# Grade 2 - Mathematics

**Standards I: <u>Mathematical Processes.</u>**

*A. Use a variety of tools and strategies in problem solving. I-A*

*B. Apply mathematical knowledge and skills routinely in other content areas and practical situations. I-B*

*C. Recognize and use connections between equivalent representations and related procedures. I-C*

*D. Evaluate the reasonableness of predictions, estimations and solutions. I-D*

*E. Use a variety of mathematical representations to organize, record, and communicate mathematical ideas. I-E*

*F. Use mathematical language and symbols to explain mathematical ideas, strategies, and solutions. I-F*

*G. Explain orally mathematical thinking and ideas. I-G*

**Benchmarks for Standard I:**

- **Use alternative strategies to problem solve.**
- **Use conventional symbols and common language to describe a problem situation and solution.**
- **Evaluate the reasonableness of predictions, estimations and solutions.**
- **Communicate and/or write in own words strategies to solve a problem.**

**Standards II: <u>Number, Number Sense and Operations.</u>**

A. Use place value concepts to represent, compare and order whole numbers using physical models, numerals and words, with ones, tens and hundreds. For example: II-C
   1. Recognize 10 can mean "10 ones" or a single entity (1 ten) through physical models and trading games.
   2. Read and write 3-digit numerals (e.g., 243 as two hundred forty three, 24 tens and 3 ones, or 2 hundreds and 43 ones, etc.) and construct models to represent each.

B. Represent fractions (halves, thirds, and fourths), using words, numerals and physical models. For example: II-A, I-E
   1. Recognize that a fractional part can mean different amounts depending on the original quantity.
   2. Recognize that a fractional part of a rectangle does not have to be shaded with contiguous parts.
   3. Identify and illustrate parts of a whole and parts of sets of objects.
   4. Compare and order physical models of 1/2, 1/3, 1/4 in relation to 0 and 1.

C. Model, represent and explain subtraction as comparison, take-away and part-to-whole; e.g., solve missing addend problems by counting up or subtracting, such as "I had six baseball cards, my sister gave me more, and I now have ten. How many did she give me?" can be represented as 6 + ? = 10 or 10 - 6 = ?. II-A,B, I-E

D. Model, represent and explain multiplication as repeated addition, rectangular arrays and skip counting. II-A,B, I-E

E. Model, represent and explain division as sharing equally and repeated subtraction. II-A,B, I-E

F. Model and use the commutative property for addition. II-B, I-E

G. Demonstrate fluency in addition facts with addends through 9 and corresponding subtractions; e.g., 9 + 9 = 18, 18 – 9 = 9. II-B,D

H. Add and subtract multiples of 10. II-B,D

I. Demonstrate multiple strategies for adding and subtracting 2- or 3-digit whole numbers, such as: II-D
   1. compatible numbers;
   2. compensatory numbers;
   3. informal use of commutative and associative properties of addition.

J. Add and subtract 2-digit numbers with and without regrouping. II-B,D

K. Estimate the results of whole number addition and subtraction problems using front-end estimation, and judge the reasonableness of the answers.

**Benchmarks for Standard II:**

- **Use place value concepts to represent whole numbers using numerals, words and physical models.**
- **Recognize, classify, compare and order whole numbers.**
- **Model, explain and master operations (addition and subtraction) with basic facts 0-18.**
- **Add and subtract 2-digit numbers with and without regrouping.**
- **Demonstrate fluency in adding and subtracting multiples of 10, and recognize combinations that make 10.**

**Standard III: <u>Measurement.</u>**

A. Identify and select appropriate units of measure for: III-A,B
   1. length – centimeters, meters, inches, feet or yards;
   2. volume (capacity) – liters, cups, pints or quarts;
   3. weight – grams, ounces or pounds;
   4. time – hours, half-hours, quarter-hours or minutes and time designations, a.m. or p.m.

B. Establish personal or common referents for units of measure to make estimates and comparisons; e.g., the width of a finger is a centimeter, a large bottle of soda pop is 2 liters, a small paper clip weighs about one gram. III-D

C. Describe and compare the relationships among units of measure, such as centimeters and meters; inches, feet and yards; cups, pints and quarts; ounces and pounds; and hours, half-hours, and quarter-hours; e.g., how many inches in a foot? III-D

D. Tell time to the nearest minute interval on digital and to the nearest 5 minute interval on analog (dial) timepieces. III-C

E. Estimate and measure the length and weight of common objects, using metric and U.S. customary units, accurate to the nearest unit. III-C

F. Select and use appropriate measurement tools; e.g., a ruler to draw a segment 3 inches long, a measuring cup to place 2 cups of rice in a bowl, a scale to weigh 50 grams of candy. III-C
G. Make and test predictions about measurements, using different units to measure the same length or volume. III-B
H. Represent and write the value of money using the ¢ sign and in decimal form when using the $ sign. II-A
I. Count money and make change using coins and a dollar bill.

