Mathematical Process Expectations

Problem Solving

1m1 • apply developing problem-solving strategies as they pose and solve problems and conduct investigations, to help deepen their mathematical understanding;

Reasoning And Proving

1m2 • apply developing reasoning skills (e.g., pattern recognition, classification) to make and investigate conjectures (e.g., through discussion with others);

Reflecting

1m3 • demonstrate that they are reflecting on and monitoring their thinking to help clarify their understanding as they complete an investigation or solve a problem (e.g., by explaining to others why they think their solution is correct);

Selecting Tools and Computational Strategies

1m4 • select and use a variety of concrete, visual, and electronic learning tools and appropriate computational strategies to investigate mathematical ideas and to solve problems;

Connecting

1m5 • make connections among simple mathematical concepts and procedures, and relate mathematical ideas to situations drawn from everyday contexts;

Representing

1m6 • create basic representations of simple mathematical ideas (e.g., using concrete materials; physical actions, such as hopping or clapping; pictures; numbers; diagrams; invented symbols), make connections among them, and apply them to solve problems;

Communicating

1m7 • communicate mathematical thinking orally, visually, and in writing, using everyday language, a developing mathematical vocabulary, and a variety of representations.

Number Sense and Numeration

Overall Expectations

1m8 • read, represent, compare, and order whole numbers to 50, and use concrete materials toinvestigate fractions and money amounts;

1m9 • demonstrate an understanding of magnitude by counting forward to 100 and backwards from 20;

1m10 • solve problems involving the addition and subtraction of single-digit whole numbers, using a variety of strategies.

Quantity Relationships

1m11 – represent, compare, and order whole numbers to 50, using a variety of tools (e.g., connecting cubes, ten frames, base ten materials, number lines, hundreds charts) and contexts (e.g., real-life experiences, number stories);

1m12 – read and print in words whole numbers to ten, using meaningful contexts (e.g., storybooks, posters);

1m13 – demonstrate, using concrete materials, the concept of conservation of number (e.g., 5 counters represent the number 5, regardless whether they are close together or far apart);

1m14 – relate numbers to the anchors of 5 and 10 (e.g., 7 is 2 more than 5 and 3 less than 10);

1m15 – identify and describe various coins (i.e., penny, nickel, dime, quarter, $1 coin, $2 coin), using coin manipulatives or drawings, and state their value (e.g., the valueof a penny is one cent; the value of a toonie is two dollars);

1m16 – represent money amounts to 20¢, through investigation using coin manipulatives;

1m17 – estimate the number of objects in a set, and check by counting (e.g., "I guessed that there were 20 cubes in the pile. I counted them and there were only 17cubes. 17 is close to 20.");

1m18 – compose and decompose numbers up to 20 in a variety of ways, using concrete materials (e.g., 7 can be decomposed using connecting cubes into 6 and 1, or 5 and 2, or 4 and 3);

1m19 – divide whole objects into parts and identify and describe, through investigation, equal-sized parts of the whole, using fractional names (e.g., halves; fourths or quarters).

Counting

1m20 – demonstrate, using concrete materials, the concept of one-to-one correspondence between number and objects when counting;

1m21 – count forward by 1's, 2's, 5's, and 10's to100, using a variety of tools and strategies(e.g., move with steps; skip count on a number line; place counters on a hundreds chart; connect cubes to show equal groups; count groups of pennies, nickels, or dimes);

1m22 – count backwards by 1's from 20 and any number less than 20 (e.g., count backwards from 18 to 11), with and without the use of concrete materials and number lines;

1m23 – count backwards from 20 by 2's and 5's, using a variety of tools (e.g., number lines, hundreds charts);

1m24 – use ordinal numbers to thirty-first in meaningful contexts (e.g., identify the days of the month on a calendar).

Operational Sense

1m25 – solve a variety of problems involving the addition and subtraction of whole numbersto 20, using concrete materials and drawings (e.g., pictures, number lines) (Sample problem: Miguel has 12 cookies.Seven cookies are chocolate. Use counters to determine how many cookies are not chocolate.);

1m26 – solve problems involving the addition and subtraction of single-digit whole numbers, using a variety of mental strategies (e.g., one more than, one less than, counting on, counting back, doubles);

1m27 – add and subtract money amounts to 10¢, using coin manipulatives and drawings.

