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.

6-2: Comparing Bits and Pieces

Unit Goals, Focus Questions, and Mathematical Reflections

Unit Goals

Fractions as numbers. Understand fractions and decimals as numbers that can be located on the number line, compared, counted, partitioned and decomposed.
Expand interpretations of a fraction to include, expressing fractions as a part-whole relationship, as a number, and as an indicated division.

- Reason about the roles of numerator and denominator in each of the interpretations of a fraction.
- Use multiple interpretations of proper fractions, improper fractions and mixed numbers.
- Use decimals to represent fractional quantities, with attention to place value.
- Recognize that the set of positive and negative fractions is called rational numbers and recognize rational numbers as points on the number line.
- Use the number line to reason about rational number relationships.
- Use benchmarks to estimate the size of fractions (and decimals), to compare and order fractions (and decimals).
- Recognize that fractions (both positive and negative) can represent both locations and distances on the number line.
- Recognize that a number and its opposite are equal distances from zero on the number line. The opposite of a is –a and the opposite of –a is a.
- Understand that the *absolute value* of a number is its distance from 0 on the number line and use it to describe real-world quantities.
- Introduce percents as a part-whole relationship where the whole is not necessarily out of 100, but is scaled or partitioned to be "out of 100" or “per 100.”
- Apply a variety of partitioning strategies to solve problems.

Ratios as comparisons. Understand ratios as comparisons of two numbers.

- Use ratios and their associated rates to compare quantities.
- Distinguish between difference (additive comparison) and ratio (multiplicative comparison).
- Distinguish between fractions as numbers and ratios as comparisons.
- Apply a variety of scaling strategies to solve problems involving ratios and unit rates.
- Understand that a unit rate is a ratio in which one of the quantities being compared has a value of 1; use rate language in the context of a ratio relationship.
- Scale percents to predict new outcomes.

Equivalence. Understand equivalence of fractions and of ratios, and use equivalence to solve problems.

- Understand that equivalent fractions represent the same amount, distance or location; develop strategies for finding equivalent fractions.
- Understand that comparing situations with different-sized wholes is difficult unless we use some common basis of comparison.
- Use partitioning and scaling strategies to generate equivalent fractions and ratios, and to solve problems.

- Develop meaningful strategies for representing fraction amounts larger than one or less than zero as both mixed numbers and improper fractions.
- Understand that equivalent ratios represent the same relationship between two quantities; develop strategies for finding and using equivalent ratios.
- Build and use rate tables of equivalent ratios to solve problems.

Focus Questions and Mathematical Reflections

INV 1: Making Connections	INV 2: Connecting Ratios and Rates	INV 3: Extending the Number Line	INV 4: Working With Percents
1.1 Fundraising: Comparing With Fractions and Ratios **Focus Question: What are two ways to compare a $500 fundraising goal to a $200 fundraising goal?**	**2.1 Equal Shares: Introducing Unit Rates** **Focus Question: What does a unit rate comparison statement tell us?**	**3.1 Extending the Number Line: Integers and Mixed Numbers** **Focus Question: How can the number line help you think about fractions greater than 1 and less than 0?**	**4.1 Who is the Best? Making Sense of Percents** **Focus Question: How is a percent bar useful in making comparisons with decimals?**
1.2 Fundraising Thermometers: Introducing Ratios **Focus Question: How does a "for every" statement show a ratio comparison?**	**2.2 Unequal Shares: Using Ratios and Fractions** **Focus Question: How are part-to-part relationships related to part-to-whole fractions?**	**3.2 Estimating and Ordering Rational Numbers: Comparing Fractions to Benchmarks** **Focus Question: When comparing two relational numbers, what are some useful strategies for deciding which is greater?**	**4.2 Genetic Traits: Finding Percents** **Focus Question: How can partitioning be used to express one number as a percent of another number?**
1.3 Equivalent Fractions on the Line **Focus Question: When you fold fraction strips, what relationships do you see emerge that show how the numerator and denominator change to make equivalent fractions?**	**2.3 Making Comparisons with Rate Tables** **Focus Question: How do rate tables help us find equivalent ratios?**	**3.3 Sharing 100 Things: Using Tenths and Hundredths** **Focus Question: How does what you know about fractions help you understand decimals?**	**4.3 The Art of Comparison: Using Ratios and Percents** **Focus Question: In what way is a percent like a ratio and like a fraction?**
1.4 Measuring Progress: Finding Fractional Parts **Focus Question: How can fraction strips help you find part of a number?**		**3.4 Decimals on the Number Line** **Focus Question: How do we use what we know about fractions to estimate and compare decimals?**	
1.5 Comparing Fundraising Goals: Using Fractions and Ratios **Focus Question: What does it mean for two fractions to be equivalent? What does it mean for two ratios to be equivalent?**		**3.5 Earthquake Relief: Moving from Fractions to Decimals** **Focus Question: Why does it make sense to divide the numerator of a fraction by the denominator to find an equivalent decimal representation?**	
Mathematical Reflection: **1. a. Write three comparison statements about the same situation, one using difference, one using a fraction, and one using a ratio.**	**Mathematical Reflection:** **1. a. How can you determine a unit rate for a situation?** **b. Describe some ways that unit rates are useful.**	**Mathematical Reflection:** **1. a. Not every fraction refers to a quantity between 0 and 1. Give some examples of numbers that are greater than 1 or less than 0.** **b. How is a number and its opposite**	**Mathematical Reflection:** **1. Describe strategies for finding a percent of a known quantity.** **2. What strategies can you use to find the percent of one quantity to another**

b. Explain what you think a ratio is. **2. a. What does it mean for two fractions to be equivalent? For two ratios to be equivalent?** **b. What are some useful ways of finding equivalent fractions and equivalent ratios?**	**2. a. What strategies do you use to make a rate table?** **b. Describe some ways that rate tables are useful.** **3. How are your strategies for writing equivalent ratios the same as or different from writing equivalent fractions?**	**represented on a number line?** **2. a. What are some strategies for deciding which of two numbers is greater? Give examples.** **b. When comparing two positive whole numbers with different numbers of digits, such as 115 and 37, the one with more digits is greater. Does this rule work for comparing decimals?**	**quantity?** **3. How are percents used to make a comparison?** **4. Describe other strategies that you can use to make comparisons.**