how nested and repeated codes can produce the same output. They also consider how mean and median describe different ways to balance data (mean as the spreading of data across the population and median as the halfway point of the data), in contrast with mode that describes the most frequent value. |

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| April | QUESTION: Scaling and splitting: How much now? | |
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| | **Topics and Specific Expectations** | **Connecting the Learning** |
| | **B: Decimals as splitting**<br>**B1.7** read, represent, compare, and order decimal tenths, in various contexts<br>**B1.8** round decimal numbers to the nearest whole number, in various contexts<br>**B1.9** describe relationships and show equivalences among fractions and decimal tenths, in various contexts<br>**B: Fractions as part-whole, division, & ratios; meaning of numerator & denominator**<br>**B1.4** represent fractions from halves to tenths using drawings, tools, and standard fractional notation, and explain the meanings of the denominator and the numerator<br>**B: Repeated addition of unit fraction and multiplication**<br>B1.6 count to 10 by halves, thirds, fourths, fifths, sixths, eighths, and tenths, with and without the use of tools<br>**B2.2** recall and demonstrate multiplication facts for 1 × 1 to 10 × 10, and related division facts<br>**B2.7** represent the relationship between the repeated addition of a unit fraction and the multiplication of that unit fraction by a whole number, using tools, drawings, and standard fractional notation<br>**E, D: Reading scales on grids, graphs & measurement tools**<br>**E2.2** use metric prefixes to describe the relative size of different metric units, and choose appropriate units and tools to measure length, mass, and capacity<br>**D1.3** select from among a variety of graphs, including multiple-bar graphs, the type of graph best suited to represent various sets of data; display the data in the graphs with proper sources, titles, and labels, and appropriate scales; and justify their choice of graphs<br>**B: Compare two sharing situations**<br>**B1.5** use drawings and models to represent, compare, and order fractions representing the individual portions that result from two different fair-share scenarios involving any combination of 2, 3, 4, 5, 6, 8, and 10 sharers<br>**B: Scale rates up & down**<br>**B2.8** show simple multiplicative relationships involving whole number rates, using various tools and drawings<br>---<br>**Number: B1.4; B1.5; B1.6; B1.7; B1.8; B1.9; B2.2; B2.7; B2.8**<br>**Data: D1.3**<br>**Spatial Sense: E2.2** | Students represent situations that involve scaling and splitting. They split a number line to show tenths and use this to describe the meaning of the denominator. They scale up to show the meaning of the numerator. They relate the splitting to division and the scaling to multiplication and use the number line to describe how fractions and decimals are related.<br><br>They read scales on grids, graphs, and measurement instruments and identify the amount of each partition. They compare two equal sharing situations, each having different amounts and different numbers of people, and determine which situation produces the greater portion size. In doing so, they compare fractions and ratios, and encounter another type of multiplication and division situation.<br><br>They scale rates up and down, and describe the constant multiplicative relationships that exist between the units and among equivalent ratios. They use these experiences to identify how multiplication and division can be used to scale and split amounts. |

| May | QUESTION: How can we make predictions and decide? | |
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| | **D: Probability line**<br>**D2.1** use mathematical language, including the terms "impossible", "unlikely", "equally likely", "likely", and "certain", to describe the likelihood of events happening, represent this likelihood on a probability line, and use it to make predictions and informed decisions<br>**D2.2** make and test predictions about the likelihood that the mean, median, and mode(s) of a data set will be the same for data collected from different population<br>**C: Represent repeating & growing patterns as rules & graphs; extend, predict & justify**<br>**C1.1** identify and describe repeating elements and operations in a variety of patterns, including patterns found in real-life contexts<br>**C1.2** create and translate patterns that have repeating elements, movements, or operations using various representations, including shapes, numbers, and tables of values<br>**C1.3** determine pattern rules and use them to extend patterns, make and justify predictions, and identify missing elements in patterns that have repeating elements, movements, or operations<br>**C1.4** create and describe patterns to illustrate relationships among whole numbers up to 1000<br>**D: Visualize & analyze data**<br>**D1.6** analyse different sets of data presented in various ways, including in stem-and-leaf plots and multiple-bar graphs, by asking and answering questions about the data and drawing conclusions, then make convincing arguments and informed decisions<br>**D, B: Mean, median, mode**<br>**D1.5** determine the mean and the median and identify the mode(s), if any, for various data sets involving whole numbers, and explain what each of these measures indicates about the data<br>**B2.4** represent and solve problems involving the addition and subtraction of whole numbers that add up to no more than 10 000 and of decimal tenths, using appropriate tools and strategies, including algorithms<br>**B2.6** represent and solve problems involving the division of two- or three-digit whole numbers by one-digit whole numbers, expressing any remainder as a fraction when appropriate, using appropriate tools, including arrays<br>**F: Financial management**<br>**F1.3** explain the concepts of spending, saving, earning, investing, and donating, and identify key factors to consider when making basic decisions related to each<br>**F1.4** explain the relationship between spending and saving, and describe how spending and saving behaviours may differ from one person to another<br>**F1.5** describe some ways of determining whether something is reasonably priced and therefore a good purchase<br>---<br>**Number: B2.4; B2.6**<br>**Algebra: C1.1; C1.2; C1.3; C1.4**<br>**Data: D1.5; D1.6; D2.1; D2.2**<br>**Financial Literacy: F1.3; F1.4; F1.5** | Students use patterns and trends in data to inform decisions and make predictions. They use a probability line, and the language of likelihood to describe levels of certainty. They examine growing and repeating patterns represented concretely, as rules, and as graphs, and they use these to justify their predictions about future trends.<br><br>They look at data presented in different ways, and they predict and test the likelihood that the mean, median, and mode of that data set will be similar to data collected from another population.<br><br>They analyze different financial scenarios and consider factors needed to make decisions about spending and saving. They make decisions about whether something is reasonably priced and describe their rationale. |

| June | QUESTION: Is this statement true? | |
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| | **Topics and Specific Expectations** | **Connecting the Learning** |
| | **C: Equivalent expressions**<br>**C2.1** identify and use symbols as variables in expressions and equations<br>**C, B: Solve equations**<br>**C2.2** solve equations that involve whole numbers up to 50 in various contexts, and verify solutions<br>**C: Solve & graph inequalities**<br>**C2.3** solve inequalities that involve addition and subtraction of whole numbers up to 20, and verify and graph the solutions<br>**C: Write, execute, & alter codes**<br>**C3.1** solve problems and create computational representations of mathematical situations by writing and executing code, including code that involves sequential, concurrent, repeating, and nested events<br>**C3.2** read and alter existing code, including code that involves sequential, concurrent, repeating, and nested events, and describe how changes to the code affect the outcomes<br>**B: Number properties**<br>**B2.1** use the properties of operations, and the relationships between addition, subtraction, multiplication, and division, to solve problems involving whole numbers, including those requiring more than one operation, and check calculations<br>---<br>**Number: B2.1**<br>**Algebra: C2.1; C2.2; C2.3; C3.1; C3.2** | Students analyze a variety of situations to decide whether they are true. They compare expressions, written using different operations and quantities, and demonstrate why they are or are not equivalent. They solve equations and verify their solutions. They solve and graph inequalities as they explain under what conditions the inequality is true or false. They write, execute and alter different codes and predict which ones produce the desired result. |