

Name \_\_\_\_\_

## Place the First Digit

**Divide.**  $763 \div 3 = \blacksquare$

**Step 1** Estimate. Then divide the hundreds.

**Think:**  $3 \times 1$  hundred = 3 hundreds  
 $3 \times 2$  hundreds = 6 hundreds  
 $3 \times 3$  hundreds = 9 hundreds

$3 \times 3$  hundreds is greater than 7 hundreds.  
 Use 2 hundreds as an estimate.

$$\begin{array}{r} 2 \quad \leftarrow \text{Divide 7 hundreds by 3.} \\ 3 \overline{)763} \\ \underline{-6} \quad \leftarrow \text{Multiply. } 3 \times 2 \text{ hundreds} \\ 1 \quad \leftarrow \text{Subtract.} \end{array}$$

**Step 2** There is 1 hundred left over.  
 Regroup 1 hundred, now there are 16 tens.  
 Divide the tens.

$$\begin{array}{r} 2 \\ 3 \overline{)763} \\ \underline{-6} \downarrow \\ 16 \quad \leftarrow 16 \text{ tens} \end{array}$$

$$\begin{array}{r} 25 \quad \leftarrow \text{Divide 16 tens by 3.} \\ 3 \overline{)763} \\ \underline{-6} \\ 16 \\ \underline{-15} \quad \leftarrow \text{Multiply. } 3 \times 5 \text{ tens} \\ 1 \quad \leftarrow \text{Subtract.} \end{array}$$

**Step 3** There is 1 ten left over. Regroup 1 ten, now there are 13 ones.  
 Divide the ones.

$$\begin{array}{r} 25 \\ 3 \overline{)763} \\ \underline{-6} \quad | \\ 16 \downarrow \\ \underline{-15} \\ 13 \quad \leftarrow 13 \text{ ones} \end{array}$$

$$\begin{array}{r} 254 \quad \leftarrow \text{Divide 13 ones by 3.} \\ 3 \overline{)763} \\ \underline{-6} \\ 16 \\ \underline{-15} \\ 13 \\ \underline{-12} \quad \leftarrow \text{Multiply. } 3 \times 4 \text{ ones} \\ 1 \quad \leftarrow \text{Subtract.} \end{array}$$

**Step 4** Check to make sure that the remainder is less than the divisor. Write the answer.

$$\begin{array}{r} 254 \text{ r}1 \quad 1 < 3 \\ 3 \overline{)763} \end{array}$$

**Divide.**

1.  $2 \overline{)531}$

2.  $4 \overline{)628}$

3.  $9 \overline{)349}$

4.  $7 \overline{)794}$

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# Divide by 1-Digit Numbers

Divide.  $766 \div 6 = \square$

**Step 1** Use place value to place the first digit.  
**Think:** 7 hundreds can be shared among 6 groups without regrouping.

$$\begin{array}{r} 1 \\ 6 \overline{)766} \end{array} \leftarrow \text{The first digit is in the hundreds place.}$$

**Step 2** There is 1 hundred left over. Regroup 1 hundred, now there are 16 tens. Divide the tens.

$$\begin{array}{r} 1 \\ 6 \overline{)766} \\ - 6 \downarrow \\ \hline 16 \end{array} \leftarrow 16 \text{ tens}$$

$$\begin{array}{r} 12 \\ 6 \overline{)766} \\ - 6 \\ \hline 16 \\ - 12 \\ \hline 4 \end{array} \leftarrow \begin{array}{l} \text{Divide 16 tens by 6.} \\ \text{Multiply. } 6 \times 2 \text{ tens} \\ \text{Subtract.} \end{array}$$

**Step 3** There are 4 tens left over. Regroup 4 tens, now there are 46 ones. Divide the ones.

$$\begin{array}{r} 12 \\ 6 \overline{)766} \\ - 6 \\ \hline 16 \\ - 12 \\ \hline 46 \end{array} \leftarrow 46 \text{ ones}$$

$$\begin{array}{r} 127 \\ 6 \overline{)766} \\ - 6 \\ \hline 16 \\ - 12 \\ \hline 46 \\ - 42 \\ \hline 4 \end{array} \leftarrow \begin{array}{l} \text{Divide 46 ones by 6.} \\ \text{Multiply. } 6 \times 7 \text{ ones} \\ \text{Subtract.} \end{array}$$

**Step 4** Check to make sure that the remainder is less than the divisor. Write the answer.

$$\begin{array}{r} 127 \text{ r}4 \\ 6 \overline{)766} \end{array} \quad 4 < 6$$

**Step 5** Use multiplication and addition to check your answer.

$$\begin{array}{r} 127 \leftarrow \text{quotient} \\ \times 6 \leftarrow \text{divisor} \\ \hline 762 \\ + 4 \leftarrow \text{remainder} \\ \hline 766 \leftarrow \text{dividend} \end{array}$$

Divide and check.

