

CURRICULUM

GUIDE

Math – Grade 5

Providence
Schools

Content students have to learn

Processes students will learn and use

**Unit 1.1 – Comparing and Ordering Numbers
(9 days)**

- Understand the magnitude of numbers by comparing and ordering whole numbers and decimals.
- Understand rational numbers from 0 to 9,999,999 using models, explanations, and representations.
- Represent rational numbers in different ways by composing and decomposing and place value.
- Extend patterns in problem situations using a variety of models.

- » Demonstrate an understanding of mathematical concepts and relationships through a variety of methods.
- » Determine the reasonableness of solutions to real-world problems.
- » Communicate by explaining, justifying, and representing using different models.

Unit 1.2 – Adding and Subtracting Whole Numbers and Decimals (11 days)

- Use place-value materials and the commutative and associative properties of addition to calculate sums.
- Estimate the sums and differences of whole numbers and decimals to the hundredths.
- Write and solve addition and subtraction problems with multiple steps.
- Identify and extend linear and nonlinear patterns.
- Compare and order decimals in context using models or number lines.
- Solve one-step linear equations.

- » Determine the reasonableness of solutions to real-world problems.
- » Add to the repertoire of problem-solving strategies and use those strategies in more sophisticated ways.
- » Use models, known facts, properties, and relationships to explain thinking and to justify answers and solution processes.
- » Demonstrate an understanding of mathematical concepts and relationships through a variety of methods.
- » Use appropriate representations to solve problems or to portray, clarify, or extend a mathematical idea.
- » Recognize equivalent representations of concepts and procedures and translate among them as appropriate.

**Unit 1.3 – Multiplying Whole Numbers
(10 days)**

- Use the commutative, associative, and identity properties of multiplication to simplify computation and verify mental math.
- Use basic facts and place-value patterns to find products mentally using multiples of 10 or 100.
- Make estimates in a given situation by identifying when estimation is appropriate and determining the level of accuracy needed.
- Use order of operations, with and without parentheses, to solve problems.

- » Determine the reasonableness of solutions to real-world problems.
- » Use models, known facts, properties, and relationships to explain thinking and to justify answers and solution processes.
- » Discuss mathematical ideas and write convincing arguments.
- » Understand, explain, analyze, and evaluate mathematical arguments and conclusions presented by others.
- » Ask clarifying and extending questions related to mathematics.
- » Demonstrate an understanding of mathematical concepts and relationships through a variety of methods (e.g., writing, graphing, charts, diagrams, number sentences, or symbols).

QUARTER I

Content students have to learn

Processes students will learn and use

Unit 1.4 – Dividing by One-Digit Divisors (12 days)

- Use mental math to divide multiples of 10 and 100 by one-digit numbers.
 - Interpret remainders to solve division problems and check answers for reasonableness.
 - Use estimation and compatible numbers to find the quotient of a division problem.
 - Divide a three-digit number by a one-digit number using models, explanations, or problem solving.
 - Solve division problems involving the use of factors, multiples, prime numbers, and composite numbers.
 - Solve one-step linear equations using models or representations of the expressions.
- » Determine the reasonableness of solutions to real-world problems.
 - » Draw conclusions and solve problems using elementary deductive reasoning and reasoning by analogy.
 - » Recognize the pervasive use and power of reasoning as a part of mathematics.
 - » Understand, explain, analyze, and evaluate mathematical arguments and conclusions presented by others.
 - » Ask clarifying and extending questions related to mathematics.
 - » Use physical models and diagrams to represent important mathematical ideas (e.g., multiplication).
 - » Use appropriate representations to solve problems or to portray, clarify, or extend a mathematical idea.

Content students have to learn

Processes students will learn and use

**Unit 2.1 – Dividing by Two-Digit Divisors
(10 days)**

- Mentally divide three- and four-digit multiples of powers of 10 by their compatible factors.
- Divide whole numbers with one- and two-digit divisors.
- Interpret remainders to solve division problems and check answers for reasonableness.
- Use estimation and compatible numbers to find the quotient of a division problem.
- Divide to solve problems involving factors and multiples.

- » Generalize solutions and apply strategies to new problem situations.
- » Use models, known facts, properties, and relationships to explain thinking and to justify answers and solution processes.
- » Recognize relationships among different topics in mathematics.
- » Recognize equivalent representations of concepts and procedures and translate among them as appropriate (for example, understand how the addition of whole numbers, fractions, and decimals is related).
- » Link concepts and procedures.
- » Determine the reasonableness of solutions to real-world problems.

