Name _____

Model Factors

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

Step 1 Record the array and list the factors.

Think: Every whole number greater than 1 has at least two factors, that number and 1.

$1 \times 25 = 25$

Factors: 1 , 25

Step 2 Make an array to see if 2 is a factor of 25.

Think: An array has the same number of tiles in every row and the same number of tiles in every column.

You cannot use all 25 tiles to make an array that has 2 rows. There is 1 tile left.

So, 2 is not a factor of 25.

Step 3 Continue making arrays, counting by 1, to find all the other factors of 25.

Is 3 a factor?

3 rows, 1 tile left

No, 3 is not a factor of 25.

Is 4 a factor?

4 rows, 1 tile left

No, 4 is not a factor of 25.

Is 5 a factor?

5 rows, all tiles used.
$5 \times 5 = 25$

There are the same number of tiles in each row and column. Yes, 5 is a factor of 25.

If you continue to make arrays up to 24, you will find there are no additional factors of 25.

So, the factors of 25 are 1, 5, and 25.

Two factors that make a product are sometimes called a factor pair.
What are the factor pairs for 25? 1 and 25, 5 and 5

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

1. 35

2. 36

Name _____

Factors and Divisibility

A number is divisible by another number if the 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
$39 \div 2 = 19$ r1 $\rightarrow$ 39 is not divisible by 2.	The last digit, 9, is not even, so 39 is not divisible by 2.
$39 \div 3 = 13$ r0 $\rightarrow$ 39 is divisible by 3.	The sum of the digits, $3 + 9 = 12$, is divisible by 3, so 39 is divisible by 3.
$39 \div 5 = 7$ r4 $\rightarrow$ 39 is not divisible by 5.	The last digit, 9, is not a 0 or 5, so 39 is not divisible by 5.
$39 \div 6 = 6$ r3 $\rightarrow$ 39 is not divisible by 6.	39 is not divisible by both 2 and 3, so it is not divisible by 6.
$39 \div 9 = 4$ r3 $\rightarrow$ 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 _____

Name _____

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
What do I need to find? I need to find the number of beads in each row, if each row is equal and has only one color.	
What information do I need to use? Susan has 35 blue, 49 red, and 21 pink beads.	
How will I use the information? I can make a list to find all of the factors of 35, 49, and 21. Then I can use the list to find the common factors.	

Factors of 35	Factors of 49	Factors of 21
1	1	1
5	7	3
7	49	7
35		21

The common factors are 7 and 1.

So, Susan can put 1 or 7 beads in each row.

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?

_____

Name _____

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 _____

Name _____

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 ÷ 1 = 55, so 1 and 55 are factors.

55 ÷ 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 ÷ 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 _____

7. 83 _____

8. 27 _____

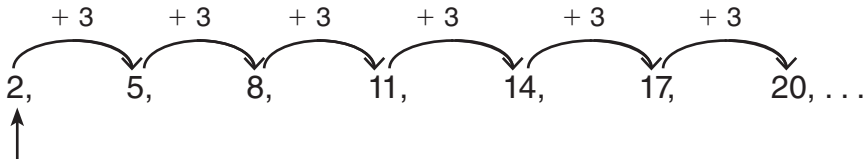
9. 34 _____

10. 78 _____

Name _____

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.

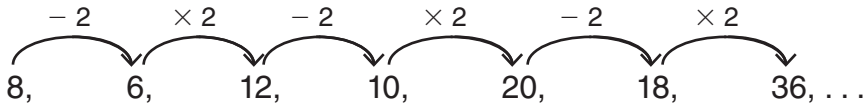


First term

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

12, ____, ____, ____, ____, . . .

2. Rule: Multiply by 3, subtract 1. First term: 2

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, ____, ____, ____, ____, . . .

_____

_____

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

4, ____, ____, ____, ____, . . .

_____

_____