Measurement

Overall Expectations

1m28 • estimate, measure, and describe length, area, mass, capacity, time, and temperature, using non-standard units of the same size;

1m29 • compare, describe, and order objects, using attributes measured in non-standard units.

Attributes, Units, and Measurement Sense

1m30 – demonstrate an understanding of the use of non-standard units of the same size (e.g., straws, index cards) for measuring (Sample problem: Measure the length of your desk in different ways; for example, by using several different non-standard units or by starting measurements from opposite ends of the desk. Discuss your findings.);

1m31 – estimate, measure (i.e., by placing non-standard units repeatedly, without overlaps or gaps), and record lengths, heights, and distances (e.g., a book is about 10 paper clips wide; a pencil is about 3 toothpicks long);

1m32 – construct, using a variety of strategies, tools for measuring lengths, heights, and distances in non-standard units (e.g., footprints on cash register tape or on connecting cubes);

1m33 – estimate, measure (i.e., by minimizing overlaps and gaps), and describe area, through investigation using non-standard units (e.g., "It took about 15 index cards to cover my desk, with only a little bit of space left over.");

1m34 – estimate, measure, and describe the capacity and/or mass of an object, through investigation using non-standard units (e.g., "My journal has the same mass as 13 pencils." "The juice can has the same capacity as 4 pop cans.");

1m35 – estimate, measure, and describe the passage of time, through investigation using nonstandard units (e.g., number of sleeps; number of claps; number of flips of a sand timer);

1m36 – read demonstration digital and analogue clocks, and use them to identify benchmark times (e.g., times for breakfast, lunch, dinner; the start and end of school; bedtime) and to tell and write time to the hour and half-hour in everyday settings;

1m37 – name the months of the year in order, and read the date on a calendar;

1m38 – relate temperature to experiences of the seasons (e.g., "In winter, we can skate because it's cold enough for there to be ice.").

Measurement Relationships

1m39 – compare two or three objects using measurable attributes (e.g., length, height, width, area, temperature, mass, capacity), and describe the objects using relative terms (e.g., taller, heavier, faster, bigger, warmer; "If I put an eraser, a pencil, and a metre stick beside each other, I can see that the eraser is shortest and the metre stick is longest.");

1m40 – compare and order objects by their linear measurements, using the same non-standard unit (Sample problem: Using a length of string equal to the length of your forearm, work with a partner to find other objects that are about the same length.);

1m41 – use the metre as a benchmark for measuring length, and compare the metre with non-standard units (Sample problem: In the classroom, use a metre stick to find objects that are taller than one metre and objects that are shorter than one metre.);

1m42 – describe, through investigation using concrete materials, the relationship between the size of a unit and the number of units needed to measure length (Sample problem: Compare the numbers of paper clips and pencils needed to measure the length of the same table.).

Geometry and Spatial Sense

Overall Expectations

1m43 • identify common two-dimensional shapes and three-dimensional figures and sort and classify them by their attributes;*

1m44 • compose and decompose common two-dimensional shapes and three-dimensional figures;

1m45 • describe the relative locations of objects using positional language.

Geometric Properties

1m46 – identify and describe common two-dimensional shapes (e.g., circles, triangles, rectangles, squares) and sort and classify them by their attributes (e.g., colour; size; texture; number of sides), using concrete materials and pictorial representations (e.g., "I put all the triangles in one group. Some are long and skinny, and some are short and fat, but they all have three sides.");

1m47 – trace and identify the two-dimensional faces of three-dimensional figures, using concrete models (e.g., "I can see squares on the cube.");

1m48 – identify and describe common three-dimensional figures (e.g., cubes, cones, cylinders, spheres, rectangular prisms) and sort and classify them by their attributes (e.g., colour; size; texture; number and shape of faces), using concrete materials and pictorial representations (e.g., "I put the cones and the cylinders in the same group because they all have circles on them.");

1m49 – describe similarities and differences between an everyday object and a three-dimensional figure (e.g., "A water bottle looks like a cylinder, except the bottle gets thinner at the top.");

1m50 – locate shapes in the environment that have symmetry, and describe the symmetry.