**Unit 2.2 – Understanding Variables and Expressions
(8 days)**

- Apply the conventions of order of operations to solve problems involving multiple operations.
- Translate word phrases into algebraic expressions using letters to represent unknown quantities.
- Write and evaluate algebraic expressions using a given value.
- Apply the distributive property to solve problems and simplify computations.
- Identify patterns and write algebraic expressions to describe relationships.

- » Demonstrate an understanding of mathematical concepts and relationships through a variety of methods (e.g., writing, graphing, charts, diagrams, number sentences, or symbols).
- » Recognize equivalent representations of concepts and procedures and translate among them as appropriate (for example, understand how the addition of whole numbers, fractions, and decimals is related).
- » Add to the repertoire of problem-solving strategies (e.g., looking for similar problems) and use those strategies in more sophisticated ways.

**Unit 2.3 – Identifying and Classifying Shapes
(8 days)**

- Identify and extend the use of linear and nonlinear patterns represented in models, tables, or problem situations.
- Classify polygons by number of sides and their length (i.e., regular and non-regular polygons).
- Classify triangles according side length and angle measure.
- Use properties or attributes to distinguish among different types of triangles and quadrilaterals.
- Make and test generalizations as part of a problem-solving strategy.

- » Generalize solutions and apply strategies to new problem situations.
- » Make and defend conjectures and generalizations.

QUARTER 2

Content students have to learn

Processes students will learn and use

Unit 2.4 – Identifying and Representing Fractions and Decimals (11 days)

- Develop understanding of positive fractional numbers using proper/improper fractions and mixed numbers.
- Represent decimals to thousandths using models, explanations, or other representations.
- Demonstrate understanding of equivalent positive fractions.
- Compare and order positive fractional numbers.
- Understand the relationship between a decimal and a fraction.

- » Recognize the pervasive use and power of reasoning as a part of mathematics.
- » Use models, known facts, properties, and relationships to explain thinking and to justify answers and solution processes.
- » Use physical models and diagrams to represent important mathematical ideas (e.g., multiplication).
- » Recognize equivalent representations of concepts and procedures and translate among them as appropriate (for example, understand how the addition of whole numbers, fractions, and decimals is related).

Unit 2.5 – Adding and Subtracting Fractions and Mixed Numbers (8 days)

- Add and subtract fractions and mixed numbers with like and unlike denominators.
- Identify equivalent positive fractional numbers in problem situations using models or number lines.
- Understand positive fractional numbers using models, explanations, or other representations.

- » Generalize solutions and apply strategies to new problem situations.
- » Add to the repertoire of problem-solving strategies (e.g., looking for similar problems) and use those strategies in more sophisticated ways.
- » Recognize equivalent representations of concepts and procedures and translate among them as appropriate (for example, understand how the addition of whole numbers, fractions, and decimals is related).
- » Recognize relationships among different topics in mathematics.

QUARTER 3

Content students have to learn

Processes students will learn and use

Unit 3.1 – Finding Perimeter and Area (9 days)

- Measure length to the nearest fraction of an inch.
- Choose the most appropriate metric unit to measure length.
- Find the perimeter of different shapes.
- Find the area of squares and rectangles.
- Find the area of polygons or irregular figures on grids.
- Find the area of right triangles using models, manipulatives, or formulas.
- Make conversions within systems when solving problems.

- » Recognize relationships among different topics in mathematics.
- » Use physical models and diagrams to represent important mathematical ideas (e.g., multiplication).
- » Use appropriate representations to solve problems or to portray, clarify, or extend a mathematical idea.
- » Recognize relationships among different topics in mathematics.

Unit 3.2 – Identifying and Describing Solids (7 days)

- Identify, compare, or describe threedimensional shapes using attributes such as bases and faces.
- Develop visualization by building models of three-dimensional figures.
- Demonstrate how to find the area of irregular figures on grids and the volume of rectangular prisms using models, manipulatives, or formulas.
- Identify and extend linear and nonlinear patterns represented in models, tables, or problem situations.

- » Generalize solutions and apply strategies to new problem situations.
- » Add to the repertoire of problem-solving strategies (e.g., looking for similar problems) and use those strategies in more sophisticated ways.
- » Use models, known facts, properties, and relationships to explain thinking and to justify answers and solution processes.
- » Use physical models and diagrams to represent important mathematical ideas (e.g., multiplication).

Unit 3.3 – Measuring Customary and Metric Units Including Time and Temperature (10 days)

- Measure and use units of measure appropriately and consistently.
- Make conversions within systems of measurement.
- Solve problems about elapsed time.

- » Determine the reasonableness of solutions to real-world problems.
- » Use models, known facts, properties, and relationships to explain thinking and to justify answers and solution processes.
- » Use mathematical skills, concepts, and applications in other disciplines (e.g., graphs in social studies, patterns in art or music, and geometry in technology education).