1.  $4 \overline{)868}$

2.  $2 \overline{)657}$

3.  $7 \overline{)8,473}$

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## Problem Solving • Multistep Division Problems

There are 72 third graders and 84 fourth graders going on a field trip. An equal number of students will ride on each of 4 buses. How many students will ride on each bus?

Read the Problem	Solve the Problem								
<p><b>What do I need to find?</b></p> <p>I need to find the number of <u>students</u> who will ride on each bus.</p>	<p>I can model the number of students in all using a bar model.</p> <table border="1" style="margin: 10px auto;"> <tr> <td style="text-align: center; width: 50px;">72</td> <td style="text-align: center; width: 50px;">84</td> </tr> <tr> <td colspan="2" style="text-align: center; border-top: 1px solid black;">156</td> </tr> </table>	72	84	156					
72	84								
156									
<p><b>What information do I need to use?</b></p> <p>There are <u>72</u> third graders and <u>84</u> fourth graders. There will be <u>4</u> buses.</p>	<p>I can model the number of buses and divide to find the number of students on each bus.</p> <table border="1" style="margin: 10px auto;"> <tr> <td style="text-align: center; width: 40px;">39</td> <td style="text-align: center; width: 40px;">39</td> <td style="text-align: center; width: 40px;">39</td> <td style="text-align: center; width: 40px;">39</td> </tr> <tr> <td colspan="4" style="text-align: center; border-top: 1px solid black;">156</td> </tr> </table>	39	39	39	39	156			
39	39	39	39						
156									
<p><b>How will I use the information?</b></p> <p>I will make a bar model for each step. I will add <u>72 and 84</u> to find the total number of students. I will divide by <u>4</u> to find how many students will ride on each bus.</p>	<p>So, <u>39</u> students will ride on each bus.</p>								




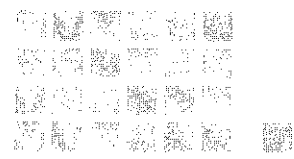
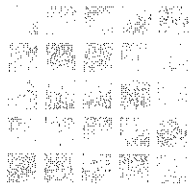
- Miranda has 180 beads for making jewelry. She buys 240 more beads. She wants to store the beads in a case with 6 sections. She wants to put the same number of beads in each section. How many beads should Miranda put in each section?

- All 203 students at Polk School eat lunch at the same time. One day 19 students were absent. If 8 students sit at each table in the lunchroom, how many tables were used that day at lunch?

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# Model Factors

Use tiles to find all the factors of 25. Record the arrays and write the factors shown.

	
<p><b>Step 1</b> Record the array and list the factors.</p> <p><b>Think:</b> Every whole number greater than 1 has at least two factors, that number and 1.</p>	<p><math>1 \times 25 = 25</math></p> <p>Factors: <u>1</u> , <u>25</u></p>
<p><b>Step 2</b> Make an array to see if 2 is a factor of 25.</p> <p><b>Think:</b> An array has the same number of tiles in every row and the same number of tiles in every column.</p>	<p>  </p> <p>You cannot use all 25 tiles to make an array that has 2 rows. There is 1 tile left. So, <u>2</u> is not a factor of 25.</p>
<p><b>Step 3</b> Continue making arrays, counting by 1, to find all the other factors of 25.</p> <div style="display: flex; justify-content: space-around;"> <div style="width: 45%;"> <p>Is 3 a factor? </p> <p>3 rows, 1 tile left <u>No, 3 is not a factor of 25.</u></p> </div> <div style="width: 45%;"> <p>Is 4 a factor? </p> <p>4 rows, 1 tile left <u>No, 4 is not a factor of 25.</u></p> </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div style="width: 45%;"> <p>Is 5 a factor? </p> <p><u>5</u> rows, all tiles used. <math>5 \times 5 = 25</math></p> <p>There are the same number of tiles in each row and column. <u>Yes, 5 is a factor of 25.</u></p> </div> </div> <p>If you continue to make arrays up to 24, you will find there are no additional factors of 25.</p> <p>So, the factors of 25 are <u>1, 5, and 25.</u></p> <p>Two factors that make a product are sometimes called a factor pair. What are the factor pairs for 25? <u>1 and 25, 5 and 5</u></p>	

Use tiles to find all the factors of the product. Record the arrays and write the factors shown.

1. 35

2. 36

# Factors and Divisibility

A number is divisible by another number if the whole-number quotient is a counting number and the remainder is 0.

