GRADE 2 MATHEMATICS *at a glance*

Grade 2 Mathematics at a Glance can be used in designing, planning, and assessing student learning for the year. It can be used as a planning tool to preview the content of the Grade 2 Mathematics curriculum.

It is organized by **strands** and sorts learning outcomes into categories or **learning targets**. The learning targets can be used to connect learning by integrating strands, learning outcomes, and other subject areas.

This document can be used with the ***Glance Across the Grades*** document to plan clear and concise expectations for student learning by using big ideas (the why behind what we are learning).

Mathematical PROCESSES

The seven interrelated **mathematical processes** are intended to permeate teaching and learning and describe the actions of doing mathematics. The math processes allow students to engage in thinking about mathematics, and support the acquisition and the use of mathematical knowledge and foundational skills that develop conceptual understanding.

These processes are outlined in detail in *Kindergarten to Grade 8 Mathematics: Manitoba Curriculum Framework of Outcomes (2013)*.

- **COMMUNICATION**
- **CONNECTIONS**
- **MENTAL MATHEMATICS AND ESTIMATION**
- **PROBLEM SOLVING**
- **REASONING**
- **TECHNOLOGY**
- **VISUALIZATION**

NUMBER Strand

- **Counting Numbers**
  Number sequence and estimation of quantities to 100 N.1 N.6
- **Representing Whole Numbers**
  Whole numbers to 100
  N.2 N.3 N.4 N.5 N.7
- **Operations with Whole Numbers**
  Addition of numbers with answers to 100 and the corresponding subtraction N.8 N.9
  Addition and related subtraction facts to 18
  N.10

PATTERNS AND RELATIONS Strand

Ç Patterns

- **Patterning and Algebraic Thinking**
  Repeating and increasing patterns
  PR.1 PR.2

Ç Variables and Equations

- **Algebraic Representations with Equations**
  Equality and inequality PR.3 PR.4

SHAPE AND SPACE Strand

Ç Measurement

- **Length, Area, Volume, and Mass**
  Measure of length and mass using non-standard units SS.2 SS.4
  Comparison of objects according to length and mass using non-standard units SS.3
  Orientation of objects in relation to measurement SS.5
- **Time**
  Relationship of the passage of time using standard units SS.1

Ç 3-D Objects and 2-D Shapes

- **Identifying, Sorting, Comparing, and Constructing**
  2-D shapes and 3-D objects
  SS.6 SS.7 SS.8 SS.9

STATISTICS AND PROBABILITY Strand

Ç Data Analysis

- **Collecting, Organizing, and Analyzing Data**
  Collection and recording of data SP. 1
  Concrete graphs and pictographs SP. 2

Ç **Substrands**
- **Learning Targets**

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GRADE 2 MATHEMATICS

Curriculum Overview

NUMBER Strand

- **Counting Numbers**
  Say the number sequence forward and backward by 2s, 5s, and 10s using starting points that are multiples of 2, 5, and 10 to 100. Say the number sequence using starting points from 1 to 9 by 10s to 100. Say the number sequence forward by 2s starting from 1 to 100. Estimate quantities to 100 using referents. ⬌ N.1 N.6

- **Representing Whole Numbers**
  Demonstrate if a number up to 100 is even or odd. Describe relative position using ordinal numbers. Represent, describe, compare, and order whole numbers to 100. Illustrate the meaning of place value for numbers to 100. ⬌ N.2 N.3 N.4 N.5 N.7

- **Operations with Whole Numbers**
  Demonstrate and explain the effect of adding zero to or subtracting zero from any number. Demonstrate an understanding of addition (limited to 1- and 2-digit numerals) with answers to 100 and corresponding subtraction by using personal strategies, by creating and solving problems, and by explaining that the order in which numbers are added does not affect the sum, but that the order in which numbers are subtracted may affect the difference. Recall of facts to 10, doubles to 9 + 9, and related subtraction facts is expected by the end of Grade 2. ⬌ N.8 N.9 N.10

PATTERNS AND RELATIONS Strand

Ç Patterns

- **Patterning and Algebraic Thinking**
  Predict an element in a repeating pattern using a variety of strategies. Demonstrate an understanding of increasing patterns by describing, reproducing, extending, and creating patterns using a variety of representations and numbers to 100. ⬌ PR.1 PR.2

