Algebra • Number Patterns

Instructional Time: 1 day

Common Core Standard

CC.3.OA.9 Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations.

Lesson Objective

Identify and describe whole-number patterns and solve problems.

Essential Question

How can you use properties to explain patterns on the addition table?

Materials

- MathBoard
- Addition Table
- orange and green crayons
- Math Journal
- HMH Mega Math
- *i*Tools Number Charts

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to describe whole number patterns. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of whole numbers to develop sound mathematical practices by asking these questions.

- *Looking at the addition table, how did you discover the patterns?*
- *How will you use the properties to explain your answer?*
- *When writing number sentences, how do you know your answer is reasonable?*
- *How can you model even and odd numbers?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, see RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these pattern concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 2, 7, 14, 16

4 Summarize Approximately 5 min.

Essential Question

How can you use properties to explain patterns on the addition table?

I can use the Commutative Property to explain that when using the addition table, the order of the addends will not affect the sum. I can use the Identity Property to explain that adding zero to any number will not change the sum.

Math Journal

Write the definitions of the Identity Property of Addition and the Commutative Property of Addition. Use the addition table to provide examples of each.

Round to the Nearest Ten or Hundred

Instructional Time: 1 day

Common Core Standard

CC.3.NBT.1 Use place value understanding to round whole numbers to the nearest 10 or 100.

Lesson Objective

Round 2- and 3-digit numbers to the nearest ten or hundred.

Essential Question

How can you round numbers?

Materials

- MathBoard
- Math Journal
- Animated Math Models
- HMH Mega Math

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to use place value and estimation to round numbers. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of place value and rounding to develop sound mathematical practices by asking these questions.

- *When rounding a number, what information do you need?*
- *What strategy would you use to round a given number?*
- *What happens if you use another strategy?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these rounding concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 16–19

4 Summarize Approximately 5 min.

Essential Question

How can you round numbers?

I can use a number line or place value.

Math Journal

Describe how to round 678 to the nearest hundred.

Estimate Sums

Instructional Time: 1 day

Common Core Standard

CC.3.NBT.1 Use place value understanding to round whole numbers to the nearest 10 or 100.

Also CC.3.NBT.2

Lesson Objective

Use compatible numbers and rounding to estimate sums.

Essential Question

How can you use compatible numbers and rounding to estimate sums?

Materials

- MathBoard
- Animated Math Models
- Math Journal

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to estimate sums. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of rounding and estimation to develop sound mathematical practices by asking these questions.

- *Why did you decide to use compatible numbers to estimate? Rounding to estimate?*
- *How do you know your answer is reasonable?*
- *How can you use math vocabulary to explain your process of estimation?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these estimation concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 16–18

4 Summarize Approximately 5 min.

Essential Question

How can you use compatible numbers and rounding to estimate sums?

I can use compatible numbers by finding a number that is close to the given number, but easier to add. I can round the numbers to the same place to estimate sums.

Math Journal

Explain how to estimate 368 + 231 two different ways.

Mental Math Strategies for Addition

Instructional Time: 1 day

Common Core Standard

CC.3.NBT.2 Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

Lesson Objective

Count by tens and ones, use a number line, make compatible numbers, or use friendly numbers to find sums mentally.

Essential Question

What mental math strategies can you use to find sums?

Materials

- MathBoard
- *i*Tools: Number Lines
- Math Journal

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to use mental math to find sums. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of addition strategies to develop sound mathematical practices by asking these questions.

- *Will the method of compatible numbers always work?*
- *How do you know?*
- *Is there a strategy you could use to make the given problem easier?*
- *How do you know your answer is reasonable?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these mental math strategies. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 10, 11

4 Summarize Approximately 5 min.

Essential Question

What mental math strategies can you use to find sums?

You could count by tens and ones, use compatible numbers or use friendly numbers and adjust.

Math Journal

Which method do you prefer to use to find sums—count by tens and ones, use compatible numbers, or use friendly numbers and adjust? Explain why.

Algebra • Use Properties to Add

Instructional Time: 1 day

Common Core Standard

CC.3.NBT.2 Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

Lesson Objective

Use the Commutative and Associative Properties of Addition to add more than two addends.

Essential Question

How can you add more than two addends?

Materials

- MathBoard
- Math Journal

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to use properties to add more than two addends. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of addition strategies to develop sound mathematical practices by asking these questions.

- *What do you remember about the Commutative Property?*
- *How will you use that information when solving problems with more than two addends?*
- *What strategy could you use to make the problem easier?*
- *Why would you use the Associative Property when solving a given problem?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these strategies and properties. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 9–12

4 Summarize Approximately 5 min.

Essential Question

How can you add more than two addends?

Use the Associative Property to group the addends to make them easier to add, group the ones or the tens to make them easier to add, or use the Commutative Property to change the order of the addends.

Math Journal

Give an example of an addition problem in which you would and would not group the addends differently to add.

Use the Break Apart Strategy to Add

Instructional Time: 1 day

Common Core Standard

CC.3.NBT.2 Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

Also CC.3.NBT.1, CC.3.OA.8

Lesson Objective

Use the break apart strategy to add 3-digit numbers.

Essential Question

How can you use the break apart strategy to add 3-digit numbers?

Materials

- MathBoard
- Math Journal
- HMH Mega Math
- *i*Tools Base-Ten Blocks

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to use the break apart strategy to add 3-digit numbers. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of place value and addition to develop sound mathematical practices by asking these questions.

- *What strategy can you use to solve the given problem?*
- *Why did you choose that strategy?*
- *What did you do first?*
- *How do you know your answer is reasonable?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand the break apart strategy. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 19–20

4 Summarize Approximately 5 min.

Essential Question

How can you use the break apart strategy to add 3-digit numbers?

I can break apart the addends into hundreds, tens and ones, then I can add each place value.

Math Journal

Explain how to use the break apart strategy to find 247 + 358.

Use Place Value to Add

Instructional Time: 1 day

Common Core Standard

CC.3.NBT.2 Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

Also, CC.3.NBT.1, CC.3.OA.8

Lesson Objective

Use place value to add 3-digit numbers.

Essential Question

How can you use place value to add 3-digit numbers?

Materials

- MathBoard
- *i*Tools Base-Ten blocks
- Math Journal
- HMH Mega Math
- Animated Math Models

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to use place value to add 3-digit numbers. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of place value to develop sound mathematical practices by asking these questions.

- *What strategy can you use to make the given problem easier?*
- *How do you know this is the best strategy?*
- *How can you use math vocabulary in your answer?*
- *What do you remember about checking your answer?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these addition concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 18, 19, 20

4 Summarize Approximately 5 min.

Essential Question

How can you use place value to add 3-digit numbers?

I can add the numbers in each place and regroup when I can.

Math Journal

Explain one way to add 3-digit numbers.

Estimate Differences

Instructional Time: 1 day

Common Core Standard

CC.3.NBT.1 Use place value understanding to round whole numbers to the nearest 10 or 100.

Also CC.3.NBT.2

Lesson Objective

Use compatible numbers and rounding to estimate differences.

Essential Question

How can you use compatible numbers and rounding to estimate differences?

Materials

- MathBoard
- Animated Math Models
- Math Journal

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to estimate differences. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of compatible numbers and estimation to develop sound mathematical practices by asking these questions.

- *What do you remember about using compatible numbers?*
- *What other ways can you estimate?*
- *In the given problem, why did you choose the strategy you used?*
- *How do you know your answer is reasonable?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these estimation and subtraction concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 16–19

4 Summarize Approximately 5 min.

Essential Question

How can you use compatible numbers and rounding to estimate differences?

I can find numbers that are close to the real numbers and are easier to subtract. Then I subtract to estimate the difference. Or I can round the numbers to the same place and subtract the rounded numbers to get an estimate.

Math Journal

Explain how to estimate 586 – 321 two different ways.

Mental Math Strategy for Subtraction

Instructional Time: 1 day

Common Core Standard

CC.3.NBT.2 Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

Lesson Objective

Use a number line, friendly numbers, or the break apart strategy to find differences mentally.

Essential Question

What mental math strategies can you use to find differences?

Materials

- MathBoard
- *i*Tools: Number Lines
- Math Journal

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to use strategies to find differences mentally. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of subtraction to develop sound mathematical practices by asking these questions.

- *What strategy can you use to solve the given problem?*
- *How do you know?*
- *Will that method always work? When might it not work?*
- *When using friendly numbers, what patterns do you see?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these subtraction strategies. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 5, 7, 9

4 Summarize Approximately 5 min.

Essential Question

What mental math strategies can you use to find differences?

I can use a number line to count up by tens and ones, or take away tens and ones. I can use friendly numbers or I can use the break apart strategy.

Math Journal

Give one example of when you would use the friendly numbers strategy to subtract. Explain why.

Use Place Value to Subtract

Instructional Time: 1 day

Common Core Standard

CC.3.NBT.2 Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

Also CC.3.NBT.1

Lesson Objective

Use place value to subtract 3-digit numbers.

Essential Question

How can you use place value to subtract 3-digit numbers?

Materials

- MathBoard
- *i*Tools: Base-Ten Blocks
- Math Journal
- HMH Mega Math
- Animated Math Models

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to use place value to subtract 3-digit numbers. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of subtracting two-digit numbers to develop sound mathematical practices by asking these questions.

- *What is the given problem asking?*
- *What strategy can you use to make the calculation easier?*
- *What do you remember about regrouping?*
- *How do you know your answer is reasonable?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these subtraction concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 18–21 or 22–25

4 Summarize Approximately 5 min.

Essential Question

How can you use place value to subtract 3-digit numbers?

I can subtract the numbers in each place and regroup when I need to.

Math Journal

Explain how to subtract 247 from 538.

Combine Place Value to Subtract

Instructional Time: 1 day

Common Core Standard

CC.3.NBT.2 Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

Also CC.3.NBT.1, CC.3.OA.8

Lesson Objective

Use the combined place values strategy to subtract 3-digit numbers.

Essential Question

How can you use the combined place values strategy to subtract 3-digit numbers?

Materials

- MathBoard
- *i*Tools: Base-Ten Blocks
- Math Journal

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to use place value to subtract three-digit numbers. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of representing numbers in different ways to develop sound mathematical practices by asking these questions.

- *Which operation should you use to solve the given problem? How do you know?*
- *What is the best strategy to use to solve the given problem? How do you know?*
- *What did you do first when solving the given problem? Why?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these subtraction concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 18–22

4 Summarize Approximately 5 min.

Essential Question

How can you use the combined place values strategy to subtract 3-digit numbers?

If there are not enough in the place, combine the tens and ones, or combine the hundreds and tens and then subtract.

Math Journal

Explain how to use the combined place values strategy to find 223 – 119.

Problem Solving • Model Addition and Subtraction

Instructional Time: 1 day

Common Core Standard

CC.3.OA.8 Solve two-step word problems using the operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

Also CC.3.NBT.2

Lesson Objective

Solve addition and subtraction problems by using the strategy *draw a diagram*.

Essential Question

How can you use the strategy *draw a diagram* to solve one- and two-step addition and subtraction problems?

Materials

- MathBoard
- Math Journal

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to draw a diagram to solve problems. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of addition and subtraction to develop sound mathematical practices by asking these questions.

- *What strategy could make the given problem easier to solve?*
- *Will the bar model method always work?*
- *How does the model represent the given problem?*
- *Is the answer reasonable? How do you know?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand the draw a diagram strategy. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 6–8

4 Summarize Approximately 5 min.

Essential Question

How can you use the strategy *draw a diagram* to solve one- and two-step addition and subtraction problems?

I can draw a bar model to see if I need to add or subtract.

Math Journal

Write an addition or subtraction problem and draw a diagram to solve it.

Problem Solving • Organize Data

Instructional Time: 1 day

Common Core Standard

CC.3.MD.3 Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs.

Also CC.3.NBT.2

Lesson Objective

Organize data in tables and solve problems by using the strategy *make a table*.

Essential Question

How can you use the strategy *make a table* to organize data and solve problems?

Materials

- MathBoard
- Animated Math Models
- Math Journal

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to organize data to solve problems. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of using tables to organize data to develop sound mathematical practices by asking these questions.

- *What strategy did you use to solve the given problem?*
- *Can you think of another way to solve the given problem?*
- *Have you solved a problem similar to this one?*
- *How can you use math vocabulary in your explanation?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand this problem solving strategy. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 6, 7, 9

4 Summarize Approximately 5 min.

Essential Question

How can you use the strategy *make a table* to organize data and solve problems?

I can represent the number of tally marks in a frequency table. Then, I can use the numbers in the table to solve problems.

Math Journal

How can you use the strategy *make a table* to organize data and solve problems?

Use Picture Graphs

Instructional Time: 1 day

Common Core Standard

CC.3.MD.3 Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs.

Also CC.3.NBT.2

Lesson Objective

Read and interpret data in a scaled picture graph.

Essential Question

How can you read and interpret data in a scaled picture graph?

Materials

- MathBoard
- Math Journal
- HMH Mega Math
- *i*Tools: Graphs

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to use picture graphs to solve problems. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of how to display data to develop sound mathematical practices by asking these questions.

- *What is the given problem asking?*
- *What math vocabulary can you use in your answer?*
- *What happens when the value of the symbol changes?*
- *How do you know your answer is reasonable?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these data display concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 6, 8, 10

4 Summarize Approximately 5 min.

Essential Question

How can you read and interpret data in a scaled picture graph?

Use the title to understand what the picture graph is about and what the row labels mean. Use the key to find out how many each symbol represents. Skip count or add to find the total for each row.

Math Journal

Explain what you can tell just by comparing the symbols in a picture graph.

Make Picture Graphs

Instructional Time: 1 day

Common Core Standard

CC.3.MD.3 Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs.

Also CC.3.NBT.2

Lesson Objective

Draw a scaled picture graph to show data in a table.

Essential Question

How can you draw a scaled picture graph to show data in a table?

Materials

- MathBoard
- Math Journal
- Animated Math Models
- HMH Mega Math
- *i*Tools: Graphs

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to make and interpret a scaled picture graph. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of picture graphs to develop sound mathematical practices by asking these questions.

- *Have you ever solved a problem similar to this?*
- *Can you use math vocabulary in your answer?*
- *Will the method of having a symbol equal more than one always work when displaying data?*
- *How do you know?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these data concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 3, 5, 6 or 7–9

4 Summarize Approximately 5 min.

Essential Question

How can you draw a scaled picture graph to show data in a table?

Write the title at the top of the picture graph. Label the rows. Choose a key and symbols that will represent the data. Than draw the correct number of symbols in each row.

