

# Revised Mathematics Curriculum 2005

## Interim Adaptations for Grades 1 - 6

## Preamble

These Interim Adaptations have been created to assist teachers of Grades 1 to 6 with the implementation of The Ontario Curriculum Grades 1-8: Mathematics 2005 (Revised). The adaptations are organized identically indicating, the Subheadings and/or Big Ideas for each strand, the Process Expectations, What's Changed, a Gap Analysis, and an overall Strand Analysis. These adaptations were generated from the Mathematics Curriculum - Comparison Charts. These charts identify the exact and types of changes made in the curriculum revisions.

The Subheadings and/or Big Ideas reflect the organization of the strands. Each strand has a set of overall expectations followed by the specific expectations. It is these specific expectations that are clustered around a Subheading. Subheadings stand by themselves but in some cases these may also represent a Big Idea, as outlined in the series of *Guides for Effective Instruction* that have been, and continue to be, published by the Ministry of Education.

A number of expectations, both overall and specific from the 1997 Mathematics Curriculum have been revised and incorporated into the seven Mathematical Process Expectations for that grade. These have been identified and the process expectation stated.

In the What's Changed section, changes, specific revisions, deletions, and important expectation movements are identified. While many expectations have been rewritten for clarification, others have been revised and combined. Where the revision is sufficiently different from the original, it has been noted, as have other changes that users of the curriculum document need to know. All Specific Expectations from the 1997 curriculum that have been deleted have been identified. Expectations that have been moved to another strand or grade have also been listed.

A general Gap Analysis has been included to identify those expectations from the previous grade that students in the 2005-2006 school year may need to have exposure to as they now form part of the expectations of the previous grade. Students may not have the prerequisite skills and knowledge for the expectations of the current grade. Providing the necessary experiences will in all likelihood be required. Once students have had the exposure to the grade's new expectations in 2005-2006, the intention is that students will have the necessary learnings and no further modifications will be required.

In addition to the highlights of student learning found at the beginning of each grade's expectations, the Strand Analysis offers a brief outline as to the emphasis of the learning that will be occurring within that strand.

## Grade 1 Number Sense and Numeration Revision Highlights

### Subheading/Big Ideas

- Quantity, Counting, Operational Sense

### Process Expectations

- one expectation has been revised and incorporated into the seven Mathematical Process Expectations, i.e., reflecting
- throughout the strand students engage in Problem Solving, Reasoning and Proving, Reflecting, Selecting Tools and Computational Strategies, Connecting and Representing

### What's Changed

*The revised expectations to this strand in this grade have resulted in the following changes so that students will be*

- counting backwards from 20 (formerly from 10) by 1's, 2's and 5's using a variety of tools
- reading and printing in words and meaningful contexts, whole numbers to ten
- representing money amounts to 20 cents (formerly 10 cents)
- identifying and describing various coins (i.e., penny, nickel, dime, quarter, \$1 coin, \$2 coin) and stating their values (formerly 1, 5 and 10 cents)
- relating numbers to anchors of 5 and 10
- using ordinal numbers to thirty-first in meaningful contexts (formerly to 10<sup>th</sup>)
- identifying and describing equal-sized parts of the whole, using fractional names (e.g., halves, fourths or quarters)
- **deleted**: understanding order by sequencing events
- **deleted**: using a calculator to explore counting and solve problems
- **deleted**: using a seriation line to display relationships of order
- **deleted**: modelling numbers grouped in 10's and 1's and use zero as a place holder
- **deleted**: representing addition and subtraction sentences using concrete materials
- **moved**: identifying the effect of zero in addition and subtraction (Grade 2 Patterning and Algebra)
- **moved**: money expectations from Measurement strand

### Strand Analysis

*The revised expectations embody a greater emphasis on*

- solving problems using a variety of mental strategies
- representing numbers using a variety of tools and contexts
- composing and decomposing numbers up to 20 in a variety of ways
- identifying and describing coins and money amounts (20 cents)
- dividing objects into equal-sized parts and using fractional names

## Grade 1 Measurement Revision Highlights

### Subheadings/Big Ideas:

- Attributes, Units, and Measurement Sense, Measurement Relationships

### Process Expectations:

- two expectations have been revised and incorporated into the seven Mathematical Process Expectations, i.e., communicating
- throughout the strand students engage in Problem Solving, Reasoning and Proving, Reflecting, Selecting Tools and Computational Strategies, Connecting and Representing

### What's Changed

*The revised expectations to this strand in this grade have resulted in the following changes so that students will be*

- using a metre as a benchmark for measuring length, comparing it with non-standard units
- naming the months of the year in order and reading the date on a calendar
- reading and writing digital and analogue clocks to the hour and half-hour, using them to identify them to benchmark times
- comparing and ordering objects by their linear measurements, using the same non-standard unit
- comparing and describing two and three objects using measurable attributes
- **deleted**: comparing the areas of shapes using non-standard units
- **deleted**: ordering sequences of events orally and with pictures
- **deleted**: understanding the passage of time by comparing durations
- **deleted**: using non-standard units to solve oral measurement problems
- **moved**: money expectations to Number Sense and Numeration strand

### Strand Analysis

*The revised expectations embody a greater emphasis on*

- comparing objects according to measurable attributes
- measuring with a variety of strategies and tools
- establishing benchmarks within measures (i.e., metre and time)

## Grade 1 Geometry Revision Highlights

### Subheading/Big Ideas

- Geometric Properties, Geometric Relationships, Location and Movement

### Process Expectations

- throughout the strand students engage in Problem Solving, Reasoning and Proving, Reflecting, Selecting Tools and Computational Strategies, Connecting and Representing

### What's Changed

*The revised expectations to this strand in this grade have resulted in the following changes so that students will be*

- tracing concrete models and identifying the two-dimensional faces of three-dimensional figures
- locating shapes in the environment that have symmetry and describing it
- composing patterns, pictures and designs using common two-dimensional shapes
- describing relative locations of objects on concrete maps
- identifying shapes within other shapes
- covering outline puzzles with two-dimensional shapes
- **deleted**: comparing the size and shape of two-dimensional shapes
- **deleted**: following directions to move or place an object in relation to another

### Strand Analysis

*The revised expectations embody a greater emphasis on*

- composing and decomposing two-dimensional shapes and three-dimensional figures
- exploring two-dimensional shapes through investigative activities i.e. puzzles, pictures and patterns
- describing relative location using concrete maps

## Grade 1 Patterning and Algebra Revision Highlights

### Subheadings/Big Ideas

- Patterns and Relationships, Expressions and Equality

### Process Expectations

- throughout the strand students engage in Problem Solving, Reasoning and Proving, Reflecting, Selecting Tools and Computational Strategies, Connecting and Representing

