

3RD GRADE MATHEMATICS

CURRICULUM GUIDE

BIG IDEAS

- ◆ Multiplication and or division of whole numbers can be represented by a number of different models.
 - ◆ Properties of addition and multiplication allow us to efficiently solve arithmetic problems.
 - ◆ Multiplication and division are inverse operations.
 - ◆ Fractions are used to represent relative parts of a whole, parts of a set, or points or distances on a number line.
 - ◆ A fractional part is equal to, less than, or greater than one whole.
 - ◆ Geometric shapes of different dimensions and their properties can be described mathematically.
 - ◆ New shapes can be created by either combining or dissecting existing shapes.
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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

- ◆ Fractions
 - Common
 - Parts of whole
 - Equivalent
 - Adding with like denominators
 - ◆ Multiplication and Division
 - Apply models
 - Inverse relationship
 - ◆ Geometry
 - Identify
 - Describe
 - Classify
 - Compare based on attributes, including perimeter
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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.

3.1 Number and Operations: Develop an understanding of fractions and fraction equivalence

- Represent common fractions (e.g., halves, thirds, fourths, tenths) as equal parts of a whole, parts of a set, or points or distances on a number line. (3.1.1)
- Recognize and demonstrate that sizes of fractional parts are relative to the size of the whole. (3.1.2)
- Use fractions to represent numbers that are equal to, less than, or greater than one. (3.1.3)
- Solve problems that involve comparing and ordering fractions by using models, benchmarks (0, $\frac{1}{2}$, 1), or common numerators or denominators. (3.1.4)
- Identify equivalent fractions using models, including the number line. (3.1.5)
- Add common fractions with like denominators. (3.1.6)

CONCEPTS AND SKILLS (CONTINUED)

3.2 Number and Operations, Algebra, and Data Analysis: Develop understandings of multiplication and division, and strategies for basic multiplication facts and related division facts

- Represent and apply the concept of multiplication as repeated addition. (3.2.1)
- Represent and apply the concept of division as repeated subtraction and forming equal groups. (3.2.2)
- Apply models of multiplication (e.g., equal-sized groups, arrays, area models, equal 'jumps' on number lines and hundreds charts) and division (e.g., repeated subtraction, partitioning, and sharing) to solve problems. (3.2.3)
- Apply increasingly sophisticated strategies based on the number properties (e.g., place value, commutative, associative, distributive, identity, and zero) to solve multiplication and division problems involving basic facts. (3.2.4)
- Apply the inverse relationship between multiplication and division (e.g., $5 \times 6 = 30$, $30 \div 6 = 5$) and the relationship between multiples and factors. (3.2.5)
- Represent, analyze and extend number patterns using rules that involve multiplication and/or addition (e.g., $\{3, 6, 9, 12, \dots\}$, $\{1, 2, 4, 8, \dots\}$). (3.2.6)
- Analyze frequency tables, bar graphs, picture graphs, and line plots; and use them to solve problems involving addition, subtraction, multiplication, and division. (3.2.7)

3.3 Geometry and Measurement: Describe and analyze properties of two dimensional shapes, including perimeters

- Identify right angles in two-dimensional shapes and determine if angles are greater than or less than a right angle (obtuse and acute). (3.3.1)
- Identify, describe, compare, analyze, and informally classify triangles by their sides and angles. (3.3.2)
- Identify, describe, compare, analyze, and classify quadrilaterals (square, rectangle, parallelogram, rhombus, and trapezoid) by their sides and angles. (3.3.3)
- Identify, describe, and compare pentagons, hexagons, and octagons by the number of sides or angles. (3.3.4)
- Investigate and describe the results of decomposing, combining, and transforming polygons to make other polygons. (3.3.5)
- Build, draw, and analyze two-dimensional shapes to understand attributes and properties of two dimensional space. (3.3.6)
- Determine an appropriate unit, tool, or strategy to find the perimeter of polygons. (3.3.7)
- Use attributes and properties of two-dimensional shapes to solve problems including applications involving parallel and perpendicular lines, congruence, symmetry, and perimeter. (3.3.8)

◆ **3RD Grade Connections**

The following connections to the concepts and skills bring in other important topics in meaningful ways. For example, the grade 2ND 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.

- Algebra
 - Create and analyze patterns and relationships involving multiplication and division.
 - Build a foundation for understanding functional relationships, e.g., “The number of legs is four times the number of chairs.”

CONCEPTS AND SKILLS (CONTINUED)

- Measurement
 - Extend precision with linear measurement to include fractional values.
 - Form understanding of perimeter as a measurable attribute
 - Select appropriate units, strategies and tools to solve problems involving perimeter.
 - Data Analysis
 - Construct and analyze frequency tables, bar graphs, picture graphs and line plots.
 - Number and Operations
 - Building on their work in grade 2, extend understanding of place value to numbers up to 10,000 in various contexts. Use of mental computation and estimation should be included.
- ◆ **Math Work Samples & Assessment** Beginning in 3rd grade, students should be provided multiple opportunities to complete math work samples and are required to complete at least one teacher-scored math work sample based on the official scoring guide. 3rd graders are also required to take the Oregon Assessment of Knowledge and Skills (OAKS) test in the spring (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 fraction? What is its relationship to a whole number? How do you know if fractions are equivalent?
 - ◆ What is the relationship between multiplication and division? Demonstrate as many strategies as possible to solve a multiplication or division problem. (i.e.: Equal-sized groups, arrays, etc.)
 - ◆ How can you describe and analyze properties of two dimensional shapes, including perimeters? Using several mathematical attributes and properties compare the similarities and differences of at least two shapes.
 - ◆ How can you create a new shape with other shapes? Prove that new shapes can be formed by combining, decomposing, and/or transforming another shape or shapes.
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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.