Math Journal

Describe why it might not be a good idea to use a key where each symbol stands for 1 in a picture graph.

Use Bar Graphs

Instructional Time: 1 day

Common Core Standard

CC.3.MD.3 Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs.

Also CC.3.NBT.2

Lesson Objective

Read and interpret data in a scaled bar graph.

Essential Question

How can you read and interpret data in a scaled bar graph?

Materials

- MathBoard
- Animated Math Models
- Math Journal
- HMH Mega Math

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to read and interpret bar graphs. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of displaying data to develop sound mathematical practices by asking these questions.

- *What is the given problem asking?*
- *What do you think will happen if you change the key?*
- *What operation did you use to solve the given problem?*
- *Is there another way to solve the given problem?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these data display concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 6–8

4 Summarize Approximately 5 min.

Essential Question

How can you read and interpret data in a scaled bar graph?

First, I look at the title and the labels to know what the graph is about. Then, I look at the scale and the length of each bar to find the value.

Math Journal

Use Kate's Favorite Amusement Ride bar graph to describe what the bar for Super Slide means.

Make Bar Graphs

Instructional Time: 1 day

Common Core Standard

CC.3.MD.3 Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs.

Also CC.3.NBT.2

Lesson Objective

Draw a scaled bar graph to show data on a table or picture graph.

Essential Question

How can you draw a scaled bar graph to show data on a table or picture graph?

Materials

- MathBoard
- Math Journal
- Animated Math Models
- HMH Mega Math
- *i*Tools: Graphs

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to make and interpret bar graphs. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of data displays to develop sound mathematical practices by asking these questions.

- *What strategies can you use to interpret data that do not fit exactly to the line on the graph?*
- *What math vocabulary can you use in your answer?*
- *Why is the data model you chose the best for the given problem?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these data display concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 9, 10, 11

4 Summarize Approximately 5 min.

Essential Question

How can you draw a scaled bar graph to show data on a table or picture graph?

Write a title and labels and draw a scale so that most of the data will end on a line. Draw bars to show the numbers for each category.

Math Journal

Have students use the data on page 82 and explain how to draw a bar for a player named Eric who scored 20 points.

Solve Problems Using Data

Instructional Time: 1 day

Common Core Standard

CC.3.MD.3 Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs.

Also CC.3.NBT.2, CC.3.OA.8

Lesson Objective

Solve one- and two-step compare problems using data represented in scaled bar graphs.

Essential Question

How can you solve problems using data represented in bar graphs?

Materials

- MathBoard
- Math Journal
- Animated Math Models
- HMH Mega Math
- *i*Tools: Graphs

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to solve problems using data represented in graphs. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of displaying data to develop sound mathematical practices by asking these questions.

- *What is the given problem asking?*
- *What information do you need?*
- *Is there another way to represent and solve the given problem?*
- *How do you know your answer is reasonable?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these problem-solving concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 7, 8, 9

4 Summarize Approximately 5 min.

Essential Question

How can you solve problems using data represented in bar graphs?

I can read the bar graph to find and use the data I need. I can count along the scale to compare the data.

Math Journal

Write a word problem that can be solved by using the November Weather bar graph.

Use and Make Line Plots

Instructional Time: 1 day

Common Core Standard

CC.3.MD.4 Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is market off in appropriate units–whole numbers, halves, or quarters.

Also CC.3.NBT.2

Lesson Objective

Read and interpret data in a line plot and use data to make a line plot.

Essential Question

How can you read and interpret data in a line plot and use data to make a line plot?

Materials

- MathBoard
- Math Journal
- HMH Mega Math
- *i*Tools: Graphs

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to read, interpret, and make line plots. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of data displays to develop sound mathematical practices by asking these questions.

- *What information are you being asked to find?*
- *What will you do first?*
- *How do you know?*
- *What new math vocabulary can you use in your answer?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these data display concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 4, 5, 6

4 Summarize Approximately 5 min.

Essential Question

How can you read and interpret data in a line plot and use data to make a line plot?

Write a title and write numbers in order on a number line. Draw X's above the numbers to represent the data. Use the data in the line plot to solve the problems.

Math Journal

Have students write and solve another problem using the data in the Daily High Temperatures line plot.

Count Equal Groups

Instructional Time: 1 day

Common Core Standard

CC.3.OA.1 Interpret products of whole numbers, e.g., interpret 5×7 as the total number of objects in 5 groups of 7 objects each.

Also CC.3.OA.3

Lesson Objective

Model and skip count objects in equal groups to find how many there are.

Essential Question

How can you use equal groups to find how many in all?

Materials

- MathBoard
- counters
- Math Journal
- HMH Mega Math
- *i*Tools: Counters
- *i*Tools: Number Lines
- Animated Math Models

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to relate skip counting with multiplication. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of modeling numbers to develop sound mathematical practices by asking these questions.

- *What is the given problem asking?*
- *What do you remember about skip counting?*
- *What strategy could you use to make the given problem easier?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these skip counting concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 6, 8, 9

4 Summarize Approximately 5 min.

Essential Question

How can you use equal groups to find how many in all?

I can skip count the groups by using drawings or counters.

Algebra • Relate Addition and Multiplication

Instructional Time: 1 day

Common Core Standard

Represent and solve problems involving multiplication and addition.

CC.3.OA.1 Interpret products of whole numbers, e.g., interpret 5×7 as the total number of objects in 5 groups of 7 objects each.

Also CC.3.OA.3, CC.3.OA.7, CC.3.NBT.2

Lesson Objective

Write an addition sentence and a multiplication sentence for a model.

Essential Question

How is multiplication like addition? How is it different?

Materials

- MathBoard
- Math Journal
- Animated Math Models
- HMH Mega Math
- *i*Tools: Counters
- *i*Tools: Number Lines

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to use models to relate addition and multiplication. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of making equal groups to develop sound mathematical practices by asking these questions.

- *Will the method of repeated addition always work? How do you know?*
- *What other method could you try with the given problem?*
- *How do you know those answers are equivalent?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these addition and multiplication concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 12, 13, 14, 15

4 Summarize Approximately 5 min.

Essential Question

How is multiplication like addition? How is it different?

Both addition and multiplication find a total. To use multiplication, I need equal groups. To use addition, I can have equal or unequal groups.

Math Journal

Write a word problem that involves combining three groups.

Skip Count on a Number Line

Instructional Time: 1 day

Common Core Standard

CC.3.OA.3 Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

Also CC.3.OA.1

Lesson Objective

Model and skip count on a number line to find how many there are.

Essential Question

How can you use a number line to skip count and find how many in all?

Materials

- MathBoard
- Math Journal
- HMH Mega Math
- *i*Tools: Number Lines
- Animated Math Models

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to use skip counting on the number line to multiply. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of skip counting and number lines to develop sound mathematical practices by asking these questions.

- *How will you use the given information to solve the problem?*
- *What did you do first? Why?*
- *Why is the number line a good model for the given problem?*
- *What strategy could you use to make the given problem easier to solve?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these skip counting concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 10, 11, 12

4 Summarize Approximately 5 min.

Essential Question

How can you use a number line to skip count and find how many in all?

I can use the number of groups for the number of times to skip count on the number line. I can use the number in each group as the number to skip count by.

Math Journal

Write a problem that can be solved by skip counting on a number line.

Problem Solving • Model Multiplication

Instructional Time: 1 day

Common Core Standard

CC.3.OA.8 Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

Also CC.3.OA.1, CC.3.OA.3

Lesson Objective

Solve one- and two-step problems by using the strategy *draw a diagram*.

Essential Question

How can you use the strategy *draw a diagram* to solve one- and two-step problems?

Materials

- MathBoard
- Math Journal
- HMH Mega Math
- *i*Tools: Counters

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to use bar models to solve multiplication problems. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of modeling to develop sound mathematical practices by asking these questions.

- *What is the problem asking?*
- *Why is this a good model for the given problem?*
- *What operation did you use to represent the situation?*
- *How does your drawing represent your work?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these problem solving concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 5, 7, 8

4 Summarize Approximately 5 min.

Essential Question

How can you use the strategy *draw a diagram* to solve one- and two-step problems?

I can draw a diagram to show the information in the problem and use the diagram to determine what operation to use to solve the problem.

Math Journal

Describe one kind of diagram you might draw to help you solve a problem.

Model with Arrays

Instructional Time: 1 day

Common Core Standard

CC.3.OA.3 Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

Also CC.3.OA.1

Lesson Objective

Use arrays to model products and factors.

Essential Question

How can you use arrays to model multiplication and find factors?

Materials

- MathBoard
- square tiles
- Math Journal
- Animated Math Models
- HMH Mega Math
- *i*Tools: Counters

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to use arrays to multiply. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of multiplication to develop sound mathematical practices by asking these questions.

- *What is the problem asking?*
- *Why are math tiles a good model for the given problem?*
- *How would you change your model if the number in the given groups changed?*
- *Are there any properties being represented in the model?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these multiplication concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 11, 12, 13

4 Summarize Approximately 5 min.

Essential Question

How can you use arrays to model multiplication and find factors?

The number of rows is the first factor and the number in each row is the second factor.

Math Journal

Write a word problem that can be solved by drawing an array. Then draw the array and solve the problem.

Algebra • Commutative Property of Multiplication

Instructional Time: 1 day

Common Core Standard

CC.3.OA.5 Apply properties of operations as strategies to multiply and divide.

Also CC.3.OA.1, CC.3.OA.3, CC.3.OA.7

Lesson Objective

Model the Commutative Property of Multiplication and use it to find products.

Essential Question

How can you use the Commutative Property of Multiplication to find products?

Materials

- MathBoard
- square tiles
- Math Journal
- Animated Math Models
- HMH Mega Math
- *i*Tools: Number Charts

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to model and use the Commutative Property of Multiplication. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of modeling multiplication to develop sound mathematical practices by asking these questions.

- *Which operation did you use?*
- *Why is the array a good model for this problem?*
- *How does the model support your work?*
- *How can you use the Commutative Property of Multiplication in the given problem?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand the Commutative Property of Multiplication. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 8, 11, 13 or 14–17

4 Summarize Approximately 5 min.

Essential Question

How can you use the Commutative Property of Multiplication to find products?

When I know one fact, I can use the Commutative property to find the answer to a related fact. For example, if I know $7 \times 2 = 14$, then I know $2 \times 7 = 14$.

Algebra • Multiply with 1 and 0

Instructional Time: 1 day

Common Core Standard

CC.3.OA.5 Apply properties of operations as strategies to multiply and divide.

Also CC.3.OA.1, CC.3.OA.3, CC.3.OA.7

Lesson Objective

Model multiplication with the factors 1 and 0.

Essential Question

What happens when you multiply a number by 0 or 1?

Materials

- MathBoard
- Math Journal
- HMH Mega Math
- *i*Tools: Number Lines
- Animated Math Models

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to understand the identity and zero properties of multiplication. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of multiplication to develop sound mathematical practices by asking these questions.

- *What do you remember about skip counting?*
- *What conclusions can you draw from the model?*
- *What properties can you use to solve the given problem? Why?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these multiplication concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 30–37 or 38–40

4 Summarize Approximately 5 min.

Essential Question

What happens when you multiply a number by 0 or 1?

When I multiply a number by 0, the product is 0. When I multiply a number by 1, the product is that number.

Multiply with 2 and 4

Instructional Time: 1 day

Common Core Standard

CC.3.OA.3 Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

Also CC.3.OA.1, CC.3.OA.7

Lesson Objective

Draw a picture, count by 2s, or use doubles to multiply with the factors 2 and 4.

Essential Question

How can you multiply with 2 and 4?

Materials

- MathBoard
- Math Journal
- Animated Math Models
- *i*Tools: Base-Ten Blocks
- *i*Tools: Counters
- *i*Tools: Number Lines

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to use different strategies to multiply with the factors 2 and 4. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of multiplication to develop sound mathematical practices by asking these questions.

- *What is the given problem asking?*
- *Is there another way to solve the given problem?*
- *What math vocabulary can you use?*
- *Are your answers reasonable?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these multiplication strategies. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 23, 24, 25 or 26, 27

4 Summarize Approximately 5 min.

Essential Question

How can you multiply with 2 and 4?

To multiply by 2, I can draw a picture, add doubles or count by 2's. To multiply by 4, I can draw a picture of multiply the other factor by 2 and double the product.

Math Journal

Explain how you can use doubles when multiplying with 4 to find 4×8.

Multiply with 5 and 10

Instructional Time: 1 day

Common Core Standard

CC.3.OA.3 Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

Also CC.3.OA.1, CC.3.OA.7

Lesson Objective

Use skip counting, a number line, or a bar model to multiply with the factors 5 and 10.

Essential Question

How can you multiply with 5 and 10?

Materials

- MathBoard
- Math Journal
- Animated Math Models
- HMH Mega Math
- *i*Tools: Counters
- *i*Tools: Number Lines

1 Engage Approximately 5 min.

This activity reviews prerequisite skills. You can include or skip this activity. Use evidence of students' understanding to make decisions like this throughout the lesson.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to use different strategies to multiply with 5 and 10. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of multiplication to develop sound mathematical practices by asking these questions.

- *What strategy could you use to solve the given problem?*
- *Is there another way to solve the given problem?*
- *What math vocabulary can you use when solving the given problem?*
- *Are your answers reasonable?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these multiplication strategies. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 34, 35, 37 or 38–40

4 Summarize Approximately 5 min.

Essential Question

How can you multiply with 5 and 10?

I could skip count, use a bar model, make a drawing or use a number line.

Multiply with 3 and 6

Instructional Time: 1 day

Common Core Standard

CC.3.OA.3 Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

Also CC.3.OA.1, CC.3.OA.7, CC.3.OA.9

Lesson Objective

Draw a picture, use 5s facts and addition, doubles, or a multiplication table to multiply with the factors 3 and 6.

Essential Question

What are some ways to multiply with 3 and 6?

Materials

- MathBoard
- Math Journal
- *i*Tools: Counters
- *i*Tools: Number Charts
- Animated Math Models

1 Engage Approximately 5 min.

This activity reviews prerequisite skills. You can include or skip this activity. Use evidence of students' understanding to make decisions like this throughout the lesson.

2 Teach and Talk Approximately 20 min.

Unlock the Problem ● Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to use different strategies to multiply with 5 and 10. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of multiplication to develop sound mathematical practices by asking these questions.