### What's Changed

*The revised expectations to this strand in this grade have resulted in the following changes so that students will be*

- creating a set that is greater than, less than, or equal to the number in another set
- demonstrating equality through a 'balance' model for whole numbers to 10, using addition and subtraction
- identifying, describing and extending geometric repeating patterns involving one attribute
- **deleted**: comparing patterns
- **deleted**: using a calculator and computer application to explore patterns
- **deleted**: recognizing similarities and differences in a variety of attributes

### Strand Analysis

*The revised expectations embody a greater emphasis on*

- developing a sense of equality through quantity (greater than, less than, or equal to) and operational sense to 10
- describing numeric and geometric repeating patterns

## **Grade 1 Data Management and Probability Revision Highlights**

### **Subheadings/Big Ideas**

- Collecting and Organizing Data, Data Relationships, Probability

### **Process Expectations**

- throughout the strand students engage in Problem Solving, Reasoning and Proving, Reflecting, Selecting Tools and Computational Strategies, Connecting and Representing

### **What's Changed**

*The revised expectations to this strand in this grade have resulted in the following changes so that students will be*

- many expectations have been combined to produce fewer but more robust expectations
- collecting and organizing primary data, using concrete graphs and pictographs and a variety of recording methods

### **Strand Analysis**

*The revised expectations embody a greater emphasis on*

- collecting and organizing data that is categorically based on qualities (i.e., colour, hobby)

## Grade 2 Number Sense and Numeration Revision Highlights

### Subheadings/Big Ideas:

- Quantity Relationships, Counting, Operational Sense

### Process Expectations:

- three expectations have been revised and incorporated into the seven Mathematical Process Expectations, i.e., problem solving, communicating and selecting tools and computational strategies
- throughout the strand students engage in Problem Solving, Reasoning and Proving, Reflecting, Selecting Tools and Computational Strategies, Connecting and Representing

### What's Changed:

*The revised expectations to this strand in this grade have resulted in the following changes so that students will be*

- counting forward to 200 using multiples of 1, 2, 5, 10, and 25 using multiples of 1,2,5 and 10 as starting points
- counting backward from 50 (formerly 20) by 1's and by 10's from 100 using any number less than 100 as a starting point
- comparing proper fractions without standard fractional notation i.e., concrete materials
- understanding the relationship between the number of fractional parts and the size of the fractional parts
- describing the relationship between quantities by using whole-number operations i.e., addition and subtraction
- regrouping fractional parts into wholes using concrete materials
- **deleted**: using a calculator for skip counting
- **deleted**: discussing number arrangements in the community
- **deleted**: use of ordinal numbers
- **moved**: money expectations to Number Sense and Numeration
- **moved**: investigating the properties of whole numbers i.e.  $3 + 2 = 2 + 3$  and the patterns in skip counting to the Patterning and Algebra strand

### Gap Analysis:

*The revised expectations in this grade may require that students have more experience*

- counting using hundreds charts, number lines, number carpets beyond 100
- counting backwards from larger numbers
- counting ordinal numbers to 31<sup>st</sup>

### Strand Analysis:

*The revised expectations embody a greater emphasis on*

- solving problems using a variety of mental strategies;
- describing number quantities in a variety of ways i.e. using money, concrete materials and through inverse operations - addition and subtraction

- understanding the relationship between the number of fractional parts and their size

## Grade 2 Measurement Revision Highlights

### Subheadings/Big Ideas:

- Attributes, Units, and Measurement Sense, Measurement Relationships

### Process Expectations:

- two expectations have been revised and incorporated into the seven Mathematical Process Expectations i.e., problem solving and communicating
- throughout the strand students engage in Problem Solving, Reasoning and Proving, Reflecting, Selecting Tools and Computational Strategies, Connecting and Representing

### What's Changed:

*The revised expectations to this strand in this grade have resulted in the following changes so that students will be*

- using benchmarks as referents for centimetre and metre
- comparing and ordering a collection of objects by mass and/or capacity using standard units
- constructing tools for measuring time intervals in non-standard units
- describing the relationship between the size of a unit of area and the number of units needed to cover a surface
- **deleted**: demonstrating the measure of an object through the measure of another object
- **deleted**: estimating and measuring the passage of time using minutes and hours
- **moved**: naming the months of the year in order and reading the date
- **moved**: money expectations to the Number Sense and Numeration strand

### Gap Analysis:

*The revised expectations in this grade may require that students have more experience*

- naming the months of the year in order and reading the date on a calendar
- understanding of arrays as an organizer for the measurement of area i.e. use of grid paper

### Strand Analysis:

*The revised expectations embody a greater emphasis on*

- justifying the choice of a standard unit of measure
- exploring a variety of non-standard units with mass, capacity and time
- using specific attributes of measure i.e. length, height and distance

## Grade 2 Geometry Revision Highlights

### Subheadings/Big Ideas:

- Geometric Properties, Geometric Relationships, Location and Movement

### Process Expectations:

- One expectation has been revised and incorporated into the seven Mathematical Process Expectations i.e. communicating
- throughout the strand students engage in Problem Solving, Reasoning and Proving, Reflecting, Selecting Tools and Computational Strategies, Connecting and Representing

### What's Changed:

*The revised expectations to this strand in this grade have resulted in the following changes so that students will be*

- creating and describing symmetrical designs using a variety of tools
- drawing simple maps and describing relative locations of objects on the map
- **deleted**: demonstrating transformations such as flips, slides and turns
- **deleted**: identify and perform translations of simple figures using concrete materials

### Gap Analysis:

*The revised expectations in this grade may require that students have more experience*

- covering outline puzzles in 2-dimensional shapes
- exploring symmetry in their environment
- describing the geometric properties in pictures, structures, designs and patterns

### Strand Analysis:

*The revised expectations embody a greater emphasis on*

- understanding, describing and using the geometric properties of 2- and 3-dimensional figures for various functions i.e. sorting and classifying
- composing and decomposing 2-dimensional shapes and 3-dimensional figures
- distinguishing between geometric attributes and geometric properties

## Grade 2 Patterning and Algebra Revision Highlights

### Subheadings/Big Ideas

- Patterns and Relationships, Expressions and Equality

### Process Expectations

- throughout the strand students engage in Problem Solving, Reasoning and Proving, Reflecting, Selecting Tools and Computational Strategies, Connecting and Representing

### What's Changed

*The revised expectations to this strand in this grade have resulted in the following changes so that students will be*

