

Unit 1: Whole Numbers, Expressions, and Volume

Unit 1 Project: A Space Capsule

Unit 1 Learning Mindset Focus: Strategic Help-Seeking / Identifies Need for Help

Module 1: Whole Number Place Value and Multiplication

Recommended Pacing with Assessments: 8 Days

Module 1 Mathematical Progressions

Prior Learning	Current Development	Future Connections
Students recognized that a digit in one place in a multi-digit whole number represents ten times what it represents in the place to its right. Students multiplied whole numbers of up to four digits by ten. Students multiplied whole numbers of up to four digits by a 1-digit whole number, and multiplied two 2-digit numbers.	Students recognize the 10 to 1 relationship among place-value positions. Students explain patterns in the number of zeros when multiplying by powers of 10. Students fluently multiply multi-digit whole numbers using the standard algorithm.	Students will apply their knowledge of place value to fluently multiply multi-digit decimals using the standard algorithm. Students will apply the properties of operations to generate equivalent expressions.

Module 1 Vocabulary

base	a number used as a repeated factor
exponent	a number that shows how many times the base is used as a factor

Lesson 1.1 Recognize the 10 to 1 Relationship Among Place-Value Positions

Build Understanding – 1 Day

Professional Learning Video

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and $\frac{1}{10}$ of what it represents in the place to its left.

Mathematical Practices and Processes

- Reason abstractly and quantitatively.
- Use appropriate tools strategically.
- Look for and make use of structure.

I Can Objective

I can describe place-value relationships in multi-digit whole numbers.

Learning Objective

Recognize the 10 to 1 relationship among place-value positions.

Language Objectives

- Explain how a digit in a place of a multi-digit number relates to the same digit in the place to its right.
- Explain how a digit in a place of a multi-digit number relates to the same digit in the place to its left.

Lesson Materials

base-ten blocks, connecting cubes

Lesson 1.2 Use Powers of 10 and Exponents

Connect Concepts and Skills – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.

Mathematical Practices and Processes

- Attend to precision.
- Look for and express regularity in repeated reasoning.

I Can Objective

I can rewrite expressions involving the product of a 1-digit number and a power of 10 as a whole number.

Learning Objective

Write and evaluate repeated factors in exponent form.

Language Objectives

- Explain how to use exponents to show powers of 10.
- Describe how to use patterns to multiply a whole number by a power of 10.

Vocabulary

New: base, exponent

Lesson Materials

base-ten blocks, connecting cubes

Lesson 1.3 Use a Pattern to Multiply by Multiples of 10, 100, and 1,000

Apply and Practice – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.

Mathematical Practices and Processes

- Attend to precision.
- Look for and make use of structure.

I Can Objective

I can use mental math to find the product of any two numbers that have one nonzero digit and are multiples of 10, 100, or 1,000.

Learning Objective

Use a basic fact and a pattern to multiply mentally by multiples of 10, 100, and 1,000.

Language Objectives

- Explain and demonstrate how to use mental math to multiply by multiples of 10, 100, and 1,000.
- Explain how to use patterns involving zero with basic multiplication facts to multiply by multiples of 10.

Lesson 1.4 Multiply by 1-Digit Numbers

Apply and Practice – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Fluently multiply multi-digit whole numbers using the standard algorithm.

Mathematical Practices and Processes

- Construct viable arguments and critique the reasoning of others.
- Attend to precision.

I Can Objective

I can multiply multi-digit whole numbers by 1-digit numbers using regrouping and place value.

Learning Objective

Multiply by 1-digit numbers.

Language Objectives

- Explain how to regroup by place value when multiplying multi-digit numbers by 1-digit numbers.
- Explain how to solve problems when multiplying by 1-digit numbers.

Lesson 1.5 Multiply by Multi-Digit Numbers

Apply and Practice – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Fluently multiply multi-digit whole numbers using the standard algorithm.

Mathematical Practices and Processes

- Attend to precision.
- Look for and make use of structure.

I Can Objective

I can multiply multi-digit whole numbers by 2-digit or 3-digit numbers.

Learning Objective

Multiply by multi-digit numbers.

Language Objectives

- Explain how to extend multiplication of multi-digit numbers by a 1-digit number to multiplication by multi-digit numbers.
- Explain how to use partial products to find the product.

Lesson 1.6 Develop Multiplication Fluency

Apply and Practice – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Fluently multiply multi-digit whole numbers using the standard algorithm.

Mathematical Practices and Processes

- Reason abstractly and quantitatively.
- Model with mathematics.

I Can Objective

I can set up and solve multistep problems with at least two steps.

Learning Objective

Fluently multiply multi-digit whole numbers to solve multistep problems.

Language Objectives

- Explain how to determine what operations to use to solve a multistep problem.
- Demonstrate and explain how to fluently multiply multi-digit whole numbers when solving multistep problems.

Unit 1: Whole Numbers, Expressions, and Volume

Unit 1 Project: A Space Capsule

Unit 1 Learning Mindset Focus: Strategic Help-Seeking / Identifies Need for Help

Module 2: Understand Division of Whole Numbers

Recommended Pacing with Assessments: 7 Days

Module 2 Mathematical Progressions

Prior Learning	Current Development	Future Connections
Students explored the relationship between multiplication and division using area models and arrays.	Students find whole-number quotients using the relationship between multiplication and division and area models.	Students will use the properties of operations to find equivalent expressions.
Students explained division with equations, rectangular arrays, and area models.	Students estimate quotients of two-digit divisors by using compatible numbers.	Students will multiply and divide multi-digit whole numbers.
Students found whole-number quotients and remainders with up to four-digit dividends and one-digit divisors.	Students use the method of partial quotients to find the quotient of whole numbers with up to four-digit dividends and two-digit divisors.	Students will multiply and divide multi-digit decimals.

Module 2 Vocabulary

compatible numbers	numbers that are easy to compute with mentally
dividend	the number that is to be divided in a division problem
divisor	the number that divides the dividend
inverse operations	opposite operations, or operations that undo each other, such as addition and subtraction or multiplication and division
quotient	the number that results from dividing
remainder	the amount left over when a number cannot be divided equally
partial quotients	a method of dividing in which multiples of the divisor are subtracted from the dividend and then the quotients are added together

Lesson 2.1 Understand Division of Whole Numbers

Build Understanding – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

Mathematical Practices and Processes

- Attend to precision.
- Model with mathematics.
- Look for and make use of structure.

I Can Objective

I can use an array or an area model to solve a division problem.

Learning Objective

Use multiplication to solve division problems.

Language Objectives

- Demonstrate and explain how to use an array to solve division problems.
- Explain how to use an area model to solve division problems.

Vocabulary

Review: dividend, divisor, inverse operations, quotient

Lesson Materials

base-ten blocks

Lesson 2.2 Represent Division with 2-Digit Divisors

Build Understanding – 2 Days Professional Learning Video

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

Mathematical Practices and Processes

- Model with mathematics.
- Use appropriate tools strategically.

I Can Objective

I can find the quotient of numbers up to four digits divided by 2-digit divisors using visual models.

Learning Objective

Model division of whole numbers by 2-digit divisors using an area model.

Language Objectives

- Explain how area models can help represent division problems.
- Describe how to use an area model to divide whole numbers by 2-digit divisors.

Lesson Materials

base-ten blocks, square tiles, Grid Paper (Teacher Resource Masters)

Lesson 2.3 Estimate with 2-Digit Divisors

Connect Concepts and Skills – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

Mathematical Practices and Processes

- Construct viable arguments and critique the reasoning of others.

I Can Objective

I can estimate quotients of division problems using compatible numbers.

Learning Objective

Estimate quotients involving 2-digit divisors using compatible numbers.

Language Objectives

- Demonstrate and explain how to estimate quotients using compatible numbers.
- Explain how to determine compatible numbers.

Vocabulary

Review: compatible numbers

Lesson Materials

base-ten blocks, Grid Paper (Teacher Resource Masters)

Lesson 2.4 Use Partial Quotients

Connect Concepts and Skills – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

Mathematical Practices and Processes

- Look for and express regularity in repeated reasoning.

I Can Objective

I can use partial quotients to divide a multi-digit number by a 2-digit divisor.

Learning Objective

Use partial quotients to divide by 2-digit divisors.

Language Objective

Explain how to use partial quotients to divide by 2-digit divisors.

Vocabulary

Review: remainder

New: partial quotients

Lesson Materials

base-ten blocks, Grid Paper (Teacher Resource Masters)

Unit 1: Whole Numbers, Expressions, and Volume

Unit 1 Project: A Space Capsule

Unit 1 Learning Mindset Focus: Strategic Help-Seeking / Identifies Need for Help

Module 3: Practice Division of Whole Numbers

Recommended Pacing with Assessments: 6 Days

Module 3 Mathematical Progressions

Prior Learning	Current Development	Future Connections
Students found whole-number quotients and remainders with up to four-digit dividends and one-digit divisors. Students divided using strategies based on place value, the properties of operations, and the relationship between multiplication and division. Students explained division by using equations, rectangular arrays, and area models.	Students divide up to four-digit dividends by two-digit divisors. Students interpret the remainder and understand when to write a remainder as a fraction. Students represent and solve a division comparison problem using a bar model.	Students will divide multi-digit whole numbers. Students will interpret and compute quotients of fractions. Students will solve word problems involving division of fractions by fractions using visual models and equations.

Module 3 Vocabulary

divide	to separate into equal groups; the inverse operation of multiplication
dividend	the number that is to be divided in a division problem
divisor	the number that divides the dividend
estimate	(verb) to find a number that is close to an exact amount
quotient	the number that results from dividing
remainder	the amount left over when a number cannot be divided equally

Lesson 3.1 Divide by 2-Digit Divisors

Apply and Practice – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

Mathematical Practices and Processes

- Reason abstractly and quantitatively.
- Look for and express regularity in repeated reasoning.

I Can Objective

I can use strategies based on place value to divide 3- and 4-digit dividends by 2-digit divisors.