- *Have you solved a problem similar to this one? Describe the problem.*
- *What strategy could you use to solve the given problem?*
- *Is there another strategy you could use to solve the given problem?*
- *Are your answers reasonable?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these multiplication strategies. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 34, 35, 37 or 38–40

4 Summarize Approximately 5 min.

Essential Question

How can you multiply with 3 and 6?

I can draw a picture, use 5's facts and addition, a multiplication table, or doubles.

Math Journal

Explain how multiplying with 6 is like multiplying with 3.

Algebra • Distributive Property
Instructional Time: 1 day

Note: The instructional time for this lesson can be 2 days. On Day 1, complete the Activity and Math Talk. Have students use counters to model 6 x 8. Relate the strategy used on p. 142 to the Distributive Property. On Day 2, in Try This! break apart 6 in other ways, then break apart 9. Complete Share and Show. Assign On Your Own for homework.

Common Core Standard
CC.3.OA.5 Apply properties of operations as strategies to multiply and divide.

Also CC.3.OA.1, CC.3.OA.3, CC.3.OA.4, CC.3.OA.7

Lesson Objective

Use the Distributive Property to find products by breaking apart arrays.

Essential Question

How can you use the Distributive Property to find products?

Materials

- MathBoard
- square tiles
- Math Journal
- HMH Mega Math

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to draw and break apart arrays to model the Distributive Property. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of multiplication to develop sound mathematical practices by asking these questions.

- *What is the problem asking?*
- *What did you do first, and why?*
- *What properties did you use to solve the given problem?*
- *What happens when you break down the array into a smaller size?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand the Distributive Property. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 6, 7, 9

4 Summarize Approximately 5 min.

Essential Question

How can you use the Distributive Property to find products?

I can break apart one of the factors and multiply each addend by the other factor. Then I can add the products to find the answer.

Multiply with 7

Instructional Time: 1 day

Common Core Standard

CC.3.OA.7 Fluently multiply and divide with 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.

Also CC.3.OA.1, CC.3.OA.3, CC.3.OA.4, CC.3.OA.5

Lesson Objective

Use the Commutative or Distributive Property or known facts to multiply with the factor 7.

Essential Question

What strategies can you use to multiply with 7?

Materials

- MathBoard
- Math Journal
- *i*Tools: Base-Ten blocks
- *i*Tools: Counters

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem ● Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to use different strategies or properties to multiply with the factor 7. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of multiplication properties to develop sound mathematical practices by asking these questions.

- *Which operation did you use to represent the situation?*
- *Is there another operation you could use?*
- *How can you use a simpler problem to help you find the answer?*
- *What properties did you use to solve the given problem?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these different multiplication strategies. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 23, 24, 26

4 Summarize Approximately 5 min.

Essential Question

What strategies can you use to multiply with 7?

Use the distributive property to break the multiplication into smaller facts, or use the commutative property, or use doubles when at least one factor is even.

Math Journal

Explain how you would use the Commutative Property of Multiplication to answer 7×3.

Algebra • Associative Property of Multiplication

Instructional Time: 1 day

Common Core Standard

CC.3.OA.5 Apply properties of operations as strategies to multiply and divide.

Also CC.3.OA.1, CC.3.OA.3, CC.3.OA.4, CC.3.OA.7

Lesson Objective

Use the Associative Property of Multiplication to multiply with three factors.

Essential Question

How can you use the Associative Property of Multiplication to find products?

Materials

- MathBoard
- Math Journal
- Animated Math Models

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to use the Associative property of Multiplication to multiply. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of multiplication properties to develop sound mathematical practices by asking these questions.

- *Which property did you use to help solve the given problem?*
- *What do you remember about the Commutative Property?*
- *Is there another way to solve the given problem?*
- *What do you think will happen if you move the factors around?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these multiplication concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 29–37 or 38–40

4 Summarize Approximately 5 min.

Essential Question

How can you use the Associative Property of Multiplication to find products?

I can change the way the factors are grouped and still get the same answer.

Math Journal

Why would you use the Associative Property of Multiplication to solve $(10 \times 4) \times 2$? How would you regroup the factors?

Algebra • Patterns on the Multiplication Table

Instructional Time: 1 day

Common Core Standard

CC.3.OA.9 Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations.

Also CC.3.OA.5

Lesson Objective

Identify and explain patterns on the multiplication table.

Essential Question

How can you use properties to explain patterns on the multiplication table?

Materials

- MathBoard
- yellow and blue crayons
- Math Journal
- *i*Tools: Numbers Chart

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to explain patterns on the multiplication table. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of multiplication and patterns to develop sound mathematical practices by asking these questions.

- *What did you do first and why?*
- *What properties did you use to solve the given problem?*
- *What patterns can you find?*
- *How did you discover the patterns you see?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand multiplication patterns. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 14, 15, 16

4 Summarize Approximately 5 min.

Essential Question

How can you use properties to explain patterns on the multiplication table?

I can use the commutative property to find patterns that show the same factors, but in a different order. I can also use the associative and distributive properties to find patterns for products that are even or odd.

Multiply with 8

Instructional Time: 1 day

Common Core Standard

CC.3.OA.7 Fluently multiply and divide with 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.

Also CC.3.OA.1, CC.3.OA.3, CC.3.OA.4, CC.3.OA.5, CC.3.OA.9

Lesson Objective

Use doubles, a number line, or Associative Property of Multiplication to multiply with the factor 8.

Essential Question

What strategies can you use to multiply with 8?

Materials

- MathBoard
- Math Journal
- HMH Mega Math
- *i*Tools: Counters
- *i*Tools: Number Lines

1 Engage Approximately 5 min.

This activity reviews prerequisite skills. You can include or skip this activity. Use evidence of students' understanding to make decisions like this throughout the lesson.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to use different strategies or properties to multiply with 8. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of multiplication to develop sound mathematical practices by asking these questions.

- *Which operation did you use to represent the situation?*
- *What strategy did you use to solve the given problem?*
- *Could you use another strategy?*
- *What do you remember about using doubles facts to solve problems?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these multiplication strategies. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 20–27, 31

4 Summarize Approximately 5 min.

Essential Question

What strategies can you use to multiply with 8?

I can use the Distributive Property to break 8 into two facts I know, or easier facts, I could use the Associative Property of Multiplication to work with a fact I know, arrays, doubles, quick pictures or skip counting on a number line can also be used to multiply 8.

Math Journal

What two facts can you double to find 8×4? Explain.

Multiply with 9

Instructional Time: 1 day

Note: The instructional time for this lesson can be 2 days. On Day 1, have students draw arrays to model Unlock the Problem. Have them use their models to justify using the Distributive Property with Subtraction. On Day 2, Review Day 1. Then have students complete Another Way, Try This!, Share and Show. Do the exercises on page 169 as a class.

Common Core Standard

CC.3.OA.7 Fluently multiply and divide with 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.

Also CC.3.OA.1, CC.3.OA.3, CC.3.OA.4, CC.3.OA.5, CC.3.OA.9

Lesson Objective

Use the Distributive Property with addition or subtraction or patterns to multiply with the factor 9.

Essential Question

What strategies can you use to multiply with 9?

Materials

- MathBoard
- Math Journal
- Animated Math Models
- HMH Mega Math
- *i*Tools: Counters
- *i*Tools: Base-Ten Blocks

1 Engage Approximately 5 min.

This activity reviews prerequisite skills. You can include or skip this activity. Use evidence of students' understanding to make decisions like this throughout the lesson.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to use the Distributive property or patterns to multiply with 9. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of multiplication properties and strategies to develop sound mathematical practices by asking these questions.

- *What strategy can you use to solve the given problem?*
- *What properties are you able to use?*
- *Do you see any patterns in the given problem? How can use these to solve the given problem?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these multiplication strategies. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 19–24 or 25–27

4 Summarize Approximately 5 min.

Essential Question

What strategies can you use to multiply with 9?

Use patterns of 9. The sum of the digits of the product of 9 is always 9. The tens digit is always one less than the other factor.

Problem Solving • Multiplication

Instructional Time: 1 day

Note: The instructional time for this lesson can be 2 days. On Day 1, complete the first three pages of the lesson and assign homework. On Day 2, Review homework. Then complete the Extend the Math activity as a class to provide additional problem-solving practice.

Common Core Standard

CC.3.OA.8 Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

Also CC.3.OA.3, CC.3.OA.7, CC.3.OA.9

Lesson Objective

Solve multiplication problems by using the strategy *make a table*.

Essential Question

How can you use the strategy *make a table* to solve multiplication problems?

Materials

- MathBoard
- HMH Mega Math
- Math Journal

1 Engage Approximately 5 min.

This activity reviews prerequisite skills. You can include or skip this activity. Use evidence of students' understanding to make decisions like this throughout the lesson.

2 Teach and Talk

Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to make a table to solve multiplication problems. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of multiplication strategies to develop sound mathematical practices by asking these questions.

- *What is the problem asking?*
- *What information do you need?*
- *What strategy could you use to solve the given problem?*
- *Do you see any patterns? How can those patterns be used?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand the make a table strategy. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 4, 5, 7

4 Summarize Approximately 5 min.

Essential Question

How can you use the strategy *make a table* to solve multiplication problems?

It organizes the information, makes the patterns easier to see and ensures I have found all possible solutions.

Math Journal

Write a problem you can use the *make the table* strategy to solve. Then solve the problem.

Algebra • Describe Patterns

Instructional Time: 1 day

Common Core Standard

CC.3.0A.9 Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations.

Also CC.3.0A.3, CC.3.0A.7

Lesson Objective

Identify and describe a number pattern shown in a function table.

Essential Question

What are some ways you can describe a pattern in a table?

Materials

- MathBoard
- Animated Math Models
- Number Wheels
- HMH Mega Math
- Math Journal

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to describe a pattern shown in a function table. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of patterns to develop sound mathematical practices by asking these questions.

- *What is the problem asking?*
- *What property can you use to solve the given problem? Why?*
- *How did you discover the pattern you see?*
- *How do you know your answer is reasonable?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these number pattern concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 7, 9, 10 or 11–15

4 Summarize Approximately 5 min.

Essential Question

What are some ways you can describe a pattern in a table?

Look at the numbers in the table and see how they relate to each other. Test the pattern with each pair of numbers in the table.

Algebra • Find Unknown Factors

Instructional Time: 1 day

Common Core Standard

CC.3.OA.4 Determine the unknown whole number in a multiplication or division equation relating three whole numbers.

Also CC.3.OA.1, CC.3.OA.3, CC.3.OA.7

Lesson Objective

Use an array or a multiplication table to find an unknown factor.

Essential Question

How can you use an array or a multiplication table to find an unknown factor?

Materials

- MathBoard
- Math Journal
- Animated Math Models
- HMH Mega Math
- *i*Tools: Number Charts

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to find an unknown factor. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of multiplication tables to develop sound mathematical practices by asking these questions.

- *What happens when there is an unknown in a given equation?*
- *What do you do first and why?*
- *Is there another strategy you could use?*
- *What math vocabulary can you use when solving the given problem?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these multiplication concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 30–35 or 36–40

4 Summarize Approximately 5 min.

Essential Question

How can you use an array or a multiplication table to find an unknown factor?

Array: draw the total number of tiles in equal rows. Use the given factor as the number of rows or the number in each row. Multiplication table: Follow the given factor down or to the right to the product, then go up or to the left to find the unknown factor.

Math Journal

Explain why it does not matter what letter or symbol is used to find an unknown factor.

Problem Solving • Use the Distributive Property

Instructional Time: 1 day

Common Core Standard

CC.3.NBT.3 Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9 × 80, 5 × 60) using strategies based on place value and properties of operations.

Also CC.3.OA.3, CC.3.OA.5, CC.3.OA.7

Lesson Objective

Solve multiplication problems by using the strategy *draw a diagram*.

Essential Question

How can you use the strategy *draw a diagram* to multiply with multiples of 10?

Materials

- MathBoard
- Math Journal

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to use the Distributive Property to solve problems. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of the properties of multiplication to develop sound mathematical practices by asking these questions.

- *What is the problem asking?*
- *How will you use that information?*
- *What model can you use to solve the given problem?*
- *What properties might make the given problem easier to solve? Why?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these problem solving concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 4, 5, 7

4 Summarize Approximately 5 min.

Essential Question

How can you use the strategy *draw a diagram* to multiply with multiples of 10?

I can draw and shade a rectangle on grid paper to show the problem. Then I can break apart a factor to make smaller rectangles for facts I know.

Math Journal

Write a description of how a diagram can help you solve 2 × 40.

Multiplication Strategies with Multiples of 10

Instructional Time: 1 day

Common Core Standard

CC.3.NBT.3 Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9×80, 5×60) using strategies based on place value and properties of operations.

Also CC.3.OA.3, CC.3.OA.5, CC.3.OA.7

Lesson Objective

Use base-ten blocks, a number line, or place value to multiply with multiples of 10.

Essential Question

What strategies can you use to multiply with multiples of 10?

Materials

- MathBoard
- Math Journal
- Real World Video, Ch. 5
- *i*Tools: Base-Ten Blocks
- *i*Tools: Number Lines

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to use different strategies to multiply by multiples of 10. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of multiplication strategies to develop sound mathematical practices by asking these questions.

- *What model could you use to help you solve this problem?*
- *Why did you decide to use the strategy you chose?*
- *Are there other strategies that may work?*
- *How do you know your answer is reasonable?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these multiplication strategies. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 9, 10, 11

4 Summarize Approximately 5 min.

Essential Question

What strategies can you use to multiply with multiples of 10?

Use base ten blocks to show groups of tens blocks, use a number line to show jumps of equal groups or use place value.

Math Journal

Which strategies do you prefer to use to multiply with numbers of 10–base-ten blocks, a number line, or a place value? Explain why.

Multiply Multiples of 10 by 1-Digit Numbers

Instructional Time: 1 day

Common Core Standard

CC.3.NBT.3 Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9 × 80, 5 × 60) using strategies based on place value and properties of operations.

Also CC.3.OA.3, CC.3.OA.7

Lesson Objective

Model and record multiplication with multiples of 10.

Essential Question

How can you model and record multiplying multiples of 10 by 1-digit whole numbers?

Materials

- MathBoard
- Math Journal
- Animated Math Models
- HMH Mega Math
- *i*Tools: Base-Ten Blocks

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to multiply by multiples of 10. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of multiplication to develop sound mathematical practices by asking these questions.

- *What strategy could you use to solve the given problem?*
- *How does your drawing support your work?*
- *What do you remember about regrouping?*
- *What is a situation that could be represented by this equation?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these multiplication concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 22–25 or 26–28

4 Summarize Approximately 5 min.

Essential Question

How can you model and record multiplying multiples of 10 by 1-digit whole numbers?

