Grade 6 Mathematics

Full Syllabus

Illustrative Mathematics® 6-8 Math (v.360)

9 Units · Unit Goals · Section Goals · Lesson-by-Lesson Outline

Source: https://accessim.org/6-8/grade-6?a=teacher

Course Overview

Grade 6 of the Illustrative Mathematics 6-8 Math curriculum is organized into 9 units. Students develop reasoning about area and surface area; build foundational understanding of ratios, equivalent ratios, rates, and percentages; deepen fluency with fraction division and base-ten arithmetic; begin formal algebraic thinking with expressions and equations; extend the number system to negative rational numbers and the four-quadrant coordinate plane; analyze data sets and distributions; and finish with an optional Putting It All Together unit that revisits and connects ideas through estimation, voting, and geometric/algebraic representations.

The unit sequence is:

- Unit 1: Area and Surface Area
- Unit 2: Introducing Ratios
- Unit 3: Unit Rates and Percentages
- Unit 4: Dividing Fractions
- Unit 5: Arithmetic in Base Ten
- Unit 6: Expressions and Equations
- Unit 7: Rational Numbers
- Unit 8: Data Sets and Distributions
- Unit 9: Putting It All Together

Each unit is divided into lettered sections (A, B, C, D, …), and each section is a sequence of daily lessons. Optional lessons (often extension activities or culminating tasks) are noted.

Unit 1: Area and Surface Area

Unit Goal

Students reason about areas of polygons and surface areas of polyhedra, building on geometric understandings developed in earlier grades.

Unit Narrative

In this unit, students reason about areas of polygons and surface areas of polyhedra, building on geometric understandings developed in earlier grades. In grade 3, students found the area of rectangles with whole-number side lengths. They also found the area of rectilinear figures by decomposing them into non-overlapping rectangles and adding those areas. Students used a formula for the area of rectangles in grade 4 and found the area of rectangles with fractional side lengths in grade 5. In this unit, students extend their reasoning about area to include shapes that are not rectangles. They learn that the area of any polygon can be found by decomposing and rearranging the figure, and develop and apply formulas for the areas of parallelograms and triangles. Students then extend reasoning about area to three-dimensional figures, learning that the surface area of a polyhedron is the sum of the areas of its faces. They use nets to represent and find surface areas of prisms and pyramids. The unit also introduces exponent notation to express areas of squares and surface areas and volumes of cubes. A final, optional "Let's Put It to Work" lesson invites students to apply these ideas in an authentic design context.

Section A: Reasoning to Find Area

Section Goals

- Reason about the area of two-dimensional figures by composing and decomposing them, using two principles: figures that match exactly have equal areas, and area is additive.

Section Narrative

In this section, students explore strategies for reasoning about the area of two-dimensional figures. The explorations highlight two principles about area: figures that match exactly have equal areas; if two figures can be placed one on top of the other so that they match up exactly, then they have the same area. And area is additive; if a given figure is decomposed into non-overlapping pieces, then the sum of the areas of the pieces equals the area of the whole figure. Students decompose, rearrange, and combine shapes to find their areas.

Lessons

1. **Tiling the Plane** — Let's look at tiling patterns and think about area.
2. **Finding Area by Decomposing and Rearranging** — Let's create shapes and find their areas.
3. **Reasoning to Find Area** — Let's decompose and rearrange shapes to find their areas.

Section B: Parallelograms

Section Goals

- Find the area of any parallelogram by identifying a base and the corresponding height.
- Generalize a process for finding the area of a parallelogram and write a formula.

Section Narrative

In this section, students reason about areas of parallelograms. They learn about bases and heights and analyze the measurements that can be used to find the area of any parallelogram. First, students use strategies they learned earlier in the unit to find the areas of given parallelograms. They see that one way to find the area of a parallelogram is to decompose it and rearrange the pieces into a rectangle. Students identify base-height pairs in parallelograms and generalize a formula: area equals base times height.

Lessons

1. **Parallelograms** — Let's investigate the characteristics and area of parallelograms.
2. **Bases and Heights of Parallelograms** — Let's investigate the area of parallelograms some more.
3. **Area of Parallelograms** — Let's practice finding the area of parallelograms.

Section C: Triangles

Section Goals

- Find the area of any triangle by identifying a base and the corresponding height.
- Generalize a process for finding the area of a triangle and write a formula.
- Apply reasoning about triangles and parallelograms to find the area of other polygons.

Section Narrative

In this section, students explore ways to find areas of triangles, generalize their observations as a formula, and use the formula to find the area of any triangle. They also apply their insights regarding triangles and parallelograms to find areas of other polygons. Students begin by investigating the relationship between triangles and parallelograms. They see that a parallelogram can always be decomposed into two identical triangles, and conversely, two identical triangles can be composed into a parallelogram. They use this relationship to find a formula for the area of a triangle: one-half times base times height.

Lessons

1. **Triangles** — Let's compare parallelograms and triangles.
2. **Finding Areas of Triangles** — Let's use what we know about parallelograms to find the area of triangles.
3. **Formula for the Area of a Triangle** — Let's write and use a formula to find the area of a triangle.
4. **Bases and Heights of Triangles** — Let's use different base-height pairs to find the area of a triangle.
5. **Polygons** — Let's investigate polygons and their areas.

Section D: Surface Area

Section Goals

- Recognize that surface area is the sum of the areas of all the faces of a three-dimensional figure.
- Use nets composed of rectangles and triangles to find the surface area of prisms and pyramids.

Section Narrative

This section introduces students to polyhedra and surface area. Students apply their knowledge about areas of polygons to create nets and find surface areas of three-dimensional figures. First, students learn that surface area is the number of unit squares that covers all the faces of a three-dimensional figure,

without gaps or overlaps. They reason about the surface areas of rectangular prisms and other polyhedra by considering the areas of their faces, and they use nets to represent, visualize, and calculate surface areas.

Lessons

1. **What Is Surface Area?** — Let's cover the surfaces of some three-dimensional objects.
2. **Polyhedra** — Let's investigate polyhedra.
3. **Nets and Surface Area** — Let's use nets to find the surface area of polyhedra.
4. **More Nets, More Surface Area** — Let's draw nets and find the surface area of polyhedra.
5. **Distinguishing Between Surface Area and Volume** — Let's contrast surface area and volume.

Section E: Squares and Cubes

Section Goals

- Use exponent notation to express areas of squares and surface areas and volumes of cubes.

