

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.

6-1: Prime Time

Unit Goals, Focus Questions, and Mathematical Reflections

Unit Goals

Factors and Multiples Understand relationships among factors, multiples, divisors, and products

- Classify numbers as prime, composite, even, odd, or square
- Recognize that factors of a number occur in pairs
- Recognize situations that call for common factors and situations that call for common multiples
- Recognize situations that call for the greatest common factor and situations that call for the least common multiple
- Develop strategies for finding factors and multiples
- Develop strategies for finding the least common multiple and the greatest common factor
- Recognize and use the fact that every whole number can be written in exactly one way as a product of prime numbers
- Use exponential notation to write repeated factors
- Relate the prime factorization of two numbers to the least common multiple and greatest common factor of two numbers
- Solve problems involving factors and multiples

Equivalent Expressions Understand why two expressions are equivalent

- Relate the area of a rectangle to the Distributive Property
- Recognize that the Distributive Property relates the multiplicative and additive structures of whole numbers
- Use the properties of operations of numbers, including the Distributive Property, and the Order of Operations convention to write equivalent numerical expressions
- Solve problems involving the Order of Operations and Distributive Property

Focus Questions and Mathematical Reflections

Investigation 1 Building on Factors and Multiples	Problem 1.1 Playing the Factor Game: Finding Proper Factors How can you find all the factors (or divisors) of a number?	Problem 1.2 Playing to Win: Prime and Composite Numbers What information about a number can you find by looking at its factors?	Problem 1.3 The Product Game: Finding Multiples If you know one factor of a number, how can you find another factor of the number?	Problem 1.4 Rectangles and Factor Pairs How do you know when you have found all of the factors of a number?
	Mathematical Reflection 1a) Explain how factors and multiples of a number are related. 1b) Describe a situation where it is useful to know about factors and multiples. 1c) Describe strategies for finding factors or multiples of a number. 2) You can describe a number by both the number of its factors and the kind of its factors. Describe several kinds of numbers that you studied in this Investigation. Give examples.			
Investigation 2 Common Multiples and Common Factors	Problem 2.1 Riding Ferris Wheels: Choosing Common Multiples or Common Factors How can you decide when finding common multiples is useful in solving a problem?	Problem 2.2 Looking at Cicada Cycles: Choosing Common Multiples or Common Factors How can you find the least common multiple of two or more numbers?	Problem 2.3 Bagging Snacks: Choosing Common Multiples or Common Factors How can you decide when finding common factors is useful in solving a problem? How can you find the greatest common factor of two numbers?	
	Mathematical Reflection 1) How can you decide if finding common multiples or common factors is helpful in solving a problem? Explain. 2a) Describe how you can find the common factors and the greatest common factor of two numbers. 2b) What information does the greatest common factor of two numbers provide in a problem? 3a) Describe how you can find the common multiples and the least common multiple of two numbers. 3b) What information does the least common multiple of two numbers provide in a problem?			
Investigation 3 Factorizations: Searching for Factor Strings	Problem 3.1 The Product Puzzle: Finding Factor Strings How can you find the prime factorization of a number?	Problem 3.2 Finding the Longest Factor String How many unique prime factorizations of a number are there?	Problem 3.3 Using Prime Factorizations How can the prime factorization of a number be used to find the LCM and GCF of two or more numbers?	Problem 3.4 Unraveling the Locker Problem: Putting It All Together What characteristics of numbers, such as factors and multiples did you use to answer the questions? What special numbers, such as prime numbers, composite numbers, and square numbers, did you use?
	Mathematical Reflection 1a) Why it is helpful to write a number as a product of primes? 1b) Describe how you can find the prime factorization of a number. 2a) When it is useful to find the LCM or GCF of two or more numbers to solve a problem? 2b) Describe a method for finding the LCM of two numbers. Is there another method? Explain. 2c) Describe a method for finding the GCF of two numbers. Is there another method? Explain.			
Investigation 4 Linking Multiplication and Addition: The Distributive Property	Problem 4.1 Reasoning With Even and Odd Numbers How do you decide whether a number is even or odd?	Problem 4.2 Using the Distributive Property How is the Distributive Property used to create equivalent expressions? How is finding the area of a rectangle related to the Distributive Property?	Problem 4.3 Ordering Operations How do you decide the order when you work on number sentences with more than one operation?	Problem 4.4 Choosing and Operation How do you decide what operations are needed in a given situation?
	Mathematical Reflection 1a) Explain what the Distributive Property means for multiplication, addition, and subtraction. Use the area of a rectangle to illustrate your answer. 1b) Explain how you can use the Distributive Property to write a number as two equivalent expressions. Give two examples.			

2a) What rules for ordering computations with numbers does the Order of Operations convention provide? Why is it important?
 2b) How do you decide what operation, addition, subtraction, multiplication, or division, is needed to solve a problem?

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<p>Problem 1.2 Playing to Win: Prime and Composite Numbers What information about a number can you find by looking at its factors?</p>	<p>Problem 2.2 Looking at Cicada Cycles: Choosing Common Multiples or Common Factors How can you find the least common multiple of two or more numbers?</p>	<p>Problem 3.2 Finding the Longest Factor String How many unique prime factorizations of a number are there?</p>	<p>Problem 4.2 Using the Distributive Property How is the Distributive Property used to create equivalent expressions? How is finding the area of a rectangle related to the Distributive Property?</p>
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