Learning Objective

Divide whole number dividends by 2-digit divisors.

Language Objectives

- Explain how to use strategies based on place value to divide by a 2-digit whole number.
- Explain the usefulness of making an estimate before dividing.

Lesson 3.2 Interpret the Remainder

Apply and Practice – 1 Day

Professional Learning Video

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Interpret a fraction as division of the numerator by the denominator ($a/b = a \div b$). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem.

Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

Mathematical Practices and Processes

- Reason abstractly and quantitatively.
- Construct viable arguments and critique the reasoning of others.

I Can Objective

I can solve a division problem and interpret the remainder in the context of the problem.

Learning Objective

Solve division problems and decide when to write the remainder as a fraction.

Language Objectives

- Explain how to interpret the remainder of a division problem.
- Show how to write the remainder as fraction.

Lesson 3.3 Adjust Quotients

Apply and Practice – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

Mathematical Practices and Processes

- Attend to precision.
- Look for and make use of structure.

I Can Objective

I can adjust a digit in a whole-number quotient based on whether an estimate is too low or too high.

Learning Objective

Adjust the whole-number quotient if the estimate is too high or too low.

Language Objectives

- Explain how to adjust a whole-number quotient that is too high.
- Explain how to adjust a whole-number quotient that is too low.

Lesson 3.4 Practice with Division

Apply and Practice – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

Mathematical Practices and Processes

- Model with mathematics.
- Look for and make use of structure.

I Can Objective

I can solve a division problem by using a bar model or an equation.

Learning Objective

Represent a problem with a bar model or an equation and solve a division problem.

Language Objectives

- Make a bar model and explain how it represents a problem.
- Explain how to use a bar model to solve a problem.

Unit 1: Whole Numbers, Expressions, and Volume

Unit 1 Project: A Space Capsule

Unit 1 Learning Mindset Focus: Strategic Help-Seeking / Identifies Need for Help

Module 4: Expressions

Recommended Pacing with Assessments: 6 Days

Module 4 Mathematical Progressions

Prior Learning	Current Development	Future Connections
Students interpreted a multiplication equation as a comparison. Students represented statements of multiplicative comparison as multiplication equations. Students solved word problems involving multiplicative comparisons.	Students write and interpret numerical expressions. Students use parentheses to group numbers and operations to represent the order of operations in a given situation. Students evaluate numerical expressions using the order of operations.	Students will write numerical expressions involving whole-number exponents. Students will identify parts of an expression using mathematical terms. Students will evaluate algebraic expressions for specific values of their variables using the order of operations.

Module 4 Vocabulary

difference	the answer to a subtraction problem
product	the answer to a multiplication problem
quotient	the number that results from dividing
sum	the answer to an addition problem
evaluate	to find the value of a numerical or algebraic expression
numerical expression	a mathematical phrase that uses only numbers and operation signs
order of operations	a set of rules for evaluating a numerical expression that gives the order in which calculations are done

Lesson 4.1 Write Numerical Expressions

Build Understanding – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.

Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them.

Mathematical Practices and Processes

- Reason abstractly and quantitatively.
- Model with mathematics.

I Can Objective

I can write a numerical expression to model a real-world situation, and I can interpret a numerical expression.

Learning Objective

Write numerical expressions.

Language Objectives

- Explain how to write a numerical expression by identifying the operation needed to write the expression.
- Explain how to combine two operations in a numerical expression.

Vocabulary

Review: difference, product, quotient, sum

New: numerical expression

Lesson Materials

two-color counters, square tiles

Lesson 4.2 Interpret Numerical Expressions

Build Understanding – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them.

Mathematical Practices and Processes

- Reason abstractly and quantitatively.
- Construct viable arguments and critique the reasoning of others.

I Can Objective

I can compare numerical expressions which are written with one expression in terms of the other.

Learning Objective

Interpret numerical expressions without evaluating them.

Language Objectives

- Explain how to compare two related expressions without evaluating them.
- Interpret a numerical expression related to another expression without evaluating either expression.

Lesson 4.3 Evaluate Numerical Expressions

Connect Concepts and Skills – 1 Day

Professional Learning Video

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.

Mathematical Practices and Processes

- Reason abstractly and quantitatively.
- Model with mathematics.

I Can Objective

I can evaluate a numerical expression using the order of operations.

Learning Objective

Use the order of operations to evaluate numerical expressions.

Language Objectives

- Describe the order of operations.
- Explain how to evaluate numerical expressions using the order of operations.

Vocabulary

New: evaluate, order of operations

Lesson 4.4 Use Grouping Symbols

Apply and Practice – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.

Mathematical Practices and Processes

- Reason abstractly and quantitatively.
- Model with mathematics.

I Can Objective

I can describe how to use grouping symbols in a numerical expression and place parentheses so an expression has a given value.

Learning Objective

Determine in what order operations must be evaluated when there are grouping symbols.

Language Objective

- Explain how to evaluate numerical expressions when there are grouping symbols in the expression.
- Explain how the placement of grouping symbols affects the value of a numerical expression.

Unit 1: Whole Numbers, Expressions, and Volume

Unit 1 Project: A Space Capsule

Unit 1 Learning Mindset Focus: Strategic Help-Seeking / Identifies Need for Help

Module 5: Volume

Recommended Pacing with Assessments and Performance Task: 11 Days

Module 5 Mathematical Progressions

Prior Learning	Current Development	Future Connections
Students measured areas by counting unit squares and expressed areas in square units, such as square meters, square inches, and square feet. Students multiplied side lengths to find areas of rectangles with whole number lengths.	Students measure volumes by counting unit cubes and improvised units. Students relate volume to multiplication and addition and solve real-world and mathematical problems involving volume.	Students will find the volume of a right rectangular prism with fractional edge lengths. Students will apply the formulas $V = lwh$ and $V = Bh$ to find the volumes of right rectangular prisms.

Module 5 Vocabulary

dimension	a measure in one direction
edge	the line segment made where two faces of a solid figure meet
face	a polygon that is a flat surface of a solid figure
right rectangular prism	a three-dimensional figure in which all six faces are rectangles
cubic unit	a unit used to measure volume, such as cubic foot (ft ³) and cubic meter (m ³)
unit cube	a cube that has a length, width, and height of 1 unit
volume	the measure of the space a solid figure occupies

Lesson 5.1 Use Unit Cubes to Build Solid Figures

Build Understanding – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

A cube with side length 1 unit, called a “unit cube,” is said to have “one cubic unit” of volume, and can be used to measure volume.

Mathematical Practices and Processes

- Use appropriate tools strategically.
- Attend to precision.

I Can Objective

I can build solid figures using unit cubes.

Learning Objective

Understand unit cubes and how they can be used to build a solid figure.

Language Objective

- Describe a unit cube.
- Explain how to use unit cubes to build solid figures, including right rectangular prisms.

Vocabulary

Review: dimension, edge, face, right rectangular prism

New: unit cube

Lesson Materials

centimeter cubes, connecting cubes

Lesson 5.2 Understand Volume

Build Understanding – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

A cube with side length 1 unit, called a “unit cube,” is said to have “one cubic unit” of volume, and can be used to measure volume.

A solid figure which can be packed without gaps or overlaps using n unit cubes is said to have a volume of n cubic units.

Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.

Mathematical Practices and Processes

- Use appropriate tools strategically.
- Attend to precision.

I Can Objective

I can use unit cubes to find the volume of a right rectangular prism.

Learning Objective

Find volume by counting the number of unit cubes that fill a right rectangular prism.

Language Objective

- Show and explain how to determine the volume of a right rectangular prism using unit cubes.
- Explain how to determine the volume of a right rectangular prism using a given unit.

Vocabulary

New: cubic unit, volume

Lesson Materials

centimeter cubes, connecting cubes

Lesson 5.3 Estimate Volume

Build Understanding – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.

Mathematical Practices and Processes

- Reason abstractly and quantitatively.
- Attend to precision.

I Can Objective

I can use an everyday object to estimate the volume of a right rectangular prism.

Learning Objective

Estimate the volume of a right rectangular prism.

Language Objective

Explain how to estimate the volumes of right rectangular prisms in real-world situations by using everyday objects.

Lesson Materials

Centimeter cubes

Lesson 5.4 Find Volume of Right Rectangular Prisms

Connect Concepts and Skills – 2 Days Professional Learning Video

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication.

Apply the formulas $V = l \times w \times h$ and $V = b \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems.

Mathematical Practices and Processes

- Look for and make use of structure.
- Look for and express regularity in repeated reasoning.

I Can Objective

I can find the volume of a right rectangular prism using the area of the base and the height.

Learning Objective

Find the volume of a right rectangular prism.

Language Objectives

- Explain how to find the volume of a right rectangular prism by multiplying the number of cubes in the base by the number of cubes in the height.
- Describe how the addition of a layer of cubes affects the volume of a right rectangular prism.

Lesson Materials

centimeter cubes, connecting cubes

Lesson 5.5 Apply Volume Formulas

Apply and Practice – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication.

Apply the formulas $V = l \times w \times h$ and $V = b \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems.

Mathematical Practices and Processes

- Reason abstractly and quantitatively.
- Model with mathematics.
- Attend to precision.

I Can Objective

I can use a formula to find the volume of a right rectangular prism.

Learning Objective

Use a formula to find the volume of a right rectangular prism.

Language Objectives

- Demonstrate how to use a formula to find the volume of a right rectangular prism.
- Relate the volume formula of a right rectangular prism to using unit cubes to find the volume.

Lesson 5.6 Find Volume of Composed Figures

Apply and Practice – 2 Days

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.

Mathematical Practices and Processes

- Model with mathematics.
- Look for and make use of structure.

I Can Objective

I can find the volume of a figure composed of right rectangular prisms.

Learning Objective

Find the volume of composed right rectangular prisms.

Language Objective

- Demonstrate how to divide a composed figure into right rectangular prisms.
- Explain how to find the volume of a composed figure.

