CURRICULUM GUIDE

Math - Grade 4

Providence Schools

Background

Providence Schools teachers and administrators worked collaboratively with consultants from the Charles A. Dana Center at the University of Texas at Austin to develop the mathematics and science curriculum frameworks. The curriculum frameworks encompass two critical questions:

- Content Standards that establish clearly defined expectations for all students, helping to answer the question, ***What do students have to learn?***
- Performance Standards that determine performance expectations for content standards, helping to answer the question, ***How well do the students have to learn it?***

The curriculum framework provides a work plan that directs the instruction delivered in every classroom in every school in the district. Instruction—the way the curriculum is presented to students—will focus on the needs of students.

Purpose and Use of Curriculum Guides

Curriculum Guides for the curriculum for each grade and subject outline the approximate number of days that each unit in the curriculum will be taught; describe the content to be learned; and list the essential questions that students should be able to answer by the end of the unit.

Parents should become familiar with the Curriculum Guides. You should know when your child is being taught different topics. You should also know the essential questions that your child should be able to answer by the end of each unit.

It is important that you understand that you do not have to be familiar with the content that your child is learning in order to help them with their studies. There are basic questions that you can ask to determine if your child understands the content.

Ask your child what she is learning in each subject

Does she understand the topic? Is the unit exciting or boring? What specifically does she like or dislike about the topic? Does she understand how the topic relates to the real world?

You know your child better than anyone. You will be able to tell if she or he is benefiting from the instruction and understanding the content of the material by the way they answer you. Speak to your child's teacher if you suspect there is a problem.

Ask your child about his assignments

What is the required work? Has he finished the work on time? Is he having difficulty? If he is having difficulty, why?

Encourage your child to talk to her teachers if she is having difficulty understanding a concept or completing an assignment. If your child continues to experience difficulty, speak to the teacher yourself so that the two of you can work together to support your child.

Even if you do not understand the content that your child is learning, the fact that you are showing interest in his or her school work and believe that it is important that he or she does well sends a powerful message.

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QUARTER 1

Content students will be learning	Essential questions students should be able to answer by end of unit
Unit 1.1 - Comparing and Ordering Numbers (8 days) • Understand rational numbers from 0 to 999,999 using models, explanations, and representations. • Represent rational numbers in different ways by composing and decomposing and place value. • Compare and order numbers to demonstrate an understanding of the magnitude of numbers. • Identify when estimation is appropriate and estimate whole numbers using a variety of methods. • Understand decimals as hundredths using money and the relationships among dollars, dimes, and pennies.	» What are some ways to represent numbers up to 999,999? » What are strategies for comparing and ordering numbers? » How can you round numbers? » When is estimation appropriate? » How are decimals related to money? » What are some ways to compose a number?
Unit 1.2 - Adding and Subtracting Whole Numbers (8 days) • Use composition and decomposition strategies mentally to add and subtract. • Perform multiple mental math estimation strategies. • Understand and apply the standard algorithm and place-value strategies for multidigit addition and subtraction.	» How can you use mental math to add and subtract? » How can you estimate sums and differences of whole numbers? » How can you determine what information is missing and needed to solve a problem? » How do you add whole numbers? » How do you subtract whole numbers? » What strategies do you use to subtract from multiples of 100? » How can a bar diagram help you to solve addition and subtraction problems?
Unit 1.3 - Understanding and Developing Multiplication (9 days) • Understand the relationship between repeated addition and multiplication. • Use the properties of factors and multiples to solve multiplication problems to develop fluency. • Apply the commutative, identity, associative, and zero properties and factors to find products.	» How can we use arrays to understand multiplication? » What patterns can help you remember multiplication facts for 2s and 5s? » What happens when you multiply two numbers and switch the order of the factors (commutative property)? What happens when you multiply by 0? When you multiply by 1? » How can the associative or distributive property and knowledge of basic multiplication facts be used to find other products? » How can you use patterns for multiplying by 10 to multiply by 11 and by 12? » How can you determine whether a number is odd or even?