Section Narrative

In this short section, students learn to use exponents to express areas of squares and surface areas and volumes of cubes. Students first explore perfect squares as areas of squares and perfect cubes as volumes of cubes with whole-number edge lengths. Next, they learn that the exponents 2 and 3 can be used to express the multiplication of edge lengths and that we read these as "squared" and "cubed."

Lessons

1. **Squares and Cubes** — Let's investigate perfect squares and perfect cubes.
2. **Surface Area of a Cube** — Let's write a formula to find the surface area of a cube.

Section F: Let's Put It to Work

Section Narrative

In this final section, students have the opportunity to apply their thinking from throughout the unit. As this is a short section followed by an End-of-Unit Assessment, there are no section goals or checkpoint questions. The lesson in this section is optional because it offers additional opportunities to practice standards that are not a focus of the grade.

Lessons

1. **Designing a Tent (Optional)** — Let's find out how much material is needed to build some tents.

Unit 2: Introducing Ratios

Unit Goal

Students learn about ratios and equivalent ratios, representing them with discrete diagrams, double number lines, tables, and tape diagrams, and reason about contexts such as recipes, color mixtures, unit pricing, constant speed, and part-part-whole situations.

Unit Narrative

This unit introduces students to ratios and equivalent ratios. It builds on previous experiences students had with relating two quantities, such as converting measurements starting in grade 3, multiplicative comparison in grade 4, and interpreting multiplication as scaling in grade 5. The work prepares students to reason about unit rates and percentages in the next unit, proportional relationships in grade 7, and linear relationships in grade 8. First, students learn that a ratio is an association between two quantities (for instance, "There are 3 pencils for every 2 erasers"). Students use sentences, drawings, or discrete diagrams to represent ratios. Next, students encounter equivalent ratios in terms of multiple batches of a recipe. They use double number line diagrams, tables, and tape diagrams to represent and reason about equivalent ratios. Students explore equivalent ratios in contexts such as constant speed, uniform pricing, and recipes, and they reason about part-part-whole situations using tape diagrams. The unit closes with a Fermi problem that gives students a chance to apply ratio reasoning to a real-world estimation task.

Section A: What Are Ratios?

Section Goals

- Create and interpret discrete diagrams that represent situations involving ratios.
- Create and interpret sentences that describe ratios.

Section Narrative

This short section introduces students to the concept of ratio and ways to represent it. Students begin by using ratios and ratio language to describe collections of physical objects. They see that quantities in a collection can be described and represented in different ways, using both numbers and words. Next, students draw diagrams to represent situations involving one or more ratios. They learn that simple diagrams can be useful and efficient for reasoning about ratios.

Lessons

1. **Introducing Ratios and Ratio Language** — Let's describe two quantities at the same time.
2. **Representing Ratios with Diagrams** — Let's use diagrams to represent ratios.

Section B: Equivalent Ratios

Section Goals

- Explain equivalent ratios in terms of the quantities in a recipe being multiplied by the same number to create a different size batch of something with the same taste or same shade.
- Generate equivalent ratios and justify that they are equivalent.

Section Narrative

In this section, students learn about equivalent ratios. Students first make sense of equivalent ratios through concrete experiences involving recipes. They learn that scaling a recipe up or down — to create

multiple batches or a fraction of a batch — produces a result that is the same as the original recipe in some important way. For example, tripling the amount of each ingredient in a drink recipe makes three times as much drink that tastes the same as the original recipe. Doubling the amount of blue water and red water in a color mixture makes twice as much water that is the same shade of purple. Students see that scaling a recipe involves multiplying each quantity by the same factor, producing a ratio of ingredients that is equivalent to that in the original recipe.

Lessons

1. **Recipes** — Let's explore how ratios affect the way a recipe tastes.
2. **Color Mixtures** — Let's see what color-mixing has to do with ratios.
3. **Defining Equivalent Ratios** — Let's investigate equivalent ratios some more.

Section C: Representing Equivalent Ratios

Section Goals

- Given prices and quantities or distances and times, calculate the price for 1 object or the distance traveled in 1 unit of time. Express each using the word "per."
- Justify whether two situations do or do not happen at the same rate, by determining if the ratios in the situations are equivalent.
- Use a double number line diagram to represent and find equivalent ratios.

Section Narrative

This section introduces new ways to represent and describe equivalent ratios, deepening students' understanding of them. Students see that double number line diagrams are useful for reasoning about equivalent ratios. First, students interpret and extend given double number line diagrams. Then they learn to create them to solve problems. Students also find equivalent ratios where one quantity has a value of 1 and express them using language such as "2.5 cups of cranberry juice for 1 cup of soda water" or "2.5 cups of cranberry juice per cup of soda water." They learn that the term "unit price" refers to the cost for 1 unit of something. Later in the section, students relate the phrases "at this rate" and "at the same rate" to equivalent ratios in contexts such as constant speed, uniform pricing, and recipes.

Lessons

1. **Introducing Double Number Line Diagrams** — Let's use number lines to represent equivalent ratios.
2. **Creating Double Number Line Diagrams** — Let's draw double number line diagrams like a pro.
3. **How Much for One?** — Let's use ratios to describe how much things cost.
4. **Constant Speed** — Let's use ratios to work with how fast things move.
5. **Comparing Situations by Examining Ratios** — Let's use ratios to compare situations.

Section D: Solving Ratio and Rate Problems

Section Goals

- Choose multipliers strategically when solving multi-step problems involving equivalent ratios.
- Use a table of equivalent ratios to solve problems.

Section Narrative

In this section, students use tables to reason about situations involving equivalent ratios. Students first observe how a table is used to represent and find equivalent ratios. They see that the values in a table don't need to be listed in order, so they can choose the multipliers strategically. As they move through the section, students work with tables with decreasing scaffolding. They complete a table that is partially filled with values, one with only column headers, and then a blank table. Later, students create a table from scratch, compare tables with other representations, and choose their own strategies to solve problems.

Lessons

1. **Representing Ratios with Tables** — Let's use tables to represent equivalent ratios.
2. **Navigating a Table of Equivalent Ratios** — Let's use a table of equivalent ratios like a pro.
3. **Tables and Double Number Line Diagrams** — Let's contrast double number lines and tables.
4. **Solving Equivalent Ratio Problems** — Let's practice getting information from our partner.

Section E: Part-Part-Whole Ratios

Section Goals

- Choose representations and solution methods to reason about ratios and sums of quantities.
- Use diagrams or other strategies to solve problems involving ratios and the total amount.

