North Penn School District

Elementary Math Parent Letter

Grade 4

Unit 2 – Chapter 5: Factors, Multiples, and Patterns

Examples for each lesson:

Lesson 5.1

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

More information on this strategy is available on Animated Math Model #20.

Lesson 5.2

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 → 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 → 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 → 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 → 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 → 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.

Lesson 5.3

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.

Lesson 5.4

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.

More information on this strategy is available on Animated Math Model #20.

Lesson 5.5

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 $\underline{1}$ and $\underline{55}$ are factors.

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

The factors of 55 are $\underline{1}$, $\underline{5}$, $\underline{11}$, and $\underline{55}$.

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 $\underline{1}$ and $\underline{61}$ are factors.

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

The factors of 61 are $\underline{1}$ and $\underline{61}$.

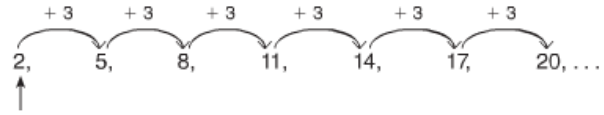
Because 61 has exactly two factors, 61 is a prime number.

More information on this strategy is available on Animated Math Model #21.

Lesson 5.6

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.

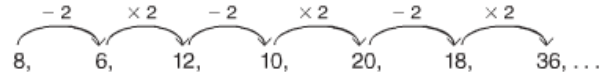


First term

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.

More information on this strategy is available on Animated Math Model #22.

Vocabulary

Common factor – a number that is a factor of two or more numbers

Common multiple – a number that is a multiple of two or more numbers

Composite number – a number that has more than two factors

Divisible – a number is divisible by another number if the quotient is a counting number and the remainder is zero

Factor – a number multiplied by another number to find a product

Pattern – an ordered set of numbers or objects

Prime number – a number that has exactly two factors, one and itself

Term – each number or object in a pattern