

## **Focus Questions**

### **Background**

The student book is organized around three to five investigations, each of which contain three to five problems and a Mathematical Reflection that students explore during class.

In the Teacher Guide the Goals for each unit include two to four big concepts with an elaboration of the essential understandings for each.

In the Teacher Guide, a Focus Question is provided for each problem in an investigation. The Focus Question collapses the mathematical understandings and strategies embedded in the problem into one overarching question. The teacher can use the Focus Question to guide his/her instructional decisions throughout his/her planning, teaching, and reflections on student understanding.

### **Description**

The Goals of the unit describe the mathematics content developed in the unit. The Focus Questions provide a story line for the mathematical development of an investigation. The set of Mathematical Reflections in the student book provide a story line for the mathematical development of the unit. The following contain all of the Goals, Focus Questions and Mathematical Reflections for each unit in CMP3.

### **Purpose**

These stories can serve as an overview of the unit and as a guide for planning, teaching and assessing.

The Goals, Mathematical Reflections, and Focus Questions can be laminated and used a bookmark for the Teacher.

# 6-5: Decimal Ops

Unit Goals, Focus Questions, and Mathematical Reflections

## Unit Goals

**Numeric Estimation** Understand that estimation can be used as a tool in a variety of situations, including as a way to check answers and make decisions

Use estimates to solve problems and check answers

**Decimal Operations** Revisit and continue to develop meanings for the four arithmetic operations on rational numbers, and practice using algorithms to operate on decimals

Recognize when addition, subtraction, multiplication, or division is the appropriate operation to solve a problem

Use place value to develop understanding of algorithms and to relate operations with decimals to the same operations with fractions

Extend understanding of multiplication and division of multidigit whole numbers

Develop standard algorithms for multiplying and dividing decimals with the aid of, at most, paper and pencil

Find a repeating or terminating decimal equivalent to a given fraction

Solve problems using arithmetic operations on decimals, including finding unit rates

**Variables and Number Sentences** Use variables to represent unknown values and number sentences to represent relationships between values

Write number sentences to represent relationships between both real-world and abstract values

Use fact families to write and solve equivalent number sentences

Use multiplication sentences to check division sentences

**Percents** Develop understanding of percents through various contexts, such as sales tax, tips, discounts, and percent increases

Develop models for percent problems

Write and solve number sentences involving percents

## Focus Questions and Mathematical Reflections

<b>Investigation 1</b> Decimal Operations and Estimation	<b>Investigation 2</b> Adding and Subtracting Decimals	<b>Investigation 3</b> Multiplying and Dividing Decimals	<b>Investigation 4</b> Using Percents
<p><b>Problem 1.1</b> Out to Lunch: Matching Operations and Questions</p> <p><b>Focus Question</b> What signals in a real-world problem tell you which operation to use?</p>	<p><b>Problem 2.1</b> Getting Things in the Right Place: Adding Decimals</p> <p><b>Focus Question</b> What's the Difference? Subtracting Decimals</p>	<p><b>Problem 3.1</b> It's Decimal Times(s): Multiplying Decimals I</p> <p><b>Focus Question</b> How do you find the product of any two decimal numbers?</p>	<p><b>Problem 4.1</b> What's the Tax on This Item?</p> <p><b>Focus Question</b> How do you find the tax and the total cost of an item from a given selling price and tax rate? How do you find the base price from a given tax rate and amount?</p>
<p><b>Problem 1.2</b> Getting Close: Estimating Decimal Calculations</p> <p><b>Focus Question</b> When you work with decimal computations, what strategies can you use to estimate the results?</p>	<p><b>Problem 2.2</b> What's the difference? Subtracting Decimals</p> <p><b>Focus Question</b> How do you subtract one decimal number from another?</p>	<p><b>Problem 3.2</b> It Works Every Time: Multiplying Decimals II</p> <p><b>Focus Question</b> What algorithm can be used to find any decimal product?</p>	<p><b>Problem 4.2</b> Computing Tips</p> <p><b>Focus Question</b> How do you find the tip and the total cost of a restaurant meal from a given meal price and tip rate? How do you find the meal price from a given tip percent and amount?</p>
<p><b>Problem 1.3</b> Take a Hike: Connecting Ratios, Rates, and Decimals</p> <p><b>Focus Question</b> How can you express a unit rate as a decimal</p>	<p><b>Problem 2.3</b> Connecting Operations: Fact Families</p> <p><b>Focus Question</b> Do fact families apply to operations</p>	<p><b>Problem 3.3</b> How Many Times? Dividing Decimals I</p> <p><b>Focus Question</b> How can a decimal division problem be</p>	<p><b>Problem 4.3</b> Percent Discounts</p> <p><b>Focus Question</b> How do you find the discount and the total</p>