- creating growing or shrinking patterns in a variety of ways
- identifying and describing through investigation growing patterns and shrinking patterns generated by the repeated addition or subtraction of 1's, 2's, 5's, 10's and 25's on a number line and on a hundreds chart
- representing with concrete materials and pictures two number expressions that are equal i.e.,  $9 + 6 = 10 + 5$
- demonstrating the concept of equality by partitioning whole numbers to 18 in a variety of ways
- determining the missing number in addition and subtraction equations to 18
- identifying the commutative property as a means to facilitate computation of whole numbers i.e.,  $9 + 8 + 1 = 9 + 1 + 8$ ;  $10 + 8 = 18$
- **moved**: identifying the properties of zero in addition and subtraction from Grade 1
- **deleted**: explaining a pattern rule
- **deleted**: given a rule expressed informally, extend a pattern
- **deleted**: using a calculator and a computer application to explore patterns (embedded in other expectations as a tool)

### Gap Analysis

*The revised expectations in this grade may require that students have more experience*

- representing equations with concrete materials

### Strand Analysis

*The revised expectations embody a greater emphasis on*

- understanding balanced equations and number equality
- exploring patterns through a variety of ways i.e., through money, music, hundreds charts, pictures, actions etc.,

## Grade 2 Data Management and Probability Revision Highlights

### Subheadings/Big Ideas

- Collecting and Organizing Data, Data Relationships, Probability

### Process Expectations

- throughout the strand students engage in Problem Solving, Reasoning and Proving, Reflecting, Selecting Tools and Computational Strategies, Connecting and Representing.

### What's Changed

*The revised expectations to this strand in this grade have resulted in the following changes so that students will be*

- distinguishing between numbers that represent data values and numbers that represent frequency
- demonstrating understanding of data by comparing different parts of the data and making statements about the comparison
- collecting and organizing discrete primary data, using pictographs, line plots and simple bar graphs and tally charts
- **deleted:** identifying attributes and rules in pre-sorted sets

### Gap Analysis

*The revised expectations in this grade may require that students have more experience*

- reading data, presented in a variety of formats
- discussing and comparing data for information
- using concrete graphs and pictographs

### Strand Analysis

*The revised expectations embody a greater emphasis on*

- describing the data using mathematical language
- drawing conclusions about data through comparisons

## Grade 3 Number Sense and Numeration Revision Highlights

### Subheadings/Big Ideas:

- Counting, Quantity and Operational Sense

### Process Expectations:

- Five expectations have been revised and incorporated into the seven Mathematical Process Expectations i.e. problem solving, selecting tools and computational strategies
- throughout the strand students engage in Problem Solving, Reasoning and Proving, Reflecting, Selecting Tools and Computational Strategies, Connecting and Representing

### What's Changed:

*The revised expectations to this strand in this grade have resulted in the following changes so that students will be*

- rounding two-digit numbers to the nearest ten;
- representing, comparing and ordering whole numbers to 1000 using a variety of tools
- representing and explaining the relationship among the numbers 1, 10, 100, and 1000
- composing and decomposing three-digit numbers in a variety of ways, using concrete materials
- representing and describing the relationships between coins and bills up to \$10 (formerly \$100)
- counting forward to 1000 and backwards from 100 with a variety of strategies and tools
- relating multiplication and division to real-life situations
- reading and printing in words whole numbers to one hundred, using meaningful contexts
- **deleted:** standard fractional notation is no longer expected
- **deleted:** use of ordinal numbers
- **moved:** money expectations to Number Sense Numeration strand
- **moved:** number relationships addressing patterns to the Patterning and Algebra strand

### Gap Analysis:

*The revised expectations in this grade may require that students have more experience*

- representing numbers using a variety of tools i.e. number lines with increments of 100 or other appropriate amounts

### Strand Analysis:

*The revised expectations embody a greater emphasis on*

- estimating i.e. rounding;
- representing numbers, using a variety of tools and strategies;

- developing strategies through investigation i.e., student-generated algorithms,
- real-life situations and standard algorithms;
- adding and subtracting with mental strategies;
- decomposing and composing numbers, in a variety of ways;
- explaining relationships i.e., use of 1,10,100 and 1000 within a context.

## Grade 3 Measurement Revision Highlights

### Subheadings/Big Ideas:

- Attributes, Units and Measurement Sense and Measurement Relationships

### Process Expectations:

- throughout the strand students engage in Problem Solving, Reasoning and Proving, Reflecting, Selecting Tools and Computational Strategies, Connecting and Representing

### What's Changed:

*The revised expectations to this strand in this grade have resulted in the following changes so that students will be*

- using benchmarks for temperature i.e., freezing, cold, warm and hot
- choosing benchmarks for kilogram and litre to help perform measurement tasks
- justifying the most appropriate standard unit to measure length
- solving problems involving the relationship between minutes and hours, hours and days,
- days and years, and weeks and years, using a variety of tools
- comparing and ordering a collection of objects, using standards unit of mass (i.e., kilogram) and/or capacity (i.e., litre)
- recording positive temperatures to the nearest degree Celsius
- comparing and ordering various shapes by area, using arrays and congruent shapes
- describing the relationship between the size of a unit of area and the number needed to cover a surface
- estimating the perimeter of two-dimensional shapes using standard units
- drawing items using a ruler, given specific lengths in centimetres
- estimating, measuring and recording the capacity of containers using the standard unit the litre or parts of a litre
- **deleted:** estimating the passage of time in five-minute intervals and in days, weeks, months, and years
- **moved:** money expectations to Number Sense and Numeration strand

### Gap Analysis:

*The revised expectations in this grade may require that students have more experience*

- using referents when estimating i.e., a paperclip has a mass of about 1 gram
- understanding of arrays as an organizer for the measurement of area i.e. use of grid paper
- using a wide-range of objects that represent the standard units of measure

**Strand Analysis:**

*The revised expectations embody a greater emphasis on*

- estimating through the use of benchmarks;
- justifying use of standard units;
- demonstrating understanding with a using a variety of tools;
- explaining relationships i.e., minutes to hours, hours to days.

## Grade 3 Geometry Revision Highlights

### Subheadings/Big Ideas:

- Geometric Properties, Geometric Relationships, Location and Movement

### Process Expectations:

- two expectations have been revised and incorporated into the seven Mathematical Process Expectations i.e., communication
- throughout the strand students engage in Problem Solving, Reasoning and Proving, Reflecting, Selecting Tools and Computational Strategies, Connecting and Representing

### What's Changed:

*The revised expectations to this strand in this grade have resulted in the following changes so that students will be*

- identifying right-angles and describing given angles relative to the size of a right-angle
- using materials as a reference tool for identifying right-angles
- comparing various angles using concrete materials and pictorial representations and describing angles as bigger than, smaller than, or about the same as other angles
- explaining relationships between different types of quadrilaterals
- solving problems requiring the greatest or least number of two-dimensional shapes
- describing designs and pictures that have a vertical, horizontal or diagonal line of symmetry
- identifying and describing the two-dimensional shapes that can be found in 3-dimensional figures
- identifying flips slides and turns, through investigation, using concrete materials and physical motion, and flips, slides, and turns as reflections, translations, and rotations
- **deleted:** sketching pictures of three-dimensional models

### Gap Analysis:

*The revised expectations in this grade may require that students have more experience*

- recognizing and referring to angles within two-dimensional shapes
- categorizing geometric properties i.e., number of sides, number of parallel sides, side lengths
- identifying categorized geometric shapes i.e., quadrilaterals, polygons, triangles, parallelograms

### Strand Notes:

*The revised expectations embody a greater emphasis on*

- identifying, comparing, describing and sorting with geometric properties;
- composing and decomposing of two-dimensional shapes;

- explaining the relationship between and among two- and three-dimensional shapes;
- identifying through investigation flips, slides and turns;
- demonstrating an understanding of symmetry through all orientations i.e., vertically, horizontally and diagonally.