Unit 2: Add and Subtract Fractions and Mixed Numbers

Unit 2 Project: Cozy Cuts

Unit 2 Learning Mindset Focus: Challenge Seeking / Defines Own Challenges

Module 6: Understand Addition and Subtraction of Fractions with Unlike Denominators

Recommended Pacing with Assessments: 6 Days

Module 6 Mathematical Progressions

Prior Learning	Current Development	Future Connections
Students compared fractions with different numerators and different denominators. Students understood that multiplying both the numerator and denominator of a fraction by the same nonzero value yielded an equivalent fraction. Students expressed the relationship between two fractions using inequality or equality statements.	Students use visual models to represent the sums and differences of fractions with different-sized parts. Students find the sums and differences of fractions with different-sized parts using visual models. Students list and compare multiples of denominators of given fractions.	Students will represent situations using quotients of fractions. Students will calculate quotients of fractions. Students will solve word problems that require the division of fractions.

Module 6 Vocabulary

equivalent fractions	fractions that name the same amount or part
common denominator	a common multiple of two or more denominators

Lesson 6.1 Represent Fraction Sums and Differences

Build Understanding – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.

Mathematical Practices and Processes

- Reason abstractly and quantitatively.
- Model with mathematics.
- Use appropriate tools strategically.

I Can Objective

I can make a visual model to represent the addition or subtraction of fractions with different-sized parts.

Learning Objective

Use visual models to generate fractions having same-sized parts in addition and subtraction expressions when the fractional parts are not the same size.

Language Objective

Describe how to use visual models to write equivalent addition expressions and subtraction expressions with same-sized parts.

Lesson Materials

fraction circles, fraction strips; Number Lines (Teacher Resource Masters)

Lesson 6.2 Represent Addition with Different-Sized Parts

Build Understanding – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.

Mathematical Practices and Processes

- Use appropriate tools strategically.
- Look for and make use of structure.

I Can Objective

I can represent the sum of fractions with different-sized parts using a visual model.

Learning Objective

Use visual models to add fractions with different-sized parts.

Language Objective

- Explain how to make visual models showing the addition of fractions having different-sized parts.
- Explain how to use a visual model to find the sum of fractions with different-sized parts.

Lesson Materials

fraction circles, fraction strips

Lesson 6.3 Represent Subtraction with Different-Sized Parts

Build Understanding – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.

Mathematical Practices and Processes

- Use appropriate tools strategically.
- Look for and make use of structure.

I Can Objective

I can represent the difference between fractions with different-sized parts using a visual model.

Learning Objective

Use visual models to subtract fractions that have different-sized parts.

Language Objectives

- Demonstrate and explain how to make visual models showing the subtraction of fractions having different-sized parts.
- Explain how to use a visual model to find the difference of fractions with different-sized parts.

Lesson Materials

fraction strips

Lesson 6.4 Rewrite Fractions with a Common Denominator

Connect Concepts and Skills – 1 Day

Professional Learning Video

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators.

Mathematical Practices and Processes

- Reason abstractly and quantitatively.

I Can Objective

I can generate equivalent fractions for given fractions using a common denominator.

Learning Objective

Use equivalent fractions to rewrite pairs of fractions with a common denominator.

Language Objective

- Describe how to use multiples of a denominator to write equivalent fractions.
- Explain how to find equivalent fractions to express pairs of fractions with a common denominator.

Vocabulary

Review: equivalent fractions
New: common denominator

Lesson Materials

fraction circles, fraction strips, pattern blocks

Unit 2: Add and Subtract Fractions and Mixed Numbers

Unit 2 Project: Cozy Cuts

Unit 2 Learning Mindset Focus: Challenge Seeking / Defines Own Challenges

Module 7: Add and Subtract Fractions and Mixed Numbers with Unlike Denominators

Recommended Pacing with Assessments and Performance Task: 10 Days

Module 7 Mathematical Progressions

Prior Learning	Current Development	Future Connections
Students used benchmark fractions to compare fractions with different numerators and different denominators.	Students use benchmark fractions to estimate sums and differences of fractions with unlike denominators.	Students will represent division situations using visual fraction models and equations.
Students generated equivalent fractions.	Students add and subtract fractions and mixed numbers with unlike denominators by using common denominators.	Students will calculate quotients of fractions.
Students added and subtracted fractions and mixed numbers with like denominators.	Students solve problems involving addition and subtraction of fractions and mixed numbers by writing equations.	Students will solve word problems involving quotients of fractions.

Module 7 Vocabulary

Associative Property of Addition	the property that states that when the grouping of addends is changed, the sum is the same
benchmark	a familiar number used as a point of reference
common denominator	a common multiple of two or more denominators
Commutative Property of Addition	the property that states that when the order of two addends is changed, the sum is the same
equivalent fractions	fractions that name the same amount or part

Lesson 7.1 Use Benchmarks and Number Sense to Estimate

Connect Concepts and Skills – 1 Day

Professional Learning Video

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.

Mathematical Practices and Processes

- Use appropriate tools strategically.
- Look for and make use of structure.

I Can Objective

I can use benchmarks to estimate a sum or difference of fractions with unlike denominators.

Learning Objective

Use benchmark fractions to estimate sums and differences of fractions with unlike denominators.

Language Objectives

- Explain how to use benchmarks to estimate sums of fractions.
- Explain how to use benchmarks to estimate differences of fractions.

Vocabulary

Review: benchmark

Lesson Materials

fraction strips; number lines (Teacher Resource Masters)

Lesson 7.2 Assess Reasonableness of Fraction Sums and Differences

Apply and Practice – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators.

Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.

Mathematical Practices and Processes

- Reason abstractly and quantitatively.
- Construct viable arguments and critique the reasoning of others.
- Attend to precision.

I Can Objective

I can add and subtract fractions with unlike denominators using a common denominator and assess reasonableness.

Learning Objective

Add and subtract fractions with unlike denominators using common denominators.

Language Objectives

- Explain how to use a common denominator to add fractions with unlike denominators.
- Explain how to use a common denominator to subtract fractions with unlike denominators.

Vocabulary

Review: common denominator, equivalent fractions

Lesson 7.3 Assess Reasonableness of Mixed Number Sums and Differences

Apply and Practice – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators.

Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.

Mathematical Practices and Processes

- Reason abstractly and quantitatively.
- Model with mathematics.
- Attend to precision.

I Can Objective

I can add and subtract mixed numbers with unlike denominators and assess reasonableness.

Learning Objective

Add and subtract mixed numbers with unlike denominators.

Language Objectives

- Explain how to rewrite mixed numbers using equivalent fractions with a common denominator.
- Explain how to add and subtract mixed numbers with unlike denominators.

Lesson 7.4 Rename Mixed Numbers to Subtract

Apply and Practice – 2 Days

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators.

Mathematical Practices and Processes

- Reason abstractly and quantitatively.
- Construct viable arguments and critique the reasoning of others.
- Use appropriate tools strategically.

I Can Objective

I can subtract mixed numbers by renaming.

Learning Objective

Rename to find the difference of two mixed numbers.

Language Objectives

- Explain how you know when to rename a mixed number in finding a difference.
- Explain how to use renaming to find the difference of two mixed numbers.

Lesson 7.5 Apply Properties of Addition

Apply and Practice – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators.

Mathematical Practices and Processes

- Reason abstractly and quantitatively.
- Model with mathematics.
- Look for and make use of structure.

I Can Objective

I can apply the properties of addition to add fractions and mixed numbers.

Learning Objective

Add fractions and mixed numbers with unlike denominators using properties.

Language Objectives

- Explain the meanings of the Associative Property of Addition and the Commutative Property of Addition.
- Write examples to show understanding of how to use the properties of addition to add fractions and mixed numbers with unlike denominators.

Vocabulary

Review: Associative Property of Addition, Commutative Property of Addition

Lesson 7.6 Practice Addition and Subtraction Using Equations

Apply and Practice – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.

Mathematical Practices and Processes

- Reason abstractly and quantitatively.
- Model with mathematics.
- Look for and make use of structure.

I Can Objective

I can solve an addition or subtraction word problem by using an equation to model the problem.

Learning Objective

Write equations to solve addition and subtraction problems.

Language Objectives

- Show and explain how to write an addition equation with fractions and mixed numbers to model a problem.
- Show and explain how to write a subtraction equation with fractions and mixed numbers to model a problem.

Unit 3: Multiply Fractions and Mixed Numbers

Unit 3 Project: Triple the Treats

Unit 3 Learning Mindset Focus: Resilience / Responds to Feedback

Module 8: Understand Multiplication of Fractions

Recommended Pacing with Assessments: 11 Days

Module 8 Mathematical Progressions

Prior Learning	Current Development	Future Connections
Students multiplied fractions by whole numbers using visual models and equations.	Students represent the multiplication of fractions with a visual model.	Students will solve word problems that involve dividing fractions.
Students used the understanding that a multiple of a/b is a multiple of $1/b$ to multiply a fraction by a whole number.	Students multiply fractions by using an area model and by multiplying the numerators and denominators.	Students will interpret and compute quotients of fractions.
Students represented the fraction a/b as the product of a and $1/b$.	Students compare a product to a factor and explain why the product is greater than, less than, or equal to one factor.	

Module 8 Vocabulary

area	the measure of the number of unit squares needed to cover a surface
multiplication	a process to find the total number of items made up of equal-sized groups, or to find the total number of items in a given number of groups; it is the inverse operation of division
unit fraction	a fraction that has 1 as a numerator

Lesson 8.1 Explore Groups of Equal Shares to Show Multiplication

Build Understanding – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Interpret the product $(a/b) \times q$ as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations $a \times q \div b$.

Mathematical Practices and Processes

- Reason abstractly and quantitatively.
- Use appropriate tools strategically.
- Look for and express regularity in repeated reasoning.

I Can Objective

I can find a fractional part of a group by using a visual model to solve a problem.

Learning Objective

Represent a fractional part of a group.

Language Objective

Explain how to use a visual model to represent a fractional part of a group.

