Grade Three Outcomes	Grade Four Outcomes	Grade Five Outcomes
Number (N) 1. Say the number sequence forward and backward from 0 to 1000 by: 5s, 10s, or 100s, using any starting point; 3s using starting points that are multiples of 3; 4s using starting points that are multiples of 4; 25s, using starting points that are multiples of 25 2. Represent and describe numbers to 1000, concretely, pictorially and symbolically. 3. Compare and order numbers to 1000. 4. Estimate quantities less than 1000 using referents. 5. Illustrate, concretely & pictorially, the meaning of place value for numerals to 1000. 6. Describe and apply mental mathematics strategies for adding two 2-digit numerals. 7. Describe and apply mental mathematics strategies for subtracting two 2-digit numerals. 8. Apply estimation strategies to predict sums and differences of two 2-digit numerals in a problem solving context. 9. Demonstrate an understanding of addition and subtraction of numbers with answers to 1000 (limited to 1, 2 and 3-digit numerals). 10. Apply mental mathematics strategies and number properties, such as: using doubles; making 10; using the commutative property; using the property of zero; thinking addition for subtraction to determine answers for basic addition facts and related subtraction facts (to 18). 11. Demonstrate an understanding of multiplication to 5 × 5. 12. Demonstrate an understanding of division (limited to division related to multiplication facts up to 5 × 5). 13. Demonstrate an understanding of fractions by: explaining that a fraction represents a part of a whole; describing situations in which fractions are used; comparing fractions of the same whole with like denominators.	**Number (N)** 1. Represent and describe whole numbers to 10 000, pictorially and symbolically. 2. Compare and order numbers to 10 000. 3. Demonstrate an understanding of addition of numbers with answers to 10 000 and their corresponding subtractions (limited to 3 and 4-digit numerals). 4. Explain the properties of 0 and 1 for multiplication and the property of 1 for division. 5. Describe and apply mental mathematics strategies, such as: skip counting from a known fact; using doubling or halving; using doubling or halving and adding or subtracting one more group; using patterns in the 9s facts; using repeated doubling to determine basic multiplication facts to 9 × 9 and related division facts. 6. Demonstrate an understanding of multiplication (2- or 3-digit by 1-digit) to solve problems. 7. Demonstrate an understanding of division (1-digit divisor and up to 2-digit dividend) to solve problems by: using personal strategies for dividing with and without concrete materials; estimating quotients; relating division to multiplication. 8. Demonstrate an understanding of fractions less than or equal to one by using concrete and pictorial representations to: name and record fractions for the parts of a whole or a set; compare and order fractions; model and explain that for different wholes, two identical fractions may not represent the same quantity; provide examples of where fractions are used. 9. Describe and represent decimals (tenths and hundredths) concretely, pictorially and symbolically. 10. Relate decimals to fractions (to hundredths). 11. Demonstrate an understanding of addition and subtraction of decimals (limited to hundredths) by: using compatible numbers; estimating sums and differences; using mental math strategies to solve problems.	**Number (N)** 1. Represent and describe whole numbers to 1 000 000. 2. Use estimation strategies, including: front-end rounding; compensation; compatible numbers in problem-solving contexts. 3. Apply mental mathematics strategies and number properties, such as: skip counting from a known fact; using doubling or halving; using patterns in the 9s facts; using repeated doubling or halving to determine answers for basic multiplication facts to 81 and related division facts. 4. Apply mental mathematics strategies for multiplication, such as: annexing then adding zero; halving and doubling; using the distributive property. 5. Demonstrate an understanding of multiplication (2-digit by 2-digit) to solve problems. 6. Demonstrate, with and without concrete materials, an understanding of division (3-digit by 1-digit) and interpret remainders to solve problems. 7. Demonstrate an understanding of fractions by using concrete and pictorial representations to: create sets of equivalent fractions; compare fractions with like and unlike denominators. 8. Describe and represent decimals (tenths, hundredths, thousandths) concretely, pictorially and symbolically. 9. Relate decimals to fractions (to thousandths). 10. Compare and order decimals (to thousandths), by using: benchmarks; place value; equivalent decimals. 11. Demonstrate an understanding of addition and subtraction of decimals (limited to thousandths).