## Grade 3 Patterning and Algebra Revision Highlights

### Subheadings/Big Ideas:

- Patterns and Relationships, Expression and Equality,

### Process Expectations:

- throughout the strand students engage in Problem Solving, Reasoning and Proving, Reflecting, Selecting Tools and Computational Strategies, Connecting and Representing

### What's Changed:

*The revised expectations to this strand in this grade have resulted in the following changes so that students will be*

- representing geometric patterns from a number sequence, number line or bar graph i.e., 4, 7, 10, ..., representing the number of sides of geometric figures
- determining missing numbers in balanced equations i.e.,  $25 - 4 = 15 + \underline{\quad}$ , with concrete materials, calculators and guess and check
- identifying the properties of zero and one in multiplication through investigation with concrete materials
- understanding the use of the associative property when computing whole numbers i.e.,  $17 + 16 = 17 + 3 + 13$ , which equals  $20 + 13 = 33$ .
- determining the inverse relationship between addition and subtraction through investigation
- identifying and describing number patterns involving addition, subtraction, and multiplication on a number line, calendar and hundreds chart
- **deleted:** using environmental data to create models of patterns
- **deleted:** using a calculator and computer application to explore patterns (this is now embedded and is a Mathematical Process Expectation)

### Gap Analysis:

*The revised expectations in this grade may require that students have more experience*

- working with balanced equations i.e., understanding what the equal sign represents when placed between 2 equations.
- representing equations with concrete materials
- using arrays when working with multiplication
- identifying the commutative property as a means to facilitate computation

### Strand Analysis:

*The revised expectations embody a greater emphasis on*

- understanding the equality between pairs of expressions;
- understanding the inverse relationship between operations i.e., addition and subtraction, since  $4 + 5 = 9$ , then  $9 - 5 = 4$ ;

- identifying number patterns represented on number lines and hundred's charts;
- using strategies to facilitate computation of whole numbers i.e., associative property, guess and check.

## Grade 3 Data Management Revision Highlights

### Subheadings/Big Ideas:

- Collecting and Organizing Data, Data Relationship, Probability

### Process Expectations:

- one expectation has been revised and incorporated into the seven Mathematical Process Expectations i.e., communication
- throughout the strand students engage in Problem Solving, Reasoning and Proving, Reflecting, Selecting Tools and Computational Strategies, Connecting and Representing

### What's Changed:

*The revised expectations to this strand in this grade have resulted in the following changes so that students will be*

- understanding mode and identifying it in a set of data
- predicting the frequency of an outcome, and comparing results with the prediction using mathematical language
- demonstrating an understanding of fairness as it relates to the occurrence of equally likely outcomes
- describing data using comparative language and describing the shape of the data
- collecting and organizing categorical or discrete primary data and presenting it in a variety of configurations i.e., vertical or horizontal bar graphs, many-to-one correspondence
- **deleted:** predicting the probability that an event will occur

### Gap Analysis:

*The revised expectations in this grade may require that students have more experience*

- interpreting and presenting data with different representations i.e., vertical or horizontal bar graphs

### Strand Analysis:

*The revised expectations embody a greater emphasis on*

- collecting data that is personally relevant to school/community issues or from the content of another subject;
- organizing categorical or discrete data in a variety of ways (charts, tables, and graphs) and presenting it in a variety of configurations i.e., vertical or horizontal bar graphs, many-to-one correspondence;
- describing the data through comparative means;
- predicting the frequency of an outcome in simple probability experiments or games;
- understanding fairness (equally likely outcomes), as it applies in a game situation.

## Grade 4 Number Sense and Numeration Revision Highlights

### Subheadings/Big Ideas:

- Quantity Relationships, Counting, Operational Sense, Proportional Relationships

### Process Expectations:

- five expectations have been revised and incorporated into the seven Mathematical Process Expectations i.e. problem solving, communicating and selecting tools and computational strategies
- throughout the strand students engage in Problem Solving, Reasoning and Proving, Reflecting, Selecting Tools and Computational Strategies, Connecting and Representing

### What's Changed:

*The revised expectations to this strand in this grade have resulted in the following changes so that students will be*

- introduction of Proportional Relationships as a big idea/subheading
- eight overall expectations have been reduced to four.
- counting forward and backwards by 0.1
- counting forward by fractional amounts (halves, thirds, quarters and tenths) beyond one whole
- reading and printing in words whole numbers to 1000, using meaningful contexts
- demonstrating and explaining the relationship between equivalent fractions
- understanding of fractions centres only on proper fractions
- comparing fractions to benchmarks of 0,  $\frac{1}{2}$ , and 1
- demonstrating and explaining the relationship between equivalent fractions
- rounding four-digit whole numbers to the nearest ten, hundred, and thousand
- using estimation when solving addition, subtraction and multiplication of whole numbers
- multiplying two-digit whole numbers by one-digit whole number (formerly three-digit by one-digit number) using a variety of tools and strategies
- dividing two-digit whole numbers by one-digit whole number (formerly three-digit by one-digit number) using a variety of tools and strategies
- demonstrating and explaining simple multiplicative relationships given a unit rate
- reading and representing money amounts to \$100 (formerly \$50)
- **moved** from the Measurement strand: all references to money
- **moved** to the Patterning and Algebra strand: relating division to multiplication
- **deleted:** counting by 3's, 4's, 6's, 7's, 8's, 9's and 10's to 100

- **deleted:** representing and explaining number concepts and procedures
- **deleted:** adding and subtracting of decimals to hundredths

**Gap Analysis:**

*The revised expectations in this grade may require that students have more experience*