Vocabulary

Review: unit fraction

Lesson Materials

two-color counters; Number Lines (Teacher Resource Masters)

Lesson 8.2 Represent Multiplication of Whole Numbers by Fractions

Build Understanding – 2 Days

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Interpret the product $(a/b) \times q$ as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations $a \times q \div b$.

Mathematical Practices and Processes

- Model with mathematics.
- Use appropriate tools strategically.
- Attend to precision.

I Can Objective

I can find the product of a whole number and a fraction using a visual model.

Learning Objective

Represent the multiplication of a whole number by a fraction.

Language Objectives

- Explain how to use a visual model to represent the multiplication of a whole number by a fraction.
- Explain how to write an equation that models finding a fractional part of a whole.

Vocabulary

fraction strips, pattern blocks; Number Lines (Teacher Resource Masters)

Lesson 8.3 Represent Multiplication with Unit Fractions

Build Understanding – 1 Day

Professional Learning Video

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Interpret the product $(a/b) \times q$ as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations $a \times q \div b$.

Mathematical Practices and Processes

- Reason abstractly and quantitatively.
- Use appropriate tools strategically.
- Attend to precision.

I Can Objective

I can solve a problem by multiplying unit fractions using a visual model.

Learning Objective

Use a visual model to represent multiplication of unit fractions.

Language Objectives

- Use a visual model to represent the multiplication of unit fractions and explain how to find the product.
- Explain how to write an equation to represent a visual model of the product of unit fractions.

Lesson Materials

fraction strips, fraction circles

Lesson 8.4 Represent Multiplication of Fractions

Build Understanding – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Interpret the product $(a/b) \times q$ as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations $a \times q \div b$.

Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.

Mathematical Practices and Processes

- Model with mathematics.
- Use appropriate tools strategically.

I Can Objective

I can multiply fractions using a visual model.

Learning Objective

Use a visual model to represent multiplication of fractions.

Language Objectives

- Explain how to represent multiplication of fractions with a visual model.
- Explain how to find the product of fractions using a visual model.

Lesson Materials

fraction strips; Number Lines (Teacher Resource Masters)

Lesson 8.5 Use Representations of Area to Develop Procedures

Connect Concepts and Skills – 2 Days

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Interpret the product $(a/b) \times q$ as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations $a \times q \div b$.

Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.

Mathematical Practices and Processes

- Use appropriate tools strategically.
- Attend to precision.

I Can Objective

I can find the product of fractions using an area model.

Learning Objective

Multiply fractions using an area model..

Language Objectives

- Explain how to represent the multiplication of fractions with an area model.
- Explain how the area model justifies the process of multiplying numerators and denominators to find the product of fractions.

Lesson Materials

Grid Paper (Teacher Resource Masters)

Lesson 8.6 Interpret Fraction Multiplication as Scaling

Connect Concepts and Skills – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Interpret multiplication as scaling (resizing), by:

- Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.
- Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence $a/b = (n \times a)/(n \times b)$ to the effect of multiplying a/b by 1.

Mathematical Practices and Processes

- Reason abstractly and quantitatively.
- Construct viable arguments and critique the reasoning of others.

I Can Objective

I can explain how the size of the product compares to the size of one factor.

Learning Objective

Relate the size of the product compared to the size of one factor when multiplying fractions.

Language Objectives

- Explain how to compare the size of the product to the size of one factor when multiplying fractions.
- When multiplying fractions, explain why the product is greater than, less than, or equal to one of the factors.

Lesson 8.7 Multiply Fractions

Apply and Practice – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Interpret the product $(a/b) \times q$ as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations $a \times q \div b$.

Mathematical Practices and Processes

- Reason abstractly and quantitatively.
- Look for and make use of structure.

I Can Objective

I can solve problems involving the multiplication of a whole number or fraction by a fraction.

Learning Objective

Multiply with fractions using an algorithm.

Language Objectives

- Explain how to multiply with fractions without using a visual model.
- Explain how to multiply a whole number by a fraction as the sequence of multiplying the numerator and the whole number and then dividing by the denominator.

Unit 3: Multiply Fractions and Mixed Numbers

Unit 3 Project: Triple the Treats

Unit 3 Learning Mindset Focus: Resilience / Responds to Feedback

Module 9: Understand and Apply Multiplication of Mixed Numbers

Recommended Pacing with Assessments and Performance Task: 7 Days

Module 9 Mathematical Progressions

Prior Learning	Current Development	Future Connections
Students represented the fraction a/b as the product of a and $1/b$. Students used the understanding that a multiple of a/b is a multiple of $1/b$ to multiply a fraction by a whole number. Students multiplied fractions by whole numbers using visual models and equations.	Students find the area of a rectangle with mixed number side lengths. Students solve real world problems involving multiplication of mixed numbers by using visual models or equations to represent the problem.	Students will interpret the quotients of fractions. Students will compute the quotients of fractions. Students will solve word problems that involve dividing fractions.

Module 9 Vocabulary

area	the measure of the number of unit squares needed to cover a surface
mixed number	a number that is made up of a whole number and a fraction

Lesson 9.1 Explore Area and Mixed Numbers

Build Understanding – 1 Day

Professional Learning Video

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.

Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.

Mathematical Practices and Processes

- Use appropriate tools strategically.

I Can Objective

I can use an area model to multiply mixed numbers.

Learning Objective

Use an area model to represent multiplication of mixed numbers.

Language Objective

- Explain how to use a grid to find the area of a rectangle with mixed-number side lengths.
- Explain how to use an area model to represent multiplication of mixed numbers.

Lesson Materials

Grid Paper (Teacher Resource Masters)

Lesson 9.2 Multiply Mixed Numbers

Connect Concepts and Skills – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.

Mathematical Practices and Processes

- Reason abstractly and quantitatively.
- Model with mathematics.
- Look for and make use of structure.

I Can Objective

I can solve real world problems involving multiplication of mixed numbers by writing an equation to model the problem.

Learning Objective

Multiply a mixed number by another mixed number.

Language Objective

Explain how to write an equation to model a problem involving multiplication of mixed numbers.

Lesson Materials

Grid Paper (Teacher Resource Masters)

Lesson 9.3 Practice Multiplication with Fractions and Mixed Numbers

Apply and Practice – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Interpret the product $(a/b) \times q$ as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations $a \times q \div b$.

Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.

Mathematical Practices and Processes

- Reason abstractly and quantitatively.
- Model with mathematics.

I Can Objective

I can solve a real world problem by writing a multiplication equation to model the problem.

Learning Objective

Multiply with mixed numbers.

Language Objectives

- Explain why a problem can be solved by multiplying with mixed numbers.
- Explain how to solve a problem by multiplying with mixed numbers.

Lesson 9.4 Apply Fraction Multiplication to Find Area

Apply and Practice – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.

Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.

Mathematical Practices and Processes

- Model with mathematics.
- Attend to precision.

I Can Objective

I can solve multiplication problems with fractions and mixed numbers to find the area of rectangles.

Learning Objective

Solve area problems with fractions and mixed numbers.

Language Objective

Explain how to find the area of a rectangle with mixed number and fractional side lengths.

Unit 4: Divide Fractions and Convert Customary Units

Unit 4 Project: Planet Size

Unit 4 Learning Mindset Focus: Perseverance / Getting Unstuck

Module 10: Understand Division with Whole Numbers and Unit Fractions

Recommended Pacing with Assessments: 9 Days

Module 10 Mathematical Progressions

Prior Learning	Current Development	Future Connections
Students represented a fraction as the product of a whole number and a unit fraction.	Students interpret a fraction as division of the numerator by the denominator.	Students will represent division situations using visual fraction models and equations.
Students multiplied fractions by whole numbers using visual models and equations.	Students divide a unit fraction by a whole number using a visual model by finding the size of the equal parts.	Students will solve word problems involving quotients of fractions.
Students used the understanding that a multiple of a fraction is a multiple of a unit fraction to multiply a fraction by a whole number.	Students use a visual model to represent the division of a whole number by a unit fraction.	Students will interpret and compute quotients of fractions.

Module 10 Vocabulary

dividend	the number that is to be divided in a division problem
divisor	the number that divides the dividend
quotient	the number that results from dividing

Lesson 10.1 Interpret a Fraction as Division

Build Understanding – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Interpret a fraction as division of the numerator by the denominator ($a/b = a \div b$). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem.

Mathematical Practices and Processes

- Reason abstractly and quantitatively.
- Use appropriate tools strategically.
- Model with mathematics.

I Can Objective

I can interpret fractions as representing division of whole numbers.

Learning Objective

Interpret a fraction as division and solve whole-number division problems that result in a fraction or mixed number.

Language Objectives

- Explain how to interpret a fraction as division.
- Use a visual model to represent a division problem with whole numbers resulting in a fraction or mixed number and explain how to interpret the results.

Vocabulary

Review: dividend, divisor, quotient

Lesson Materials

fraction strips, pattern blocks

Lesson 10.2 Represent and Find the Size of Equal Parts

Connect Concepts and Skills – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Interpret division of a unit fraction by a non-zero whole number, and compute such quotients.

Mathematical Practices and Processes

- Reason abstractly and quantitatively.
- Use appropriate tools strategically.
- Look for and make use of structure.

I Can Objective

I can divide a unit fraction by a whole number using a visual fraction model.

Learning Objective

Divide a unit fraction by a whole number to find the size of the equal parts by using visual fraction models.

Language Objectives

- Demonstrate how to use a visual model to divide a unit fraction by a whole number.
- Explain how to find the quotient of a unit fraction and a whole number by using a visual model.

Lesson Materials

fraction strips, fraction circles

Lesson 10.3 Use Representations of Division of Unit Fractions by Whole Numbers

Connect Concepts and Skills – 2 Days

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Interpret division of a unit fraction by a non-zero whole number, and compute such quotients.

Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem.

Mathematical Practices and Processes

- Reason abstractly and quantitatively.
- Use appropriate tools strategically.
- Attend to precision.