Section Narrative

In this section, students reason about situations in which the quantities in the ratio have the same units and questions can be asked about the individual quantities (the parts) and their sum (the total). Students learn to use tape diagrams as a way to represent such situations. They also interpret ratios expressed in "parts" rather than standard units, such as cups, ounces, meters, and so on. As they solve application problems, students have greater flexibility to choose reasoning strategies and representations (such as double number lines, tables, or tape diagrams) that make sense to them and to the problem at hand.

Lessons

1. **Part-Part-Whole Ratios** — Let's look at situations where you can add the quantities in a ratio together.
2. **Solving More Ratio Problems** — Let's compare all our strategies for solving ratio problems.

Section F: Let's Put It to Work

Section Narrative

In the final section, students have the opportunity to apply their thinking from throughout the unit. As this is a short section followed by an End-of-Unit Assessment, there are no section goals or checkpoint questions.

Lessons

1. **A Fermi Problem** — Let's solve a Fermi problem.

Unit 3: Unit Rates and Percentages

Unit Goal

Students develop understanding of unit rates and percentages, building on prior work with equivalent ratios and constant rates and using measurement and unit-conversion situations to reason about rates per 1 and rates per 100.

Unit Narrative

This unit develops students' understanding of unit rates and percentages. Students build on their experience with equivalent ratios and constant rates earlier in the course. They also build on knowledge of measurement and unit conversion in earlier grades. When learning about percentages, they draw on ideas about multiplicative comparison and equivalent fractions from grade 4 and multiplication of fractions from grade 5. Students begin by recalling what they know about standard units of measurement — the attributes that they measure and their relative sizes. They use ratios and rates to reason about measurements and to convert between units of measurement. Next, students learn about unit rates. They see that there are two unit rates associated with any ratio and interpret them in context. Students practice finding unit rates and using them to solve various problems. Students then use their understanding of ratios and rates to make sense of percentages. Just as a unit rate can be interpreted in context as a rate per 1, a percentage can be interpreted in context as a rate per 100. Throughout the unit, students can use familiar representations such as tables and double number line diagrams in their reasoning.

Section A: Units of Measurement and Unit Conversion

Section Goals

- Recognize that when we measure things in two different units, the pairs of measurements are equivalent ratios. Apply this understanding to convert a measurement from one unit to another unit.
- Use a "rate per 1" to solve problems involving unit conversion.

Section Narrative

This section extends students' knowledge of units of measurement. It prompts them to reason about ratios and rates to perform unit conversion, including across different measurement systems. Students begin by grounding their perception of standard measurement units in benchmark objects. Next, students recall that it takes more of a smaller unit than a larger unit to measure the same quantity. In the last lesson of the section, students learn that two measurements of the same thing given in different units form a ratio and that conversion across units can be done by finding equivalent ratios and using familiar representations.

Lessons

1. **Anchoring Units of Measurement** — Let's see how big different things are.
2. **Measuring with Different-Size Units (Optional)** — Let's measure things.
3. **Converting Units** — Let's convert measurements to different units.

Section B: Rates

Section Goals

- Apply reasoning about ratios and unit rates to solve problems and explain the solution methods.

- Calculate the two unit rates associated with a ratio and interpret them in the context of a situation.

Section Narrative

In this section, students further explore “rates per 1” and solve various problems involving rates. Students observe that using rates per 1 is a helpful way to make comparisons. They learn that a rate per 1 is a “unit rate,” and that each ratio has two associated unit rates. In interpreting unit rates in context, students see that one unit rate might be more helpful than the other, depending on the question. Students generalize that when two ratios have the same unit rate, the ratios are equivalent. As students progress through the section, they encounter problems with less scaffolding. In the last lesson, students reason about the movement of two objects relative to each other; this lesson is optional because it exceeds the expectations of the standards.

Lessons

1. **Comparing Speeds and Prices** — Let’s compare some speeds and some prices.
2. **Interpreting Rates** — Let’s explore unit rates.
3. **Equivalent Ratios Have the Same Unit Rates** — Let’s revisit equivalent ratios.
4. **More Rate Comparisons** — Let's use unit rates like a pro.
5. **Solving Rate Problems** — Let’s investigate the Burj Khalifa building.
6. **More about Constant Speed (Optional)** — Let’s investigate constant speed some more.

Section C: Percentages

Section Goals

- Choose a strategy to solve problems involving percentages and explain the solution method.
- Create tape diagrams, double number line diagrams, or tables to represent situations involving percentages.

Section Narrative

In this section, students make sense of percentages as rates per 100 and solve problems involving percentages. Students begin by reasoning about percentages of 100 and of 1. Then they work with percentages of other quantities, paying attention to what 100% represents in each situation. To reinforce percentages as rates, double number line diagrams are the primary representation used initially. Later, students also make sense of percentages using tables and tape diagrams. Students go on to solve various problems involving percentages, generalizing the process for calculating any percentage of any number. In the last lesson, students find a general way to determine what percentage a number is of another number; generalizing this calculation is beyond the expectations of the course, so this lesson is optional.

Lessons

1. **What Are Percentages?** — Let’s learn about percentages.
2. **Representing Percentages with Double Number Line Diagrams** — Let’s use double number line diagrams to represent percentages.
3. **Representing Percentages in Different Ways** — Let's use tape diagrams to understand percentages.
4. **Benchmark Percentages** — Let’s contrast percentages and fractions.
5. **Solving Percentage Problems** — Let’s solve more percentage problems.

6. **Finding This Percent of That** — Let's solve percentage problems like a pro.
7. **Finding the Percentage (Optional)** — Let's find percentages in general.

Section D: Let's Put It to Work

Section Narrative

In the final section, students have the opportunity to apply their thinking from throughout the unit. As this is a short section followed by an End-of-Unit Assessment, there are no section goals or checkpoint questions.

Lessons

1. **Painting a Room** — Let's see what it takes to paint a room.

Unit 4: Dividing Fractions

Unit Goal

Students develop understanding of division of fractions by fractions, generalizing a process for finding quotients and applying it to problems about geometric figures with fractional measurements.

Unit Narrative

This unit develops students' understanding of division of fractions by fractions. This work draws on students' prior knowledge of multiplication, division, and the relationship between the two. It also builds on concepts from grades 3 to 5 about multiplicative situations and about fractions. Students begin by exploring meanings of division and the relationship between the quantities in division situations. They recall that we can think of dividing as finding an unknown factor in a multiplication equation. In situations involving equal-size groups, division can be used to answer two questions: "How many groups?" and "How much in each group?" Next, students investigate ways to answer those two questions in cases involving fractions. They use tape diagrams and equations to reason about these situations. Students then apply their insights to generalize the process of finding quotients, noticing that dividing a number by a fraction is the same as multiplying that number by the reciprocal of the fraction. Students go on to use this algorithm to solve problems about geometric figures that have fractional length, area, or volume measurements, and they apply the concepts to multi-step problems in other contexts.