- rounding two-digit numbers to the nearest ten

**Strand Analysis:**

*The revised expectations embody a greater emphasis on*

- representing numbers from 0.1 to 10 000 in a variety of ways
- counting by tenths and fractional amounts beyond one whole
- developing quantity relationship understanding of whole numbers to 10 000 and decimals to tenths
- reading and representing money amounts to \$100
- developing operational sense by employing a variety of mental strategies
- using mental strategies in determining quantity relationships and in operations
- using concrete materials, estimation, student-generated algorithms, along with standard algorithms in operations
- using investigations to develop conceptual understanding

## Grade 4 Geometry and Spatial Sense Revision Highlights

### Subheadings/Big Ideas:

- Geometric Properties, Geometric Relationships, Location and Movement

### Process Expectations:

- four expectations have been revised and incorporated into the seven Mathematical Process Expectations i.e., communicating and connecting
- throughout the strand students engage in Problem Solving, Reasoning and Proving, Reflecting, Selecting Tools and Computational Strategies, Connecting and Representing

### What's Changed:

*The revised expectations to this strand in this grade have resulted in the following changes so that students will be*

- drawing and describing nets of rectangular and triangular prisms
- identifying and comparing specific quadrilaterals: rectangles, squares, trapezoids, parallelograms and rhombuses (rhombi) through their properties
- identifying and describing prisms and pyramids through their properties
- identifying and comparing of angle benchmarks, straight angle, right angle, half a right angle
- specific references to protractors removed
- identifying benchmark angles and comparing other angles to these benchmarks
- relating the names of benchmark angles to their measure in degrees
- constructing a three-dimensional figure from a picture or model of the figure, using connecting cubes and pictures
- constructing prisms and pyramids from given nets
- constructing three-dimensional figures using only congruent shapes
- identifying, performing, and describing reflections
- creating and analysing symmetrical designs by reflecting a shape, or shapes, using a variety of tools and identify the congruent shapes in the designs
- identifying and describing the general location of an object using a grid system
- **deleted**: identifying similar and congruent figures in a variety of media
- **deleted**: constructing congruent figures in a variety of ways
- **deleted**: discovering geometric patterns and solving geometric puzzles
- **moved** to grade 5: translations
- **moved** to grade 6: rotations

### Gap Analysis:

*The revised expectations in this grade may require that students have more experience*

- investigating the properties of objects rather than the object's attributes
- using materials as reference tools for comparing angles

**Strand Analysis:**

*The revised expectations embody a greater emphasis on*

- identifying, comparing, and describing the properties of both two-dimensional and three-dimensional figures, while the attributes of these figures are de-emphasized
- measuring angles with a wide variety of tools and using benchmarks as referents to compare angles
- performing and describing the reflections of two-dimensional figures
- identifying and locating objects on a grid system

## Grade 4 Patterning and Algebra Revision Highlights

### Subheadings/Big Ideas:

- Patterns and Relationships, Expressions and Equality

### Process Expectations:

- four expectations have been revised and incorporated into the seven Mathematical Process Expectations i.e., problem solving and reasoning and proving
- throughout the strand students engage in Problem Solving, Reasoning and Proving, Reflecting, Selecting Tools and Computational Strategies, Connecting and Representing

### What's Changed:

*The revised expectations to this strand in this grade have resulted in the following changes so that students will be*

- extending, describing, and creating of repeating, growing, and shrinking number patterns
- using a table of values to record number patterns
- connecting number patterns involving addition, subtraction or multiplication
- extending and creating repeating patterns using a variety of tools including dynamic geometry software
- investigating the commutative property of multiplication
- investigating the distributive property of multiplication over addition
- **moved** from Number Sense and Numeration: investigating the inverse relationship between multiplication and division
- **deleted**: analyzing number patterns and stating a rule for any relationships
- **deleted**: using a calculator and computer applications to explore patterns (this is now embedded and is a Mathematical Process Expectation)

### Gap Analysis:

*The revised expectations in this grade may require that students have more experience*

- representing geometric patterns from a number sequence (e.g., 4, 7, 10...)
- determining missing numbers in balanced equations (e.g.,  $24 - 4 = 15 + \_$  ,)
- identifying and describing number patterns involving addition, subtraction, and multiplication on a number line, calendar and hundreds chart
- identifying the properties of zero and one in multiplication through investigation with concrete materials.

### Strand Analysis:

*The revised expectations embody a greater emphasis on*

- recognising and using number relationships (i.e., the commutative property of multiplication)
- extending, describing and creating number patterns
- identifying relationships within equations

## Grade 4 Data Management and Probability Revision Highlights

### Subheadings/Big Ideas:

- Collection and Organization of Data, Data Relationships, Probability

### Process Expectations:

- one expectation has been revised and incorporated into the seven Mathematical Process Expectations i.e., problem solving
- throughout the strand students engage in Problem Solving, Reasoning and Proving, Reflecting, Selecting Tools and Computational Strategies, Connecting and Representing

### What's Changed:

*The revised expectations to this strand in this grade have resulted in the following changes so that students will be*

- investigating and understanding of the median of a set of data
- reading, interpreting, and drawing conclusions from primary and secondary data
- using dynamic statistical software to organize primary data
- reading and representing data in stem-and-leaf plots and double bar graphs
- describing the shape of data across a range of values found on charts, tables, and graphs
- investigating how the number of repetitions of a probability experiment can affect the conclusions drawn
- **deleted**: before gathering data, predicting the possible results of a survey
- **deleted**: comparing experimental results with predicted results
- **deleted**: using tree diagrams to organize data according to several criteria
- **deleted**: using a knowledge of probability to pose and solve problems

### Gap Analysis:

*The revised expectations in this grade may require that students have more experience*

- investigating and understanding mode in a set of data
- recording and representing data in vertical and horizontal graphs

### Strand Analysis:

*The revised expectations embody a greater emphasis on*

- understanding the distinction between primary and secondary data
- understanding the shape of data through an understanding of median
- understanding how the prediction of the frequency of an outcome and how the number of repetitions of a probability experiment can affect conclusions

## Grade 5 Number Sense and Numeration Revision Highlights

### Subheadings/Big Ideas:

- Quantity Relationships, Counting, Operational Sense, Proportional Relationships

### Process Expectations:

- six expectations have been revised and incorporated into the seven Mathematical Process Expectations i.e., problem solving, communicating and selecting tools and computational strategies
- throughout the strand students engage in Problem Solving, Reasoning and Proving, Reflecting, Selecting Tools and Computational Strategies, Connecting and Representing

### What's Changed:

*The revised expectations to this strand in this grade have resulted in the following changes so that students will be*