and use it to solve problems?	with decimal numbers?	written in equivalent fraction and whole number form?	cost of an item from a given selling price and discount rate? How do you find the base price from a given discount rate and amount? How can you express a change in a given amount as a percent change?
		<p><b>Problem 3.4</b> Going the Long Way: Dividing Decimals II</p> <p><b>Focus Question</b> How can you carry out a decimal division using a method similar to long division of whole numbers?</p>	<p><b>Problem 4.4</b> Putting Operations Together</p> <p><b>Focus Question</b> How do you decide which operations to perform when a problem involves decimals and percents?</p>
		<p><b>Problem 3.5</b> Challenging Cases: Dividing Decimals III</p> <p><b>Focus Question</b> How can you complete a long division problem that doesn't give a whole number quotient? That is, how do you express remainders in decimal form?</p>	
<p><b>Mathematical Reflection</b></p> <ol style="list-style-type: none"> <li>How do you know when solving a problem that involves decimals requires addition? Subtraction? Multiplication? Division?</li> <li>Describe a strategy that</li> </ol>	<p><b>Mathematical Reflection</b></p> <ol style="list-style-type: none"> <li>How does interpreting decimals as fractions help you make sense of adding and subtracting decimals? Give an example to show your thinking.</li> <li>How does the place-value</li> </ol>	<p><b>Mathematical Reflection</b></p> <ol style="list-style-type: none"> <li>What algorithm can be used to multiply any two decimal numbers? Explain why your algorithm works, and give an example that shows how it works.</li> </ol>	<p><b>Mathematical Reflection</b></p> <ol style="list-style-type: none"> <li> <ol style="list-style-type: none"> <li>How do you find the tax on a purchase and calculate the final bill? Give an example, then write and solve a number sentence to illustrate your strategy.</li> </ol> </li> </ol>

<p>you use when estimating with decimals. Explain why it is helpful to you.</p> <p><b>3.</b> What is a unit rate? Describe how unit rates are useful.</p>	<p>interpretation of decimals help you add and subtract decimals? Give an example to show your thinking.</p> <p><b>3.</b> Describe algorithms for adding and subtracting any two decimal numbers.</p>	<p><b>2.</b> <b>a.</b> What algorithm can be used to divide any two decimal numbers? Explain why your algorithm works, and give an example that shows how it works.</p> <p><b>b.</b> How can you predict whether a quotient will be a terminating decimal or a repeating decimal?</p> <p><b>3.</b> <b>a.</b> What is the fact-family connection between decimal multiplication and division?</p> <p><b>b.</b> How can you check the result of a division calculation?</p> <p><b>c.</b> How can you check the result of a multiplication calculation?</p>	<p><b>b.</b> How do you find the price of a discounted item if you know the percent of the discount? Give an example, then write and solve a number sentence to illustrate your strategy.</p> <p><b>c.</b> How do you find the cost of a purchase if you know the percent and the amount of the tax on the purchase? Give an example, then write and solve a number sentence to illustrate your strategy.</p> <p><b>d.</b> How can you find the percent one number is of another? For example, what percent of 35 is 7? Write and solve a number sentence to illustrate your answer.</p> <p><b>e.</b> How are all the number sentences in parts (a)-(d) the same?</p> <p><b>2.</b> How do you recognize when addition, subtraction, multiplication, and/or division of decimals is required to solve a problem?</p>
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