Use base ten blocks to show groups of tens blocks, or use place value to first multiply the ones, then multiply the tens and record the answer.

Math Journal

Explain how to find 4 × 80. Show your work.

Problem Solving • Model Division

Instructional Time: 1 day

Common Core Standard

CC.3.OA.3 Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

Also CC.3.OA.2

Lesson Objective

Solve division problems by using the strategy *act it out*.

Essential Question

How can you use the strategy *act it out* to solve problems with equal groups?

Materials

- MathBoard
- counters
- Math Journal
- HMH Mega Math
- *i*Tools: Counters

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to use equal groups to solve division problems. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of modeling problems to develop sound mathematical practices by asking these questions.

- *What did you do first? Why?*
- *Which operation did you use to represent the given problem?*
- *Why does that operation represent the given problem?*
- *How do you know your answer is reasonable?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand strategies for dividing. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 5, 7, 8

4 Summarize Approximately 5 min.

Essential Question

How can you use the strategy *act it out* to solve problems with equal groups?

Use objects to model what is going on in the problem.

Math Journal

Write a word problem about equal groups and act it out to solve it.

Size of Equal Groups

Instructional Time: 1 day

Common Core Standard

CC.3.OA.2 Interpret whole-number quotients of whole numbers, e.g., interpret 58 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each.

Also CC.3.OA.3

Lesson Objective

Use models to explore the meaning of partitive (sharing) division.

Essential Question

How can you model a division problem to find how many in each group?

Materials

- MathBoard
- counters
- Math Journal
- Animated Math Models
- HMH Mega Math
- *i*Tools: Base-Ten Blocks

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem ● Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to divide to find how many in each group. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of modeling and division to develop sound mathematical practices by asking these questions.

- *What did you do first? Why?*
- *Why are counters a good model for this problem?*
- *What conclusions can you draw from your model?*
- *How would your model change if you were sorting into 4 boxes?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these division concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 10, 11, 12

4 Summarize Approximately 5 min.

Essential Question

How can you model a division problem to find how many in each group?

I can place counters, one at a time, in each group. Then I can count the number of counters in each group.

Math Journal

Describe how to divide cookies equally between 2 of your friends.

Number of Equal Groups

Instructional Time: 1 day

Common Core Standard

CC.3.OA.2 Interpret whole-number quotients of whole numbers, e.g., interpret 58 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each.

Also CC.3.OA.3

Lesson Objective

Use models to explore the meaning of quotative (measurement) division.

Essential Question

How can you model a division problem to find how many equal groups?

Materials

- MathBoard
- Math Journal
- Animated Math Models
- HMH Mega Math
- *i*Tools: Counters

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to divide to find the number of equal groups. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of modeling and division to develop sound mathematical practices by asking these questions.

- *Have you solved a problem similar to the one given? Describe the similarities.*
- *What model could you use to help you solve the problem?*
- *Why are counters a good model for this problem?*
- *What conclusions can you draw from your model?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these division concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 5, 8, 10

4 Summarize Approximately 5 min.

Essential Question

How can you model a division problem to find how many equal groups?

Draw the total number of counters. Circle counters to make equal groups until all the counters are circled. The number of circles is the number of equal groups.

Math Journal

Write and solve a math problem in which you need to find how many equal groups.

Model with Bar Models

Instructional Time: 1 day

Common Core Standard

CC.3.OA.2 Interpret whole-number quotients of whole numbers, e.g., interpret 58 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each.

Also CC.3.OA.3

Lesson Objective

Model division by using equal groups and bar models.

Essential Question

How can you use bar models to solve division problems?

Materials

- MathBoard
- counters
- Math Journal
- HMH Mega Math
- *i*Tools: Counters
- *i*Tools: Base-Ten Blocks
- Animated Math Models

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to use equal groups and bar models to divide. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of modeling and division to develop sound mathematical practices by asking these questions.

- *Which operation did you use to represent the situation?*
- *Why is a bar model a good model for the given problem?*
- *What conclusions can you draw from your model?*
- *How would your model change if there were only 2 dogs in the class?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these division concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 12, 13, 14

4 Summarize Approximately 5 min.

Essential Question

How can you use bar models to solve division problems?

I can draw a whole separated into equal groups. Then I can find the number in each group.

Math Journal

Describe how to find the number of $4 train tickets you can buy with $32.

Algebra • Relate Subtraction and Division

Instructional Time: 1 day

Common Core Standard

CC.3.OA.3 Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

Also CC.3.OA.2, CC.3.OA.7

Lesson Objective

Use repeated subtraction and a number line to relate subtraction to division.

Essential Question

How is division related to subtraction?

Materials

- MathBoard
- Math Journal
- Real World Video, Ch. 6
- Animated Math Models
- HMH Mega Math
- *i*Tools: Base-Ten Blocks

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to relate division to subtraction. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of subtraction and division to develop sound mathematical practices by asking these questions.

- *Which operation did you use to represent the situation?*
- *Why did you choose that operation?*
- *How can you use a number line to help you find the answer?*
- *How can you use math vocabulary in your explanation?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these division concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 8, 10, 12 or 13–15

4 Summarize Approximately 5 min.

Essential Question

How is division related to subtraction?

You can think of division as repeated subtraction of the divisor.

Math Journal

Explain how you can use subtraction to solve a division problem.

Investigate • Model with Arrays

Instructional Time: 1 day

Common Core Standard

CC.3.OA.3 Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

Also CC.3.OA.2

Lesson Objective

Model division by using arrays.

Essential Question

How can you use arrays to solve division problems?

Materials

- MathBoard
- square tiles
- Math Journal
- *i*Tools: Counters

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Investigate • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to use arrays to divide. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of modeling and division to develop sound mathematical practices by asking these questions.

- *Why are arrays a good model for the given problem?*
- *What conclusions can you draw from your model?*
- *How would your model change if you make only 3 rows?*
- *What equation could represent the given situation?*

3 Practice

Share and Show Approximately 20 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

Students can begin independent practice once they understand these division concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 8, 10, 11

4 Summarize Approximately 5 min.

Essential Question

How can you use arrays to solve division problems?

I can find how many equal groups by placing that number of tiles in each row of an array until all tiles are used. The number of rows is the answer. I can divide the tiles into a number of rows, placing 1 tile at a time in each row, until all the tiles are used. The number of tiles in each row is the answer.

Math Journal

Draw an array to show how to arrange 20 chairs into 5 equal rows. Explain what each part of the array represents.

Algebra • Relate Multiplication and Division

Instructional Time: 1 day

Note: The instructional time for this lesson can also be 2 days. Use the extra time for students to model Unlock the Problem with counters and model On Your Own exercises in class.

Common Core Standard

CC.3.OA.6 Understand division as an unknown-factor problem.

Also CC.3.OA.2, CC.3.OA.3, CC.3.OA.4, CC.3.OA.7

Lesson Objective

Use bar models and arrays to relate multiplication and division as inverse operations.

Essential Question

How can you use multiplication to divide?

Materials

- MathBoard
- Math Journal
- Animated Math Models
- *i*Tools: Counters
- *i*Tools: Number Charts

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk

Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to relate multiplication and division as inverse operations. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of multiplication and division to develop sound mathematical practices by asking these questions.

- *Which operation did you use to represent the situation?*
- *Why is a bar model a good model for the given problem?*
- *What conclusions can you draw from your model?*
- *How do you know your answer is reasonable?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these multiplication and division concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 16–21 or 22–24

4 Summarize Approximately 5 min.

Essential Question

How can you use multiplication to divide?

Possible answer: dividing is like finding the unknown factor in a multiplication problem. Use the product as the dividend and one of the factors as the divisor. The other factor is the quotient.

Algebra • Write Related Facts

Instructional Time: 1 day

Common Core Standard

CC.3.OA.7 Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g. knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.

Also CC.3.OA.2, CC.3.OA.3

Lesson Objective

Write related multiplication and division facts.

Essential Question

How can you write a set of related multiplication and division facts?

Materials

- MathBoard
- square tiles
- Math Journal
- Animated Math Models
- *i*Tools: Counters

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to write related multiplication and division equations. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of multiplication and division to develop sound mathematical practices by asking these questions.

- *What model could you use to help you solve the problem?*
- *Why is an array a good model?*
- *What conclusions can you draw from your model?*
- *How would your model change if you used 12 tiles?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these multiplication and division concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 18, 19, 20

4 Summarize Approximately 5 min.

Essential Question

How can you write a set of related multiplication and division facts?

The product in a multiplication fact is the dividend in a division fact. The factors in a multiplication fact are the same as the divisor and quotient in the division facts.

Math Journal

Write a division fact. Write the rest of the related facts.

Algebra • Division Rules for 1 and 0

Instructional Time: 1 day

Common Core Standard

CC.3.OA.5 Apply properties of operations as strategies to multiply and divide.

Also CC.3.OA.2, CC.3.OA.3, CC.3.OA.7

Lesson Objective

Divide using the rules for 1 and 0.

Essential Question

What are the rules for dividing with 1 and 0?

Materials

- MathBoard
- square tiles
- Math Journal
- Animated Math Models
- *i*Tools: Counters

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to divide using the rules for 1 and 0. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of division to develop sound mathematical practices by asking these questions.

- *Have you solved a problem similar to the one given? Describe the similarities.*
- *What properties did you use to find your answer?*
- *How do you know your answer is reasonable?*
- *How can you use math vocabulary in your explanation?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these division concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 26, 27, 28

4 Summarize Approximately 5 min.

Essential Question

What are the rules for dividing with 1 and 0?

Any number divided by 1 equals that number. Any number (except 0) divided by itself equals 1. Zero divided by any number (except 0) equals 0. You cannot divide by 0.

Math Journal

Compare and contrast the multiplication rules for 1 and 0 with the division rules for 1 and 0.

Divide by 2

Instructional Time: 1 day

Common Core Standard

CC.3.OA.3 Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

Also CC.3.OA.2, CC.3.OA.7

Lesson Objective

Use models to represent division by 2.

Essential Question

What does dividing by 2 mean?

Materials

- MathBoard Models
- counters
- Math Journal
- Animated Math
- HMH Mega Math
- *i*Tools: Counters

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to use models to divide by 2. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of modeling and division to develop sound mathematical practices by asking these questions.

- *Which operation did you choose to represent the situation?*
- *Why are counters a good model for this problem?*
- *What conclusion can you draw from your model?*
- *How would your model change if you used 20 counters?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these modeling and division concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 17– 20 or 21–23

4 Summarize Approximately 5 min.

Essential Question

What does dividing by 2 mean?

Possible answer: dividing a number into 2 equal groups or into groups of 2

Math Journal

Explain how to divide an amount by 2. Use the terms *dividend, divisor,* and *quotient*.

Divide by 10

Instructional Time: 1 day

Common Core Standard

CC.3.OA.7 Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g. knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.

Also CC.3.OA.2, CC.3.OA.3, CC.3.OA.4, CC.3.OA.6

Lesson Objective

Use repeated subtraction, a number line, or a multiplication table to divide by 10.

Essential Question

What strategies can you use to divide by 10?

Materials

- MathBoard
- Math Journal
- *i*Tools: Counters
- *i*Tools: Number Lines
- HMH Mega Math

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to use different strategies to divide by 10. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of division strategies to develop sound mathematical practices by asking these questions.

- *Have you solved a problem similar to the one given? Describe the similarities.*
- *How does a number line help you to divide?*
- *How does a multiplication chart help you to divide?*
- *How can you use math vocabulary in your explanation?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these division strategies . Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 24–29 or 30–32

4 Summarize Approximately 5 min.

Essential Question

What strategies can you use to divide by 10?

Possible answers: use repeated subtraction, jumps on a number line, or a multiplication table.

Math Journal

Write and solve a word problem that involves dividing by 10.

Divide by 5

Instructional Time: 1 day

Common Core Standard

CC.3.OA.3 Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

Also CC.3.OA.2, CC.3.OA.7

Lesson Objective

Count up by 5s, count back on a number line, or use 10s facts and doubles to divide by 5.

Essential Question

What does dividing by 5 mean?

Materials

- MathBoard
- Math Journal
- Animated Math Models
- HMH Mega Math
- *i*Tools: Counters
- *i*Tools: Number Lines

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to use different strategies to divide by 5. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of division strategies to develop sound mathematical practices by asking these questions.

- *Have you solved a problem similar to the one given? Describe the similarities.*
- *Which operation did you use to represent the situation?*
- *Why did you choose that operation?*
- *What strategies can you use to solve the problem?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these division strategies. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 23, 24, 26

4 Summarize Approximately 5 min.

Essential Question

What does dividing by 5 mean?

Dividing by 5 means that you are making equal groups of 5.

Math Journal

Write about which method you prefer to use to divide by 5—counting up, counting back on a number line, or dividing by 10, and then doubling the quotient. Explain why.

Divide by 3

Instructional Time: 1 day

Common Core Standard

CC.3.OA.7 Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g. knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.

Also CC.3.OA.2, CC.3.OA.3, CC.3.OA.4, CC.3.OA.6

Lesson Objective

Use equal groups, a number line, or a related multiplication fact to divide by 3.

Essential Question

What strategies can you use to divide by 3?

Materials

- MathBoard
- Math Journal
- Real World Video, Ch. 7
- Animated Math Models
- *i*Tools: Counters
- *i*Tools: Number Lines

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to use different strategies to divide by 3. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of division strategies to develop sound mathematical practices by asking these questions.

- *Why are counters a good model for the given problem?*
- *What conclusions can you draw from your model?*
- *Will that method always work?*
- *What is another method you could use?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these division strategies. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 30–35 or 36–38

4 Summarize Approximately 5 min.

Essential Question

What strategies can you use to divide by 3?

Possible answers: make equal groups of 3 with counters, count back by 3s on a number line, use a related multiplication fact.

Math Journal

Explain how to divide an amount by 3.

Divide by 4

Instructional Time: 1 day

Common Core Standard

CC.3.OA.7 Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g. knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.

Also CC.3.OA.2, CC.3.OA.3, CC.3.OA.4, CC.3.OA.5, CC.3.OA.6

Lesson Objective

Use an array, equal groups, factors, or a related multiplication fact to divide by 4.

Essential Question

What strategies can you use to divide by 4?

Materials

- MathBoard
- Math Journal
- Animated Math Models
- HMH Mega Math
- *i*Tools: Counters
- *i*Tools: Number Charts

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to use different strategies to divide by 4. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of division strategies to develop sound mathematical practices by asking these questions.