I Can Objective

I can create a story context and use a visual model to interpret the division of a unit fraction by a whole number.

Learning Objective

Write a word problem and use a visual model to interpret the division of a unit fraction by a whole number.

Language Objectives

- Explain how to write a word problem to interpret the division of a unit fraction by a whole number.
- Use a visual model to represent the division of a unit fraction by a whole number and explain the model.

Lesson Materials

fraction circles

Lesson 10.4 Represent and Find the Number of Equal-Sized Parts

Connect Concepts and Skills – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Interpret division of a unit fraction by a non-zero whole number, and compute such quotients.

Mathematical Practices and Processes

- Model with mathematics.
- Use appropriate tools strategically.
- Look for and make use of structure.

I Can Objective

I can divide a whole number by a unit fraction using a visual fraction model.

Learning Objective

Divide a whole number by a unit fraction to find the number of equal-sized parts by using visual models.

Language Objectives

- Use visual models to divide a whole number by a unit fraction, and explain how the quotient is represented in the visual model.
- Explain how to solve a problem by interpreting division of a whole number by a unit fraction.

Lesson Materials

fraction strips

Lesson 10.5 Use Representations of Division of Whole Number by Unit Fractions

Connect Concepts and Skills – 2 Days

Professional Learning Video

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Interpret division of a unit fraction by a non-zero whole number, and compute such quotients.

Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem.

Mathematical Practices and Processes

- Reason abstractly and quantitatively.
- Attend to precision.
- Look for and express regularity in repeated reasoning.

I Can Objective

I can create a story context and use a visual fraction model to interpret the division of a whole number by a unit fraction.

Learning Objective

Write a word problem and use a visual model to interpret the division of a whole number by a unit fraction.

Language Objectives

- Explain how to write a word problem to interpret the division of a whole number by a unit fraction.
- Use a visual model to represent the division of a whole number by a unit fraction, and explain the model.

Lesson Materials

fraction circles, fraction strips

Unit 4: Divide Fractions and Convert Customary Units

Unit 4 Project: Planet Size

Unit 4 Learning Mindset Focus: Perseverance / Getting Unstuck

Module 11: Divide with Whole Numbers and Unit Fractions

Recommended Pacing with Assessments: 8 Days

Module 11 Mathematical Progressions

Prior Learning	Current Development	Future Connections
Students multiplied fractions and whole numbers. Students compared fractions with different numerators and different denominators. Students used visual models to explain why a fraction a/b is equivalent to a fraction $\frac{n \times a}{n \times b}$.	Students divide a whole number by a unit fraction and a unit fraction by a whole number. Students use visual models to represent division with unit fractions. Students write and solve real world problems involving division with unit fractions and whole numbers using equations to represent the problem.	Students will compute quotients of fractions. Students will solve word problems involving division of fractions by fractions. Students will use visual models and equations to represent division with fractions.

Module 11 Vocabulary

divide	to separate into equal groups; the inverse operation of multiplication
dividend	the number that is to be divided in a division problem
divisor	the number that divides the dividend
quotient	the number that results from dividing
unit fraction	a fraction that has 1 as a numerator

Lesson 11.1 Relate Multiplication and Division of Fractions

Connect Concepts and Skills – 1 Day

Professional Learning Video

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Interpret division of a unit fraction by a non-zero whole number, and compute such quotients.

Interpret division of a whole number by a unit fraction, and compute such quotients.

Mathematical Practices and Processes

- Reason abstractly and quantitatively.
- Construct viable arguments and critique the reasoning of others.
- Use appropriate tools strategically.

I Can Objective

I can divide a whole number by a unit fraction or a unit fraction by a whole number using a related multiplication equation.

Learning Objective

Divide a whole number by a fraction, and divide a fraction by a whole number.

Language Objectives

- Explain how to find the quotient of a whole number and a unit fraction by solving a related multiplication equation.
- Explain how to find the quotient of a unit fraction and a whole number by solving a related multiplication equation.

Lesson 11.2 Divide Whole Numbers by Unit Fractions

Apply and Practice – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem.

Mathematical Practices and Processes

- Reason abstractly and quantitatively.
- Model with mathematics.
- Use appropriate tools strategically.

I Can Objective

I can represent division of a whole number by a unit fraction using visual fraction models and equations.

Learning Objective

Represent division of a whole number by a unit fraction by using visual fraction models and equations.

Language Objectives

- Explain how to represent division of a whole number by a unit fraction on a number line.
- Explain how to write an equation to model a situation involving dividing a whole number by a fraction.

Lesson 11.3 Interpret and Solve Division of a Whole Number by a Unit Fraction

Apply and Practice – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Interpret division of a whole number by a unit fraction, and compute such quotients.

Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem.

Mathematical Practices and Processes

- Reason abstractly and quantitatively.
- Model with mathematics.
- Use appropriate tools strategically.

I Can Objective

I can create a story context for a given equation and use a visual fraction model to represent the quotient.

Learning Objective

Write a word problem for a given equation, and use a visual fraction model to represent the quotient.

Language Objectives

- Explain how a word problem can be modeled by an equation with a whole number divided by a unit fraction.
- Draw a visual model to represent a quotient of a whole number and a unit fraction, and explain how the visual model represents a word problem.

Lesson 11.4 Divide Unit Fractions by Whole Numbers

Apply and Practice – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem.

Mathematical Practices and Processes

- Reason abstractly and quantitatively.
- Model with mathematics.
- Use appropriate tools strategically.

I Can Objective

I can represent division of a unit fraction by a whole number using visual fraction models and equations.

Learning Objective

Represent division of a unit fraction by a whole number by using visual models and equations.

Language Objectives

- Explain how to represent division of a unit fraction by a whole number using a visual model.
- Find the quotient of a unit fraction and a whole number using a number line, and explain how the number line was used.

Lesson 11.5 Interpret and Solve Division of a Unit Fraction by a Whole Number

Apply and Practice – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Interpret division of a whole number by a unit fraction, and compute such quotients.

Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem.

Mathematical Practices and Processes

- Model with mathematics.
- Use appropriate tools strategically.
- Attend to precision.

I Can Objective

I can create a story context for a given equation and use a visual fraction model to represent the quotient.

Learning Objective

Write a word problem for a given equation, and use a visual fraction model to represent the quotient.

Language Objectives

- Explain how a word problem is modeled by an equation dividing a unit fraction by a whole number.
- Draw a visual model to represent a quotient of a unit fraction and a whole number, and explain

Lesson 11.6 Solve Division Problems Using Visual Models and Equations

Apply and Practice – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem.

Mathematical Practices and Processes

- Reason abstractly and quantitatively.
- Construct viable arguments and critique the reasoning of others.
- Model with mathematics.

I Can Objective

I can solve problems involving the division of fractions and whole numbers.

Learning Objective

Solve problems involving the division of fractions and whole numbers.

Language Objectives

- Explain how to solve problems involving the division of unit fractions and whole numbers by using related equations.
- Explain how to solve problems involving the division of unit fractions and whole numbers by using visual models.

Unit 4: Divide Fractions and Convert Customary Units

Unit 4 Project: Planet Size

Unit 4 Learning Mindset Focus: Perseverance / Getting Unstuck

Module 12: Customary Measurement

Recommended Pacing with Assessments and Performance Task: 8 Days

Module 12 Mathematical Progressions

Prior Learning	Current Development	Future Connections
Students expressed larger customary units of measurement in terms of smaller units. Students made line plots to display fractional measurements and solved problems using fractional data from line plots. Students expressed larger units of time in terms of smaller units.	Students compare and convert customary units of measurement. Students solve multistep problems with customary units of measurement. Students make and interpret line plots that display fractional measurements. Students convert units of time and solve elapsed time problems.	Students will use ratio reasoning to convert measurement units. Students will solve real-world and mathematical problems by graphing points in the coordinate plane.

Module 12 Vocabulary

elapsed time	the time that passes between the start of an activity and the end of that activity
line plot	a graph that shows frequency of data along a number line
liquid volume	the measure of the space a liquid occupies
weight	how heavy an object is

Lesson 12.1 Customary Measurement

Connect Concepts and Skills – 2 Days

Professional Learning Video

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.

Mathematical Practices and Processes

- Reason abstractly and quantitatively.
- Model with mathematics.
- Attend to precision.

I Can Objective

I can compare and convert customary units of measurement.

Learning Objective

Compare and convert customary units of measurement.

Language Objectives

- Explain how to convert from a larger customary unit of measurement to a smaller customary unit of measurement.
- Explain how to convert from a smaller customary unit of measurement to a larger customary unit of measurement.

Vocabulary

Review: liquid volume, weight

Lesson Materials

inch rulers

Lesson 12.2 Solve Multistep Customary Measurement Problems

Apply and Practice – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.

Mathematical Practices and Processes

- Reason abstractly and quantitatively.
- Model with mathematics.

I Can Objective

I can solve multistep problems that include customary measurement conversions.

Learning Objective

Convert measurement units to solve multistep problems.

Language Objective

Demonstrate and explain how to solve problems using customary measurement conversions.

Lesson 12.3 Represent and Interpret Measurement Data in Line Plots

Apply and Practice – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Make a line plot to display a data set of measurements in fractions of a unit ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$). Use operations on fractions for this grade to solve problems involving information presented in line plots.

Mathematical Practices and Processes

- Reason abstractly and quantitatively.
- Use appropriate tools strategically.
- Look for and make use of structure.

I Can Objective

I can make a line plot to display data in fractional measurements and use the line plot to solve problems.

Learning Objective

Make and use line plots with data given in fractions to solve problems.

Language Objectives

- Explain how to make a line plot with data given in fractions of a unit.
- Show and explain how to solve problems involving information in a line plot.

Vocabulary

Review: line plot

Lesson 12.4 Convert Time and Find Elapsed Time

Apply and Practice – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.

Mathematical Practices and Processes

- Reason abstractly and quantitatively.
- Use appropriate tools strategically.

I Can Objective

I can solve elapsed time problems by converting units of time.

Learning Objective

Convert units of time to solve elapsed time problems.