You can decide if a number is divisible by 2, 3, 5, 6, or 9 by using divisibility rules instead of dividing. Divisibility rules help you decide if one number is a factor of another.

**Is 39 divisible by 2, 3, 5, 6, or 9?**

## Divisibility Rules

$39 \div 2 = 19 \text{ r}1 \rightarrow 39$  is not divisible by 2.

The last digit, 9, is not even, so 39 is not divisible by 2.

$39 \div 3 = 13 \text{ r}0 \rightarrow 39$  is divisible by 3.

The sum of the digits,  $3 + 9 = 12$ , is divisible by 3, so 39 is divisible by 3.

$39 \div 5 = 7 \text{ r}4 \rightarrow 39$  is not divisible by 5.

The last digit, 9, is not a 0 or 5, so 39 is not divisible by 5.

$39 \div 6 = 6 \text{ r}3 \rightarrow 39$  is not divisible by 6.

39 is not divisible by both 2 and 3, so it is not divisible by 6.

$39 \div 9 = 4 \text{ r}3 \rightarrow 39$  is not divisible by 9.

The sum of the digits,  $3 + 9 = 12$ , is not divisible by 9, so 39 is not divisible by 9.

39 is divisible by 3.

3 is a factor of 39.

**Tell whether 30 is divisible by 2, 3, 5, 6, or 9. Show your work.**

1.  $30 \div 2$

\_\_\_\_\_

2.  $30 \div 3$

\_\_\_\_\_

3.  $30 \div 5$

\_\_\_\_\_

4.  $30 \div 6$

\_\_\_\_\_

5.  $30 \div 9$

\_\_\_\_\_

**Is 4 a factor of the number? Write yes or no.**

6. 81

\_\_\_\_\_

7. 24

\_\_\_\_\_

8. 56

\_\_\_\_\_

# Problem Solving • Common Factors

Susan sorts a collection of beads. There are 35 blue, 49 red, and 21 pink beads. She arranges all the beads into rows. Each row will have the same number of beads, and all the beads in a row will be the same color. How many beads can she put in each row?

Read the Problem	Solve the Problem															
<p><b>What do I need to find?</b></p> <p>I need to find <u>the number of beads in each row, if each row is equal and has only one color</u></p>	<table border="1" style="margin: 0 auto; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="padding: 5px;">Factors of 35</th> <th style="padding: 5px;">Factors of 49</th> <th style="padding: 5px;">Factors of 21</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;"><u>1</u></td> <td style="padding: 5px;"><u>1</u></td> <td style="padding: 5px;"><u>1</u></td> </tr> <tr> <td style="padding: 5px;"><u>5</u></td> <td style="padding: 5px;"><u>7</u></td> <td style="padding: 5px;"><u>3</u></td> </tr> <tr> <td style="padding: 5px;"><u>7</u></td> <td style="padding: 5px;"><u>49</u></td> <td style="padding: 5px;"><u>7</u></td> </tr> <tr> <td style="padding: 5px;"><u>35</u></td> <td></td> <td style="padding: 5px;"><u>21</u></td> </tr> </tbody> </table> <p>The common factors are <u>7</u> and <u>1</u>.</p> <p>So, Susan can put <u>1</u> or <u>7</u> beads in each row.</p>	Factors of 35	Factors of 49	Factors of 21	<u>1</u>	<u>1</u>	<u>1</u>	<u>5</u>	<u>7</u>	<u>3</u>	<u>7</u>	<u>49</u>	<u>7</u>	<u>35</u>		<u>21</u>
Factors of 35		Factors of 49	Factors of 21													
<u>1</u>		<u>1</u>	<u>1</u>													
<u>5</u>	<u>7</u>	<u>3</u>														
<u>7</u>	<u>49</u>	<u>7</u>														
<u>35</u>		<u>21</u>														
<p><b>What information do I need to use?</b></p> <p>Susan has <u>35 blue, 49 red, and 21 pink beads</u></p>																
<p><b>How will I use the information?</b></p> <p>I can make a list to find all of the factors of <u>35, 49, and 21</u></p> <p>Then I can use the list to find the <u>common factors</u></p>																

1. Allyson has 60 purple buttons, 36 black buttons, and 24 green buttons. She wants to put all of the buttons in bins. She wants each bin to have only one color and all bins to have the same number of buttons. How many buttons can Allyson put in one bin?
2. Ricardo has a marble collection with 54 blue marbles, 24 red marbles, and 18 yellow marbles. He arranges the marbles into equal rows. The marbles in each row will be the same color. How many marbles can he put in one row?

