

Name \_\_\_\_\_

**Problem Solving • Common Factors**

**Essential Question** How can you use the *make a list* strategy to solve problems with common factors?



**Operations and Algebraic Thinking—4.OA.B.4**

**MATHEMATICAL PRACTICES**  
**MP1, MP5**

**Unlock the Problem**

Chuck has a coin collection with 30 pennies, 24 quarters, and 36 nickels. He wants to arrange the coins into rows. Each row will have the same number of coins, and all the coins in a row will be the same. How many coins can he put in each row?



The information in the graphic organizer below will help you solve the problem.

Read the Problem	Solve the Problem
<p><b>What do I need to find?</b></p> <p>I need to find _____ that can go in each row so that each row has _____.</p>	<p>I can list all the factors of each number. Then I can circle the factors that are common to all three numbers.</p> <p>Factors of: 30 24 36</p> <p>The common factors are _____.</p>
<p><b>What information do I need to use?</b></p> <p>Chuck has _____ _____. Each row has _____.</p>	
<p><b>How will I use the information?</b></p> <p>I can make a list to find all the factors of _____ _____. Then I can use the list to find the common factors. A <b>common factor</b> is a factor of two or more numbers.</p>	

So, Chuck can put \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, or \_\_\_\_\_ coins in each row.

## Try Another Problem

Ryan collects animal figures. He has 45 elephants, 36 zebras, and 18 tigers. He will arrange the figures into rows. Each row will have the same number of figures, and all the figures in a row will be the same. How many figures can be in each row?

Use the graphic organizer below to help you solve the problem.



### Read the Problem

What do I need to find?

What information do I need to use?

How will I use the information?

### Solve the Problem

So, Ryan can put \_\_\_\_\_, \_\_\_\_\_, or \_\_\_\_\_ figures in each row.

**Math  
Talk**

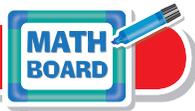
**MATHEMATICAL PRACTICES 5**

**Use Appropriate Tools**

How did the strategy help you solve the problem?

Name \_\_\_\_\_

## Share and Show



## Unlock the Problem

- ✓ Use the Problem-Solving MathBoard.
- ✓ Underline the important facts.

1. Lucy has 40 bean plants, 32 tomato plants, and 16 pepper plants. She wants to put the plants in rows with only one type of plant in each row. All rows will have the same number of plants. How many plants can Lucy put in each row?

**First**, read the problem and think about what you need to find. What information will you use? How will you use the information?

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**Next**, make a list. Find the factors for each number in the problem.

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**Finally**, use the list. Circle the common factors.

So, Lucy can put \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, or \_\_\_\_\_ plants in each row.

2. What if Lucy has 64 bean plants instead of 40 bean plants? How many plants can Lucy put in each row?

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3. **THINK SMARTER** One common factor of two numbers is 40. Another common factor is 10. If both numbers are less than 100, what are the two numbers?

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4. The sum of two numbers is 136. One number is 51. What is the other number? What are the common factors of these two numbers?

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**WRITE** *Math*  
Show Your Work



## On Your Own

5. **MATHEMATICAL PRACTICE 1 Analyze** A number is called a *perfect number* if it equals the sum of all of its factors except itself. For instance, 6 is a perfect number because its factors are 1, 2, 3, and 6, and  $1 + 2 + 3 = 6$ . What is the next greater perfect number?
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6. **THINK SMARTER** Sona knits 10 squares a day for 7 days. Can she sew together the squares to make 5 equal-sized blankets? Explain.
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7. Julianne earned \$296 working at a grocery store last week. She earns \$8 per hour. How many hours did Julianne work?
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**WRITE** *Math*  
Show Your Work

8. **GO DEEPER** There are 266 students watching a play in the auditorium. There are 10 rows with 20 students in each row and 5 rows with 8 students in each row. How many students are sitting in each of the 2 remaining rows if each of those rows has an equal number of students?
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### Personal Math Trainer

9. **THINK SMARTER +** Ben is planting a garden with 36 zinnias, 18 marigolds, and 24 petunias. Each row will have only one type of plant. Ben says he can put 9 plants in each row. He listed the common factors of 36, 18 and 24 below to support his reasoning.

36: 1, 2, 3, 4, 6, 9, 12, 18, 36

18: 1, 2, 3, 6, 8, 9, 18

24: 1, 2, 3, 4, 6, 8, 9, 12, 24

Is he correct? Explain your answer. If his reasoning is incorrect, explain how he should have found the answer.

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Name \_\_\_\_\_

**Problem Solving • Common Factors**



**COMMON CORE STANDARD—4.OA.B.4**  
*Gain familiarity with factors and multiples.*

**Solve each problem.**

1. Grace is preparing grab bags for her store’s open house. She has 24 candles, 16 pens, and 40 figurines. Each grab bag will have the same number of items, and all the items in a bag will be the same. How many items can Grace put in each bag?

Find the common factors of 24, 16, and 40.

1, 2, 4, or 8 items

2. Simon is making wreaths to sell. He has 60 bows, 36 silk roses, and 48 silk carnations. He wants to put the same number of items on each wreath. All the items on a wreath will be the same type. How many items can Simon put on each wreath?

3. Justin has 20 pencils, 25 erasers, and 40 paper clips. He organizes them into groups with the same number of items in each group. All the items in a group will be the same type. How many items can he put in each group?

4. A food bank has 50 cans of vegetables, 30 loaves of bread, and 100 bottles of water. The volunteers will put the items into boxes. Each box will have the same number of food items and all the items in the box will be the same type. How many items can they put in each box?

5. **WRITE** *Math* Describe how making a list can help you solve a math problem. Write a problem that could be solved by making a list.

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## Lesson Check (4.OA.B.4)

1. What are all the common factors of 24, 64, and 88?
2. What are all the common factors of 15, 45, and 90?

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## Spiral Review (4.NBT.B.5, 4.NBT.B.6)

3. Dan puts \$11 of his allowance in his savings account every week. How much money will he have after 15 weeks?
4. James is reading a book that is 1,400 pages. He will read the same number of pages each day. If he reads the book in 7 days, how many pages will he read each day?

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5. Emma volunteered at an animal shelter for a total of 119 hours over 6 weeks. Estimate the number of hours she volunteered each week.
6. Write an expression that can be used to multiply  $6 \times 198$  mentally.

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