- *Why is an array a good model for the division?*
- *Why are counters a good model for division?*
- *What conclusions can you draw from your models?*
- *What is another method you could use to solve the given problem?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these division strategies. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 32–39 or 40–42

4 Summarize Approximately 5 min.

Essential Question

What strategies can you use to divide by 4?

Possible answers: make an array, make equal groups, use factors of 4: 2 and 2, and use a related multiplication fact.

Math Journal

Write and solve a word problem that involves dividing by 4.

Divide by 6

Instructional Time: 1 day

Common Core Standard

CC.3.OA.7 Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g. knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.

Also CC.3.OA.2, CC.3.OA.3, CC.3.OA.4, CC.3.OA.5, CC.3.OA.6

Lesson Objective

Use equal groups, a related multiplication fact, or factors to divide by 6.

Essential Question

What strategies can you use to divide by 6?

Materials

- MathBoard
- Math Journal
- Animated Math Models
- HMH Mega Math
- *i*Tools: Counters
- *i*Tools: Number Charts

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to use different strategies to divide by 6. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of division strategies to develop sound mathematical practices by asking these questions.

- *Have you solved a problem similar to this one? Describe the similarities.*
- *Why are counters a good model for the given problem?*
- *What conclusions can you draw from your model?*
- *What is another method for the solving the given problem?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these division strategies. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 28–35 or 36–38

4 Summarize Approximately 5 min.

Essential Question

What strategies can you use to divide by 6?

Possible answers: make equal groups, use a related multiplication fact, or use factors.

Math Journal

Which strategy would you use to divide 36 ÷ 6? Explain why you chose that strategy.

Divide by 7

Instructional Time: 1 day

Common Core Standard

CC.3.OA.7 Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g. knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.

Also CC.3.OA.2, CC.3.OA.3, CC.3.OA.4, CC.3.OA.6

Lesson Objective

Use an array, a related multiplication fact, or equal groups to divide by 7.

Essential Question

What strategies can you use to divide by 7?

Materials

- MathBoard
- Math Journal
- Animated Math Models
- HMH Mega Math
- *i*Tools: Counters
- *i*Tools: Number Charts

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to use different strategies to divide by 7. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of division strategies to develop sound mathematical practices by asking these questions.

- *Have you solved a problem similar to the one given? Describe the similarities.*
- *Why is an array a good model for division?*
- *What conclusions can you draw from your model?*
- *What is another model you could use for the given problem?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these division strategies. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 29, 32, 33

4 Summarize Approximately 5 min.

Essential Question

What strategies can you use to divide by 7?

Possible answers: make an array, use a related multiplication fact, make equal groups.

Math Journal

Describe how to find the number of weeks equal to 56 days.

Divide by 8

Instructional Time: 1 day

Common Core Standard

CC.3.OA.4 Determine the unknown whole number in a multiplication or division equation relating three whole numbers.

Also CC.3.OA.2, CC.3.OA.3, CC.3.OA.6, CC.3.OA.7

Lesson Objective

Use repeated subtraction, a related multiplication fact, or a multiplication table to divide by 8.

Essential Question

What strategies can you use to divide by 8?

Materials

- MathBoard
- Math Journal
- Animated Math Models
- HMH Mega Math
- *i*Tools: Counters
- *i*Tools: Number Charts

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to use different strategies to divide by 8. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of division strategies to develop sound mathematical practices by asking these questions.

- *How can a multiplication table help you solve the given problem?*
- *What is another strategy for solving the given problem?*
- *Have you solved a similar problem? Describe the similarities.*
- *Will that method always work?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these division strategies. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 28–31 or 32–34

4 Summarize Approximately 5 min.

Essential Question

What strategies can you use to divide by 8?

Possible answers: repeated subtraction, a related multiplication fact, or the multiplication table

Math Journal

Describe which strategy would you use to divide 48 by 8.

Divide by 9

Instructional Time: 1 day

Common Core Standard

CC.3.OA.7 Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g. knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.

Also CC.3.OA.2, CC.3.OA.3, CC.3.OA.4, CC.3.OA.5, CC.3.OA.6

Lesson Objective

Use equal groups, factors, or related multiplication fact to divide by 9.

Essential Question

What strategies can you use to divide by 9?

Materials

- MathBoard
- Math Journal
- HMH Mega Math
- *i*Tools: Counters
- *i*Tools: Number Charts

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to use different strategies to divide by 9. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of division strategies to develop sound mathematical practices by asking these questions.

- *Have you solved a problem similar to this one? Describe the similarities.*
- *Why are counters a good model for this problem?*
- *What is another method you could use to solve the given problem?*
- *Will that method always work?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these division strategies. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 36, 38, 39

4 Summarize Approximately 5 min.

Essential Question

What strategies can you use to divide by 9?

Make equal groups, use relate multiplication facts, and use factors.

Math Journal

Explain which division facts were the easiest for you to learn.

Problem Solving • Two-Step Problems

Instructional Time: 1 day

Common Core Standard

CC.3.OA.8 Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

Also CC.3.OA.2, CC.3.OA.3, CC.3.OA.7

Lesson Objective

Solve two-step problems by using the strategy *act it out*.

Essential Question

How can you use the strategy *act it out* to solve two-step problems?

Materials

- MathBoard
- Math Journal
- *i*Tools: Counters

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to solve two-step division problems. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of division to develop sound mathematical practices by asking these questions.

- *What did you do first? Why?*
- *What strategy could you use to help you solve the given problem?*
- *Why are counters a good model for the given problem?*
- *What would happen if you divided before subtracting in the given problem?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand how to solve two-step problems. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 5, 6, 7

4 Summarize Approximately 5 min.

Essential Question

How can you use the strategy *act it out* to solve two-step problems?

I can act out the problem by using counters, or by writing descriptions, making drawings, or writing equations. It organizes what I am doing and helps me see the steps. It also makes checking my work easy.

Math Journal

Write a division word problem and explain how to solve it by acting it out.

Investigate • Order of Operations

Instructional Time: 1 day

Note: The instructional time for this lesson can also be 2 days. On Day 1, complete Draw Conclusions, Make Connections, and Share and Show. On Day 2, complete Connect to Science and Extend the Math.

Common Core Standard

CC.3.OA.8 Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

Also CC.3.OA.1, CC.3.OA.2, CC.3.OA.3, CC.3.OA.7

Lesson Objective

Perform operations in order when there are no parentheses.

Essential Question

Why are there rules such as the order of operations?

Materials

- MathBoard
- Math Journal

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Investigate • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to use the correct order of operations to solve equations. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of mathematical operations to develop sound mathematical practices by asking these questions.

- *How can you use math vocabulary in your explanation?*
- *What do you think will happen if you don't follow the order of operations?*
- *What did you do first? Why?*
- *How do you know your answer is reasonable?*

3 Practice

Share and Show Approximately 20 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

Students can begin independent practice once they understand the correct order of operations. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 16–20

4 Summarize Approximately 5 min.

Essential Question

Why are there rules such as the order of operations?

The rules make sure that the answer is the same no matter who completes the equation.

Math Journal

Give a description of the rules for the order of operations in your own words.

Equal Parts of a Whole

Instructional Time: 1 day

Common Core Standard

CC.3.NF.1 Understand a fraction $\frac{1}{b}$ as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction $\frac{a}{b}$ as the quantity formed by a parts of size $\frac{1}{b}$.

Also CC.3.G.2

Lesson Objective

Explore and identify equal parts of a whole.

Essential Question

What are equal parts of a whole?

Materials

- MathBoard
- Animated Math Models
- Math Journal
- *i*Tools: Fractions

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to identify equal parts of a whole. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of partitive (sharing) division to develop sound mathematical practices by asking these questions.

- *What is the given problem asking?*
- *What would happen if each of the sandwich pieces were cut evenly, again?*
- *How could you use math vocabulary in your discussion or answers?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand the concept of equal parts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 13, 14, 16, 19 or 20–24

4 Summarize Approximately 5 min.

Essential Question

What are equal parts of a whole?

Equal parts are parts that are exactly the same size, but they do not need to be the same shape.

Math Journal

Describe how 4 friends could share a sandwich equally.

Equal Shares

Instructional Time: 1 day

Common Core Standard

CC.3.NF.1 Understand a fraction $\frac{1}{b}$ as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction $\frac{a}{b}$ as the quantity formed by a parts of size $\frac{1}{b}$.

Also CC.3.G.2

Lesson Objective

Divide models to make equal shares.

Essential Question

Why do you need to know how to make equal shares?

Materials

- MathBoard
- Math Journal
- HMH Mega Math
- *i*Tools: Fractions

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to divide models to make equal shares. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of models and division to develop sound mathematical practices by asking these questions.

- *What strategy can you use to solve the given problem?*
- *Why did you choose that method for dividing?*
- *What math vocabulary can you use in your answer?*
- *How do you know your answer is reasonable?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these division concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 5, 6, 8

4 Summarize Approximately 5 min.

Essential Question

Why do you need to know how to make equal shares?

Possible answer: when I want to share food equally, I need to know how to divide it into equal parts so that everyone gets the same amount.

Math Journal

Draw a diagram to show 3 pizzas shared equally among 6 friends.

Unit Fractions of a Whole

Instructional Time: 1 day

Common Core Standard

CC.3.NF.1 Understand a fraction $\frac{1}{b}$ as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction $\frac{a}{b}$ as the quantity formed by a parts of size $\frac{1}{b}$.

Also CC.3.G.2

Lesson Objective

Use a fraction to name one part of a whole that is divided into equal parts.

Essential Question

What do the top and the bottom numbers of a fraction tell?

Materials

- MathBoard
- Math Journal
- Animated Math Models
- HMH Mega Math
- *i*Tools: Fractions

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to use unit fractions to find a whole. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of equal parts of wholes to develop sound mathematical practices by asking these questions.

- *What is the given problem asking?*
- *Have you solved a problem similar to this one? Describe the similarities.*
- *How could you model a situation similar to this one?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these fraction concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 13, 14, 17 or 18–22

4 Summarize Approximately 5 min.

Essential Question

What do the top and the bottom numbers of a fraction tell?

The top number tells how many equal parts are being counted. The bottom number tells how many equal parts are in the whole.

Math Journal

Draw a picture to show what 1 out of 3 equal parts looks like. Then write the fraction.

Fractions of a Whole

Instructional Time: 1 day

Common Core Standard

CC.3.NF.1 Understand a fraction $\frac{1}{b}$ as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction $\frac{a}{b}$ as the quantity formed by a parts of size $\frac{1}{b}$.

Also CC.3.G.2

Lesson Objective

Read, write, and model fractions that represent more than one part of a whole that is divided into equal parts.

Essential Question

How does a fraction name part of a whole?

Materials

- MathBoard
- Math Journal
- Animated Math Models
- HMH Mega Math
- *i*Tools: Fractions

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to name equal parts of a whole. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of fractions to develop sound mathematical practices by asking these questions.

- *What conclusions can you draw from the given models?*
- *How can you use math vocabulary in your response?*
- *What happens if more pieces are shaded? Fewer pieces?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these fraction concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 8, 10, 11, 15 or 17–20

4 Summarize Approximately 5 min.

Essential Question

How does a fraction name part of a whole?

The numerator tells how many equal parts are being counted, the denominator tells how many total parts there are.

Math Journal

Draw a rectangle and divide it into 4 equal parts. Shade 3 parts. Then write the fraction that names the shaded part.

Fractions on a Number Line

Instructional Time: 1 day

Common Core Standard

CC.3.NF.2a Represent a fraction $\frac{1}{b}$ on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part size $\frac{1}{b}$ and that the endpoint of the part based at 0 locates the number $\frac{1}{b}$ on the number line.

Also CC.3.NF.2b, CC.3.NF.2

Lesson Objective

Represent and locate fractions on a number line.

Essential Question

How can you represent and locate fractions on a number line?

Materials

- MathBoard
- Fraction Strips
- Math Journal
- HMH Mega Math
- *i*Tools: Fractions

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to locate and name fractions on the number line. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of the number line and fractions to develop sound mathematical practices by asking these questions.

- *What is the given problem asking you to find?*
- *Can you tell us a different method for finding the fraction?*
- *Can you use math vocabulary in your answer?*
- *How is the number line like a fraction strip? A fraction circle?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these fraction concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 7, 8, 9, 10

4 Summarize Approximately 5 min.

Essential Question

How can you represent and locate fractions on a number line?

I divide the number line into equal lengths, and draw a mark on the line at the end of each equal length. To locate a fraction, I use the numerator to count the number of equal lengths.

Math Journal

Explain how showing fractions with models and a number line are alike and different.

Relate Fractions and Whole Numbers

Instructional Time: 1 day

Common Core Standard

CC.3.NF.3c Explain equivalences of fractions in special cases, and compare fractions by reasoning about their size. Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. *Examples: Express 3 in the form $3 = \frac{3}{1}$; recognize that $\frac{6}{1} = 6$; locate $\frac{4}{4}$ and 1 at the same point of a number line diagram.*

Also CC.3.NF.2, CC.3.NF.2a, CC.3.NF.2b, CC.3.G.2

Lesson Objective

Relate fractions and whole numbers by expressing whole numbers as fractions and recognizing fractions that are equivalent to whole numbers.

Essential Question

When might you use a fraction greater than 1 or a whole number?

Materials

- MathBoard
- Fraction Strips
- Math Journal
- Animated Math Models
- HMH Mega Math
- *i*Tools: Fractions

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to relate fractions and whole numbers. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of fractions and whole numbers to develop sound mathematical practices by asking these questions.

- *What is a situation that could be represented by this number line?*
- *How would you change your model if there were 8 equal parts? 10?*
- *How do you know your answer is reasonable?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these fraction concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 8–11 or 12–16

4 Summarize Approximately 5 min.

Essential Question

When might you use a fraction greater than 1 or a whole number?

Possible answer: when I am describing things such as whole pizzas that are divided into equal slices or the slices that make up one whole pizza.

Math Journal

Write a problem that uses a fraction greater than 1.

Fractions of a Group

Instructional Time: 1 day

Common Core Standard

CC.3.NF.1 Understand a fraction $\frac{1}{b}$ as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction $\frac{a}{b}$ as the quantity formed by a parts of size $\frac{1}{b}$.

Lesson Objective

Model, read, and write fractional parts of a group.

Essential Question

How can a fraction name part of a group?

Materials

- MathBoard
- Math Journal
- Animated Math Models
- HMH Mega Math
- *i*Tools: Fractions

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to a fraction to name part of a group. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of fractional parts to develop sound mathematical practices by asking these questions.