- nine overall expectations reduced to four, one for each subheading/big idea; introduction of Proportional Relationships as a subheading
- reading and printing in words whole numbers to 10 000 in meaningful contexts
- rounding decimal numbers to the nearest tenth, in problems arising from real-life situations
- counting forward by hundredths from any decimal number expressed to two decimal places using concrete materials and number lines
- multiplying two-digit whole numbers by two-digit whole numbers using a variety of tools and strategies
- dividing three-digit whole numbers by one-digit whole number (formerly dividing a four-digit number by a one-digit number) using a variety of tools and strategies
- multiplying decimal numbers by 10, 100, 1000, and 10 000 (formerly multiply by 10 and 100), and dividing decimal numbers by 10 and 100 (formerly divide by 10), using mental strategies
- determining and explaining the relationship between fractions (i.e., with denominators of 2, 4, 5, 10, 20, 25, 50, and 100) decimal forms
- describing multiplicative thinking between quantities by using simple fractions and decimals
- demonstrating an understanding of simple multiplicative relationships involving whole-number rates
- **moved** from the Measurement strand: all references to money
- **moved** from the Measurement strand: identifying simple multiplicative relationships
- **deleted**: identifying the use of numbers in various careers
- **deleted**: identifying and appreciating the use of numbers in the media

**Gap Analysis:**

*The revised expectations in this grade may require that students have more experience*

- understanding proper fractions
- comparing fractions to benchmarks of 0,  $\frac{1}{2}$ , and 1
- using estimation when solving addition, subtraction, and multiplication of whole numbers
- multiplying and dividing numbers by one-digit whole numbers using a variety of tools and strategies
- demonstrating and explaining simple multiplicative relationships given a unit rate

**Strand Analysis:**

*The revised expectations embody a greater emphasis on*

- developing operational sense by using mental strategies in determining quantity relationships and in using the operations (e.g., using the commutative property when multiplying)
- developing quantity relationship understanding of whole numbers to 100 000 and decimals to hundredths
- representing numbers from 0.01 to 100 000 in a variety of ways
- using concrete materials, estimation, student-generated algorithms, along with standard algorithms in operations
- using benchmarks in fractional relationships
- using investigations in conceptual understanding development
- counting decimals by hundredths

## Grade 5 Measurement Revision Highlights

### Subheadings/Big Ideas:

- Attributes, Units, and Measurement Sense, Measurement Relationships

### Process Expectations:

- throughout the strand students engage in Problem Solving, Reasoning and Proving, Reflecting, Selecting Tools and Computational Strategies, Connecting and Representing

### What's Changed:

*The revised expectations to this strand in this grade have resulted in the following changes so that students will be*

- solving problems requiring conversion from metres to centimetres and from kilometres to metres
- measuring and recording temperatures to determine and represent temperature changes over time
- estimating and determining elapsed time of events expressed in minutes, hours, days, weeks, months or years
- solving problems involving the relationship between a 12-hour and 24-hour clock
- creating, through investigation, two-dimensional shapes with the same perimeter or the same area
- determining, through investigation using stacked congruent rectangular layers of concrete materials, the relationship between the height, the area of the base, and the volume of a rectangular prism, and generalize to develop the formula
- **moved:** to the Number Sense and Numeration strand: all references to money
- **moved:** to the Number Sense and Numeration strand: identifying the relationship between the movement of objects and speed
- **deleted:** using prefixes in the metric system correctly
- **deleted:** drawing items using a wide variety of SI units of length
- **deleted:** estimating long lengths using non-standard units
- **deleted:** investigating measures of circumference using concrete materials
- **deleted:** reading and writing dates and times using SI notation
- **deleted:** determining the relationship between kilograms and metric tonnes

### Gap Analysis:

*The revised expectations in this grade may require that students have more experience*

- estimating and determining elapsed time
- estimating and measuring the capacity of containers

**Strand Analysis:**

*The revised expectations embody a greater emphasis on*

- using measurement in real-world contexts
- estimating measurements
- using investigations to see measurement relationships (e.g., linking the volume of a container to its capacity)
- selecting and justifying the appropriate unit of measurement used

## Grade 5 Geometry and Spatial Sense Revision Highlights

### Subheadings/Big Ideas:

- Geometric Properties, Geometric Relationships, Location and Movement

### Process Expectations:

- six expectations have been revised and incorporated into the seven Mathematical Process Expectations i.e., problem solving, communicating, connecting, and selecting tools and computational strategies
- throughout the strand students engage in Problem Solving, Reasoning and Proving, Reflecting, Selecting Tools and Computational Strategies, Connecting and Representing

### What's Changed:

*The revised expectations to this strand in this grade have resulted in the following changes so that students will be*

- measuring and constructing angles up to  $90^\circ$ , using a protractor
- constructing triangles given acute or right angles and side measurements
- distinguishing among prisms, right prisms, pyramids, and other three-dimensional figures
- identifying, performing, and describing translations
- locating objects using cardinal directions
- comparing grid systems commonly found on maps
- creating and analysing designs by translating and/or reflecting a shape, or shapes
- **deleted**: sketching faces that make up a three-dimensional figure by looking at a three-dimensional figure
- **deleted**: constructing a figure with interlocking cubes that matches a picture
- **deleted**: demonstrating an understanding of congruent figures
- **deleted**: demonstrating the congruence of figures using various tools
- **deleted**: exploring tiling patterns that cover a plane
- **deleted**: constructing two-dimensional shapes with one line of symmetry
- **moved** to grade 6: rotations

### Gap Analysis:

*The revised expectations in this grade may require that students have more experience*

- drawing, describing and constructing nets of rectangular and triangular prisms
- investigating the properties of two-dimensional and three-dimensional figures
- identifying and comparing angle benchmarks, straight line, right angle, half a right angle and relating the benchmarks to angle measurements

**Strand Analysis:**

*The revised expectations embody a greater emphasis on*

- using computer applications including dynamic geometry software
- identifying and classifying two-dimensional shapes by properties
- identifying angles and constructing triangles
- identifying and constructing three-dimensional figures and working with nets
- working with translations and reflections

## Grade 5 Patterning and Algebra Revision Highlights

### Subheadings/Big Ideas:

- Patterns and Relationships, Variables, Expressions, and Equations

### Process Expectations:

- three expectations have been revised and incorporated into the seven Mathematical Process Expectations i.e., problem solving, and reasoning and proving
- throughout the strand students engage in Problem Solving, Reasoning and Proving, Reflecting, Selecting Tools and Computational Strategies, Connecting and Representing

### What's Changed:

*The revised expectations to this strand in this grade have resulted in the following changes so that students will be*

