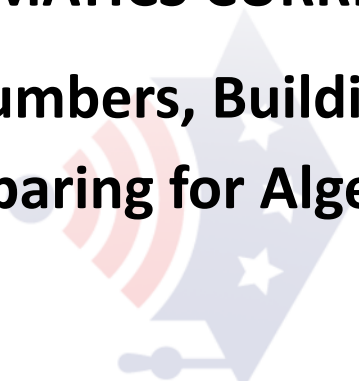


4th Grade American Online School

MATHEMATICS CURRICULUM

Mastering Numbers, Building Structure, Preparing for Algebra



Version May/2025

1. Introduction

The Role of Mathematics Education in 4th Grade

The 4th Grade Math curriculum bridges foundational arithmetic with more complex operations and introduces early algebraic thinking. Students explore numbers into the millions, deepen their understanding of multiplication and division, and apply math to solve real-world problems involving measurement, geometry, and data. This curriculum nurtures mathematical reasoning, accuracy, and confidence.

By the end of this course, students will:

- ✓ Perform multi-digit operations with accuracy and efficiency.
 - ✓ Understand place value up to one million.
 - ✓ Apply concepts of fractions, measurement, and geometry.
 - ✓ Solve word problems using multiple strategies.
 - ✓ Begin exploring mathematical structure in preparation for algebra.
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2. Core Competence Areas

MTH.1 Addition and Subtraction (1–5 Digit Numbers)

Learning Outcomes

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

- ✓ Add and subtract numbers through five digits with regrouping.
- ✓ Use place value understanding to align numbers.
- ✓ Solve multi-step word problems involving addition and subtraction.

Competencies

MTH.1.A.1 – Mastering addition and subtraction through strategies and algorithms.

- Add and subtract within 1,000,000 using the standard algorithm.
- Check reasonableness of answers using estimation.

MTH.1.A.2 – Applying operations to real-life contexts.

- Solve problems related to distance, money, and population.
- Use bar models, number lines, and tape diagrams.

MTH.2 Numeration and Place Value Understanding

Learning Outcomes

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

- ✓ Read and write numbers through 1,000,000 using standard, word, and expanded form.
- ✓ Compare and round multi-digit numbers.
- ✓ Identify patterns in the place value system.

Competencies

MTH.2.A.1 – Understanding digit value and number patterns.

- Recognize that a digit in one place represents 10 times what it represents in the place to its right.
- Use base-10 blocks, place value charts, and expanded notation.

MTH.2.A.2 – Estimating and rounding with place value knowledge.

- Round numbers to the nearest 10, 100, or 1,000 for estimation.
 - Apply rounding in real-world scenarios like budgeting or measuring.
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MTH.3 Multiplication and Division

Learning Outcomes

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

- ✓ **Recall basic multiplication and division facts with fluency.**
- ✓ **Multiply up to four-digit numbers by one-digit numbers.**
- ✓ **Divide multi-digit numbers by one-digit numbers using models and strategies.**

Competencies

MTH.3.A.1 – Building fluency and flexibility with multiplication.

- Use area models, partial products, and the standard algorithm.
- Apply distributive, associative, and commutative properties.

MTH.3.A.2 – Understanding division as repeated subtraction and partitioning.

- Use arrays, number lines, and repeated subtraction.
 - Solve multi-step problems involving multiplication and division.
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MTH.4 Fractions and Fraction Concepts

Learning Outcomes

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

- ✓ **Understand fractions as numbers on the number line.**
- ✓ **Compare and order fractions with like denominators.**
- ✓ **Recognize equivalent fractions using visual models.**

Competencies

MTH.4.A.1 – Representing fractions using shapes and number lines.

- Write fractions from visual parts of a whole.
- Place fractions on a number line between 0 and 1.

MTH.4.A.2 – Comparing, decomposing, and building fractions.

- Use fraction strips and diagrams to identify equivalent values.
 - Add and subtract fractions with the same denominator.
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MTH.5 Measurement and Data

Learning Outcomes

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

- ✓ **Solve problems involving units of time, length, volume, and weight.**
- ✓ **Convert units within a system (e.g., inches to feet, minutes to hours).**
- ✓ **Represent and interpret data using line plots and bar graphs.**

Competencies

MTH.5.A.1 – Measuring accurately using appropriate tools.

- Use rulers, scales, thermometers, and timers.
- Apply formulas for perimeter and area.

MTH.5.A.2 – Reading and creating data representations.

- Construct line plots using fractions.
 - Analyze data from graphs to solve problems.
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MTH.6 Geometry and Spatial Reasoning

Learning Outcomes

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

- ✓ **Classify 2D shapes by angles and sides.**
 - ✓ **Understand symmetry, lines, and points.**
 - ✓ **Relate geometry to maps, architecture, and art.**
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Competencies

MTH.6.A.1 – Exploring shape attributes and classifications.

- Identify triangles, quadrilaterals, and polygons.
- Recognize right, acute, and obtuse angles.

MTH.6.A.2 – Connecting geometry to design and environment.

- Build symmetrical figures and identify symmetry lines.
 - Create tessellations and shape mosaics.
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MTH.7 Introduction to Algebraic Thinking

Learning Outcomes

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

- ✓ **Identify patterns and generate number rules.**
- ✓ **Use variables to represent unknowns.**
- ✓ **Write and solve simple equations using all four operations.**

Competencies

MTH.7.A.1 – Recognizing and extending patterns.

- Use tables and charts to identify relationships.
- Create input-output rules.

MTH.7.A.2 – Writing and solving equations.

- Solve for unknowns (e.g., $x + 8 = 12$).
 - Use algebra tiles or bar models to represent equations.
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3. Assessment and Evaluation

Formative Assessments – Daily Practice

- ✓ Math journals, fluency drills, and think-alouds.
- ✓ Interactive whiteboard responses.
- ✓ Peer teaching and error analysis.

Summative Assessments – Unit Performance

- ✓ Mid-Test (Chapters 1–5).
- ✓ Final Assessment (Cumulative Chapters 1–9).
- ✓ Multi-step Word Problem Performance Task.

Authentic Assessment – Application and Projects

- ✓ “My Measurement Day” Log.
 - ✓ Build-a-Budget Simulation.
 - ✓ Geometry Art & Shape Scavenger Hunt.
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4. Instructional Strategies for Online Learning

Hands-On and Visual Learning

- ✓ Use base-10 blocks, fraction circles, math tiles, and graphs.
- ✓ Encourage drawing, annotating, and modeling.

Collaborative and Creative Thinking

- ✓ Small-group math circles and stations.
- ✓ Student-designed math board games.

Technology Integration

- ✓ Use of digital math tools.
- ✓ Interactive geometry and graphing apps.

Learning Culture

- ✓ Emphasize growth mindset and perseverance.
- ✓ Celebrate problem-solving creativity and progress.
- ✓ Foster curiosity and joy in numbers and patterns.