- *What do you remember about parts of a whole?*
- *What is the given problem asking?*
- *Why is the muffin pan a good model for this problem?*
- *What happens when the denominator is smaller than the numerator?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these fraction concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 10, 11, 13, 14 or 15–17

4 Summarize Approximately 5 min.

Essential Question

How can a fraction name part of a group?

You can use the total number in the group or the number of subgroups for the denominator. The numerator is the number of objects or subgroups you are counting.

Math Journal

Draw a set of objects where you can find a fractional part of the group using the total number of objects and by using subgroups.

Finding Part of a Group Using Unit Fractions

Instructional Time: 1 day

Common Core Standard

CC.3.NF.1 Understand a fraction $\frac{1}{b}$ as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction $\frac{a}{b}$ as the quantity formed by a parts of size $\frac{1}{b}$.

Lesson Objective

Find fractional parts of a group using unit fractions.

Essential Question

How can a fraction tell how many are in part of a group?

Materials

- MathBoard
- two-color counters
- Math Journal
- HMH Mega Math
- *i*Tools: Fractions

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to use unit fractions to find part of a group. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of fractional parts to develop sound mathematical practices by asking these questions.

- *What do you remember about the process of multiplication? Division?*
- *What is the given problem asking you to do?*
- *Will the method shown always work?*
- *How is the method like division?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these fraction concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 13–15 or 16–18

4 Summarize Approximately 5 min.

Essential Question

How can a fraction tell how many are in part of a group?

Use the denominator to find how many smaller, equal groups to divide the total number in the group into. Then use the numerator to find how many groups to count. Count the total number of objects in those groups.

Math Journal

Explain how to find which is greater: $\frac{1}{4}$ of 12 or $\frac{1}{3}$ of 12.

Problem Solving • Find the Whole Group Using Unit Fractions

Instructional Time: 1 day

Note: The instructional time for this lesson can also be 2 days. Use the extra time for students to work together with counters to complete Try Another Problem. Allow students to reason and self-correct. Complete Share and Show exercises 1 and 2 as a class.

Common Core Standard

CC.3.NF.1 Understand a fraction $\frac{1}{b}$ as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction $\frac{a}{b}$ as the quantity formed by a parts of size $\frac{1}{b}$.

Lesson Objective

Solve fraction problems by using the strategy *draw a diagram*.

Essential Question

How can you use the strategy *draw a diagram* to solve fraction problems?

Materials

- MathBoard
- Math Journal
- Real World Video, Ch. 8
- HMH Mega Math
- *i*Tools: Fractions

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to use unit fractions to find the whole group. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of fractions to develop sound mathematical practices by asking these questions.

- *What strategy can you use to solve the given problem?*
- *Which operation did you use to represent the situation?*
- *What happens when the denominator changes?*
- *How can you use math vocabulary in your answer?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand how to draw a diagram to find the whole group. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 5, 6, 7

4 Summarize Approximately 5 min.

Essential Question

How can you use the strategy *draw a diagram* to solve fraction problems?

I can draw a diagram to represent all of the equal groups in a whole. Then I can draw the number of objects in each group. Finally, I can add or multiply to find how many objects are in the whole.

Problem Solving • Compare Fractions

Instructional Time: 1 day

Common Core Standard

CC.3.NF.3d Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.

Also CC.3.NF.1

Lesson Objective

Solve comparison problems by using the strategy *act it out*.

Essential Question

How can you use the strategy *act it out* to solve comparison problems?

Materials

- MathBoard
- Fraction Circles
- Fraction Strips
- Math Journal
- Animated Math Models
- HMH Mega Math
- *i*Tools: Fractions

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to solve comparison problems with fractions. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of fractions to develop sound mathematical practices by asking these questions.

- *What do you remember about numerators and denominators?*
- *What strategy can you use?*
- *What conclusions can you draw from your model?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand how to compare fractions. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 4, 6, 7

4 Summarize Approximately 5 min.

Essential Question

How can you use the strategy *act it out* to solve comparison problems?

To compare fractions, I can use fraction strips or fraction circles to represent each fraction and compare the models.

Math Journal

Explain how you can find whether $\frac{5}{6}$ or $\frac{5}{8}$ is greater.

Compare Fractions with the Same Denominator

Instructional Time: 1 day

Common Core Standard

CC.3.NF.3d Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.

Also CC.3.NF.1, CC.3.NF.2b

Lesson Objective

Compare fractions with the same denominator by using models and reasoning strategies.

Essential Question

How can you compare fractions with the same denominator?

Materials

- MathBoard
- Math Journal
- *i*Tools: Fractions
- *i*Tools: Number Lines
- HMH Mega Math

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to compare fractions of a whole and fractions of a group when the denominators are the same. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of fractions to develop sound mathematical practices by asking these questions.

- *What model did you choose to solve the given problem? Why was this the best choice?*
- *What conclusions can you draw from your model?*
- *How can you use math vocabulary in your answer?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand fraction comparison strategies. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 10–13 or 14, 15, 17

4 Summarize Approximately 5 min.

Essential Question

How can you compare fractions with the same denominator?

I can use fraction strips to model each fraction and show their locations on a number line. Then, I can compare the lengths to find the greater fraction.

Math Journal

Explain how you can use reasoning to compare two fractions with the same denominator.

Compare Fractions with the Same Numerator

Instructional Time: 1 day

Common Core Standard

CC.3.NF.3d Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.

Also CC.3.NF.1

Lesson Objective

Compare fractions with the same numerator by using models and reasoning strategies.

Essential Question

How can you compare fractions with the same numerator?

Materials

- MathBoard
- Math Journal
- Animated Math Models
- HMH Mega Math
- *i*Tools: Fractions

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to compare fractions with the same numerator. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of modeling and fractions to develop sound mathematical practices by asking these questions.

- *Have you solved a problem similar to this one? What is different?*
- *What might be a good model for this problem?*
- *What will you do first? Why?*
- *How do you know your answer is reasonable?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these fraction comparison concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 13, 14, 16

4 Summarize Approximately 5 min.

Essential Question

How can you compare fractions with the same numerator?

I can look at the denominator and compare the size of the pieces. The fraction with the greater denominator has smaller pieces so it is the lesser fraction.

Math Journal

Explain how the number of pieces in a whole relates to the size of each piece.

Compare Fractions

Instructional Time: 1 day

Common Core Standard

CC.3.NF.3d Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.

Also CC.3.NF.1, CC.3.NF.3

Lesson Objective

Compare fractions by using models and strategies involving the size of the pieces in the whole.

Essential Question

What strategies can you use to compare fractions?

Materials

- MathBoard
- Math Journal
- Animated Math Models
- HMH Mega Math
- *i*Tools: Fractions

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to use strategies to compare the sizes of pieces in a whole. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of comparing fractions to develop sound mathematical practices by asking these questions.

- *What do you remember about fractions with the same denominator? Numerator?*
- *What is the problem asking?*
- *What strategy will work best for the given problem?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these fraction comparison concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 11, 14, 16

4 Summarize Approximately 5 min.

Essential Question

What strategies can you use to compare fractions?

I can use the missing pieces strategy, the same numerator strategy or the same denominator strategy to compare fractions.

Math Journal

Explain how to use the missing pieces strategy to compare two fractions. Include a diagram with your explanation.

Compare Fractions

Instructional Time: 1 day

Note: The instructional time for this lesson can also be 2 days. On Day 1, complete Activity 1 and Activity 2. On Day 2, complete Extend the Math, and Share and Show.

Common Core Standard

CC.3.NF.3d Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.

Also CC.3.NF.1

Lesson Objective

Compare and order fractions by using models and reasoning strategies.

Essential Question

How can you compare and order fractions?

Materials

- MathBoard
- color pencils
- Math Journal
- Real World Video, Ch. 9
- *i*Tools: Fractions

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to compare and order fractions. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of comparing fractions to develop sound mathematical practices by asking these questions.

- *What do you remember about comparing fractions?*
- *How will you use that information?*
- *What method will you use to order the given fractions?*
- *Will that method always work?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand comparing and ordering fractions. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 7, 10, 11 or 12–14

4 Summarize Approximately 5 min.

Essential Question

How can you compare and order fractions?

If the denominators are the same, you can compare the numerators to order the number of pieces. If the numerators are the same you can compare the denominators to order the size of the pieces.

Math Journal

Describe how fraction strips can help you order fractions.

Investigate • Model Equivalent Fractions

Instructional Time: 1 day

Common Core Standard

CC.3.NF.3a Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.

Also CC.3.NF.1, CC.3.NF.2a, CC.3.NF.2b, CC.3.NF.3, CC.3.NF.3b, CC.3.NF.3c, CC.3.G.2

Lesson Objective

Model equivalent fractions by folding paper, using area models, and using number lines.

Essential Question

How can you use models to find equivalent fractions?

Materials

- MathBoard
- sheet of paper
- crayon or color pencil
- Fraction Strips
- Math Journal
- Animated Math Models
- HMH Mega Math
- *i*Tools: Fractions

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Investigate • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to find equivalent fractions. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of modeling and fractions to develop sound mathematical practices by asking these questions.

- *What is the problem asking?*
- *What strategy will you try?*
- *Is there another strategy you could use to solve the problem?*
- *What conclusions can you draw from your model?*

3 Practice

Share and Show Approximately 20 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

Students can begin independent practice once they understand these fraction concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 5, 6, 7

4 Summarize Approximately 5 min.

Essential Question

How can you use models to find equivalent fractions?

I can fold my paper in half and label one part $\frac{1}{2}$. I can fold it again to make more equal parts. I can label each of the folded parts and compare the parts to find equivalent fractions.

Math Journal

Draw a number line that shows two equivalent fractions. Label your number line and explain how you know the fractions are equivalent.

Equivalent Fractions

Instructional Time: 1 day

Common Core Standard

CC.3.NF.3b Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. Recognize and generate simple equivalent fractions, e.g., $\frac{1}{2} = \frac{2}{4}$, $\frac{4}{6} = \frac{2}{3}$. Explain why the fractions are equivalent, e.g. by using a visual fraction model.

Also CC.3.NF.1, CC.3.NF.2a, CC.3.NF.2b, CC.3.NF.3, CC.3.NF.3b, CC.3.NF.3c, CC.3.G.2

Lesson Objective

Generate equivalent fractions by using models.

Essential Question

How can you use models to name equivalent fractions?

Materials

- MathBoard
- Math Journal
- Animated Math Models
- HMH Mega Math
- *i*Tools: Fractions

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Investigate • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to name equivalent fractions. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of modeling and fractions to develop sound mathematical practices by asking these questions.

- *What is the problem asking?*
- *What do you remember about comparing fractions?*
- *What strategy can you use to solve the problem?*
- *How do you know your answer makes sense?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these fraction concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 10–12 or 13–16

4 Summarize Approximately 5 min.

Essential Question

How can you use models to name equivalent fractions?

I can shade models and draw pictures to show equal parts.

Math Journal

Explain how you can find a fraction that is equivalent to $\frac{1}{4}$.

Time to the Minute

Instructional Time: 1 day

Common Core Standard

CC.3.MD.1 Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.

Lesson Objective

Read, write, and tell time on analog and digital clocks to the nearest minute.

Essential Question

How can you tell the time to the nearest minute?

Materials

- MathBoard
- Math Journal
- HMH Mega Math
- *i*Tools: Measurement
- Animated Math Models

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to tell time to the nearest minute. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of telling time to develop sound mathematical practices by asking these questions.

- *What do you remember about telling time?*
- *What strategy could you use to make telling time easier?*
- *Will that method always work?*
- *How do you know?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these time measurement concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 6, 9, 11 or 12–15

4 Summarize Approximately 5 min.

Essential Question

How can you tell the time to the nearest minute?

Name the hour, and then count by fives and ones to where the minute hand is pointing.

Math Journal

Draw a clock showing a time to the nearest minute. Write the time as many different ways as you can.

A.M. and P.M.

Instructional Time: 1 day

Common Core Standard

CC.3.MD.1 Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.

Lesson Objective

Describe when to use A.M. and P.M. when telling time to the nearest minute.

Essential Question

How can you tell when to use A.M. and P.M. with time?

Materials

- MathBoard
- Math Journal
- Animated Math Models
- *i*Tools: Measurement

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to use A.M. and P.M. when telling time. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of time to develop sound mathematical practices by asking these questions.

- *Have you solved a problem similar to this one? Describe the similarities.*
- *What tool could you use to help you solve this problem?*
- *Why is a number line a good model for this problem?*
- *How can you use math vocabulary in your explanation?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these time measurement concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 15–17

4 Summarize Approximately 5 min.

Essential Question

How can you tell when to use A.M. and P.M. with time?

Possible answer: Times in the A.M. are after midnight and before noon and are times in the morning. Times in P.M. are after noon and before midnight and are times in the afternoon or evening.

Math Journal

Write your schedule for today. List each activity with its starting time. Write A.M. or P.M. for each time.

Measure Time Intervals

Instructional Time: 1 day

Common Core Standard

CC.3.MD.1 Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.

Lesson Objective

Use a number line or an analog clock to measure time intervals in minutes.

Essential Question

How can measure elapsed time in minutes?

Materials

- MathBoard
- Math Journal
- Animated Math Models
- *i*Tools: Number Lines
- *i*Tools: Measurement

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to use the number line or a clock to measure time intervals. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of measuring time to develop sound mathematical practices by asking these questions.

- *What do you remember about using mental math to add numbers?*
- *What tool could you use to help you solve this problem?*
- *Why is a number line a good tool for this problem?*
- *What is a different method you could use to solve this problem?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these time measurement concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 4, 6, 7 or 8–10

4 Summarize Approximately 5 min.

Essential Question

How can you measure elapsed time in minutes?

Possible answer: find the starting time. Then use a number line, analog clock, or subtraction to count the minutes to the ending time.

Math Journal

Describe two different methods to find the elapsed time from 2:30 P.M. to 2:58 P.M.

Use Time Intervals

Instructional Time: 1 day

Common Core Standard

CC.3.MD.1 Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.

Also CC.3.NBT.2

Lesson Objective

Use a number line or an analog clock to add or subtract time intervals to find starting times or ending times.

Essential Question

How can you find a starting time or an ending time when you know the elapsed time?

Materials

- MathBoard
- Math Journal
- Real World Video, Ch. 10
- Animated Math Models
- *i*Tools: Number Lines
- *i*Tools: Measurement

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to find starting or ending times when they know the elapsed time. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of measuring time to develop sound mathematical practices by asking these questions.