QUARTERS 1 & 2

Content students will be learning	Essential questions students should be able to answer by end of unit
Unit 1.4 - Understanding and Developing Division (6 days) • Use strategies to solve problems. • Use the inverse operations of multiplication and division to solve problems within fact families. • Understand and apply the zero, identity, and commutative properties of multiplication and division.	» How can you use counters to show that division can be thought of as repeated subtraction or sharing equally? » How are division and multiplication related? » How can the inverse relationship between multiplication and division be used to find division facts? » How can different models help you solve a division problem?
Unit 1.5 - Multiplying by One-Digit Numbers (9 days) • Use mental math strategies to make multiplication calculation easier. • Understand and apply a variety of strategies for multiplication. • Demonstrate that different numerical expressions can have the same value or that the value of one expression can be less than (or greater than) the value of the other expression. • Estimate using appropriate methods to evaluate the reasonableness of a solution. • Demonstrate that place-value patterns can be used to find products when one factor is 10 or 100.	» What place-value patterns can you see when you multiply by multiples of 10 and 100? » What are some ways to multiply mentally? » How can you use rounding to estimate when you multiply? » How can you use models to record multiplication? » How do you multiply a two-digit number by a one-digit number? » How do you know your answer is reasonable?
QUARTER 2 **Unit 2.1 - Extending Patterns and Writing Expressions (5 days)** • Represent mathematical phrases using a variable in an algebraic expression. • Determine the value of an algebraic expression by replacing the variable(s) with given number(s) and doing the calculation. • Identify patterns that can be used to find the relationship between two quantities. • Find the value of an unknown quantity by using the relationship it has with a known quantity.	**QUARTER 2** » How can you use expressions with variables? » How can you find a rule and write an addition and subtraction expression? » How can you find a rule and write a multiplication and division expression? » How can you use objects and reasoning to solve a problem?
Unit 2.2 - Multiplying by Two-Digit Numbers (8 days) • Make estimates in a situation by identifying when estimation is appropriate. • Select the appropriate method of estimation and evaluate the reasonableness of the solution. • Use basic facts and place-value patterns to mentally multiply a two-digit number by a multiple of 10, 100, or 1,000. • Use and compare the array, expanded, and standard algorithms for multiplication limited to two digits by two digits.	» How can you multiply by multiples of 10 and 100? » What are some ways to estimate products? » How can arrays help you multiply two-digit numbers? » How can you find the product of two numbers? » How do you multiply two-digit numbers by two-digit numbers? » How can you use the answer from one question to answer a second question?

QUARTER 2 (CONTINUED)

Content students will be learning	Essential questions students should be able to answer by end of unit
Unit 2.3 - Dividing by One-Digit Divisors (11 days) • Use basic facts and place-value patterns to divide multiples of 10 and 100 by one-digit numbers. • Use a variety of algorithms and estimation skills to solve division problems. • Interpret the meaning of a remainder when solving problems.	» How can you use place-value patterns to help you divide mentally? » When and how do you estimate quotients to solve problems? » What does it mean to divide and have some left over? » How can place value help you divide? » How can you divide numbers in the hundreds, and what do you do when there are not hundreds to divide? » How can you use multiplication to find all the factors of a number? » How can you sort factors by their factors?
Unit 2.4 - Identifying Lines, Angles, and Shapes (8 days) • Describe and classify polygons by their sides and angles. • Use attributes of angles and sides including parallelism and perpendicularity to identify and distinguish among polygons. • Classify angles of polygons relative to 90 degrees. • Copy, compare, and draw models of polygons.	» What are some important geometric names for lines? » What geometric terms describe types of angles? » How can you use attributes to identify polygons? » How can you use attributes to classify triangles? » How can you use attributes to classify quadrilaterals? » How can you test generalizations?
Unit 2.5 - Understanding Fractions (10 days) • Describe a fraction using an area, set, and linear model. • Use benchmark fractions, 0, and 1 to compare and order fractions. • Represent the same fractional amount with different but equivalent fractions. • Compare and order proper positive fractional numbers using models, number lines, or explanations.	» How can you name and show parts of the region? » How can you share items? » How can you estimate parts? » How can you find two fractions that name the same part of a whole? » How do you write a fraction in simplest form? » How can you use benchmark fractions to compare fractions? » How can you use equivalent fractions to compare and order fractions?
Unit 2.6 - Adding and Subtracting Fractions (3 days) • Understand concepts of addition and subtraction of positive fractional numbers with like denominators using models, number lines, or explanations.	» How can you add and subtract fractions with like denominators? » How can a model help you add or subtract fractions?

QUARTER 3

Content students will be learning	Essential questions students should be able to answer by end of unit
QUARTER 3	QUARTER 3
Unit 3.1 - Understanding Decimals **(7 days)** • Demonstrate conceptual understanding of decimals as hundredths using models, explanations, or other representations. • Compare and order decimals using models, number lines, or explanations. • Understand the relationship between a fraction and a decimal.	» What are some ways to represent decimals? » How do you compare decimals? » How do you write a fraction as a decimal? » How can you locate points for decimals and mixed numbers on a number line?
Unit 3.2 - Adding and Subtracting Decimals **(9 days)** • Solve problems involving addition and subtraction of decimals. • Use estimating strategies to calculate addition or subtraction of decimals. • Understand the models and algorithms for adding or subtracting multidigit decimals.	» How do you round a decimal number? » How can you estimate sums and differences of decimals? » How do you use the grid model to add and subtract decimals? » How can you subtract decimal numbers? » How can you add decimal numbers? » How can you solve a problem by trying, checking, and revising your work?
Unit 3.3 - Finding Area and Perimeter of Shapes **(10 days)** • Develop conceptual understanding of perimeter of polygons using models, manipulatives, or formulas. • Develop conceptual understanding of area of rectangles, polygons, or irregular shapes on grids using models, manipulatives, or formulas. • Make estimates by selecting appropriate methods. • Evaluate estimation methods for reasonableness. • Identify the relationships between the perimeter and area of a polygon. • Understand how recording information in a table can help with understanding and solving problems.	» How do you measure the amount of space a figure covers? » How can you find the area of an irregular figure? » How can you use parallelograms to find the area of triangles? » How do you find the distance around an object? » How can rectangles with the same perimeter have different areas and rectangles with the same area have different perimeters?
Unit 3.4 - Identifying and Classifying Solids **(6 days)** • Use properties or attributes to identify, compare, and describe three-dimensional shapes. • Identify, compare, and describe rectangular prisms, triangular prisms, cylinders, or spheres.	» How can you use solids to describe the shapes, faces, edges, and vertices of solid figures?
UNIT CONTINUES ON NEXT PAGE	UNIT CONTINUES ON NEXT PAGE