Section A: Making Sense of Division

Section Goals

- Create a diagram and a multiplication or division equation to represent the relationship in situations involving equal-size groups, and coordinate these representations.
- Interpret a division expression in two ways: as an answer to a "How many groups?" question or to a "How many in each group?" question.

Section Narrative

In this section, students investigate the quantities in a division situation, recall the relationship between multiplication and division, and revisit ways to represent this relationship. First, students look at how the numbers in a division situation are related. Students observe how the size of the dividend and the divisor affect the size of the quotient. Next, students reason about division in terms of equal-size groups. They are reminded that multiplication is a way to find the total amount when given the number of groups and the size of each group, and that division is a way to find an unknown factor, which can either be the number of groups or the size of one group, when given a total amount. The last lesson in the section is optional. It offers additional practice in interpreting and representing situations that involve equal-size groups.

Lessons

1. **Size of Divisor and Size of Quotient** — Let's explore quotients of different sizes.
2. **Meanings of Division** — Let's explore ways to think about division.
3. **Interpreting Division Situations (Optional)** — Let's explore situations that involve division.

Section B: Meanings of Fraction Division

Section Goals

- Create a diagram, a multiplication equation, and a division equation to represent a problem that involves a fractional divisor and that asks “How many groups?” or “How much in one group?”
- Solve problems involving division of fractions by using diagrams, writing equations, or reasoning about the relationship between multiplication and division. Explain the solution methods.

Section Narrative

In this section, students make sense of division situations involving fractions, gradually building an understanding that can later be generalized into an algorithm. The first four lessons explore “How many groups?” questions in various contexts. In the first lesson, the size of a group is a fraction and the number of groups is a whole number. This lesson is optional because it reinforces grade 5 work. Then, students investigate situations in which the number of groups is a fraction greater than 1 or less than 1. To represent and reason about different situations, students use tape diagrams and equations. Next, students explore cases in which the size of 1 group is unknown. The section concludes with an optional lesson to practice finding the amount in 1 group and solving various division problems in context.

Lessons

1. **How Many Groups? (Part 1) (Optional)** — Let’s play with blocks and diagrams to think about division with fractions.
2. **How Many Groups? (Part 2)** — Let’s use blocks and diagrams to understand more about division with fractions.
3. **Using Diagrams to Find the Number of Groups** — Let’s draw tape diagrams to think about division with fractions.
4. **What Fraction of a Group?** — Let’s think about dividing things into groups when we can’t even make one whole group.
5. **How Much in Each Group? (Part 1)** — Let’s look at division problems that help us find the size of one group.
6. **How Much in Each Group? (Part 2) (Optional)** — Let’s practice dividing fractions in different situations.

Section C: Algorithm for Fraction Division

Section Goals

- Generalize a process for dividing a number by a fraction as multiplying by its reciprocal.

Section Narrative

In this section, students extend their generalized steps to divide a fraction by a fraction. They conclude that dividing by a fraction is the same as multiplying by its reciprocal. Finally, students practice applying this algorithm and using it strategically to calculate quotients.

Lessons

1. **Dividing by Unit and Non-Unit Fractions** — Let’s look for patterns when we divide by a fraction.
2. **Using an Algorithm to Divide Fractions** — Let’s divide fractions using the rule we learned.

Section D: Fractions in Lengths, Areas, and Volumes

Section Goals

- Determine the volume of a rectangular prism by packing it with unit cubes with appropriate unit-fraction edge lengths and by multiplying the edge lengths.

- Solve problems about length comparison, the side lengths and area of a rectangle, and the edge lengths and volume of a rectangular prism using fraction division.

Section Narrative

In this section, students apply their insights about multiplication and division, as well as prior knowledge about area and volume, to solve geometric problems. Students first solve multiplicative comparison problems in contexts that involve fractional lengths in one dimension. Next, students reason about measurements of two-dimensional figures. They find the area of rectangles and triangles given base-height pairs and find an unknown base or height given the area and a known height or base. Students then go on to reason about three-dimensional figures. They multiply and divide to find the volume of rectangular prisms with fractional edge lengths and to find an edge length when the volume of a prism and two other edge lengths are known.

Lessons

1. **Fractional Lengths** — Let's solve problems about fractional lengths.
2. **Rectangles with Fractional Side Lengths** — Let's explore rectangles that have fractional measurements.
3. **Fractional Lengths in Triangles and Prisms** — Let's explore area and volume when fractions are involved.
4. **Volume of Prisms** — Let's look at the volume of prisms that have fractional measurements.

Section E: Let's Put It to Work

Section Narrative

In this final section, students have the opportunity to apply their thinking from throughout the unit. As this is a short section followed by an End-of-Unit Assessment, there are no section goals or checkpoint questions. The first lesson in this section is optional because it consolidates the concepts from this unit with those of an earlier course.

Lessons

1. **Solving Problems Involving Fractions (Optional)** — Let's add, subtract, multiply, and divide fractions.
2. **Fitting Boxes into Boxes** — Let's use what we learned about fractions to find shipping costs.

Unit 5: Arithmetic in Base Ten

Unit Goal

Students solidify their understanding of the base-ten number system, extend the standard algorithms to add, subtract, and multiply decimals beyond tenths and hundredths, and learn to use algorithms to calculate quotients including long division.

Unit Narrative

In this unit, students solidify their understanding of the base-ten number system, extend their use of the standard algorithms to add, subtract, and multiply decimals beyond tenths and hundredths, and learn to use algorithms to calculate quotients. The work here builds on what students learned in earlier grades about operations on whole numbers and decimals. Students begin by exploring the use of decimals in a shopping context and by revisiting addition and subtraction of decimals, using both concrete representations and numerical calculations. The activities in the first section reinforce ideas about place value, properties of operations, the algorithms for adding and subtracting, and the relationship between addition and subtraction. Next, students investigate various ways to find the product of two decimals: by using decimal fractions, writing equivalent expressions with whole numbers and unit decimals, using diagrams and partial products, and reasoning about the relationship between a decimal and a related whole number. The next section focuses on division. Students have an opportunity to use base-ten blocks or diagrams to represent division of multi-digit numbers before exploring other numerical methods, such as using partial quotients and long division. In the last section, students apply the mathematics from the unit to solve problems in applied situations.

