

Lesson 3-1

Understand, Represent, and Evaluate Exponents

_____ : The number used as a factor

_____ : tells how many times to multiply the factor with itself

*You will not multiply the base and the exponent together... the base gets multiplied by _____!

Write Products as Powers (_____ & _____)

$$4 \times 4 \times 4$$

$$7 \times 7 \times 7 \times 7$$

$$3 \times 3 \times 3 \times 3 \times 3$$

$$12 \times 12$$

Goal: Write Powers as Products-

$$5^2$$

$$1.5^3$$

$$10^5$$

$$\left(\frac{1}{2}\right)^2$$

Any nonzero number with an exponent of zero has the value of _____.

$$5^0$$

$$-6^0$$

$$1.5^0$$

$$\frac{1}{2}^0$$

Power	10^1	10^2	10^3	10^4	10^5
Value	10	100	1,000	10,000	100,000

$$10^5 = 10 \times 10 \times 10 \times 10 \times 10 = 100,000$$

10^0

10^3

When you multiply by a power of ten, you move the decimal place the

_____ of times that matches the _____.

1.9×10^3

0.6×10^6

2.9×10^2

3.4×10^0

Apply Math Models Malik read that the land area of Alaska is about 5.7×10^5 square miles. About how many square miles is the land area of Alaska?



A marine biologist studies the population of seals in a research area. How many seals are in the research area?

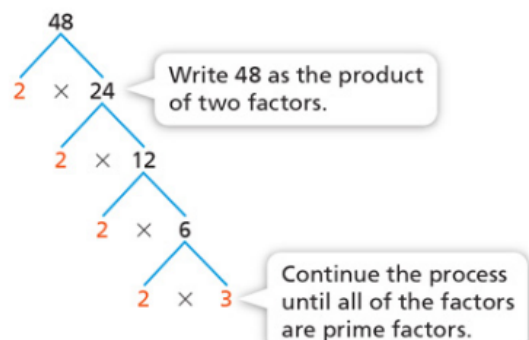
Seal population
 3.27×10^2



Lesson 3-2

Find Greatest Common Factor and Least Common Multiple

Prime Factorization: Make a _____ then use all the numbers at the _____ of a branch. The numbers at the end are _____ which means their only factors are _____ and itself.



The prime factorization of 48 is $2 \times 2 \times 2 \times 2 \times 3$ or $2^4 \times 3$.

There is only one prime factorization for any number.

Try it!

56

Find the Greatest Common Factor (GCF)

1. _____ the factors.
2. Find the _____ one they have in common!

Find the greatest common factor of 18 & 24.

18

24

Find the greatest common factor of 12 & 36.

12

36

Use the GCF to factor expressions.

1. Put the GCF _____ the parenthesis.
2. _____ to get the numbers _____ the parenthesis.

$$18 + 24$$

$$12 + 36$$

$$30 + 66$$

Find the Least Common Multiple (LCM)

1. _____ the multiples.
2. Find the _____ one they have in common!

Find the least common multiple of 6 & 8

6:

8:

Find the least common multiple of 3 & 9.

3:

9:

Keesha is putting together bags of supplies. She puts an equal number of craft sticks and an equal number of glue bottles in each bag. There are no supplies left over. What is the greatest number of bags of supplies that Keesha can make?

Identify the **greatest common factor (GCF)** of 12 and 42. The GCF is the greatest number that is a factor of two or more numbers.

$$12 = 2 \times 2 \times 3$$
$$42 = 2 \times 3 \times 7$$

Write the prime factorization of each number and identify common factors.

Multiply the common factors.

$$2 \times 3 = 6$$



12 bottles of glue
42 craft sticks

To celebrate its grand opening, a store is giving customers gift certificates. Which customer is the first to get two gift certificates?



Every 8th customer gets a \$50 gift certificate.

Every 6th customer gets a \$10 gift certificate.

Write and Evaluate Numerical Expressions

Order of Operations

1. _____

2. _____

3. _____ (_____ to _____)

4. _____ (_____ to _____)

Follow the steps above to find the value for an expression with a mixture of operations.

$$10 + 2 \times 15$$

$$16 \div 2 \times 4$$

$$5 + (8^2 - 2) \times 2$$

$$24 \div (2^3 + 4)$$

13. $2^2 - (3 + 6) + 4$

$$= 2^2 - \boxed{} + 4$$

$$= \boxed{} - \boxed{} + 4$$

$$= \boxed{} + 4$$

$$= \boxed{}$$

14. $(8.7 + 3.3) \times \left(\frac{1}{2}\right)^2$

$$= \boxed{} \times \left(\frac{1}{2}\right)^2$$

$$= \boxed{} \times \boxed{}$$

$$= \boxed{}$$

16. $4.3 + (8.4 - 5.1)$

17. $1.25 \times 4 + 3 \times 2 \div \left(\frac{1}{2}\right)^3$

19. Target value: -16

$$2^3 \times (-9) + 7$$

20. Target value: 4

$$\frac{1}{3} \times 21 - 3^2$$

Apply Math Models Tyrell bought some baseball equipment. He used a coupon for $\frac{1}{2}$ off the price of the bat and glove. Write and evaluate a numerical expression to find the total cost of the bat, the glove, and 3 baseballs.



Lesson 3-4

Write Algebraic Expressions

$+$	$-$
\times	\div

An algebraic expression uses variables and operations to represent a situation.

How can you write an algebraic expression to fit a given situation?

How can you write a situation to fit an algebraic expression?

- A.** five minutes **more than** time t

addition

$$t + 5$$

- C.** n nectarines **shared equally** by three

division

$$n \div 3 \text{ or } \frac{n}{3}$$



- B.** $10 - n$

Subtraction means *decreased by*.