QUARTERS 3 & 4

Content students will be learning	Essential questions students should be able to answer by end of unit
UNIT 3.4 - IDENTIFYING AND CLASSIFYING SOLIDS (CONTINUED)	UNIT 3.4 - IDENTIFYING AND CLASSIFYING SOLIDS (CONTINUED)
• Use the shape of bases or the number of lateral faces to describe three-dimensional shapes. • Build models of rectangular prisms from twoor three-dimensional representations.	» How can you use a two-dimensional shape to represent a three-dimensional solid? » How can you get information about a solid from different perspectives?
Unit 3.5 - Measuring, Estimating Customary & Metric Units Including Time & Temperature (13 days)	
• Measure and use units of length to solve problems and make conversions. • Measure and use units of capacity to solve problems and make conversions. • Express time using different units that are related to each other. • Express temperature using degrees Fahrenheit or Celsius. • Determine the duration of an event when the start and end times can be identified. • Estimate length in different measurement systems.	» How can you estimate and measure length? » How can you measure capacity with customary units? » How can you measure weight? » How do you change customary units? » How can you estimate and measure length using metric units? » How can you measure capacity with metric units? » How can you measure mass? » How do you change metric units? » How can you compare units of time? » How can you find elapsed time? » How can you solve problems involving changes in temperature? » How can you work backward to solve a problem?
QUARTER 4	QUARTER 4
Unit 4.1 - Using Data in Graphs (11 days)	
• Interpret line plots, tables, bar graphs, pictographs, and circle graphs to answer questions related to data. • Interpret and give directions between locations in the first quadrant of a coordinate grid. • Organize & display data using tables, line plots, bar graphs, and pictographs to answer questions and solve problems. • Understand that median, mode, and range are ways to analyze patterns, trends, and distributions of data. • Collect, organize, and display data to draw conclusions and make predictions in real-world situations.	» How do you take a survey and record the results? » How can you read a bar graph, stem-and-leaf plot, and circle graph? » How can you organize data in a line plot? » How do you name a point on a coordinate plane? » How do you read and interpret a line graph? » How can you find the mean, median, mode, and range of a set of data?
Unit 4.2 - Understanding Equations (6 days)	
• Show equivalence between two algebraic expressions when the variable is replaced with its assigned number and the resulting calculations are completed.	» How can you change both sides of an equation so that it stays true? » How can you use addition and subtraction to solve equations?
UNIT CONTINUES ON NEXT PAGE	UNIT CONTINUES ON NEXT PAGE

QUARTER 4 (CONTINUED)

Content students will be learning	Essential questions students should be able to answer by end of unit
UNIT 4.2 - UNDERSTANDING EQUATIONS (CONTINUED)	UNIT 4.2 - UNDERSTANDING EQUATIONS (CONTINUED)
• Understand that a solution to an equation is a value of the unknown (or unknowns) that makes an equation true. • Solve equations by using properties of equality and inverse operations. • Understand that a solution to an inequality is a value that makes the inequality true.	» How can you use multiplication and division to solve equations? » How can you solve an inequality?
Unit 4.3 - Identifying Transformations, Congruency, and Symmetry (10 days)	
• Demonstrate congruency with translations, reflections, and rotations of plane figures using models or explanations. • Identify similarity by applying the characteristics of similar figures to solve problems using models or explanations. • Identify rotational symmetry and use an angle measure to describe a rotation. • Determine similarity by using models and pictures.	» What is one way to move a figure? » When are figures congruent? » What is a line of symmetry? » What is rotational symmetry? » How do you draw a picture to solve a problem?
Unit 4.4 - Probability (9 days)	
• Use counting techniques to find the number of possible combinations in a probability event. • Use counting techniques to find simple permutations. • Determine the possible outcomes of an event by representing pictorially using a tree diagram and counting to find the number of possible outcomes. • Determine the chance or likelihood of an event occurring.	» How can you find all possible combinations? » How can you show all the possible combinations of a situation? » How can you find all the possible permutations? » How can you show all the possible permutations of a situation? » How can you find probability? » How do you use reasoning to solve a problem? » How can you find all the possible ways to solve a problem when order matters?