Language Objectives

- Explain how to solve elapsed time problems.
- Demonstrate and explain how to convert units of time.

Vocabulary

Review: elapsed time

Unit 5: Add and Subtract Decimals

Unit 5 Project: A Healthy Snack Stand

Unit 5 Learning Mindset Focus: Perseverance / Checks for Understanding

Module 13: Decimal Place Value

Recommended Pacing with Assessments: 6 Days

Module 13 Mathematical Progressions

Prior Learning	Current Development	Future Connections
Students recognized that a digit in a whole number represents 10 times what it represents in the place to the right. Students read, wrote, and compared whole numbers. Students rounded whole numbers to any place.	Students recognize the 10-to-1 relationship of place-value positions in decimals. Students read, write, and compare decimals to thousandths. Students round decimals to any place.	Students will use standard algorithms to add, subtract, multiply, and divide multi-digit decimals. Students will evaluate expressions that include decimals.

Module 13 Vocabulary

greater than (>)	a symbol used to compare two numbers or two quantities when the greater number or greater quantity is given first
less than (<)	a symbol used to compare two numbers or two quantities, with the lesser number or lesser quantity given first
round	to replace a number with one that is simpler and is approximately the same size as the original number
thousandth	one of one thousand equal parts

Lesson 13.1 Understand Thousandths

Build Understanding – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and $1/10$ of what it represents in the place to its left.

Mathematical Practices and Processes

- Use appropriate tools strategically.
- Look for and make use of structure.

I Can Objective

I can describe the relationship between two decimal place-value positions to the thousandths place.

Learning Objective

Recognize the 10 to 1 relationship among decimal place-value positions.

Language Objectives

- Explain the relationship between two decimal place-value positions.
- Explain how to use a place-value chart to find patterns in decimal numbers.

Vocabulary

New: thousandth

Lesson 13.2 Read and Write Decimals to Thousandths

Build Understanding – 1 Day

Professional Learning Video

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., $347.392 = 3 \times 100 + 4 \times 10 + 7 \times 1 + 3 \times (1/10) + 9 \times (1/100) + 2 \times (1/1000)$.

Mathematical Practices and Processes

- Reason abstractly and quantitatively.
- Look for and make use of structure.

I Can Objective

I can read, write, and represent decimals to thousandths.

Learning Objective

Read and write decimals to thousandths.

Language Objective

- Explain how to read and write decimals to thousandths by using a place-value chart.
- Explain how to read and write decimals to thousandths by using place-value patterns.

Lesson Materials

Place-Value Charts (Teacher Resource Masters)

Lesson 13.3 Round Decimals

Connect Concepts and Skills – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Use place value understanding to round decimals to any place.

Mathematical Practices and Processes

- Reason abstractly and quantitatively.
- Look for and make use of structure.

I Can Objective

I can use an understanding of place value to round decimals to a given place.

Learning Objective

Round decimals to any place.

Language Objective

- Demonstrate how to round decimals to the nearest whole number, tenth, or hundredth by using a number line.
- Explain how to round decimals to the nearest whole number, tenth, or hundredth by using place value.

Vocabulary

Review: round

Lesson Materials

Place-Value Charts, Number Lines (Teacher Resource Masters)

Lesson 13.4 Compare and Order Decimals

Apply and Practice – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Compare two decimals to thousandths based on meanings of the digits in each place, using $>$, $=$, and $<$ symbols to record the results of comparisons.

Mathematical Practices and Processes

- Reason abstractly and quantitatively.
- Attend to precision.

I Can Objective

I can use place value to compare and order decimals to thousandths.

Learning Objective

Compare and order decimals to thousandths using place value.

Language Objective

- Explain how to compare two decimals.
- Explain how to order three or more decimals.

Vocabulary

Review: greater than ($>$), less than ($<$)

Unit 5: Add and Subtract Decimals

Unit 5 Project: A Healthy Snack Stand

Unit 5 Learning Mindset Focus: Perseverance / Checks for Understanding

Module 14: Add and Subtract Decimals

Recommended Pacing with Assessments and Performance Task: 9 Days

Module 14 Mathematical Progressions

Prior Learning	Current Development	Future Connections
Students added and subtracted whole numbers using the standard algorithm.	Students use concrete models and visual models to add and subtract decimals. Students use the relationship between addition and subtraction to add and subtract decimals. Students use place-value strategies and properties of operations to add and subtract decimals.	Students will use standard algorithms to add and subtract multi-digit decimals.

Module 14 Vocabulary

Associative Property of Addition	the property that states when the grouping of the addends is changed, the sum is the same
benchmark	a familiar number used as a point of reference
Commutative Property of Addition	the property that states when the order of the two addends is changed, the sum is the same

Lesson 14.1 Represent Decimal Addition

Build Understanding – 1 Day

Professional Learning Video

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Mathematical Practices and Processes

- Construct viable arguments and critique the reasoning of others.
- Use appropriate tools strategically.
- Attend to precision.

I Can Objective

I can use concrete models or drawings to represent decimal addition.

Learning Objective

Represent decimal addition using concrete models or drawings.

Language Objectives

- Explain how to add decimals using a concrete model.
- Explain how to add decimals using a visual model.

Lesson Materials

base-ten blocks; Decimal Models (Teacher Resource Masters)

Lesson 14.2 Represent Decimal Subtraction

Build Understanding – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Mathematical Practices and Processes

- Construct viable arguments and critique the reasoning of others.
- Use appropriate tools strategically.

I Can Objective

I can use concrete models or drawings to represent decimal subtraction.

Learning Objective

Represent decimal subtraction using concrete models or drawings.

Language Objectives

- Explain how to subtract decimals using a concrete model.
- Explain how to subtract decimals using a visual model.

Lesson Materials

base-ten blocks; Decimal Models (Teacher Resource Masters)

Lesson 14.3 Assess Reasonableness of Sums and Differences

Connect Concepts and Skills – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Mathematical Practices and Processes

- Construct viable arguments and critique the reasoning of others.
- Use appropriate tools strategically.

I Can Objective

I can use benchmarks or rounding to check the reasonableness of decimal sums and differences.

Learning Objective

Assess the reasonableness of decimal sums and differences.

Language Objectives

- Explain how to assess the reasonableness of a decimal sum.
- Explain how to assess the reasonableness of a decimal difference.

Lesson Materials

Number Lines (Teacher Resource Masters)

Lesson 14.4 Add Decimals

Apply and Practice – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Mathematical Practices and Processes

- Model with mathematics.
- Use appropriate tools strategically.
- Attend to precision.

I Can Objective

I can use a written method and strategies based on place value to add decimals.

Learning Objective

Add decimals using a written method and strategies based on place value.

Language Objectives

- Explain how to use place value to add decimals.
- Use a chart to add decimals and explain how the chart is a useful tool.

Lesson 14.5 Subtract Decimals

Apply and Practice – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Mathematical Practices and Processes

- Construct viable arguments and critique the reasoning of others.
- Attend to precision.

I Can Objective

I can use a written method and strategies based on place value to subtract decimals.

Learning Objective

Subtract decimals using a written method and strategies based on place value.

Language Objectives

- Explain how to use place value to subtract decimals.
- Use a chart to subtract decimals and explain how the chart is a useful a tool.

Lesson 14.6 Use Strategies and Reasoning to Add and Subtract

Apply and Practice – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Mathematical Practices and Processes

- Reason abstractly and quantitatively.
- Look for and make use of structure.

I Can Objective

I can add and subtract decimals by using reasoning and strategies involving addition properties or friendly numbers.

Learning Objective

Use strategies based on properties and reasoning to add and subtract decimals.

Language Objectives

- Explain how to use friendly numbers to add and subtract decimals.
- Explain how to use properties of addition to add decimals.

Unit 6: Multiply Decimals

Unit 6 Project: Photo-Booth Frenzy

Unit 6 Learning Mindset Focus: Perseverance / Learns Effectively

Module 15: Multiply Decimals and Whole Numbers

Recommended Pacing with Assessments: 10 Days

Module 15 Mathematical Progressions

Prior Learning	Current Development	Future Connections
Students recognized that a digit in a whole number represents 10 times what it represents in the place to the right. Students multiplied fractions by whole numbers. Students multiplied whole numbers up to four digits by one-digit whole numbers and multiplied two two-digit whole numbers.	Students find, explain, and use patterns in the placement of decimal points when multiplying decimals by powers of 10. Students use visual models, place-value strategies, and properties of operations to multiply decimals and whole numbers. Students assess the reasonableness of products of decimals less than 1 and whole numbers.	Students will use the standard algorithm to divide multi-digit whole numbers. Students will use standard algorithms to add, subtract, multiply, and divide multi-digit decimals.

Module 15 Vocabulary

Distributive Property	the property that states that multiplying a sum by a number is the same as multiplying each addend in the sum by the number and then adding the products
estimate (noun)	a number close to an exact amount
estimate (verb)	to find a number that is close to an exact amount

Lesson 15.1 Understand Decimal Multiplication Patterns

Build Understanding – 2 Days

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.

Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Mathematical Practices and Processes

- Attend to precision.
- Look for and make use of structure.
- Look for and express regularity in repeated reasoning.

I Can Objective

I can multiply decimals by powers of 10 that are both greater than and less than 1.

Learning Objective

Find patterns in products when multiplying by powers of 10.

Language Objectives

- Write and explain how to use a pattern to place a decimal point in a product.
- Explain how to multiply a decimal by a power of 10.

Lesson Materials

Decimal Models, Place-Value Charts (Teacher Resource Masters)

Lesson 15.2 Represent Multiplication with Decimals and Whole Numbers

Build Understanding – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Mathematical Practices and Processes

- Model with mathematics.
- Use appropriate tools strategically.

I Can Objective

I can represent the product of a decimal less than one and a whole number using a visual model.

Learning Objective

Represent multiplication of whole numbers and decimals less than 1.