Section A: Exploring, Adding, and Subtracting Decimals

Section Goals

- Explain the sum or difference of two decimals in terms of combining like base-ten units and composing (or decomposing) a larger unit from (or into 10) units of a lower value.
- Use the standard algorithm to add or subtract decimals with multiple non-zero digits.

Section Narrative

This section deepens students' understanding of the base-ten structure and extends their ability to add and subtract decimals beyond hundredths. Students begin by revisiting decimal operations in the context of money. This exploration is followed by an optional lesson to revisit place-value concepts. Students recall that each place of the base-ten system has a value that is 10 times that of the place to its right. They reason about composition and decomposition using both base-ten diagrams and vertical calculations. In the last lesson of the section, students consider the meaning of zeros in a decimal. They also solve addition and subtraction problems that involve decimals that have very different numbers of decimal places.

Lessons

1. **Using Decimals in a Shopping Context** — Let's use what we know about decimals to make shopping decisions.
2. **Using Diagrams to Represent Addition and Subtraction (Optional)** — Let's represent addition and subtraction of decimals.
3. **Adding and Subtracting Decimals with Few Non-Zero Digits** — Let's add and subtract decimals.

4. **Adding and Subtracting Decimals with Many Non-Zero Digits** — Let's add and subtract decimals with many non-zero digits.

Section B: Multiplying Decimals

Section Goals

- Calculate the product of two decimals and explain the solution method.
- Use an algorithm to calculate the product of whole numbers, and justify how to use that value to find the product of two decimals with the same significant digits.

Section Narrative

In this section, students learn to multiply decimals by building on their understanding of whole-number multiplication. They find products by reasoning about place value, using representations such as base-ten blocks and area diagrams, and finding partial products, before arriving at an algorithm. Students begin finding products by using the relationship between decimals and fractions. Next, students make use of the structure of base-ten numbers. They multiply decimal factors by powers of 10 to obtain whole-number factors, multiply them, and then divide the result by the same powers of 10. Then students reason using area diagrams and partial products. In the last lesson of the section, students generalize the various ways of reasoning into an algorithm.

Lessons

1. **Using Fractions to Multiply Decimals** — Let's look at products that are decimals.
2. **Methods for Multiplying Decimals** — Let's look at some ways we can represent multiplication of decimals.
3. **Using Diagrams to Represent Multiplication** — Let's use area diagrams to find products.
4. **Calculating Products of Decimals** — Let's multiply decimals.

Section C: Dividing Decimals

Section Goals

- Calculate the quotient of a whole-number or a decimal dividend and a decimal divisor, and explain the solution method.
- Use long division to divide a multi-digit whole number or a decimal by a whole number.

Section Narrative

In this section, students reason about quotients of multi-digit numbers and work toward the standard algorithm for division. The section begins with an optional lesson that revisits concepts from grade 5 and reinforces the role of place value in division. Next, students calculate quotients by finding partial quotients, building on a strategy developed in earlier courses. Then students make sense of the standard division algorithm by analyzing worked examples. Students practice using the algorithm — first to divide a whole number by a whole number, and then to divide a decimal by a whole number. Finally, students use equivalent division expressions and the algorithm to divide a decimal by a decimal.

Lessons

1. **Using Base-Ten Diagrams to Divide (Optional)** — Let's use base-ten diagrams to find quotients.
2. **Using Partial Quotients** — Let's divide whole numbers.
3. **Using Long Division** — Let's use long division.
4. **Dividing Numbers that Result in a Decimal** — Let's find quotients that are not whole numbers.

5. **Dividing a Decimal by a Decimal** — Let's divide a decimal by a decimal.

Section D: Let's Put It to Work

Section Narrative

In this final section, students have the opportunity to apply their thinking from throughout the unit. As this is a short section followed by an End-of-Unit Assessment, there are no section goals or checkpoint questions. The final lesson in this section is optional because it offers additional opportunities to practice standards that are not a focus of the grade.

Lessons

1. **Solving Problems Involving Decimals** — Let's solve some problems using decimals.
2. **Making and Measuring Boxes (Optional)** — Let's use what we know about decimals to make and measure boxes.

Unit 6: Expressions and Equations

Unit Goal

Students apply their understanding of arithmetic to reason about algebraic expressions and equations, solving simple equations, identifying equivalent expressions, working with exponents, and modeling relationships between two quantities with tables, graphs, and equations.

Unit Narrative

In this unit, students apply their understanding of arithmetic to reason about algebraic expressions and equations. In the first section, students work with equations of two forms where the unknown is added to or multiplied by a known positive rational number. They use tape diagrams and hanger diagrams to reason about the meaning of equations and develop an understanding that to solve an equation is to find a value that would make the equation true. Students end the section by identifying, interpreting, and writing equations to represent and solve real-world problems. In the second section, students write algebraic expressions and evaluate them for given values. They identify and write equivalent expressions, reasoning using diagrams, the distributive property, and other properties of operations. The third section is all about exponents. Students write expressions with a whole-number exponent and a base that may be a whole number, a fraction, or a variable. They analyze such expressions for equivalence, as well as use the conventional order of operations to evaluate them. In the last two sections, students analyze real-world relationships between two quantities where one quantity depends on the other. They use tables, graphs, and equations to represent and reason about such relationships.

Section A: Equations in One Variable

Section Goals

- Solve equations of the form x + p = q or px = q and explain the solution method.
- Understand that solving an equation with a variable means finding a value for the variable that makes the equation true, and use substitution to determine whether a number is a solution to the equation.

Section Narrative

In this section, the key understandings are that an equation with a variable represents a relationship that can be true or false, and a solution to the equation is a value for the variable that makes the equation true. First, students revisit tape diagrams and equations as tools for representing relationships and learn about variables and solutions. To find solutions to equations, students reason about the numbers and relationships — with or without tape diagrams — and use substitution to determine if a given value makes the equation true. Next, hanger diagrams are used to help students understand the concept of keeping equations balanced. Students use repeated calculations to generalize an algebraic method for solving simple equations. They then choose the best strategies to solve such equations as well as real-world problems. In the last lesson of the section, students discover that equations can be used to represent and solve percentage problems.

Lessons

1. **Tape Diagrams and Equations** — Let's recall how tape diagrams and equations can show relationships between amounts.
2. **Truth and Equations** — Let's see what it means to find a solution for an equation with a variable.
3. **Staying in Balance** — Let's use balanced hangers to help us solve equations.