- *Have you solved a problem similar to this one? Describe the similarities.*
- *What tool could you use to help solve the given problem?*
- *Why is a number line a good tool for the given problem?*
- *Will that method always work?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these time measurement concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 7–9

4 Summarize Approximately 5 min.

Essential Question

How can you find a starting time or an ending time when you know the elapsed time?

Possible answer: I can use a number line or a clock to start at the ending time, count back the elapsed time to find the starting time. To find ending time, I can start at the starting time and count on using the elapsed time.

Math Journal

Describe a situation in your life when you need to know how to find a starting time.

Problem Solving • Time Intervals

Instructional Time: 1 day

Common Core Standard

CC.3.MD.1 Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.

Also CC.3.OA.8, CC.3.NBT.2

Lesson Objective

Solve problems involving addition and subtraction of time intervals by using the strategy *draw a diagram*.

Essential Question

How can you use the strategy *draw a diagram* to solve problems about time?

Materials

- MathBoard
- Math Journal
- HMH Mega Math
- *i*Tools: Number Lines
- *i*Tools: Measurement

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to solve problems involving addition and subtraction of time intervals. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of time intervals to develop sound mathematical practices by asking these questions.

- *What did you do first? Why?*
- *What strategy could you use to help you solve the given problem?*
- *Will that method always work?*
- *Why is a number line a good tool for this problem?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these time interval concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 5, 6, 7

4 Summarize Approximately 5 min.

Essential Question

How can you use the strategy *draw a diagram* to solve problems about time?

Possible answer: I can draw a number line to find the solution to an elapsed time problem.

Math Journal

Write a multistep word problem that has at least two amounts of elapsed time. The problem may require finding a starting time or ending time. Include a solution.

Measure Length

Instructional Time: 1 day

Common Core Standard

CC.3.MD.4 Generate measurement data by measuring lengths using rules marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units–whole numbers, halves, or quarters.

Lesson Objective

Measure length to the nearest half or fourth inch and use measurement data to make a line plot.

Essential Question

How can you generate measurement data and show the data on a line plot?

Materials

- MathBoard
- inch ruler
- crayons
- Math Journal
- Animated Math Models
- HMH Mega Math

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to measure length to the nearest half or fourth inch and show measurement data in a line plot. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of measurement and data displays to develop sound mathematical practices by asking these questions.

- *What do you remember about measuring length?*
- *What do you remember about line plots?*
- *Why is a line plot a good tool for displaying data?*
- *How can you use math vocabulary in your explanation?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these measurement and data display concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 5, 7, 9 or 10–12

4 Summarize Approximately 5 min.

Essential Question

How can you generate measurement data and show the data on a line plot?

Possible answer: I can align the zero mark on the ruler with the left end of the object that I am measuring. Then, I can find the nearest unit that is closest to the right end of the object I'm measuring. I can measure the length of many similar objects, and then I can make a line plot to display my data.

Math Journal

Measure the lengths of 10 color pencils to the nearest fourth inch. Then make a line plot of the data.

Estimate and Measure Liquid Volume

Instructional Time: 1 day

Common Core Standard

CC.3.MD.2 Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given the same units, e.g., by using drawings (such as a breaker with a measurement scale) to represent the problem.

Lesson Objective

Estimate and measure liquid volume in liters.

Essential Question

How can you estimate and measure liquid volume in metric units?

Materials

- MathBoard
- 1–L beaker
- containers
- water
- tape
- Math Journal
- Animated Math Models
- *i*Tools: Measurement

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to estimate and measure liquid volume in liters. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of measurement to develop sound mathematical practices by asking these questions.

- *What do you remember about liquid volume?*
- *What tool could you use to help you with this problem?*
- *How do you know the amounts are equivalent?*
- *How do you know your answer is reasonable?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these measurement concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 8–10 or 11–13

4 Summarize Approximately 5 min.

Essential Question

How can you estimate and measure liquid volume in metric units? *Possible answer: I can use benchmarks to visualize and estimate the number of liters of liquid the container will hold when full, and then measure the actual liquid volume using a beaker filled with water to the 1-liter mark.*

Estimate and Measure Mass

Instructional Time: 1 day

Common Core Standard

CC.3.MD.2 Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given the same units, e.g., by using drawings (such as a breaker with a measurement scale) to represent the problem.

Lesson Objective

Estimate and measure mass in grams and kilograms.

Essential Question

How can you estimate and measure mass in metric units?

Materials

- MathBoard
- pan balance
- gram and kilogram masses
- classroom objects
- Math Journal
- Animated Math Models
- *i*Tools: Measurement

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to estimate and measure mass in grams and kilograms. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of estimation and measurement to develop sound mathematical practices by asking these questions.

- *What do you remember about measuring mass?*
- *What tool could you use to help you?*
- *How do you know the amounts are equivalent?*
- *Will that method always work?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these measurement concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 6, 9, 10 or 11–14

4 Summarize Approximately 5 min.

Essential Question

How can you estimate and measure mass in metric units?

Possible answer: compare the object to a small paper clip for a gram or a box of 1,000 paper clips for a kilogram; use gram masses or kilogram masses; place the object on a pan balance; add gram masses or kilogram masses to the other pan until the pans are even.

Math Journal

Name an object in your home that has a mass of about 1 kg.

Solve Problems About Liquid Volume and Mass

Instructional Time: 1 day

Common Core Standard

CC.3.MD.2 Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given the same units, e.g., by using drawings (such as a breaker with a measurement scale) to represent the problem.

Also CC.3.OA.7, CC.3.NBT.2

Lesson Objective

Add, subtract, multiply, or divide to solve problems involving liquid volumes or masses.

Essential Question

How can you use models to solve liquid volume and mass problems?

Materials

- MathBoard
- pan balance
- gram masses
- glue stick
- Math Journal
- *i*Tools: Number Lines

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to solve problems involving liquid volume or mass. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of mathematical operations to develop sound mathematical practices by asking these questions.

- *Have you solved a problem similar to this one? Describe the similarities.*
- *Which operation did you choose to represent the situation?*
- *Why is a bar model a good model for this type of problem?*
- *What conclusions can you draw from your model?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these problem-solving and measurement concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 4, 6, 7

4 Summarize Approximately 5 min.

Essential Question

How can you use models to solve liquid volume and mass problems?

Possible answer: first you can draw a bar model to show the information in the problem. Next, you use the bar model to write an equation. Then, you solve the equation.

Math Journal

Write a problem that can be solved with a bar model that shows equal liters. Then solve the problem.

Investigate • Model Perimeter

Instructional Time: 1 day

Common Core Standard

CC.3.MD.8 Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.

Lesson Objective

Explore perimeter of polygons by counting units on grid paper.

Essential Question

How can you find perimeter?

Materials

- MathBoard
- geoboard
- rubber bands
- Math Journal
- Animated Math Models
- HMH Mega Math
- *i*Tools: Geometry

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Investigate • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to find perimeter. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of polygons to develop sound mathematical practices by asking these questions.

- *Why is a geoboard a good model for this type of problem?*
- *What conclusions can you draw from your model?*
- *How would your model change if it were 4 units on each side?*
- *What might be a shortcut for finding the perimeter?*

3 Practice

Share and Show Approximately 20 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

Students can begin independent practice once they understand the concept of perimeter. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 5, 7, 8

4 Summarize Approximately 5 min.

Essential Question

How can you find perimeter?

Possible answer: to find the perimeter of a shape, I can add the lengths of its sides to find the sum. If all the sides are equal in length, I can multiply the length of each side by the number of sides.

Math Journal

Draw a rectangle and another shape that is not a rectangle by tracing lines on grid paper. Describe how to find the perimeter of both shapes.

Find Perimeter

Instructional Time: 1 day

Common Core Standard

CC.3.MD.8 Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.

Also CC.3.NBT.2, CC.3.MD.4

Lesson Objective

Estimate and measure perimeter of polygons using inch and centimeter rules.

Essential Question

How can you measure perimeter?

Materials

- MathBoard
- inch ruler
- centimeter ruler
- Math Journal
- Animated Math Models
- HMH Mega Math
- *i*Tools: Geometry

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to estimate and measure perimeter of polygons using rulers. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of measurement and perimeter to develop sound mathematical practices by asking these questions.

- *Have you solved a problem similar to this one? Describe the similarities.*
- *How could estimation help you solve the problem?*
- *How do you know those answers are equivalent?*
- *How could you use grid paper to help you solve the problem?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these measurement concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 6–8 or 9–12

4 Summarize Approximately 5 min.

Essential Question

How can you measure perimeter?

Possible answer: I can estimate the perimeter of a shape using benchmarks. I can use an inch ruler to find the length of each side. Then I add the lengths and compare the perimeter to the estimate.

Math Journal

Draw two different shapes that each have a perimeter of 20 units.

Algebra • Find Unknown Side Lengths

Instructional Time: 1 day

Common Core Standard

CC.3.MD.8 Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.

Also CC.3.NBT.2

Lesson Objective

Find the unknown length of a side of a polygon when you know its perimeter.

Essential Question

How can you find the unknown length of a side in a plane shape when you know its perimeter?

Materials

- MathBoard
- Math Journal
- Animated Math Models
- *i*Tools: Geometry

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to find the unknown length of the side of a polygon. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of perimeter to develop sound mathematical practices by asking these questions.

- *What do you remember about inverse operations?*
- *What did you do first? Why?*
- *How does the drawing support your work?*
- *How do you know your answer is reasonable?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand the concept of perimeter. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 4, 5, 7

4 Summarize Approximately 5 min.

Essential Question

How can you find the unknown length of a side in a plane shape when you know its perimeter?

Possible answer: I can add the side lengths I know and subtract the sum from the perimeter to find the unknown side length.

Math Journal

Explain how to write and solve an equation to find an unknown side length of a rectangle when given the perimeter.

Understand Area
Instructional Time: 1 day

Common Core Standard
CC.3.MD.5 Recognize areas as an attribute of plane figures and understand concepts of area measurement.

Also CC.3.MD.5a, CC.3.MD.5b, CC.3.MD.6, CC.3.MD.8

Lesson Objective

Explore perimeter and area as attributes of polygons.

Essential Question

How is finding the area of a shape different from finding the perimeter of a shape?

Materials

- MathBoard
- geoboard
- rubber bands
- Math Journal
- Animated Math Models
- HMH Mega Math
- *i*Tools: Geometry

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to relate perimeter and area in polygons and use square units. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of perimeter and area to develop sound mathematical practices by asking these questions.

- *What tool could you use to help you solve this problem?*
- *Why is a geoboard a good tool for this type of drawing?*
- *How does that drawing support your work?*
- *How do you know your answer is reasonable?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these geometric concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 7, 12, 15, 16, 19 or 20–23

4 Summarize Approximately 5 min.

Essential Question

How is finding the area of a shape different from finding the perimeter of a shape?

Possible answer: to find area, I find the number of unit squares needed to cover the shape. To find perimeter, I find the number of units around the shape.

Math Journal

Draw a rectangle using dot paper. Find the area, and explain how you found your answer.

Measure Area

Instructional Time: 1 day

Common Core Standard

CC.3.MD.5b Recognize areas as an attribute of plane figures and understand concepts of area measurement. A plane figure which can be converted without gaps or overlaps by *n* unit squares is said to have an area of *n* square units.

Also CC.3.MD.5, CC.3.MD.5a, CC.3.MD.6, CC.3.MD.7a

Lesson Objective

Estimate and measure area of plane shapes by counting unit squares.

Essential Question

How can you find the area of a plane shape?

Materials

- MathBoard
- scissors
- green and blue paper
- 1-Inch Grid Paper
- Math Journal
- Real World Video, Ch. 11
- Animated Math Models
- HMH Mega Math
- *i*Tools: Geometry

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to estimate and measure area by counting unit squares. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of estimation and measurement to develop sound mathematical practices by asking these questions.

- *What do you remember about area?*
- *How would estimation help you solve the problem?*
- *How does the drawing support your work?*
- *How do you know your answer is reasonable?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these area concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 4, 5 or 6–9

4 Summarize Approximately 5 min.

Essential Question

How can you find the area of a plane shape?

I can estimate the area by guessing about how many square units fit inside the shape. I can find the area by using tiles, making sure there are no gaps or overlaps, and counting the number of square units inside the shape.

Math Journal

Explain how to find the area of a shape using square tiles.

Use Area Models

Instructional Time: 1 day

Common Core Standard

CC.3.MD.7 Relate area to the operations of multiplication and addition.

Also CC.3.MD.5, CC.3.MD.5a, CC.3.MD.5b, CC.3.MD.6, CC.3.MD.7a, CC.3.MD.7b, CC.3.OA.3, CC.3.OA.7, CC.3.NBT.2

Lesson Objective

Relate area to addition and multiplication by using area models.

Essential Question

Why can you multiply to find the area of a rectangle?

Materials

- MathBoard
- Math Journal
- HMH Mega Math
- *i*Tools: Geometry

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to use repeated addition and multiplication to find area. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of area to develop sound mathematical practices by asking these questions.

- *What do you remember about how addition and multiplication are related?*
- *Why is a rectangular array a good model for the problem?*
- *What conclusions can you draw from your model?*
- *What might be a shortcut for finding area?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand the concept of area. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 7, 8, 10 or 11–12

4 Summarize Approximately 5 min.

Essential Question

Why can you multiply to find the area of a rectangle?

A rectangle is like an array involving rows with an equal number a unit squares, so I can use multiplication to find the area of a rectangle just like I can use an array to solve a multiplication problem.

Math Journal

Describe each of the three methods you can use to find the area of a rectangle.

Problem Solving Areas of Rectangles

Instructional Time: 1 day

Common Core Standard

CC.3.MD.7b Relate area to the operations of multiplication and addition. Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.

Also CC.3.OA.3, CC.3.OA.7, CC.3.OA.9

Lesson Objective

Solve area problems using the strategy *find a pattern*.

Essential Question

How can you use the strategy *find a pattern* to solve area problems?

Materials

- MathBoard
- Math Journal
- *i*Tools: Geometry

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to find a pattern to solve area problems. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of area and patterns to develop sound mathematical practices by asking these questions.

- *Have you solved a problem similar to the given problem? Describe the similarities.*
- *What did you do first? Why?*
- *Why is a table a good (tool) model for this problem?*
- *What conclusions can you draw from your model?*
- *How did you discover that pattern?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these area and pattern concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 4, 5, 6

4 Summarize Approximately 5 min.

Essential Question

How can you use the strategy *find a pattern* to solve area problems?

