

6TH GRADE MATHEMATICS

CURRICULUM GUIDE

BIG IDEAS

- ◆ Fractions, decimals and percents can represent the same quantity in different forms.
 - ◆ Ratios, proportions, and percents have many applications such as determining rates and unit cost.
 - ◆ Fluency and accuracy with using math formulas, algorithms, properties, and strategies expedites the problem-solving process.
 - ◆ Variables represent numbers whose exact values are not yet specified.
 - ◆ Expressions in different forms can be equivalent.
 - ◆ Solutions of an equation are values that make the equation true.
 - ◆ Number benchmarks are useful for relating numbers and estimating amounts.
 - ◆ Probability can be estimated by using an appropriate model and conducting an experiment.
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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

Note: Units of study may include a review of whole number operations, and decimal and fraction addition and subtraction from elementary grades.

- ◆ Division of whole numbers with decimal and fraction results
 - ◆ Properties of operations and algebraic thinking
 - ◆ Algebraic expressions and one-step equations
 - ◆ Multiplication and division of decimals
 - ◆ Multiplication and division of fractions
 - ◆ Ratio, proportion and percent
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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.

6.1 Number and Operations: Develop an understanding of and fluency with multiplication and division of fractions and decimals

- Select and use appropriate strategies to estimate fraction and decimal products and quotients. (6.1.1)
- Use and analyze a variety of strategies, including models, for solving problems with multiplication and division of fractions. (6.1.2)
- Use and analyze a variety of strategies, including models, for solving problems with multiplication and division of decimals. (6.1.3)
- Develop fluency with efficient procedures for multiplying and dividing fractions and decimals and justify why the procedures work. (6.1.4)
- Apply the inverse relationship between multiplication and division to make sense of procedures for multiplying and dividing fractions and justify why they work. (6.1.5)
- Apply the properties of operations to simplify calculations. (6.1.6)
- Use the relationship between common decimals and fractions to solve problems including problems involving measurement (including area and volume). (6.1.7)

CONCEPTS AND SKILLS (CONTINUED)

6.2 Number and Operations and Probability: Connect ratio, rate, and percent to multiplication and division

- Develop, analyze, and apply the meaning of ratio, rate, and percent to solve problems. (6.2.1)
- Determine decimal and percent equivalents for common fractions, including approximations. (6.2.2)
- Understand the meaning of probability and represent probabilities as ratios, decimals, and percents. (Circle graphs). (6.2.3)
- Determine simple probabilities, both experimental and theoretical. (6.2.4)
- Develop the concept of π as the ratio of the circumference of a circle to its diameter. (6.2.5)

6.3 Algebra: Writing, interpreting and using mathematical expressions and equations

- Use order of operations to simplify expressions that may include exponents and grouping symbols. (6.3.1)
- Develop the meanings and uses of variables. (6.3.2)
- Write, evaluate, and use expressions and formulas to solve problems. (6.3.3)
- Identify and represent equivalent expressions (e.g., different ways to see a pattern). (6.3.4)
- Represent, analyze, and determine relationships and patterns using tables, graphs, words and when possible, symbols. (6.3.5)
- Recognize that the solutions of an equation are the values of the variables that make the equation true. (6.3.6)
- Solve one-step equations by using number sense, properties of operations, and the idea of maintaining equality on both sides of an equation. (6.3.7)

◆ **6th Grade Connections**

(Not standards for mastery, but are important topics to use to support and enrich the focal points.)

○ **Numbers and Operations**

- Division of whole numbers with decimal and fraction results
- Primes and prime factorization

◆ **Math Work Samples & Assessment** In 6th 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. 6th 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)

ESSENTIAL QUESTIONS

- ◆ Why learn math formulas and algorithms? How can they help us in real life?
- ◆ How do fractions, decimals and percents relate?
- ◆ What are rates and ratios? How do they relate to fractions and decimals?
- ◆ How do variables represent mathematical thinking?
- ◆ How does probability relate to fractions, decimals, and percents?

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.
- ◆ Think critically and analytically. This skill includes all of the following:
 - Identify and explain the key elements of a complex event, text, issue, problem or phenomenon.

ESSENTIAL SKILLS (CONTINUED)

- Develop a method to explore the relationships between the key elements of a complex event, text, issue, problem or phenomenon.
- Propose defensible conclusions that address multiple and diverse perspectives.
- Evaluate the strength of conclusions, differentiating reasoning based on facts from reasoning based on opinions.
- See [ESSENTIAL SKILLS](#) for more information about ODE requirements.