

2ND GRADE MATHEMATICS

CURRICULUM GUIDE

BIG IDEAS

- ◆ The base-ten numeration system is based on counting and grouping in units and multiples of ten.
 - ◆ Fluently and accurately recalling basic facts allows us to solve arithmetic problems more efficiently.
 - ◆ Properties of addition and subtraction allow us to add and subtract multi-digit numbers.
 - ◆ Standard units of equal length are the basis for linear measurement.
 - ◆ Facility with linear measurement allows us to accurately determine and represent the lengths of objects.
 - ◆ Our monetary system is based on the accurate exchange of coins and currency of various values.
 - ◆ Fluency and accuracy with time and time relationships allows us to function in a schedule-oriented society.
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THEMATIC FOCUS

- ◆ Math classrooms are lively places for learning where students receive a rich diet of the following:
 - The use of mathematics to *solve problems*.
 - Application of *logical reasoning* to justify procedures and solutions.
 - Design and analyze multiple *representations*, make *connections* in and out of school.
 - See the National Council of Teachers of Mathematics (NCTM) [PRINCIPLES & STANDARDS FOR SCHOOL MATHEMATICS](#) for further information.
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UNITS OF STUDY

- ◆ Base Ten System
 - ◆ Place Value concepts to 1,000.
 - ◆ Counting in Multiples
 - ◆ Addition and Subtraction Operations
 - ◆ Multi-digit addition and subtraction
 - ◆ Coin Values
 - ◆ Estimation
 - ◆ Telling time
 - ◆ Linear measurement
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CONCEPTS AND SKILLS

It is essential that the following concepts and skills be addressed in contexts that promote problem solving, reasoning, communication, making connections and designing and analyzing representations. See [FOCAL POINTS](#) for more information about grade level content for mathematics.

2.1 Number and Operations: Developing an understanding of the base-ten numeration system and place-value concepts

- Write, compare, and order whole numbers to 1000. (2.1.1)
- Understand and apply base-ten numeration, and count in multiples of one, two, five, ten, and one hundred. (2.1.2)
- Compose and decompose whole numbers less than one thousand by place value (e.g., 426 as 4 hundreds + 2 tens + 6 ones and $400 + 20 + 6$). (2.1.3)
- Use place value and properties of operations to find and use equivalent representations of numbers (such as 35 represented by 35 ones, 3 tens and 5 ones, or 2 tens and 15 ones). (2.1.4)

CONCEPTS AND SKILLS (CONTINUED)

2.2 Number and Operations and Algebra: Developing a quick recall of addition and related subtraction facts and fluency with multidigit addition and subtraction

- Apply, with fluency, sums to 20 and related subtraction facts. (2.2.1)
- Solve multi-digit whole number problems by applying various meanings (e.g. taking away, and comparing) and models (e.g. combining or separating sets, using number lines, and hundreds charts) of addition and subtraction. (2.2.2)
- Develop fluency with efficient procedures for adding and subtracting multi-digit whole numbers and understand why the procedures work on the basis of place value and number properties. (2.2.3)
- Select and apply efficient methods to estimate sums and differences or calculate them mentally depending on the numbers and context involved. (2.2.4)
- Determine the value of mixed collections of coins to \$1.00. (2.2.5)

2.3 Measurement: Develop an understanding of linear measurement and facility in measuring lengths

- Determine length by finding the total number of equal-length units that are placed end-to-end without gaps or overlaps. (2.3.1)
- Apply concepts of partitioning (the mental activity of slicing the length of an object into equal-sized units) and transitivity (e.g. if object A is longer than object B and object B is longer than object C, then object A is longer than object C). (2.3.2)
- Demonstrate an understanding that using different measurement units will result in different numerical measurements for the same object. (2.3.3)
- Explain the need for equal length units and the use of standard units of measure. (2.3.4)
- Use rulers and other measurement tools to estimate and measure length in common units (e.g. centimeter and inch). (2.3.5)
- Use the measurement process: choose an appropriate measurement unit, compare that unit to the object, and report the number of units. (2.3.6)
- Demonstrate an understanding of time and use of time relationships (e.g. how many minutes in an hour, days in a week, and months in a year). (2.3.7)
- Tell time in increments of five minutes using analog and digital clocks. (2.3.8)

◆ **2nd Grade Connections**

The following connections to the concepts and skills bring in other important topics in meaningful ways. For example, the grade Second Grade Connections highlight the fact that the measurement focal point for grade 2 (“Developing an understanding of linear measurement and facility in measuring lengths”) includes work with applications and models using the shapes from the geometry focal point for grade 1 (“Composing and decomposing geometric shapes”). At the same time, students in grade 2 continue to use vocabulary and spatial reasoning that will be essential for learning the content specified in the geometry focal point for grade 3 (“Describing and analyzing properties of two-dimensional shapes”). Because a curriculum that is integrated and internally connected (see [FOCAL POINTS OVERVIEW](#) for additional information) in this way uses related concepts and skills to support and enrich one or more focal points at a grade level, it has the potential to maximize students’ learning.

- Numbers and Operations
 - Understanding of multiplication as repeated addition
- Geometry and Measurement
 - Estimate, measure, and compute lengths.
 - Composing and decomposing 2-dimensional shapes.
 - Geometry knowledge and spatial reasoning to develop understanding of area, fractions, and proportions.
- Algebra
 - Use patterns to extend knowledge of properties and operations of numbers and operations.

CONCEPTS AND SKILLS (CONTINUED)

- ◆ **Math Work Samples & Assessment** Beginning in 3rd grade, students are required to complete at least one teacher-scored math work sample and take the OAKS assessment. 2nd graders should be provided the opportunity to complete work samples with teacher feedback based on the official scoring guide (see [Assessment](#) section for math scoring guides, sample tasks, and additional information).
 - ◆ **Problem Solving** (see [Problem Solving](#) section for definitions, grade level descriptions, and instructional resources)
 - ◆ **Math Placement** (see [Placement](#) section for course flowcharts, placement criteria, and additional information)
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ESSENTIAL QUESTIONS

- ◆ What is a digit? Why isn't a digit always worth the same amount?
 - ◆ How do we use numbers to represent different quantities?
 - ◆ How does a digit determine the value of a number?
 - ◆ What is addition and subtraction? When do you use them?
 - ◆ What is estimation? How do we use it?
 - ◆ What is time? How do we use it?
 - ◆ How are the values of various coins relevant to our lives?
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ESSENTIAL SKILLS

- ◆ Apply mathematics in a variety of settings
 - Interpret a situation and apply workable mathematical concepts and strategies, using appropriate technologies where applicable.
 - Produce evidence, such as graphs, data, or mathematical models, to obtain and verify a solution.
 - Communicate and defend the verified process and solution, using pictures, symbols, models, narrative or other methods.
 - See [ESSENTIAL SKILLS](#) for more information about ODE requirements.