# Factors and Multiples

You know that  $1 \times 10 = \underline{10}$  and  $2 \times 5 = \underline{10}$ .

So, 1, 2, 5, and 10 are all **factors** of 10.

You can skip count to find **multiples** of a number:

Count by 1s: 1, 2, 3, 4, 5, 6, 7, 8, 9, **10**, ...

Count by 2s: 2, 4, 6, 8, **10**, 12, ...

Count by 5s: 5, **10**, 15, 20, 25, ...

Count by 10s: **10**, 20, 30, 40, ...

Note that **10** is a multiple of 1, 2, 5, and 10. A number is a multiple of all of its factors.

A **common multiple** is a multiple of two or more numbers. So, 10 is a common multiple of 1, 2, 5, and 10.

1. Multiply to list the next five multiples of 3.

3, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

2. Multiply to list the next five multiples of 7.

7, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Is the number a factor of 8? Write *yes* or *no*.

3. 2

\_\_\_\_\_

4. 8

\_\_\_\_\_

5. 15

\_\_\_\_\_

6. 20

\_\_\_\_\_

Is the number a multiple of 4? Write *yes* or *no*.

7. 2

\_\_\_\_\_

8. 12

\_\_\_\_\_

9. 16

\_\_\_\_\_

10. 18

\_\_\_\_\_

# Prime and Composite Numbers

A **prime number** is a whole number greater than 1 that has exactly two factors, 1 and the number itself.

A **composite number** is a whole number greater than 1 that has more than two factors.

You can use division to find the factors of a number and tell whether the number is prime or composite.

**Tell whether 55 is *prime* or *composite*.**

Use division to find all the numbers that divide into 55 without a remainder. Those numbers are the factors of 55.

$55 \div 1 = 55$ , so 1 and 55 are factors.

$55 \div 5 = 11$ , so 5 and 11 are factors.

The factors of 55 are 1, 5, 11, and 55.

Because 55 has more than two factors, 55 is a composite number.

**Tell whether 61 is *prime* or *composite*.**

Use division to find all the numbers that divide into 61 without a remainder. Those numbers are the factors of 61.

$61 \div 1 = 61$ , so 1 and 61 are factors.

There are no other numbers that divide into 61 evenly without a remainder.

The factors of 61 are 1 and 61.

Because 61 has exactly two factors, 61 is a prime number.

**Tell whether the number is *prime* or *composite*.**

1. 44

Think: Is 44 divisible by any number other than 1 and 44?

\_\_\_\_\_

2. 53

Think: Does 53 have other factors besides 1 and itself?

\_\_\_\_\_

3. 12

4. 50

5. 24

6. 67

\_\_\_\_\_

\_\_\_\_\_

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\_\_\_\_\_

7. 83

8. 27

9. 34

10. 78

\_\_\_\_\_

\_\_\_\_\_

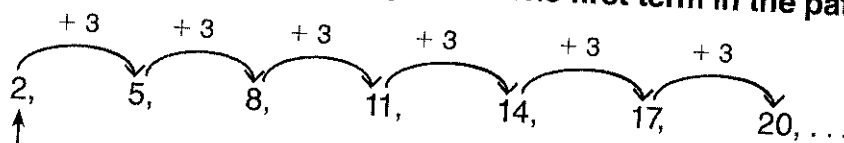
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# Algebra • Number Patterns

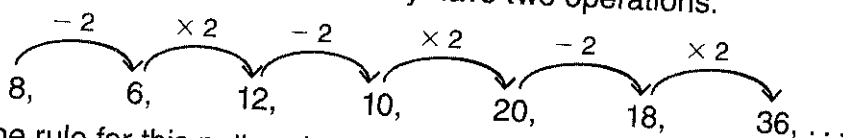
A pattern is an ordered set of numbers or objects, called terms.  
The numbers below form a pattern. The first term in the pattern is 2.



**First term**

A rule is used to describe a pattern. The rule for this pattern is add 3.  
You can describe other patterns in the numbers. Notice that the terms in the pattern shown alternate between even and odd numbers.

For some patterns, the rule may have two operations.



The rule for this pattern is subtract 2, multiply by 2. The first term is 8.  
Notice that all of the terms in this pattern are even numbers.

Use the rule to write the numbers in the pattern.

1. Rule: Add 7. First term: 12      2. Rule: Multiply by 3, subtract 1. First term: 2
- 12, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, ...      2, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, ...

Use the rule to write the numbers in the pattern.  
Describe another pattern in the numbers.

3. Rule: Subtract 5. First term: 50

50, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, ...

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4. Rule: Multiply by 2, add 1. First term: 4

4, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, ...

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