Ç Variables and Equations

- **Algebraic Representations with Equations**
  Demonstrate and explain the meaning of equality and inequality, and record equalities and inequalities using the equal and not-equal symbol. ⬌ PR.3 PR.4

SHAPE AND SPACE Strand

Ç Measurement

- **Length, Area, Volume, and Mass**
  Relate the size of a unit of measure to the number of units (limited to non-standard units) used to measure length (including the iteration process) and mass. Compare and order the attributes of objects using non-standard units, and make statements of comparison. Demonstrate that changing the orientation of an object does not alter the measurement of its attributes. ⬌ SS.2 SS.3 SS.4 SS.5

- **Time**
  Relate the number of days to a week and the number of months to a year in a problem-solving context. ⇻ SS.1

Ç 3-D Objects and 2-D Shapes

- **Identifying, Sorting, Comparing, and Constructing**
  Sort, describe, compare, and construct 2-D shapes and 3-D objects. Identify 2-D shapes as parts of 3-D objects in the environment. ⬌ SS.6 SS.7 SS.8 SS.9

STATISTICS AND PROBABILITY Strand

Ç Data Analysis

- **Collecting, Organizing, and Analyzing Data**
  Gather and record data to answer questions about self and others. Construct and interpret concrete graphs and pictographs to solve problems. ⇻ SP. 1 SP. 2

n	Concept/learning outcomes are taught in this grade only and will be applied in future grades.
⇽	Concept/learning outcomes introduced in previous grade(s) are further taught in this grade and will be applied in future grades.
⇻	Concept/learning outcomes are taught for the first time in this grade and will be taught in future grade(s).
⬌	Concept/learning outcomes introduced in previous grades are taught in this grade and will continue to be taught in future grades.

REPORT CARD CATEGORIES

KNOWLEDGE AND UNDERSTANDING OF MATHEMATICAL CONCEPTS

The student demonstrates knowledge and understanding of grade-specific mathematical concepts and skills in each strand (number, patterns and relations, shape and space, statistics and probability).

MENTAL MATH AND ESTIMATION

The student uses math knowledge and number facts to calculate mentally or estimate within each strand (number, patterns and relations, shape and space, statistics and probability). Students apply mental math strategies with efficiency, accuracy, and flexibility. They are able to make reasonable estimates of values or quantities using benchmarks and referents.

PROBLEM SOLVING

The student applies knowledge, skill, or understanding to solve problems in each strand (number, patterns and relations, shape and space, statistics and probability). By learning to solve problems and by learning through problem solving, students connect mathematical ideas in new contexts. Students think logically, visualize, model, reason, and communicate and justify their solutions.

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GRADE 2 MATHEMATICS

Mathematical Processes

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COMMUNICATION

Students communicate daily (orally, through diagrams and pictures, and by writing) about their mathematics learning. They need opportunities to read about, represent, view, write about, listen to, and discuss mathematical ideas. This enables them to reflect, to validate, and to clarify their thinking. Journals and learning logs can be used as a record of student interpretations of mathematical meanings and ideas.

CONNECTIONS

Mathematics should be viewed as an integrated whole, rather than as the study of separate strands or units. Connections must also be made between and among the different representational modes—concrete, pictorial, and symbolic (the symbolic mode consists of oral and written word symbols as well as mathematical symbols). The process of making connections, in turn, facilitates learning. Concepts and skills should also be connected to everyday situations and other curricular areas.

MENTAL MATH AND ESTIMATION

Mental mathematics and estimation are a combination of cognitive strategies that enhance flexible thinking and number sense. Strategies within mental mathematics and estimation enable students to calculate mentally without the use of external aids. In the process, they improve their computational fluency—developing efficiency, accuracy, and flexibility.

PROBLEM SOLVING

Students are exposed to a wide variety of problems in all areas of mathematics. They explore a variety of methods for solving and verifying problems. In addition, they are challenged to find multiple solutions for problems and to create their own problems.

REASONING

Mathematics reasoning involves informal thinking, conjecturing, and validating—these help children understand that mathematics makes sense. Students are encouraged to justify, in a variety of ways, their solutions, thinking processes, and hypotheses. In fact, good reasoning is as important as finding correct answers.

TECHNOLOGY

Technology contributes to the learning of a wide range of mathematical learning outcomes, and enables students to explore and create patterns, examine relationships, test conjectures, and solve problems.

VISUALIZATION

Mental images help students to develop concepts and to understand procedures. Students clarify their understanding of mathematical ideas, images, and explanations.