Language Objectives

- Demonstrate and explain how to use a decimal model to multiply a whole number and a decimal less than 1.
- Demonstrate and explain how to use quick pictures to multiply a whole number and a decimal less than 1.

Lesson Materials

base-ten blocks, color pencils, Decimal Models (Teacher Resource Masters)

Lesson 15.3 Assess Reasonableness of Products

Connect Concepts and Skills – 1 Day

Professional Learning Video

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Mathematical Practices and Processes

- Reason abstractly and quantitatively.
- Look for and make use of structure.
- Look for and express regularity in repeated reasoning.

I Can Objective

I can assess the reasonableness of the product of a decimal less than one and a whole number.

Learning Objective

Assess the reasonableness of the product of a decimal less than 1 and a whole number.

Language Objectives

- Explain ways to assess the reasonableness of a product of a decimal less than 1 and a whole number.
- Explain how assessing the reasonableness of a product can be useful.

Vocabulary

Review: estimate (noun)

Lesson Materials

Decimal Models (Teacher Resource Masters)

Lesson 15.4 Multiply Decimals by 1-Digit Whole Numbers

Apply and Practice – 2 Days

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Mathematical Practices and Processes

- Reason abstractly and quantitatively.
- Model with mathematics.
- Look for and make use of structure.

I Can Objective

I can multiply a decimal by a 1-digit whole number using the Distributive Property, partial products, and an area model.

Learning Objective

Multiply a decimal and a whole number using properties and place value.

Language Objectives

- Explain how to use partial products to multiply a decimal and a 1-digit whole number.
- Explain how to use properties of operations to multiply a decimal and a 1-digit whole number.

Vocabulary

Review: Distributive Property, estimate (verb)

Lesson 15.5 Multiply Decimals by 2-Digit Whole Numbers

Apply and Practice – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Mathematical Practices and Processes

- Use appropriate tools strategically.
- Look for and make use of structure.

I Can Objective

I can use an area model and place-value patterns to multiply a decimal by a 2-digit whole number.

Learning Objective

Multiply a decimal and a whole number using properties and place value.

Language Objectives

- Explain how to use partial products to multiply a decimal and a 2-digit whole number.
- Explain how to use properties of operations to multiply a decimal and a 2-digit whole number.

Lesson 15.6 Solve Problems Using Bar Models

Apply and Practice – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Mathematical Practices and Processes

- Model with mathematics.
- Look for and make use of structure.

I Can Objective

I can use a bar model to solve a multistep problem that uses multiplication.

Learning Objective

Solve problems using a bar model to show the solution process.

Language Objectives

- Explain how to use a bar model to represent a word problem.
- Explain how to solve multistep problems using bar models.

Unit 6: Multiply Decimals

Unit 6 Project: Photo-Booth Frenzy

Unit 6 Learning Mindset Focus: Perseverance / Learns Effectively

Module 16: Multiply Decimals

Recommended Pacing with Assessments and Performance Task: 6 Days

Module 16 Mathematical Progressions

Prior Learning	Current Development	Future Connections
Students multiplied whole numbers up to four digits by 1-digit whole numbers and multiplied two 2-digit whole numbers.	Students use visual models to multiply decimals. Students place decimal points in products of decimals. Students multiply decimals with zeros in the products.	Students will use the standard algorithm to multiply multi-digit decimals.

Module 16 Vocabulary

place value	the value of each digit in a number based on the location of the digit
product	the answer to a multiplication problem

Lesson 16.1 Represent Decimal Multiplication

Build Understanding – 1 Day

Professional Learning Video

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Mathematical Practices and Processes

- Use appropriate tools strategically.
- Attend to precision.

I Can Objective

I can find the product of two decimals to the tenths place by using a decimal model.

Learning Objective

Use a visual model to multiply decimals.

Language Objectives

- Explain how to use a decimal model to multiply decimals when both factors are less than 1.
- Explain how to use a decimal model to multiply decimals when only one factor is less than 1.

Lesson Materials

two-color counters, color pencil; Decimal Models (Teacher Resource Masters)

Lesson 16.2 Multiply Decimals

Connect Concepts and Skills – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Mathematical Practices and Processes

- Reason abstractly and quantitatively.
- Attend to precision.

I Can Objective

I can multiply two decimal numbers by applying an understanding of place value.

Learning Objective

Place the decimal point in decimal multiplication.

Language Objectives

- Explain how to place the decimal point by using estimation.
- Explain how to place the decimal point in a product using the number of decimal places in the factors.

Lesson 16.3 Multiply Decimals with Zero in the Product

Apply and Practice – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Mathematical Practices and Processes

- Attend to precision.
- Look for and make use of structure.

I Can Objective

I can write the correct number of zeros in the product of two decimal numbers.

Learning Objective

Multiply decimals with zeros in the product.

Language Objectives

- Write and solve problems with zeros in the product.
- Explain how you know the correct number of zeros have been placed in the product.

Unit 7: Divide Decimals

Unit 7 Project: The Price is Nice

Unit 7 Learning Mindset Focus: Challenge-Seeking / Sets Achievable Stretch Goals

Module 17: Divide Decimals

Recommended Pacing with Assessments: 11 Days

Module 17 Mathematical Progressions

Prior Learning	Current Development	Future Connections
Students found whole-number quotients and remainders with dividends up to four digits and one-digit divisors. Students used equations, rectangular arrays, and area models to explain division calculations.	Students use patterns when dividing decimals by powers of 10. Students divide decimals by whole numbers, decimals by decimals, and whole numbers by decimals. Students estimate decimal quotients.	Students will use the standard algorithm to divide multi-digit decimals.

Module 17 Vocabulary

dividend	the number that is to be divided in a division problem
divisor	the number that divides the dividend
estimate	a number close to an exact amount
quotient	the number that results from dividing

Lesson 17.1 Understand Decimal Division Patterns

Build Understanding – 2 Days

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.

Mathematical Practices and Processes

- Reason abstractly and quantitatively.
- Attend to precision.
- Look for and express regularity in repeated reasoning.

I Can Objective

I can use patterns to place the decimal point in a quotient.

Learning Objective

Find patterns in quotients when dividing by powers of 10.

Language Objectives

- Explain how to use patterns to place the decimal point in a quotient when dividing by powers of 10.
- Explain how dividing by 101, 102, 103 is related to multiplying by 0.1, 0.01, and 0.001.

Lesson Materials

Place-Value Charts (Teacher Resource Masters)

Lesson 17.2 Represent Division of Decimals by Whole Numbers

Build Understanding – 2 Days

Professional Learning Video

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Mathematical Practices and Processes

- Model with mathematics.
- Use appropriate tools strategically.

I Can Objective

I can use a concrete or visual model to divide a decimal by a whole number.

Learning Objective

Use a concrete or visual model to show division of decimals by whole numbers.

Language Objectives

- Explain how to represent division of a decimal by a whole number using a concrete or visual model.
- Explain how to solve division of a decimal by a whole number using a concrete or visual model.

Lesson Materials

base-ten blocks; Decimal Models (Teacher Resource Masters)

Lesson 17.3 Assess Reasonableness of Quotients

Connect Concepts and Skills – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Mathematical Practices and Processes

- Use appropriate tools strategically.
- Look for and make use of structure.

I Can Objective

I can estimate the quotient of a decimal division problem by using compatible numbers.

Learning Objective

Estimate decimal quotients.

Language Objectives

- Explain how to use compatible numbers to estimate decimal quotients.
- Describe how a decimal quotient can be estimated.

Lesson Materials

base-ten blocks; Decimal Models (Teacher Resource Masters)

Lesson 17.4 Divide Decimals by Whole Numbers

Connect Concepts and Skills – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Mathematical Practices and Processes

- Use appropriate tools strategically.
- Attend to precision.

I Can Objective

I can divide a decimal by a whole number.

Learning Objective

Divide decimals by whole numbers.

Language Objective

Explain how to divide a decimal by a whole number by using whole-number division.

Lesson Materials

base-ten blocks

Lesson 17.5 Represent Decimal Division

Connect Concepts and Skills – 2 Days

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Mathematical Practices and Processes

- Use appropriate tools strategically.
- Look for and express regularity in repeated reasoning.

I Can Objective

I can divide a decimal by a decimal using a visual model.

Learning Objective

Represent division by decimals using a concrete or visual model.

Language Objectives

- Explain how to use concrete or visual models to divide a decimal by a decimal.
- Explain how to use concrete or visual models to divide a whole number by a decimal.

Lesson Materials

base-ten blocks; Decimal Models (Teacher Resource Masters)

Lesson 17.6 Divide Decimals

Apply and Practice – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Mathematical Practices and Processes

- Attend to precision.
- Look for and make use of structure.

I Can Objective

I can divide a decimal by a decimal.

Learning Objective

Place the decimal point in decimal division.

Language Objectives

- Explain how to place the decimal point in decimal division.
- Explain how to multiply by powers of 10 to write a whole-number division problem equivalent to a decimal division problem.

Lesson 17.7 Write Zeros in the Dividend

Apply and Practice – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Mathematical Practices and Processes

- Construct viable arguments and critique the reasoning of others.
- Attend to precision.

I Can Objective

I can find a quotient by writing a zero in the dividend.

Learning Objective

Write a zero in the dividend to find a quotient.

Language Objectives

- Explain when to write a zero in the dividend to find a quotient.
- Explain why writing a zero to the right of a decimal dividend does not change the value of the quotient.

Unit 7: Divide Decimals

Unit 7 Project: The Price is Nice

Unit 7 Learning Mindset Focus: Challenge-Seeking / Sets Achievable Stretch Goals

Module 18: Customary and Metric Measurement

Recommended Pacing with Assessments and Performance Task: 6 Days

Module 18 Mathematical Progressions

Prior Learning	Current Development	Future Connections
Students understood relative sizes of customary units of measurement and metric units of measurement. Students expressed larger units of measurement in terms of smaller units.	Students compare and convert metric units of measurement. Students solve problems by converting customary and metric units of measurement.	Students will use ratio reasoning to convert measurement units.