4. **Practice Solving Equations** — Let's solve equations by doing the same to each side.
5. **Represent Situations with Equations** — Let's use equations to represent and solve real-world problems.
6. **Percentages and Equations** — Let's use equations to find percentages.

Section B: Equal and Equivalent

Section Goals

- Justify whether two expressions are "equivalent," or equal to each other for every value of their variable.
- Use the distributive property to write equivalent algebraic expressions.

Section Narrative

In this section, students focus on writing expressions and equivalent expressions. This is also where the distributive property is formally introduced. First, students write expressions that represent situations, using tape diagrams for reasoning as needed. Then equivalent expressions are introduced. Students learn that equivalent expressions with variables are always equal when the same value is used for the variable in each expression. They use properties of operations to identify and write equivalent expressions. In the latter half of the section, students explore the distributive property. They use rectangular diagrams to first represent equivalent numerical expressions, and then to reason about equivalent expressions with variables. The final optional lesson offers additional reinforcement in using the distributive property.

Lessons

1. **Write Expressions with Variables** — Let's use expressions with variables to describe situations.
2. **Equal and Equivalent** — Let's use diagrams to figure out which expressions are equivalent and which are just sometimes equal.
3. **The Distributive Property, Part 1** — Let's use the distributive property to describe expressions.
4. **The Distributive Property, Part 2** — Let's use rectangles to understand the distributive property with variables.
5. **The Distributive Property, Part 3 (Optional)** — Let's practice writing equivalent expressions by using the distributive property.

Section C: Expressions with Exponents

Section Goals

- Evaluate expressions with whole-number exponents at specific values of their variables.
- Justify whether numerical expressions involving whole-number exponents are equal by evaluating the expressions and performing operations in the conventional order.

Section Narrative

In this section, students extend their understanding of exponential expressions beyond squares and cubes. They evaluate expressions that include both variables and exponents. First, students use exponent notation to represent repeated multiplication in patterns and situations. Next, they use prior knowledge about operations to practice evaluating exponential expressions with various bases, including whole numbers, fractions, and decimals. Then, students evaluate expressions that include exponents and another operation. A real-world example involving surface area of a cube helps students

see a rationale for following the order of operations. Then, students practice following the conventional order for evaluating expressions with and without grouping symbols. Finally, students encounter exponential expressions with variables and evaluate such expressions at specific values of the variables.

Lessons

1. **Meaning of Exponents** — Let's see how exponents show repeated multiplication.
2. **Expressions with Exponents** — Let's use the meaning of exponents to decide if equations are true.
3. **Evaluating Expressions with Exponents** — Let's find the values of expressions with exponents.
4. **Equivalent Exponential Expressions** — Let's investigate expressions with variables and exponents.

Section D: Relationships Between Quantities

Section Goals

- Create a table, graph, and equation to represent the relationship between two quantities.
- Identify the independent and dependent variable in a situation.

Section Narrative

In this section, students apply their understanding of algebraic expressions and equations to represent two quantities that change in relationship to one another. Students explore these relationships through multiple representations, such as tables, graphs, and equations. They also delve into the concepts of independent and dependent variables. First, students create and analyze tables and graphs that represent how one quantity affects another. Next, the context of traveling at a constant rate is used to create representations of the relationship between time and distance. Students explore how switching independent and dependent variables affects the different representations. Finally, an optional lesson invites students to explore additional contexts in which two quantities vary together.

Lessons

1. **Two Related Quantities, Part 1** — Let's use tables, equations, and graphs to describe relationships.
2. **Two Related Quantities, Part 2** — Let's use equations and graphs to describe stories with constant speed.
3. **More Relationships (Optional)** — Let's use graphs and equations to show relationships involving area, volume, and exponents.

Section E: Let's Put It to Work

Section Narrative

In this final section, students have the opportunity to apply their thinking from the unit. As this is a short section followed by an End-of-Unit Assessment, there are no section goals or checkpoint questions.

Lessons

1. **Tables, Equations, and Graphs, Oh My!** — Let's explore some equations from real-world situations.

Unit 7: Rational Numbers

Unit Goal

Students learn about negative numbers and ways to represent them on a number line and the coordinate plane, write and graph simple inequalities in one variable, and determine the greatest common factor and least common multiple of two whole numbers.

Unit Narrative

In this unit, students learn about negative numbers and ways to represent them on a number line and the coordinate plane. They write and graph simple inequalities in one variable and determine the greatest common factor and least common multiple of two whole numbers. In grade 7, students will perform arithmetic operations with signed numbers and write and solve more complex inequalities. Students begin by considering situations involving temperature or elevation and interpreting what negative numbers mean in those contexts. They also plot points to represent positive and negative values and their opposites. Previously, when students worked only with nonnegative numbers, magnitude and order were indistinguishable. In this unit, when comparing two signed numbers, students learn to distinguish between the absolute value of a number (magnitude) and a number's relative position on the number line (order). Next, students use the symbols < and > to compare two values. They represent an unknown value with constraints as an inequality, and they graph the solutions on a number line. Then students use ordered pairs to describe pairs of numbers that include negative numbers and plot them in all four quadrants of the coordinate plane. The last section of the unit returns to whole numbers; students are introduced to common factors and common multiples and determine the greatest common factor or the least common multiple of two numbers.

Section A: Negative Numbers and Absolute Value

Section Goals

- Interpret a rational number and the absolute value of a number in context.
- Plot rational numbers and their opposites on a number line; know that a number and its opposite have the same absolute value.
- Use words and symbols to compare rational numbers, where a rational number could also be the absolute value of a number.

Section Narrative

Work in this section expands students' understanding of the number system to include both positive and negative numbers. Students begin by examining situations involving temperature and elevation to understand the need for numbers less than 0. They work with both vertical and horizontal number lines to represent positive and negative values, observing the symmetry present in the number line. Students use the number line to compare values and practice ordering rational numbers from least to greatest. They use the inequality symbols < and > to write comparison statements. Next, students examine more situations that can be represented using both positive and negative numbers, such as money and inventory. The end of this section introduces students to the idea of absolute value, which is the distance of a number from zero.

Lessons

1. **Positive and Negative Numbers** — Let's explore how we represent temperatures and elevations.
2. **Points on the Number Line** — Let's plot positive and negative numbers on the number line.