- building a model to represent a number pattern presented in a table of values that shows the term number and the terms
- extending and creating repeating patterns that result from translations
- creating, identifying and extending numeric and geometric patterns, using a variety of tools
- making predictions related to growing and shrinking geometric and numeric patterns
- making a table of values for a pattern that is generated by adding or subtracting a number to get the next term, or by multiplying or dividing by a constant to get the next term, given the sequence or the pattern rule in words
- understanding of variables as changing quantities, given equations with letter or other symbols that describe relationships involving simple rates
- understanding of variables as unknown quantities represented by a letter or other symbol
- determining the missing number in equations involving addition, subtraction, multiplication or division and one- or two-digit numbers
- **deleted**: analysing number patterns and stating a rule for any relationships
- **deleted**: using a calculator and computer applications to explore patterns (this is now embedded and is a Mathematical Process Expectation)

### Gap Analysis:

*The revised expectations in this grade may require that students have more experience*

- extending, describing, and creating of repeating, growing and shrinking number patterns
- using a table of values to record number patterns
- using dynamic geometry software
- investigating the commutative property of multiplication
- investigating the distributive property of multiplication over addition

- using translations to generate repeating patterns

**Strand Analysis:**

*The revised expectations embody a greater emphasis on*

- using a table of values to determine relationships in growing and shrinking patterns and patterns involving translations
- understanding the use of variables in equations and using letters to represent unknowns in equations
- building models to represent growing, shrinking, and repeating number patterns

## Grade 5 Data Management and Probability Revision Highlights

### Subheadings/Big Ideas:

- Collection and Organization of Data, Data Relationships, Probability

### Process Expectations:

- one expectation has been revised and incorporated into the seven Mathematical Process Expectations i.e., problem solving
- throughout the strand students engage in Problem Solving, Reasoning and Proving, Reflecting, Selecting Tools and Computational Strategies, Connecting and Representing

### What's Changed:

*The revised expectations to this strand in this grade have resulted in the following changes so that students will be*

- distinguishing between discrete and continuous data
- collecting and organizing discrete or continuous primary and secondary data
- using broken-line graphs
- using dynamic statistical software
- understanding that sets of data can be samples of larger populations
- describing how a set of data is collected
- reading, interpreting, and drawing conclusions from primary and secondary data
- calculating the mean for a small set of data and using it to describe the shape of the data across its range of values
- determining and representing all the possible outcomes in a simple probability experiment using systematic lists and area models
- representing the probability that an event will occur in games and simple experiments by a common fraction
- pose and solve simple probability problems, and solve them by conducting probability experiments and selecting appropriate methods for recording the results
- **deleted**: explaining the choice of intervals used to construct a bar graph or the choice of symbols on a pictograph
- **deleted**: recognizing that graphs, tables, and charts can present data with accuracy or bias
- **deleted**: connecting real-life statements with probability concepts
- **deleted**: using tree diagrams to record the results of simple probability experiment

### Gap Analysis:

*The revised expectations in this grade may require that students have more experience*

- investigating and understanding the mode and median in a set of data
- reading and representing data in stem-and-leaf plots and double bar graphs

- describing the shape of data across a range of values found on charts, tables, and graphs
- investigating how the number of repetitions of a probability experiment can affect the conclusions drawn

**Strand Analysis:**

*The revised expectations embody a greater emphasis on*

- collecting and organizing discrete or continuous primary and secondary data
- interpreting primary and secondary data
- posing and solving simple probability problems by way of experiments

## Grade 6 Number Sense and Numeration Revision Highlights

### Subheadings/Big Ideas:

- Quantity Relationships, Operational Sense, Proportional Relationships

### Process Expectations:

- nine expectations have been revised and incorporated into the seven Mathematical Process Expectations i.e., problem solving, communicating and selecting tools, connecting and computational strategies
- throughout the strand students engage in Problem Solving, Reasoning and Proving, Reflecting, Selecting Tools and Computational Strategies, Connecting and Representing

### What's Changed:

*The revised expectations to this strand in this grade have resulted in the following changes so that students will be*

- ten overall expectations reduced to three, one for each subheading/big idea; introduction of Proportional Relationships as a subheading
- reading and printing in words whole numbers to 100 000 in meaningful contexts
- identifying composite numbers and prime numbers, and explaining the relationship between them
- determining and explaining through investigation the relationship among fractions with denominators of 2, 4, 5, 10, 20, 25, 50, and 100, decimal numbers and percents
- representing ratios found in real-world contexts
- solving problems that arise from real-life situations and that relate to the magnitude of whole numbers up to 1 000 000
- estimating quantities using benchmarks of 10%, 25%, 50%, 75% and 100%
- multiplying and dividing decimal numbers to tenths by whole numbers
- explaining the need for a standard order for performing operations by investigation
- solving problems involving the multiplication and division of whole numbers (four-digit by two-digit) using a variety of tools and strategies (formerly multiplying a three-digit number by a two-digit number and dividing a four-digit number by a two-digit number)
- using estimation when solving problems involving the addition and subtraction of whole numbers and decimals, to help judge the reasonableness of a solution
- representing relationships using unit rates
- **deleted**: identifying the use of numbers in various careers
- **deleted**: identifying and appreciating the use of numbers in the media
- **deleted**: identifying real-world applications of integers

**Gap Analysis:**

*The revised expectations in this grade may require that students have more experience*

- rounding decimal numbers to the nearest tenth
- counting forward by hundredths from any decimal number expressed to two decimal places using concrete materials and number lines
- describing multiplicative thinking between quantities by using simple fractions and decimals
- demonstrating an understanding of simple multiplicative relationships involving whole-number rates

**Strand Analysis:**

*The revised expectations embody a greater emphasis on*

- working with numbers from 0.001 to 1 000 000
- developing operational sense by using mental strategies in determining quantity relationships and in operations (e.g., using the commutative and distributive properties)
- using benchmarks in both fractional and percent relationships
- understanding percent, ratio, and unit rate and their relationships
- using concrete materials, drawings, and calculators to represent understanding

## Grade 6 Measurement Revision Highlights

### Subheadings/Big Ideas

- Attributes, Units and Measurement Sense, Measurement Relationships

### Process Expectations

- throughout the strand students engage in Problem Solving, Reasoning and Proving, Reflecting, Selecting Tools and Computational Strategies, Connecting and Representing

### What's Changed

*The revised expectations to this strand in this grade have resulted in the following changes so that students will be*

- solving area problems that involve conversions from square metres to square centimetres and other metric conversions from larger to smaller metric units
- understanding the relationship between estimated and precise measurements and justifying the appropriateness of each
- developing the formulas for the area of a triangle and parallelogram using the area relationships among rectangles, parallelograms and triangles
- constructing a rectangle, square, triangle or parallelogram using a variety of tools, given the area and/or perimeter
- solving problems involving estimation and calculation of the surface area and volume of triangular and rectangular prisms
- determining, through investigation using a variety of tools and strategies, the relationship between the height, the area of the base, and the volume of a triangular prism, and generalise to develop the formula
- determining the surface area of rectangular and triangular prisms through investigation, using a variety of tools
- **deleted:** using prefixes in the metric system correctly
- **deleted:** describing the relationship between 12 and 24-hour clock
- **deleted:** representing amounts of money under \$100 with the smallest possible number of coins and bills
- **deleted:** estimating and counting money amounts to \$10 000, using a calculator
- **deleted:** relating time and distance and speed i.e., kilometres per hour
- **deleted:** relating the dimensions of rectangles and area to factors and products
- **moved:** from the Measurement strand: all references to money