Patterns & Relations (PR) **(Patterns)** 1. Demonstrate an understanding of increasing patterns by: describing, extending, comparing, creating patterns using manipulatives, diagrams, sounds and actions (numbers to 1000). 2. Demonstrate an understanding of decreasing patterns by: describing, extending, comparing, creating patterns using manipulatives, diagrams, sounds and actions (numbers to 1000). **(Variables and Equations)** 3. Solve one-step addition and subtraction equations involving symbols representing an unknown number.	**Patterns & Relations (PR)** **(Patterns)** 1. Identify and describe patterns found in tables and charts, including a multiplication chart. 2. Reproduce a pattern shown in a table or chart using concrete materials. 3. Represent and describe patterns and relationships using charts and tables to solve problems. 4. Identify and explain mathematical relationships using charts and diagrams to solve problems. **(Variables and Equations)** 5. Express a given problem as an equation in which a symbol is used to represent an unknown number. 6. Solve one-step equations involving a symbol to represent an unknown number.	**Patterns & Relations (PR)** **(Patterns)** 1. Determine the pattern rule to make predictions about subsequent elements. **(Variables and Equations)** 2. Solve problems involving single-variable, one-step equations with whole number coefficients and whole number solutions.
Shape and Space (SS) **(Measurement)** 1. Relate the passage of time to common activities using non-standard and standard units (minutes, hours, days, weeks, months, years). 2. Relate the number of seconds to a minute, the number of minutes to an hour and the number of days to a month in a problem solving context. 3. Demonstrate an understanding of measuring length (cm, m) by: selecting and justifying referents for the units cm and m; modelling and describing the relationship between the units cm and m; estimating length using referents; measuring and recording length, width and height. 4. Demonstrate an understanding of measuring mass (g, kg). 5. Demonstrate an understanding of perimeter of regular and irregular shapes. **(3-D Objects and 2-D Shapes)** 6. Describe 3-D objects according to the shape of the faces, and the number of edges and vertices. 7. Sort regular and irregular polygons, including: triangles, quadrilaterals, pentagons, hexagons, octagons, according to the number of sides. **(Transformations)**	**Shape and Space (SS)** **(Measurement)** 1. Read and record time using digital and analog clocks, including 24-hour clocks. 2. Read and record calendar dates in a variety of formats. 3. Demonstrate an understanding of area of regular and irregular 2-D shapes by: recognizing that area is measured in square units selecting and justifying referents for the units cm^2 or m^2; estimating area by using referents for cm^2 or m^2; determining and recording area (cm^2 or m^2); constructing different rectangles for a given area (cm^2 or m^2) in order to demonstrate that many different rectangles may have the same area. **(3-D Objects and 2-D Shapes)** 4. Describe and construct rectangular and triangular prisms. **(Transformations)** 5. Demonstrate an understanding of line symmetry by: identifying symmetrical 2-D shapes; creating symmetrical 2-D shapes; drawing one or more lines of symmetry in a 2-D shape. 6. Demonstrate an understanding of congruency, concretely and pictorially.	**Shape and Space (SS)** **(Measurement)** 1. Design and construct different rectangles given either perimeter or area, or both (whole numbers) and draw conclusions. 2. Demonstrate an understanding of measuring length (mm). 3. Demonstrate an understanding of volume by: selecting and justifying referents for cm^3 or m^3 units; estimating volume by using referents for cm^3 or m^3; measuring and recording volume (cm^3 or m^3); constructing rectangular prisms for a given volume. 4. Demonstrate an understanding of capacity by: describing the relationship between mL and L; selecting and justifying referents for mL or L units; estimating capacity by using referents for mL or L; measuring and recording capacity (mL or L). **(3-D Objects and 2-D Shapes)** 5. Describe and provide examples of edges and faces of 3-D objects and sides of 2-D shapes that are: parallel; intersecting; perpendicular; vertical; horizontal. 6. Identify and sort quadrilaterals, including: rectangles; squares; trapezoids; parallelograms; rhombuses according to their attributes. **(Transformations)** 7. Perform a single transformation (translation, rotation or reflection) of a 2-D shape, (with and without technology) and draw and describe the image. 8. Identify a single transformation including a translation, a rotation and a reflection of 2-D shapes.
Statistics and Probability (SP) **(Data Analysis)** 1. Collect first-hand data and organize it using: tally marks, line plots, charts, lists to answer questions. 2. Construct, label and interpret bar graphs to solve problems. **(Chance and Uncertainty)**	**Statistics and Probability (SP)** **(Data Analysis)** 1. Demonstrate an understanding of many-to-one correspondence. 2. Construct and interpret pictographs and bar graphs involving many-to-one correspondence to draw conclusions. **(Chance and Uncertainty)**	**Statistics and Probability (SP)** **(Data Analysis)** 1. Differentiate between first-hand and second-hand data. 2. Construct and interpret double bar graphs to draw conclusions. **(Chance and Uncertainty)** 3. Describe the likelihood of a single outcome occurring using words, such as: impossible; possible; certain. 4. Compare the likelihood of two possible outcomes occurring using words, such as: less likely; equally likely; more likely.