I can make a table to list the lengths and widths of rectangles and find their areas. Then I can examine the table to look for patterns in lengths, widths, and areas.

Math Journal

Write and solve an area problem that illustrates how to use the *find a pattern* strategy.

Area of Combined Rectangles

Instructional Time: 1 day

Common Core Standard

CC.3.MD.7c Relate area to the operations of multiplication and addition. Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and $b + c$ is the sum of $a \times b$ and $c \times c$. Use area models to represent the distributive properly in mathematical reasoning.

Also CC.3.MD.5, CC.3.MD.5a, CC.3.MD.5b, CC.3.MD.7b, CC.3.MD.7d, CC.3.OA.3, CC.3.OA.5, CC.3.OA.7, CC.3.NBT.2

Lesson Objective

Apply the Distributive Property to area models and to find the area of combined rectangles.

Essential Question

How can you break apart a shape to find the area?

Materials

- MathBoard
- Math Journal
- square tiles

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to apply the Distributive Property to find the area of combined rectangles. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of area to develop sound mathematical practices by asking these questions.

- *What do you remember about the Distributive Property?*
- *Have you solved a problem similar to the given problem? Describe the similarities.*
- *Why are square tiles a good model for this problem?*
- *How does your drawing support your work?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these area concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 4, 6, 7 or 8–11

4 Summarize Approximately 5 min.

Essential Question

How can you break apart a shape to find the area?

I can break apart a shape into rectangles, find the area of both rectangles, and then add the areas to find the total area of the original shape.

Math Journal

Draw a shape that is not a rectangle and find its area. Use grid paper and show each step.

Same Perimeter, Different Areas

Instructional Time: 1 day

Common Core Standard

CC.3.MD.8 Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.

Also CC.3.MD.5, CC.3.MD.5a, CC.3.MD.5b, CC.3.MD.7b, CC.3.OA.3, CC.3.OA.7, CC.3.NBT.2

Lesson Objective

Compare areas of rectangles that have the same perimeter.

Essential Question

How can you use an area to compare rectangles with the same perimeter?

Materials

- MathBoard
- square tiles
- Math Journal
- Animated Math Models
- HMH Mega Math
- *i*Tools: Geometry

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to compare areas of rectangles that have the same perimeter. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of area and perimeter to develop sound mathematical practices by asking these questions.

- *Have you solved a problem similar to the given problem? Describe the similarities.*
- *Why are square tiles a good model for this problem?*
- *How could you use a table to help you solve this problem?*
- *How does your drawing support your answer?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these geometric concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 7, 8, 9

4 Summarize Approximately 5 min.

Essential Question

How can you use area to compare rectangles with the same perimeter?

Possible answer: I can create different rectangles with the same perimeter. Then I can calculate the areas to see how they change.

Math Journal

Draw three examples of rectangles that have the same perimeter, but different areas. Note which of the areas is greatest and which is smallest.

Same Area, Different Perimeters

Instructional Time: 1 day

Common Core Standard

CC.3.MD.8 Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.

Also CC.3.MD.5, CC.3.MD.5a, CC.3.MD.5b, CC.3.MD.7b, CC.3.OA.3, CC.3.OA.7, CC.3.NBT.2

Lesson Objective

Compare perimeters of rectangles that have the same area.

Essential Question

How can you use perimeter to compare rectangles with the same area?

Materials

- MathBoard
- square tiles
- Math Journal
- Animated Math Models
- HMH Mega Math
- *i*Tools: Geometry

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to compare perimeters of rectangles that have the same area. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of perimeter and area to develop sound mathematical practices by asking these questions.

- *Have you solved a problem similar to the given problem? Describe the similarities.*
- *Why is grid paper a good tool (model) for this problem?*
- *What conclusions can you draw from your model?*
- *How does your drawing support your work?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these geometric concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 7, 8, 9

4 Summarize Approximately 5 min.

Essential Question

How can you use perimeter to compare rectangles with the same area?

I can create different rectangles with the same area. Then I can calculate the perimeters to see how they change.

Math Journal

Draw two rectangles with different perimeters but the same area.

Describe Plane Shapes

Instructional Time: 1 day

Common Core Standard

CC.3.G.1 Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a ladder category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.

Lesson Objective

Identify and describe attributes of plane shapes.

Essential Question

What are some ways to describe two-dimensional shapes?

Materials

- MathBoard
- Animated Math Models
- Math Journal
- *i*Tools: Geometry

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to identify and describe attributes of plane shapes. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of geometry to develop sound mathematical practices by asking these questions.

- *What do you remember about different plane shapes?*
- *What happens when you put an arrow on the end of a line segment?*
- *How do you know?*
- *How can you use math vocabulary in your explanation?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these geometric concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 10, 12, 14, 16 or 18–21

4 Summarize Approximately 5 min.

Essential Question

What are some ways to describe two-dimensional shapes?

Two dimensional shapes have length and width but no thickness.

Math Journal

Draw an open shape and closed shape. Label your shapes.

Describe Angles in Plane Shapes

Instructional Time: 1 day

Common Core Standard

CC.3.G.1 Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a ladder category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.

Lesson Objective

Describe angles in plane shapes.

Essential Question

How can you describe angles in plane shapes?

Materials

- MathBoard
- bendable straws
- scissors
- Math Journal
- *i*Tools: Measurement
- *i*Tools: Geometry

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to describe angles in plane shapes and use appropriate mathematics terminology. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of geometry to develop sound mathematical practices by asking these questions.

- *Why is dot paper a good tool for this activity?*
- *Why are bendable straws a good model for angles?*
- *Why are analog clocks a good model for angles?*
- *How can you use math vocabulary in your explanation?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these geometric concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 9, 13, 14

4 Summarize Approximately 5 min.

Essential Question

How can you describe angles in plane shapes?

I can describe an angle as a right angle if it forms a square corner. I can identify angles that are less than or greater than right angles by comparing the angles to right angles.

Math Journal

Draw an example of a shape that has at least one right angle, one angle less than a right angle, and one angle greater than a right angle. Label the angles.

Identify Polygons

Instructional Time: 1 day

Common Core Standard

CC.3.G.1 Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a ladder category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.

Lesson Objective

Identify polygons by the number of sides they have.

Essential Question

How can you use line segments and angles to make polygons?

Materials

- MathBoard
- Math Journal
- Animated Math Models
- HMH Mega Math
- *i*Tools: Geometry

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to identify polygons by the number of sides and angles they have. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of geometry to develop sound mathematical practices by asking these questions.

- *What do you remember about line segments and angles?*
- *How do you know a shape is a polygon?*
- *When would that not be true?*
- *How can you use math vocabulary in your explanation?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these geometric concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 9, 10, 12, 13 or 14–17

4 Summarize Approximately 5 min.

Essential Question

How can you use line segments and angles to make polygons?

Possible answer: Draw line segments so that they form a closed shape.

Math Journal

Draw a pentagon. Explain how you knew the number of sides and angles to draw.

Describe Sides of Polygons

Instructional Time: 1 day

Common Core Standard

CC.3.G.1 Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a ladder category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.

Lesson Objective

Determine if lines or line segments are intersecting, perpendicular, or parallel.

Essential Question

How can you describe line segments that are sides of polygons?

Materials

- MathBoard
- Math Journal
- Animated Math Models
- HMH Mega Math
- *i*Tools: Geometry

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to determine if sides of polygons are intersecting, perpendicular, or parallel. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of geometry to develop sound mathematical practices by asking these questions.

- *What do you remember about line segments, lines and rays?*
- *When do you know a shape is a polygon?*
- *When would that not be true?*
- *How can you use math vocabulary in your explanation?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these geometric concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 5–7 or 8–13

4 Summarize Approximately 5 min.

Essential Question

How can you describe line segments that are sides of polygons?

Possible answer: the line segments that form the sides of polygons intersect. Some may also be parallel or perpendicular to each other.

Math Journal

Give some examples of perpendicular lines inside or outside your classroom.

Classify Quadrilaterals

Instructional Time: 1 day

Common Core Standard

CC.3.G.1 Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a ladder category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.

Lesson Objective

Describe, classify, and compare quadrilaterals based on sides and angles.

Essential Question

How can you use sides and angles to help you describe quadrilaterals?

Materials

- MathBoard
- Math Journal
- Animated Math Models
- HMH Mega Math
- *i*Tools: Geometry

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to describe quadrilaterals based on their sides and angles. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of geometry to develop sound mathematical practices by asking these questions.

- *What do you remember about quadrilaterals?*
- *What do you remember about parallel and perpendicular lines?*
- *What would happen if all of the sides did not connect?*
- *How can you use math vocabulary in your explanation?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these geometric concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 7–9 or 11, 16, 20

4 Summarize Approximately 5 min.

Essential Question

How can you use sides and angles to help you describe quadrilaterals?

All quadrilaterals have 4 sides and have special names if the sides are parallel or perpendicular, or equal in length.

Math Journal

Explain how a trapezoid and rectangle are different.

Draw Quadrilaterals

Instructional Time: 1 day

Common Core Standard

CC.3.G.1 Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a ladder category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.

Lesson Objective

Draw quadrilaterals.

Essential Question

How can you draw quadrilaterals?

Materials

- MathBoard
- ruler
- Math Journal
- Animated Math Models
- HMH Mega Math
- *i*Tools: Geometry

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to draw quadrilaterals. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of geometry to develop sound mathematical practices by asking these questions.

- *What do you remember about quadrilaterals?*
- *Why is grid paper a good tool for this activity?*
- *What other tool could you use to help you draw quadrilaterals?*
- *How do you know when a polygon is not a quadrilateral?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these geometric concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 4, 7, 8 or 9–11

4 Summarize Approximately 5 min.

Essential Question

How can you draw quadrilaterals?

Possible answer: I always draw four sides, but I change the angles and the number of sides of equal length for each kind of quadrilateral.

Math Journal

Draw a quadrilateral that is NOT a rectangle. Describe your shape, and explain why it is not a rectangle.

Describe Triangles

Instructional Time: 1 day

Common Core Standard

CC.3.G.1 Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a ladder category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.

Lesson Objective

Describe and compare triangles based on the number of sides that have equal length and by their angles.

Essential Question

How can you use sides and angles to help you describe triangles?

Materials

- MathBoard
- straws
- scissors
- Math Journal
- Real World Video, Ch. 12
- *i*Tools: Geometry

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to describe and compare triangles based on the number of sides and their angles. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of geometry to develop sound mathematical practices by asking these questions.

- *What do you remember about triangles?*
- *How do know if you can make a triangle from the given straws?*
- *How can you use math vocabulary in your explanation?*
- *What happens when one straw is twice as long as the other two straws?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these geometric concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 5–7 or 8–11

4 Summarize Approximately 5 min.

Essential Question

How can you use sides and angles to help you describe triangles?

I can measure the sides of triangles to find out which sides, if any, have equal lengths. I can also find out if there is one right angle, 3 angles less than a right angle, or 1 angle greater than a right angle to describe a triangle.

Math Journal

Draw a triangle that has two sides of equal length and one right angle.

Problem Solving • Classify Plane Shapes

Instructional Time: 1 day

Common Core Standard

CC.3.G.1 Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a ladder category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.

Lesson Objective

Solve problems by using the strategy *draw a diagram* to classify plane shapes.

Essential Question

How can you use the strategy *draw a diagram* to classify plane shapes?

Materials

- MathBoard
- Math Journal
- HMH Mega Math
- *i*Tools: Geometry

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Unlock the Problem • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to make a Venn diagram to classify plane shapes and solve problems. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of geometry to develop sound mathematical practices by asking these questions.

- *What did you do first? Why?*
- *What strategy could you use to help you solve this problem?*
- *How does the Venn diagram support your work?*
- *What conclusions can you draw from the diagram?*

3 Practice

Share and Show Approximately 10 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

On Your Own Approximately 10 min.

Students can begin independent practice once they understand these geometric concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 6, 7, 8

4 Summarize Approximately 5 min.

Essential Question

How can you use the strategy *draw a diagram* to classify plane shapes?

Possible answer: I can draw a Venn diagram to sort shapes based on their side lengths and number of sides. If a shape fits both categories, it goes in the section where the circles overlap.

Math Journal

Draw a Venn diagram with one circle labeled *Quadrilaterals* and the other circle labeled *Polygons With More Than 3 Sides.* Draw at least 2 shapes in each section of the diagram. Explain why you drew the shapes you chose in the overlapping section.

Investigate • Relate Shapes, Fractions, and Area

Instructional Time: 1 day

Common Core Standard

CC.3.G.2 Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole.

Also CC.3.NF.1, CC.3.NF.3d, CC.3.MD.5

Lesson Objective

Partition shapes into parts with equal areas and express the area as a unit fraction of the whole.

Essential Question

How can you divide shapes into parts with equal areas and write the areas as a unit fraction of the whole?

Materials

- MathBoard
- pattern blocks
- color pencils
- ruler
- Math Journal
- HMH Mega Math
- *i*Tools: Geometry

1 Engage Approximately 5 min.

This activity reviews prerequisite skills, establishing a common conceptual foundation for the lesson. Use evidence of students' understanding to decide how deeply to discuss.

2 Teach and Talk Approximately 20 min.

Investigate • Activity to Build Conceptual Understanding

Remember, this is the core instruction for this lesson, in which conceptual development is key. The goal of this activity is for students to divide shapes into equal parts and express the area as a unit fraction of the whole. As students work through Unlock the Problem, gauge their level of understanding to make better decisions about how to progress through instruction.

Build on students' understanding of geometry and fractions to develop sound mathematical practices by asking these questions.

- *What do you remember about area?*
- *What do you remember about fractions?*
- *How does your drawing support your work?*
- *How do you know your answer is reasonable?*

3 Practice

Share and Show Approximately 20 min.

Use the checked exercises as a diagnostic assessment. If students answer either exercise incorrectly, use RtI (Response to Intervention).

Students can begin independent practice once they understand these geometric concepts. Select exercises based on students' depth of understanding. The exercises below require higher order thinking skills and critical reasoning, making them especially rich.

Exercises 11, 12

4 Summarize Approximately 5 min.

Essential Question

How can you divide shapes into parts with equal areas and write the areas as a unit fraction of the whole?

Possible answer: I can trace pattern blocks and then draw lines that divide the shape into equal parts. Then I can write the area of each part as a fraction by using 1 as the numerator and the number of equal parts as the denominator.

Math Journal

Trace a pattern block. Divide it into two equal parts, and write a unit fraction to describe the area of each part. Explain your work.