Module 18 Vocabulary

gram	a metric unit used to measure mass; 1,000 grams = 1 kilogram
liter	a metric unit used to measure capacity and liquid volume; 1 liter = 1,000 milliliters
meter	a metric unit used to measure length or distance; 1 meter = 100 centimeters

Lesson 18.1 Understand Metric Conversions

Apply and Practice – 1 Day

Professional Learning Video

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.

Mathematical Practices and Processes

- Reason abstractly and quantitatively.
- Look for and make use of structure.

I Can Objective

I can convert between any two metric units of length, liquid volume, or mass.

Learning Objective

Convert and compare metric units.

Language Objectives

- Explain how to convert and compare metric units of length.
- Explain how to convert and compare metric units of mass.
- Explain how to convert and compare metric units of liquid volume.

Lesson 18.2 Solve Customary and Metric Conversion Problems

Apply and Practice – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.

Mathematical Practices and Processes

- Use appropriate tools strategically.
- Attend to precision.

I Can Objective

I can solve problems involving conversions within the same system of measurement.

Learning Objective

Solve problems involving customary and metric conversions.

Language Objectives

- Write and solve problems using customary conversions.
- Write and solve problems using metric conversions.

Lesson 18.3 Solve Multistep Measurement Problems

Apply and Practice – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.

Mathematical Practices and Processes

- Reason abstractly and quantitatively.
- Attend to precision.

I Can Objective

I can solve a multistep problem that includes measurement conversions.

Learning Objective

Convert measurement units to solve multistep problems.

Language Objectives

- Explain how to use measurement conversions to solve multistep problems.
- Explain how to determine what operations to use in a multistep problem involving measurement conversions.

Unit 8: Graphs, Patterns, and Geometry

Unit 8 Project: Classroom Coordinates

Unit 8 Learning Mindset Focus: Challenge-Seeking / Make Decisions

Module 19: Graphs and Patterns

Recommended Pacing with Assessments: 7 Days

Module 19 Mathematical Progressions

Prior Learning	Current Development	Future Connections
Students identified points, lines, line segments, rays, angles, and perpendicular and parallel lines in plane figures. Students generated a number pattern following a given rule. Students identified features of a number pattern that were not explicit from the given rule.	Students define a coordinate system. Students solve problems by graphing points on a coordinate grid. Students use rules to generate two numerical patterns and identify the relationship between corresponding terms.	Students will understand rational numbers as points on a number line. Students will solve problems by graphing points in all four quadrants of the coordinate plane.

Module 19 Vocabulary

axes	the two perpendicular lines of a coordinate plane that intersect at the origin
coordinate grid	the part of the coordinate system that describes all of the ordered pairs on or above the x-axis and on or to the right of the y-axis
coordinate system	a plane formed by the intersection of a horizontal number line called the x-axis and a vertical number line called the y-axis
ordered pair	a pair of numbers used to locate a point on a grid; the first number tells the left-right position and the second number tells the up-down position
x-axis	the horizontal number line on a coordinate plane
x-coordinate	the first number in an ordered pair; tells the distance to move right or left from (0, 0)
y-axis	the vertical number line on a coordinate plane
y-coordinate	the second number in an ordered pair; tells the distance to move up or down from (0, 0)

Lesson 19.1 Describe a Coordinate System

Build Understanding – 1 Day

Professional Learning Video

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates.

Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).

Mathematical Practices and Processes

- Use appropriate tools strategically.
- Attend to precision.
- Look for and make use of structure.

I Can Objective

I can identify and describe a point in a coordinate system.

Learning Objective

Identify and describe a point in a coordinate system.

Language Objectives

- Explain how to use a coordinate system.
- Explain how to identify and describe points located on a coordinate system.

Vocabulary

New: axes, coordinate grid, coordinate system, ordered pairs, x -axis, x -coordinate, y-axis, y-coordinate

Lesson Materials

Grid Paper (1-cm) (Teacher Resource Masters)

Lesson 19.2 Understand Ordered Pairs

Connect Concepts and Skills – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.

Mathematical Practices and Processes

- Attend to precision.
- Look for and make use of structure.

I Can Objective

I can graph a point on a coordinate grid and interpret the coordinate values.

Learning Objective

Graph points on a coordinate grid and interpret the coordinate values.

Language Objectives

- Explain how to graph points on a coordinate grid.
- Show how to interpret coordinate values of points given in context.

Lesson Materials

Grid Paper (1-cm) (Teacher Resource Masters)

Lesson 19.3 Use Ordered Pairs to Represent Problems

Apply and Practice – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.

Mathematical Practices and Processes

- Reason abstractly and quantitatively.
- Look for and make use of structure.

I Can Objective

I can use coordinate graphing to represent and solve problems.

Learning Objective

Use coordinate graphing to represent and solve problems.

Language Objectives

- Explain how to interpret coordinates on a coordinate grid in context.
- Explain how to represent problems on a coordinate grid.

Lesson 19.4 Generate and Identify Numerical Patterns

Apply and Practice – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane.

Mathematical Practices and Processes

- Reason abstractly and quantitatively.
- Attend to precision.

I Can Objective

I can use two rules to generate numerical patterns, write ordered pairs using corresponding terms, and identify a relationship between them.

Learning Objective

Use two rules to generate numerical patterns and identify the relationship between the corresponding terms in the patterns.

Language Objectives

- Explain how to generate two numerical patterns given two rules.
- Explain how to find a relationship between corresponding terms of two numerical patterns.

Lesson 19.5 Identify and Graph Relationships and Patterns

Apply and Practice – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane.

Mathematical Practices and Processes

- Reason abstractly and quantitatively.
- Look for and make use of structure.
- Look for and express regularity in repeated reasoning.

I Can Objective

I can write and graph ordered pairs on a coordinate grid using two numerical patterns.

Learning Objective

Form ordered pairs from two numerical patterns and graph the ordered pairs on a coordinate grid.

Language Objectives

- Explain how to form ordered pairs from two numerical patterns.
- Explain how to represent two numerical patterns on a coordinate grid.

Unit 8: Graphs, Patterns, and Geometry

Unit 8 Project: Classroom Coordinates

Unit 8 Learning Mindset Focus: Challenge-Seeking / Make Decisions

Module 20: Classify Two-Dimensional Figures

Recommended Pacing with Assessments and Performance Task: 7 Days

Module 20 Mathematical Progressions

Prior Learning	Current Development	Future Connections
Students used angle measures and parallel or perpendicular segments to classify two-dimensional figures.	Students use the attributes of polygons to identify and classify them.	Students will draw and identify polygons on the coordinate plane.
Students recognized that categories of figures share attributes.	Students name, classify, and draw triangles.	Students will find the lengths of sides joining points with the same first coordinate or the same second coordinate.
Students solved problems by using the area and perimeter formulas for rectangles.	Students compare and classify quadrilaterals.	
	Students use the attributes of two-dimensional figures to organize them in Venn diagrams.	

Module 20 Vocabulary

congruent	having the same size and shape
equilateral triangle	a triangle with three congruent sides
heptagon	a polygon with seven sides and seven angles
isosceles triangle	a triangle with at least two congruent sides
nonagon	a polygon with nine sides and nine angles
regular polygon	a polygon in which all sides are congruent and all angles are congruent
scalene triangle	a triangle with no congruent sides
trapezoid (exclusive)	a quadrilateral with exactly one pair of parallel sides
trapezoid (inclusive)	a quadrilateral with at least one pair of parallel sides

Lesson 20.1 Identify and Classify Polygons

Build Understanding – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category.

Classify two-dimensional figures in a hierarchy based on properties.

Mathematical Practices and Processes

- Use appropriate tools strategically.
- Attend to precision.
- Look for and make use of structure.

I Can Objective

I can identify and classify polygons.

Learning Objective

Identify and classify polygons.

Language Objective

- Explain how to identify polygons.
- Explain what it means to classify a polygon.

Vocabulary

New: congruent, heptagon, nonagon, regular polygon

Lesson Materials

Venn Diagram (Teacher Resource Masters)

Lesson 20.2 Classify and Organize Triangles

Connect Concepts and Skills – 1 Day

Professional Learning Video

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category.

Classify two-dimensional figures in a hierarchy based on properties.

Mathematical Practices and Processes

- Construct viable arguments and critique the reasoning of others.
- Attend to precision.
- Look for and make use of structure.

I Can Objective

I can classify triangles.

Learning Objective

Classify and draw triangles using their attributes.

Language Objectives

- Explain how triangles are classified by their attributes.
- Describe how to draw a triangle given its attributes.

Vocabulary

New: equilateral triangle, isosceles triangle, scalene triangle

Lesson 20.3 Classify and Organize Quadrilaterals

Connect Concepts and Skills – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category.

Classify two-dimensional figures in a hierarchy based on properties.

Mathematical Practices and Processes

- Attend to precision.
- Look for and make use of structure.

I Can Objective

I can classify and compare quadrilaterals.

Learning Objective

Classify and compare quadrilaterals using their attributes.

Language Objective

- Explain how quadrilaterals are classified by their attributes.
- Demonstrate how to draw a quadrilateral given its attributes.

Vocabulary

New: parallelogram, rectangle, rhombus, square, trapezoid

Lesson 20.4 Use Venn Diagrams to Classify Two-Dimensional Figures

Connect Concepts and Skills – 1 Day

Conceptual	Conceptual and Procedural	Procedural
Build Understanding	Connect Concepts and Skills	Apply and Practice

Mathematics Standards

Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category.

Classify two-dimensional figures in a hierarchy based on properties.

Mathematical Practices and Processes

- Attend to precision.
- Use appropriate tools strategically.
- Look for and make use of structure.

I Can Objective

I can compare and classify two-dimensional figures using Venn diagrams.

Learning Objective

Compare and classify two-dimensional figures using Venn diagrams.

Language Objective

- Explain how to use a Venn diagram to classify figures.
- Explain how to compare figures in a Venn diagram.

Lesson Materials

Venn Diagram (Teacher Resource Masters)