3. **Comparing Positive and Negative Numbers** — Let's compare numbers on the number line.
4. **Ordering Rational Numbers** — Let's order rational numbers.
5. **Using Negative Numbers to Make Sense of Contexts** — Let's make sense of negative amounts of money.
6. **Absolute Value of Numbers** — Let's explore distances from zero more closely.
7. **Comparing Numbers and Distance from Zero** — Let's use absolute value and negative numbers to think about elevation.

Section B: Inequalities

Section Goals

- Determine whether a given value is a solution to a given inequality.
- Draw and label a number line diagram to represent the solutions to an inequality.
- Write an inequality statement to represent a constraint.

Section Narrative

Work in this section introduces students to writing inequalities and representing solutions to inequalities on a number line. Students must consider reasonable solutions for situations in context. For each situation, they consider possible minimum and maximum values, whether boundary values should be included, whether negative numbers make sense, and whether solutions are discrete or continuous. They compare the different ways each of these are represented on a number line: open or closed circles and shading to the right or left of a number. Students find solutions to an inequality by determining if given values make the inequality true and observe that a value is a solution to an inequality if it lies within the shaded region on a number line.

Lessons

1. **Writing and Graphing Inequalities** — Let's write inequalities.
2. **Solutions of Inequalities** — Let's think about the solutions to inequalities.
3. **Interpreting Inequalities** — Let's examine what inequalities can tell us.

Section C: The Coordinate Plane

Section Goals

- Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.
- Use coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.
- Working in all four quadrants, plot a point given its coordinates, or identify the coordinates of a given point in the coordinate plane.

Section Narrative

In this section, students explore ways to represent pairs of numbers that include negative values. They do so by extending the horizontal axis to the left of 0 and the vertical axis below 0 and plotting ordered pairs in all four quadrants of the coordinate plane. They reason about how to appropriately scale and label a set of axes in order to most effectively display a given set of coordinate pairs. Students observe patterns between the location of a point and the signs of the numbers in its coordinates. They notice

that when the numbers in two ordered pairs differ only by signs, those two points are located on opposite sides of the x- or y-axis. Students also develop strategies for determining the distance between two points on the same horizontal or vertical line.

Lessons

1. **Points in the Coordinate Plane** — Let's explore the coordinate plane.
2. **Constructing the Coordinate Plane** — Let's investigate different ways of creating a coordinate plane.
3. **Interpreting Points in a Coordinate Plane** — Let's examine what points in the coordinate plane can tell us.
4. **Distances in the Coordinate Plane** — Let's explore distance on the coordinate plane.
5. **Shapes in the Coordinate Plane** — Let's use the coordinate plane to solve problems and puzzles.

Section D: Common Factors and Common Multiples

Section Goals

- List the factors of a number, and identify common factors for two numbers in a real-world situation.
- List the multiples of a number, and identify common multiples for two numbers in a real-world situation.

Section Narrative

In this section, students expand on their knowledge of factors and multiples and use the greatest common factor and the least common multiple of two whole numbers to solve problems. Students begin by finding factors of numbers in the context of splitting items up into groups. They relate the greatest common factor as the largest number of groups that can be created where each group is identical and every item belongs to one and only one group. Students also find multiples of numbers in the context of repeating events or purchasing items that come in certain-sized groups. They relate the least common multiple as the first instance of two events occurring at the same time or as the smallest number of items that can be collected where there are equal numbers of both items. Lastly, students investigate multiple situations and discern whether the problem involves common multiples or common factors before solving.

Lessons

1. **Common Factors** — Let's use factors to solve problems.
2. **Common Multiples** — Let's use multiples to solve problems.
3. **Using Common Multiples and Common Factors** — Let's use common factors and common multiples to solve problems.

Section E: Let's Put It to Work

Section Narrative

In this final section, students have the opportunity to apply their thinking from throughout the unit. The lesson in this section is optional because it offers additional opportunities to practice standards that are not a focus of the grade. As this is a short section followed by an End-of-Unit Assessment, there are no section goals or checkpoint questions.

Lessons

1. **Drawing in the Coordinate Plane (Optional)** — Let’s draw on the coordinate plane.

Unit 8: Data Sets and Distributions

Unit Goal

Students learn to classify questions as statistical or non-statistical, represent distributions of data with dot plots, histograms, and box plots, and describe distributions using measures of center (mean, median) and measures of variability (MAD, range, IQR).

Unit Narrative

In this unit, students learn about populations and study variables associated with a population. They begin by classifying questions as either statistical or non-statistical — based on whether variable data is necessary to answer the question. This leads to further investigation into variability and data displays, such as dot plots and histograms. As students visualize data, they begin to describe the distribution of data more precisely as they work with mean and mean absolute deviation (MAD). After working with those statistics, students begin to recognize that some distributions are not well-suited to description by mean and MAD. Students are introduced to median, range, and interquartile range as additional measures of center and variability that can be used to describe distributions in some situations. That also leads to the box plot as an additional way to visualize data. Note that the introduction of mean absolute deviation is used as an introductory model for understanding variability. In later courses, students will learn about standard deviation and evolve their understanding away from mean absolute deviation.

Section A: Data, Variability, and Statistical Questions

Section Goals

- Comprehend and use the terms “numerical” and “categorical” to describe data sets.
- Justify whether a question is “statistical” based on whether variability is expected in the data that could be collected.

Section Narrative

In this section, students collect data about themselves and their classmates, then classify survey questions in two ways. First, they distinguish the questions based on whether the information collected is numerical or categorical data. Then, they determine whether questions are statistical questions or not based on whether data they collect to answer the question shows variability. Students use dot plots to visualize numerical data in this section, but will look more closely at them in later sections.

Lessons

1. **Got Data?** — Let's explore different kinds of data.
2. **Statistical Questions** — Let's look more closely at data and the questions they can help to answer.

Section B: Dot Plots and Histograms

Section Goals

- Describe a distribution represented by a dot plot, including informal observations about its center and spread.
- Interpret a histogram to answer statistical questions about a data set.

Section Narrative

In this section, students focus on describing distributions. In particular, they learn to describe the center and spread of a distribution by using informal language to refer to a typical value for a distribution and how spread out the data are. They add histograms to the ways in which they can represent data, and use the visualization to describe features of a distribution such as clusters, peaks, gaps, and symmetry. Note that in all histograms in this unit, the left-end boundary of each bin or interval is included and the right-end boundary is excluded.