10 erasers decreased by a number n



- D.** $5 + 4.6b$

This expression includes two operations, addition and multiplication.

A bicycle rental agency charges \$5 for a helmet plus \$4.60 per hour for a bicycle.

Algebraic Expression: Math expression that has at least _____ and one _____.

Variable: Letter or symbol that represents an _____.

Term: Part of an expression that is separated by a _____ or _____ sign.

Coefficient: The _____ that is multiplied by a variable. Ex. $12r$

Identify the terms and coefficients:

$$\frac{w}{4} + 12.5 - 7z.$$

$$12r + \frac{r}{2} - 19$$

Use the expression $y \div 3(4 - 2) + 5.5$ to complete the table. Identify the parts of the expression that correspond to the descriptions.

Description of Part	Part
Variable	
Difference	
Product	
Constant numerical value	

Write an algebraic expression

12 times a number g

p pennies added to 22 pennies

The floats in the Orlando Citrus parade may use as many citrus fruits as a small orchard produces in 6 years. If f is the number of citrus fruits a small orchard produces in 1 year, write an algebraic expression to represent the number of citrus fruits the floats in the parade may use.

Camila walked p poodles and b bulldogs on Monday. She walked the same number of poodles and bulldogs each day Tuesday through Friday as she did on Monday. Write an algebraic expression to represent how many total dogs were walked in this 5-day period.

Lesson 3-5

Evaluate Algebraic Expressions

1. _____ the problem by replacing each _____ with the assigned _____.
2. Solve by using _____ of _____.

$5g \text{ if } g = 7$

$4w - 12 \text{ if } w = 5$

In 18–20, evaluate each expression for $x = -8$, $x = 2$, and $x = 6$.

18. $x \div 2$

19. $x - 3$

20. $2x + 5$

Evaluate the expression for each value of b .

b	-3	5	0
$b(3) + 20$	<input type="text"/>	<input type="text"/>	<input type="text"/>

The formula $V = s^3$ can be used to find the volume of a cube. Use the formula to find the volume, V , of a cube-shaped bin with side length s of 2 feet.

Which value of x makes the equation true?  6.AR.1.3

$$-5x + (x \div 3) = 14$$

(A) $x = 5$

(B) $x = -5$

(C) $x = 6$

(D) $x = -3$

Lesson 3-6

Apply Properties of Operations: Algebraic Expressions

Commutative Property	
Associative Property	
Distributive Property	

Determine if the two expressions are equal. If so, tell what property is used.

$$(35 + 17) + 43 \quad \& \quad 35 + (17 + 43)$$

$$(25 - 9) - 5 \quad \& \quad 25 - (9 - 5)$$

$$12 + 13 \quad \& \quad 13 + 12$$

$$8(x+2) \quad \& \quad 8x + 16$$

Use the Distributive Property to Factor Expressions

- Find the GCF of the factors
- Divide it out from each number
- Write what is left inside a parenthesis

$12 + 8 \quad \text{GCF} = \underline{\hspace{2cm}}$

$14 + 28 \quad \text{GCF} = \underline{\hspace{2cm}}$

$9 + 21 \quad \text{GCF} = \underline{\hspace{2cm}}$

$80 + 56 \quad \text{GCF} = \underline{\hspace{2cm}}$



Try It!

Which of the following expressions are equivalent? Explain.

$10y + 5$

$15y$

$5(2y + 1)$

14. $-2x + 10$

15. $8\left(2y + \frac{1}{4}\right)$

21. $5(2x + 3)$

a. $10x + 15$

b. $5x + 15 + 5x$

c. $10x + 8$

18. $2x + 4y$

19. $-5[2(y - 2)]$

25. Represent and Connect Write an algebraic expression that represents each purchase.

- a.** Ms. Tonkery bought x number of soccer balls and 3 baseballs.



- b.** Dennis, Eddie, and Félix are on a baseball team. They each bought a baseball and x pairs of sweat socks.

Lesson 3-7a

Simplify Algebraic Expressions

Like Terms: Terms with the same _____ to the same _____ can be combined.

Simplify Expressions

$$3x + 4y - 2y - x$$

$$x + x + x$$

$$4d + 12 + d$$

$$3x + 9y + 12x$$

REVIEW Add/Subtract Fractions (remember-we need common denominators)

$$1/4 + 2/4$$

$$2/3 + 1/3$$

$$4/5 - 2/5$$

$$2/3 + 1/2$$

$$4/5 - 2/3$$

$$1/6 + 2/9$$

7. $-4c - c$

8. $7y - 4.5 - 6y$

13. $x + 2 - 3x - \frac{1}{2}$

9. $3 + 3y - 1 + y$

10. $-x + (-6x)$

11. $5w + 7w - 0.5$

12. $12b + 6\frac{2}{3} - 10b$

Lesson 3-7b

Simplify Algebraic Expressions with Parentheses and Decimals

Remember Order of Operations and Distributive Property



Try It!

Simplify each expression.

a. $-2(t - 4.5 + 3t)$

b. $7(-2y + 3.9)$

c. $-3[-2(5b - 2)] - b + 2.5$

17. $-5 + 3w + 3 - w$

18. $5w - 5w$

19. $2x + 5 + 3x + 6$

20. $3z^3 + 4 - z^3$

21. $-2[-2(8.5m + 6m)]$

22. $2n + 5 - 3n$

Use Patterns and Structure Use the table at the right. Yolanda is planning a party that will take place in three rooms.

- a. Write an expression that can be used to represent the total amount Yolanda will need to rent all three rooms and the sound system for t hours.

Room	Rental Fee (per hour)	Sound System Fee
1	\$25	\$15
2	\$20	\$10
3	\$50	no charge

- b. How can you use a property to write a simplified equivalent expression?