STUDENT ACTIVITIES
Actively engaged in meaningful and quality learning experiences that build on what they know and can do.

Students: (S)
1. Have a positive attitude towards math
2. Can articulate the learning outcome being explored
3. Communicate their ideas and understanding using oral language, concrete materials and/or drawings
4. Ask questions and share ideas with the teacher and other students
5. Are appropriately involved in some aspect of the task and are engaged
6. Make connections with math and their experiences
7. Seek assistance when needed
8. Use a variety of models, manipulatives and technology appropriately
9. Work in groups, pairs, or independently (opportunity for each of these)
10. Use a variety of problem solving strategies:
    - act it out — make a chart, table, graph
    - use a model — make an organized list
    - draw a picture — solve a simpler problem
    - guess and check — work backward
    - use a pattern
11. Accept that there are a variety of solution methods: not just one that is "correct"

TEACHER ACTIVITIES
Observe, record and assess individual and group progress and base instruction on this information as well as curriculum outcomes.

Teacher:
Instructional Practices (IP)
1. Uses a variety of types of lessons that include a balance of student-centred and teacher-directed
    - Shared: working with others
    - Guided: teacher as facilitator
    - Independent: by themselves
2. Exhibits a progression of lesson parts
    - Before: warm up, explore ideas
    - During: deepen understanding
    - After: share and reflect
3. Focuses instruction on the meaningful development of key mathematical concepts
4. Presents concepts beginning with *concrete* models (i.e. manipulatives) and then moves toward *pictorial* and *symbolic* at an appropriate rate for all to make sense of the math
5. Ensures the balance between developing of conceptual understanding and learning mathematical procedures and "rules"
6. Uses a variety of resources for the delivery of the lesson
7. Uses open-ended questions and problems
    - often more than one method of solving and more than one solution with many entry points
8. Incorporates mental math regularly in lessons
9. Connects lessons to previous learning, real world experiences and other subjects
10. Uses differentiated instruction to meet the needs of all students
11. Looks for opportunities to extend learning beyond math classroom environment
12. Provides appropriate "wait time" for all students to think and respond
13. Reviews previously taught concepts regularly
14. Focuses on problem solving and communication skills and models this for students
15. Ensures that practice is relevant and appropriate in type and quantity

Curriculum Management (CM)
1. Uses curriculum document: to ensure key skills and knowledge for that grade are being taught
2. Identifies outcome(s) being addressed and teaches these in groups as appropriate
3. Uses a variety of resources to plan, such as: curriculum, core and other resources, technology
4. Ensures instruction is developmentally appropriate: focuses on understanding concepts
5. Makes note of misconceptions and problems students may encounter with concept
6. Writes a clear lesson plan daily and a yearly plan is evident and is adjusted as needed
7. Maximizes use of instructional time

Assessment (A)
1. Uses formative assessment and self-reflection to inform instruction
2. Uses a variety of approaches, including rubrics, conferencing and interviews, observations, journals, self-assessment ("What did I learn?")
3. Assesses conceptual understanding and skills
4. Circulates throughout the lesson to assist and assess students
5. Ensures homework is meaningful and appropriate
6. Establishes method for recording student performance information
7. Accommodates students' abilities & learning styles
8. Communicates student progress regularly to parents and students

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GUIDELINES
The following pages describe what one should observe in classrooms that promote student learning of mathematical concepts and skills.

These "Look Fors" are organized in three categories:
- **Classroom Environment:** that includes… physical organization, mathematical models, and student involvement
- **Student Activities:** that includes… a variety of learning experiences that promote problem solving, reasoning, making connections, and communication
- **Teacher Activities:** that includes… a variety of instructional approaches and assessment strategies used regularly

The purpose of these "Look Fors" is to provide a framework for teachers and schools as a common model for mathematics instruction and to assist administrators in providing specific and valuable feedback to teachers to help implement best practices in mathematics classrooms. The following guidelines are not intended to limit individual teacher's creativity or to suggest that all mathematics classes should be identical; they are meant to assist teachers in the teaching of math.

CLASSROOM ENVIRONMENT
The teacher created classroom environment has a profound effect on the social, emotional, physical and intellectual development of students.

Social/Emotional (SE)
inclusive, engaging, supportive

1. Teacher demonstrates that they believe all students can learn math
2. Teacher models a positive attitude and enthusiasm towards math
3. Teacher values and builds upon students' prior knowledge and makes math relevant to students' experiences
4. Teacher creates a classroom community that values all contributors; there is an acceptance of alternative approaches and solutions
5. Teacher provides students with choices in support of differentiation: content, process, product
6. Teacher supports students to explore ideas, ask questions, and take risks
7. Teacher shares and displays students' work and demonstrates a variety of representations
8. Teacher communicates the purpose and value of what students are learning

Physical (P)
interactive, intentional, managed

1. Teacher arranges furniture so students can interact effectively (partner/small group work)
2. Teacher arranges students in groups that are of an appropriate size and variety to encourage participation by all students
3. Teacher posts curriculum outcome currently being taught
4. Teacher displays words, symbols, calendars, charts, and other math related materials around the room
5. Teacher locates math materials (blocks, cubes, shapes, learning carpets, etc.) in the room for easy access by students
6. Teacher establishes routines for distributing and collecting materials
7. Teacher uses models (manipulatives, etc.) as thinking/learning tools for all students
8. Teacher uses exploratory centres (such as extension activities) to support and further students' understanding of math
9. Teacher uses technology appropriately to support instruction (calculators, computers, projected displays, SMARTBoards)

New Brunswick Nouveau
Be…in this place • Être…ici on le peut