**Benchmarks for Standard III:**

- **Select appropriate units for length, weight, volume and time, using: objects; i.e., non-standard units; U.S. customary units: inch, foot, ounce, pound, cup, quart, gallon, minutes, hour, day, week and year; metric units: centimeter, meter, gram and liter.**
- **Develop common referents for units of measure for length, weight, volume, and time to make comparisons and estimates.**
- **Apply measurement techniques to measure length, weight and volume.**
- **Recognize that using different units of measurement will yield different numbers for the same measurement.**
- **Determine the value of a collection of coins and dollar bills.**

**Standard IV: <u>Geometry and Spatial Sense.</u>**

A. Identify, describe, compare and sort two and three-dimensional objects (i.e., cubes, spheres, prisms, cones, cylinders, pentagon, hexagon and pyramids). IV-A,G
B. Predict what new shapes will be formed by combining or cutting apart existing shapes. IV-F
C. Recognize two-dimensional shapes and three-dimensional objects from different positions. IV-A
D. Create and identify two-dimensional figures with line symmetry; e.g., what letter shapes, logos, polygons are symmetrical? IV-A,E

**Benchmarks for Standard IV:**

- **Describe and create plane figures; circle, rectangle, square, triangle, hexagon, trapezoid, parallelogram and rhombus, and identify them in the environment.**
- **Describe solid objects: cube, rectangular prism, sphere, cylinder, cone and pyramid, and identify them in the environment.**
- **Recognize two- and three-dimensional objects from different positions.**
- **Identify and draw figures with line symmetry.**

**Standard V: <u>Patterns, Functions and Algebra.</u>**

A. Solve open sentences by representing an expression in more than one way using the commutative property; e.g., 4 + 5 = 5 + 4 or the number of blue balls plus red balls is the same as the number of red balls plus blue balls (R + B = B + R). V-G
B. Extend simple number patterns (both repeating and growing patterns), and create similar patterns using different objects, such as using physical materials or shapes to represent numerical patterns. V-B
C. Use patterns to make generalizations and predictions; e.g., determine a missing element in a pattern. V-B
D. Create new patterns with consistent rules or plans, and describe the rule or general plan of existing patterns. V-C
E. Use objects, pictures, numbers and other symbols to represent a problem situation. V-F
F. Understand equivalence and extend the concept to situations involving symbols; e.g., 4 + 5 = 9 and 9 = 4 + 5, and 4 + 5 = 3 + 6 = Δ + □... V-G
G. Use symbols to represent unknown quantities and identify values for symbols in an expression or equation using addition and subtraction; e.g., □ + O = 10, Δ - 2 = 4. V-G

**Benchmarks of Standard V:**

- **Represent an unknown quantity as a variable using a symbol such as □, Δ, 0.**

**Standard VI: <u>Data Analysis and Probability.</u>**

A. Pose questions, use observations, interviews and surveys to collect data, and organize data in charts, picture graphs and bar graphs. VI-A
B. Read, interpret and make comparisons and predictions from data represented in charts, line plots, picture graphs and bar graphs. VI-C
C. Read and construct simple timelines to sequence events. VI-A
D. Write a few sentences to describe and compare categories of data represented in a chart or graph, and make statements about the data as a whole. VI-C
E. Identify untrue or inappropriate statements about a given set of data. VI-C
F. Recognize that data may vary from one population to another; e.g., favorite TV shows of students and of parents. VI-E
G. List some of the possible outcomes of a simple experiment, and predict whether given outcomes are more, less or equally likely to occur. VI-F
H. Use physical models and pictures to represent possible arrangements of 2 or 3 objects. VI-B

**Benchmarks for Standard VI:**

- **Represent data using objects, picture graphs and bar graphs.**
- **Describe the probability of chance events as more, less or equally likely to occur.**

**Key to using this document:**

**- Items in bold with Roman numerals are COS standards.**

**- Items in bold without Roman numerals are benchmarks.**

- Items in regular print are state grade level indicators with the COS letter/number correlation.

*- Items in italics reference the Diocesan COS objectives that are not in state standards.*