Geometric Relationships

1m51 – compose patterns, pictures, and designs, using common two-dimensional shapes (Sample problem: Create a picture of a flower using pattern blocks.);

1m52 – identify and describe shapes within other shapes (e.g., shapes within a geometric design);

1m53 – build three-dimensional structures using concrete materials, and describe the two-dimensional shapes the structures contain;

1m54 – cover outline puzzles with two-dimensional shapes (e.g., pattern blocks, tangrams) (Sample problem: Fill in the outline of a boat with tangram pieces.).

Location and Movement

1m55 – describe the relative locations of objects or people using positional language (e.g., over, under, above, below, in front of, behind, inside, outside, beside, between, along);

1m56 – describe the relative locations of objects on concrete maps created in the classroom (Sample problem: Work with your group to create a map of the classroom in the sand table, using smaller objects to represent the classroom objects. Describe where the teacher's desk and the bookshelves are located.);

1m57 – create symmetrical designs and pictures, using concrete materials (e.g., pattern blocks, connecting cubes, paper for folding), and describe the relative locations of the parts.

Patterning and Algebra

Overall Expectations

1m58 • identify, describe, extend, and create repeating patterns;

1m59 • demonstrate an understanding of the concept of equality, using concrete materials and addition and subtraction to 10.

Patterns and Relationships

1m60 – identify, describe, and extend, through investigation, geometric repeating patterns involving one attribute (e.g., colour, size, shape, thickness, orientation);

1m61 – identify and extend, through investigation, numeric repeating patterns (e.g., 1, 2, 3, 1, 2, 3, 1, 2, 3, …);

1m62 – describe numeric repeating patterns in a hundreds chart;

1m63 – identify a rule for a repeating pattern (e.g., "We're lining up boy, girl, boy, girl, boy, girl.");

1m64 – create a repeating pattern involving one attribute (e.g., colour, size, shape, sound) (Sample problem: Use beads to make a string that shows a repeating pattern involving one attribute.);

1m65 – represent a given repeating pattern in a variety of ways (e.g., pictures, actions, colours, sounds, numbers, letters) (Sample problem: Make an ABA, ABA, ABA pattern using actions like clapping or tapping.).

Expressions and Equality

1m66 – create a set in which the number of objects is greater than, less than, or equal to the number of objects in a given set;

1m67 – demonstrate examples of equality, through investigation, using a "balance" model (Sample problem: Demonstrate, using a pan balance, that a train of 7 attached cubes on one side balances a train of 3 cubes and a train of 4 cubes on the other side.);

1m68 – determine, through investigation using a "balance" model and whole numbers to 10, the number of identical objects that must be added or subtracted to establish equality (Sample problem: On a pan balance, 5 cubes are placed on the left side and 8 cubes are placed on the right side. How many cubes should you take off the right side so that both sides balance?).

Data Management and Probability

Overall Expectations

1m69 • collect and organize categorical primary data and display the data using concrete graphs and pictographs, without regard to the order of labels on the horizontal axis;

1m70 • read and describe primary data presented in concrete graphs and pictographs;

1m71 • describe the likelihood that everyday events will happen.

Collection and Organization of Data

1m72 – demonstrate an ability to organize objects into categories by sorting and classifying objects using one attribute (e.g., colour, size), and by describing informal sorting experiences (e.g., helping to put away groceries) (Sample problem: Sort a collection of attribute blocks by colour. Re-sort the same collection by shape.);

1m73 – collect and organize primary data (e.g., data collected by the class) that is categorical (i.e., that can be organized into categories based on qualities such as colour or hobby), and display the data using one-to-one correspondence, prepared templates of concrete graphs and pictographs (with titles and labels), and a variety of recording methods (e.g., arranging objects, placing stickers, drawing pictures, making tally marks) (Sample problem: Collect and organize data about the favourite fruit that students in your class like to eat.).

Data Relationships

1m74 – read primary data presented in concrete graphs and pictographs, and describe the data using comparative language (e.g., more students chose summer than winter as their single favourite season);

1m75 – pose and answer questions about collected data (Sample problem: What was the most popular fruit chosen by the students in your class?).

Probability

1m76 – describe the likelihood that everyday events will occur, using mathematical language (i.e., impossible, unlikely, less likely, more likely, certain) (e.g., "It's unlikely that I will win the contest shown on the cereal box.").