Lessons

1. **Representing Data Graphically** — Let’s represent data with dot plots and bar graphs.
2. **Dot Plots** — Let's investigate what dot plots and bar graphs can tell us.
3. **Using Dot Plots to Answer Statistical Questions** — Let's use dot plots to describe distributions and answer questions.
4. **Interpreting Histograms** — Let's explore how histograms represent data sets.
5. **Using Histograms to Answer Statistical Questions** — Let's draw histograms and use them to answer questions.
6. **Describing Distributions on Histograms** — Let's describe distributions displayed in histograms.

Section C: Measures of Center and Variability

Section Goals

- Compare the means and mean absolute deviations of different distributions.
- Interpret the mean and mean absolute deviation (MAD) in the context of the data.

Section Narrative

In this section, students begin to quantify their understanding of center and spread by finding values for the mean and mean absolute deviation (MAD). The mean is explained as a way of fairly sharing as well as a balance point to give additional intuition into the measure of center. Then students see that, even with the same mean, distributions can be very different and that a description of a measure of variability is often important. They use mean absolute deviation as a way to describe the variability of a distribution in a way that has some meaning.

Lessons

1. **Mean** — Let’s explore the mean of a data set and what it tells us.
2. **Finding and Interpreting the Mean as the Balance Point** — Let's look at another way to understand the mean of a data set.
3. **Variability and MAD** — Let's study distances between data points and the mean and see what they tell us.
4. **Using Mean and MAD to Make Comparisons** — Let's use mean and MAD to describe and compare distributions.

Section D: Median and IQR

Section Goals

- Compare and contrast distributions that are represented with box plots.
- Interpret the median and interquartile range (IQR) in the context of the data.

Section Narrative

In this section, students add “median,” “range,” and “interquartile range” to their methods of describing a measure of center or measure of variability. They use the symmetry of a distribution to determine whether mean or median is likely to be a better description of the center. Then they explore box plots as a way to visualize a summary of data using the five-number summary including the minimum, maximum, median, and 2 other quartiles. Students compare dot plots, histograms, and box plots to determine which represent the distributions best and what information is readily available from each.

Lessons

1. **Median** — Let's explore the median of a data set and what it tells us.
2. **Comparing Mean and Median** — Let's compare the mean and median of data sets.
3. **Quartiles and Interquartile Range** — Let's look at other measures for describing distributions.
4. **Box Plots** — Let's explore how box plots can help us summarize distributions.
5. **Using Box Plots** — Let's use box plots to make comparisons.

Section E: Let’s Put It to Work

Section Narrative

In this final section, students have the opportunity to apply their thinking from throughout the unit. Because this is a short section followed by an End-of-Unit Assessment, there are no section goals or checkpoint questions. The lesson in this section is optional because it offers additional opportunities to practice standards that are not a focus of the grade.

Lessons

1. **Using Data to Solve Problems (Optional)** — Let's compare data sets using visual displays.

Unit 9: Putting It All Together

Unit Goal

Students revisit and connect topics from across the year through optional explorations of estimation, energy and population, voting systems, and connections between geometric and algebraic representations of fractions.

Unit Narrative

This optional unit consists of eleven lessons. The first section has four lessons about exploring our world. These lessons are independent of each other and explore working with estimation and decimals or large numbers. These lessons should be taught after Unit 3. The second section has five lessons about different systems of voting. These lessons build on each other and should be completed in order after Unit 3 has been taught. The final section has two lessons making connections between algebraic and geometric representations of topics in earlier units. This section should be taught after Unit 8 and the lessons should be completed in order. All related standards in this unit have been addressed in prior units. These sections provide an optional opportunity for students to go more deeply and make connections between domains.

Section A: Exploring Our World

Section Goals

- Choose a method for comparing numbers.
- Estimate quantities in a real-world situation, and explain the estimation strategy.
- Solve problems involving rates.

Section Narrative

This optional sequence of four lessons can be completed anytime after Unit 3 has been taught because it uses many of the skills developed in Units 1, 2, and 3, including ratios, rates, and percentages. These lessons can be completed in any order. This series of lessons begins with students working on Fermi problems, in which they estimate values and change units to answer challenging questions. Then students work with large numbers while investigating water and energy usage as well as the energy used to make paper from different materials. Finally, students use percentages to understand the world in terms of members of their class community.

Lessons

1. **Fermi Problems (Optional)** — Let’s make some estimates.
2. **Energy Flow (Optional)** — Let's compare numbers and rates.
3. **Making Paper (Optional)** — Let's decide what material to make paper from.
4. **If Our Class Were the World (Optional)** — Let’s use math to better understand our world.

Section B: Voting

Section Goals

- Choose and justify which voting system seems the fairest for dealing with more than two choices.
- Critique a statement reporting the results of a vote.

- Interpret voting situations involving more than two choices through the use of ratios and percentages.

Section Narrative

This optional sequence of lessons explores the mathematics of voting. These lessons build on one another and should be completed in order. It is not necessary to do all five lessons to get some benefit, although more connections are made the further one gets. Students begin by comparing election results to determine which group is more in favor of the result. They then explore supermajorities and see the impact of elections with few voters participating. Students compare how the results of the same election can change depending on the system of election that is used. Specifically, they look at plurality, runoff, and instant runoff elections. Finally, students try to fairly assign representatives and explore how the design of districts can affect election results.

Lessons

1. **How Do We Choose? (Optional)** — Let's vote and choose a winner!
2. **More than Two Choices (Optional)** — Let's explore different ways to determine a winner.
3. **Comparing Voting Systems (Optional)** — Let's compare voting systems.
4. **Picking Representatives (Optional)** — Let's think about fair representation.
5. **Designing Districts (Optional)** — Let's design districts.

Section C: Making Connections

Section Goals

- Coordinate diagrams and expressions involving equivalent fractions.
- Interpret and create diagrams involving a rectangle decomposed into squares.

Section Narrative

This optional pair of lessons encourages students to make connections between topics they have studied: numerical and geometric representations of fractions and mixed numbers. All standards in this section have been addressed in prior units. This section provides an optional opportunity for students to go more deeply and make connections between domains.

Lessons

1. **Rectangle Madness (Optional)** — Let’s cut up rectangles.
2. **Rectangle Fractions (Optional)** — Let's compare fractions and rectangles.

About This Syllabus

This syllabus was compiled from the publicly available Illustrative Mathematics 6-8 Math v.360 curriculum at accessim.org. Unit and section narratives, goals, and lesson titles are sourced from the teacher view. Optional lessons are labeled “(Optional).”
Assessments (checkpoints, mid-unit, and end-of-unit assessments) are referenced in the source curriculum but require a Kendall Hunt educator account to view; they are not included here.
https://accessim.org/6-8/grade-6?a=teacher