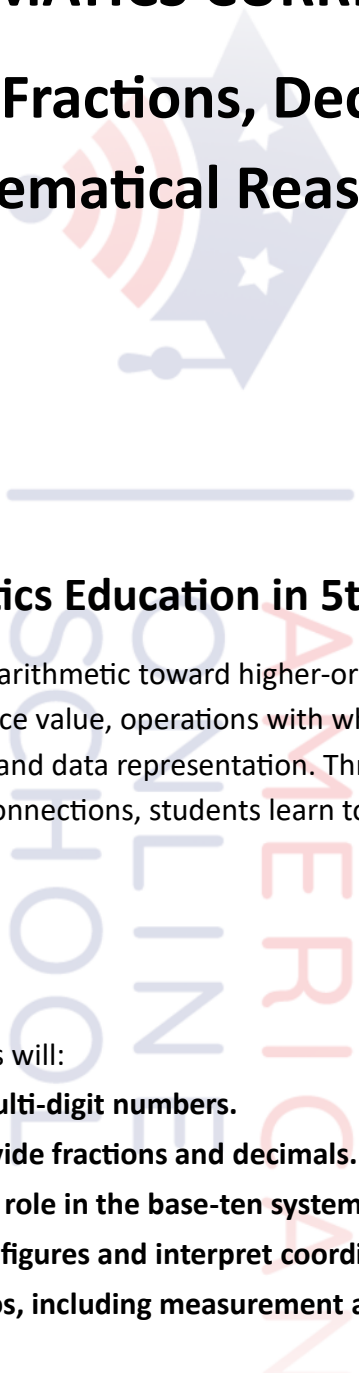


5th Grade American Online School

MATHEMATICS CURRICULUM

Mastering Fractions, Decimals, and Mathematical Reasoning



Version May/2025

1. Introduction

The Role of Mathematics Education in 5th Grade

In 5th grade, students move from arithmetic toward higher-order mathematical thinking. They deepen their understanding of place value, operations with whole numbers and fractions, and explore measurement, geometry, and data representation. Through visual models, multi-step problem solving, and real-world connections, students learn to communicate mathematically and reason abstractly.

By the end of this course, students will:

- ✓ Fluently multiply and divide multi-digit numbers.
 - ✓ Add, subtract, multiply, and divide fractions and decimals.
 - ✓ Understand place value and its role in the base-ten system.
 - ✓ Analyze and classify geometric figures and interpret coordinate graphs.
 - ✓ Apply math in real-life scenarios, including measurement and data.
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2. Core Competence Areas

MTH.1 Whole Number Operations and Place Value

Learning Outcomes

By the end of this course, students will be able to:

- ✓ **Multiply and divide multi-digit numbers using standard algorithms.**
- ✓ **Understand place value relationships in multi-digit numbers.**
- ✓ **Round and estimate results in context.**

Competencies

MTH.1.A.1 – Performing multi-digit multiplication and division.

- Solve problems using area models, partial products, and long division.
- Apply multiplication and division to word problems.

MTH.1.A.2 – Understanding place value and patterns.

- Read and write numbers to the millions.
- Use powers of 10 and base-10 patterns.

MTH.2 Decimals and Fractions

Learning Outcomes

By the end of this unit, students will be able to:

- ✓ **Read, write, and compare decimals to thousandths.**
- ✓ **Add and subtract fractions and decimals with unlike denominators.**
- ✓ **Interpret and solve problems involving fraction multiplication and division.**

Competencies

MTH.2.A.1 – Working with decimals.

- Model and calculate decimal operations using grids and place value.
- Apply to money, measurement, and data tasks.

MTH.2.A.2 – Adding, subtracting, and multiplying fractions.

- Use visual models and equivalent fractions to compute.
- Solve fraction word problems with mixed numbers and remainders.

MTH.2.A.3 – Dividing with unit fractions.

- Interpret and model division of fractions by whole numbers and vice versa.
- Apply in recipes, sharing, and ratios.

MTH.3 Algebraic Thinking and Math Expressions

Learning Outcomes

By the end of this unit, students will be able to:

- ✓ **Write and evaluate numerical expressions using parentheses and brackets.**
- ✓ **Analyze patterns and relationships using tables and rules.**

Competencies

MTH.3.A.1 – Understanding expressions and equations.

- Translate verbal phrases into math expressions.
- Use the order of operations (PEMDAS).

MTH.3.A.2 – Exploring input/output tables.

- Create and complete tables from rules.
- Identify patterns in multiplication and addition.

MTH.4 Measurement and Geometry

Learning Outcomes

By the end of this unit, students will be able to:

- ✓ **Convert measurement units within the same system.**
- ✓ **Classify shapes by properties of sides and angles.**
- ✓ **Understand volume and measure it using unit cubes and formulas.**

Competencies

MTH.4.A.1 – Solving measurement problems.

- Convert time, length, weight, and volume.
- Apply to real-life tasks like schedules and recipes.

MTH.4.A.2 – Exploring 2D and 3D shapes.

- Identify polygons, classify triangles and quadrilaterals.
 - Calculate volume of rectangular prisms using unit cubes and formulas.
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MTH.5 Graphing and Data Interpretation

Learning Outcomes

By the end of this unit, students will be able to:

- ✓ Graph points on the coordinate plane.
- ✓ Interpret line plots with fractional data.
- ✓ Analyze data sets and solve related problems.

Competencies

MTH.5.A.1 – Using the coordinate plane.

- Plot ordered pairs in the first quadrant.
- Represent geometric shapes and real-life paths.

MTH.5.A.2 – Interpreting data.

- Construct and interpret line plots using fraction units.
 - Analyze data to solve multistep problems.
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3. Assessment and Evaluation

Formative Assessments – Practice and Process

- ✓ Exit slips and quick checks.
- ✓ Math journals and number talks.
- ✓ Peer tutoring and math circles.

Summative Assessments – Application of Mastery

- ✓ Chapter quizzes and multi-step problem sets.
- ✓ Performance tasks and projects.
- ✓ Mid-year and final cumulative tests.

Authentic Assessment – Real-Life Connections

- ✓ Budgeting simulation or marketplace math.
 - ✓ Fraction cooking lab.
 - ✓ Measurement and geometry scavenger hunt.
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4. Instructional Strategies for Online Learning

Hands-On, Minds-On Learning

- ✓ Use manipulatives like fraction tiles, base-ten blocks, and clocks.
- ✓ Encourage visual models, drawings, and real-world materials.

Growth Mindset and Peer Collaboration

- ✓ Use math affirmations and error analysis.
- ✓ Promote math discussions, think-pair-share, and collaborative stations.

Learning Culture

- ✓ Celebrate strategies, not just answers.
- ✓ Normalize challenge as part of learning.
- ✓ Encourage student-created math videos or mini-lessons.