**Gap Analysis**

*The revised expectations in this grade may require that students have more experience*

- using a variety of tools to investigate the concepts of area, surface area and volume
- conjecturing through investigation

**Strand Analysis**

*The revised expectations embody a greater emphasis on*

- converting metric units from larger to smaller
- developing formulas through investigation and using a variety of tools
- justifying use of units i.e., estimation vs. precise measure and choice of metric unit

## Grade 6 Geometry and Spatial Sense Revision Highlights

### Subheadings/Big Ideas:

- Geometric Properties, Geometric Relationships, Location and Movement

### Process Expectations:

- six expectations have been revised and incorporated into the seven Mathematical Process Expectations i.e., communicating, connecting, reasoning and proving, and selecting tools and computational strategies
- Throughout the strand students engage in Problem Solving, Reasoning and Proving, Reflecting, Selecting Tools and Computational Strategies, Connecting and Representing

### What's Changed:

*The revised expectations to this strand in this grade have resulted in the following changes so that students will be*

- sorting and classifying quadrilaterals by geometric properties related to symmetry, angles, and sides through investigation using a variety of tools and strategies
- measuring and constructing angles up to  $180^\circ$  using a protractor, and classifying them as acute, right, obtuse or straight angles
- using dynamic geometry software
- identifying, performing, and describing rotations of  $180^\circ$  and clockwise and counter clockwise rotations of  $90^\circ$  with the centre inside or outside the shape
- **deleted**: identifying nets for a variety of polyhedra from drawings
- **deleted**: designing nets of cubes and pyramids
- **deleted**: sketching the net for a three-dimensional figure
- **deleted**: demonstrating an understanding of similar and congruent figures
- **deleted**: demonstrating congruence of figures by measuring angles and sides and matching corresponding parts
- **deleted**: constructing two-dimensional shapes with more than one line of symmetry
- **deleted**: constructing tiling patterns to cover a plane

### Gap Analysis:

*The revised expectations in this grade may require that students have more experience*

- measuring and constructing angles up to  $90^\circ$  using a protractor
- locating objects using cardinal directions

### Strand Analysis:

*The revised expectations embody a greater emphasis on*

- using computer applications including dynamic geometry software
- identification and classification of polygons by properties
- sketching and constructing three-dimensional figures

- creating and analysing designs made by reflecting translating, and rotating a shape or shapes

## Grade 6 Patterning and Algebra Revision Highlights

### Subheadings/Big Ideas

- Patterns and Relationships, Variables, Expressions and Equations

### Process Expectations

- three expectations have been revised and incorporated into the seven Mathematical Process Expectations i.e., Problem Solving, Reasoning and Proving
- throughout the strand students engage in Problem Solving, Reasoning and Proving, Reflecting, Selecting Tools and Computational Strategies, Connecting and Representing

### What's Changed

*The revised expectations to this strand in this grade have resulted in the following changes so that students will be*

- extending and creating repeating patterns that result from rotations, through investigation using a variety of tools
- demonstrating an understanding of different ways variables are used i.e. unknown or changing quantity
- identifying the quantities in an equation that vary and remain constant
- determining a given term number in growing patterns represented in words, tables or graphs
- determining a term, given its term number by extending growing or shrinking patterns
- describing pattern rules (in words) that generate a pattern by adding or subtracting a constant, or multiplying or dividing by a constant, to get the next term, then distinguishing such pattern rules from pattern rules, given in words, that describe the general term by referring to the term number
- identifying geometric patterns through investigation
- solving problems that use two or three symbols or letters as variables to represent different unknown quantities
- **deleted:** extending a pattern, given a rule expressed in mathematical language
- **deleted:** using a calculator and computer application to explore patterns (this is now embedded and is a Mathematical Process Expectation)

### Gap Analysis

*The revised expectations in this grade may require that students have more experience*

- working with geometric patterns, representing them numerically
- identifying term numbers and determining terms, given the term number
- using dynamic statistical software and dynamic geometry software
- understanding variables as unknown quantities and changing quantities

- using more than one symbol or letter to represent unknowns in equations

### **Strand Analysis**

*The revised expectations embody a greater emphasis on*

- using term numbers to establish patterns
- understanding the nature of variables
- determining patterns through investigation, using a variety of strategies and tools

## Grade 6 Data Management and Probability Revision Highlights

### Subheadings/Big Ideas:

- Collection and Organization of Data, Data Relationships, Probability

### Process Expectations:

- one expectation has been revised and incorporated into the seven Mathematical Process Expectations i.e., problem solving
- throughout the strand students engage in Problem Solving, Reasoning and Proving, Reflecting, Selecting Tools and Computational Strategies, Connecting and Representing

### What's Changed:

*The revised expectations to this strand in this grade have resulted in the following changes so that students will be*

- collecting and organizing discrete or continuous primary and secondary data
- using continuous line graphs
- using dynamic statistical software
- investigating how well a set of data represents a population on the basis of the method used to collect the data
- reading, interpreting, and drawing conclusions from primary and secondary data
- demonstrating an understanding of mean and using the mean to compare two sets of related data
- expressing theoretical probability as a ratio of the number of favourable outcomes to the total number of possible outcomes, where outcomes are equally likely
- representing the probability that an event using a value from the range of 0 to 1
- predicting the frequency of an outcome of a simple probability experiment or game, by calculating and using the theoretical probability of that outcome
- **deleted:** references to scatter plots and circle graphs
- **deleted:** evaluating and exploring how data were collected and how the results represent the population
- **deleted:** examining experimental probability results in the light of theoretical results
- **deleted:** using tree diagrams to record the results of systematic counting
- **deleted:** showing an understanding of probability in making relevant decisions

### Gap Analysis:

*The revised expectations in this grade may require that students have more experience*

- investigating and understanding the mode and median in a set of data
- reading and representing data in stem-and-leaf plots, double bar graphs and broken line graphs

- determining and representing all the possible outcomes in a simple probability experiment using systematic lists and area models
- representing the probability that an event will occur in games and simple experiments by a common fraction

**Strand Analysis:**

*The revised expectations embody a greater emphasis on*

- collecting and organizing discrete or continuous primary and secondary data
- interpreting primary and secondary data and displaying the data on appropriate graphs
- finding and predicting the frequency of a outcome based on theoretical probability