Unit 3.4 – Solving and Writing Equations (7 days)

- Use addition and subtraction to solve an equation.
- Multiply and divide to solve an equation.
- Develop understanding of equality between two expressions using models or different representations.
- Identify and extend linear and nonlinear patterns using models, tables, and problem situations.
- Draw a picture and write an equation to solve a problem.

- » Use models, known facts, properties, and relationships to explain thinking and to justify answers and solution processes.
- » Recognize equivalent representations of concepts and procedures and translate among them as appropriate (for example, understand how the addition of whole numbers, fractions, and decimals is related).

QUARTER 3

Content students have to learn

Processes students will learn and use

Unit 3.5 – Understanding Percents (8 days)

- Develop understanding of benchmark percents using models, explanations, or other representations.
 - Explore the relationships among fractions, decimals, and percents.
 - Compare and order fractions or percents.
 - Identify fraction and percent equivalents.
- » Use models, known facts, properties, and relationships to explain thinking and to justify answers and solution processes.
 - » Demonstrate an understanding of mathematical concepts and relationships through a variety of methods (e.g., writing, graphing, charts, diagrams, number sentences, or symbols).
 - » Use physical models and diagrams to represent important mathematical ideas (e.g., multiplication).
 - » Use appropriate representations to solve problems or to portray, clarify, or extend a mathematical idea.
 - » Recognize equivalent representations of concepts and procedures and translate among them as appropriate (for example, understand how the addition of whole numbers, fractions, and decimals is related).

Content students have to learn

Processes students will learn and use

**Unit 4.1 – Understanding Equations and Graphs
(8 days)**

- Understand the magnitude of integers in context using a number line.
- Identify and graph points in all four quadrants on a coordinate plane.
- Determine horizontal and vertical distances between points on a coordinate grid.
- Evaluate linear expressions and identify linear patterns in tables and graphs using whole numbers.
- Write a rule for finding specific cases of a linear equation using letters to represent unknown quantities.
- Demonstrate understanding of linear relationships as a constant rate of change by identifying situations that represent constant rates of change.
- Demonstrate understanding of equality by solving one-step linear equations.
- Determine which values of a replacement set make the equation a true statement.

- » Use models, known facts, properties, and relationships to explain thinking and to justify answers and solution processes.
- » Demonstrate an understanding of mathematical concepts and relationships through a variety of methods (e.g., writing, graphing, charts, diagrams, number sentences, or symbols).
- » Ask clarifying and extending questions related to mathematics.
- » Recognize and use mathematics in other curriculum areas and in their daily lives.
- » Recognize equivalent representations of concepts and procedures and translate among them as appropriate (for example, understand how the addition of whole numbers, fractions, and decimals is related).

**Unit 4.2 – Using Data in Graphs
(10 days)**

- Collect, organize, and appropriately display data to make predictions or solve problems.
- Make and interpret double-bar graphs, line graphs, frequency tables, and circle graphs.
- Analyze data to determine mean, median, mode, and range from a set of data.
- Identify representations that best display a given set of data.

- » Demonstrate an understanding of mathematical concepts and relationships through a variety of methods (e.g., writing, graphing, charts, diagrams, number sentences, or symbols).
- » Recognize relationships among different topics in mathematics.
- » Use appropriate representations to solve problems or to portray, clarify, or extend a mathematical idea.
- » Make and defend conjectures and generalizations.

Unit 4.3 – Describing Transformations, Congruency, and Symmetry (14 days)

- Recognize and build similar figures using triangles and rectangles.
- Demonstrate conceptual understanding of similarity by describing the relationships among angles, line lengths, and areas of similar figures using triangles and rectangles.
- Identify vertices of polygons as they are translated, reflected, and rotated on a coordinate grid.
- Interpret and give directions on a coordinate grid using all four quadrants.

- » Use models, known facts, properties, and relationships to explain thinking and to justify answers and solution processes.
- » Discuss mathematical ideas and write convincing arguments.
- » Use physical models and diagrams to represent important mathematical ideas (e.g., multiplication).
- » Use appropriate representations to solve problems or to portray, clarify, or extend a mathematical idea.

QUARTER 4

Content students have to learn

Processes students will learn and use

Unit 4.4 – Probability (8 days)

- Use tree diagrams or multiplication to find all possible outcomes of a probability event.
 - Determine the theoretical probability of an event and express the results as a fraction.
 - Determine the experimental probability of an event and express the results as a fraction.
 - Use the probability of an event to make predictions.
- » Generalize solutions and apply strategies to new problem situations.
 - » Use physical models and diagrams to represent important mathematical ideas (e.g., multiplication).
 - » Link concepts and procedures.
 - » Recognize and use mathematics in other curriculum areas and in their daily lives.

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