

Name: _____

Period: _____

Date: _____

Math Unit 1: Numerical Expressions and Factors**Lesson 1.3- Order of Operations****SWBAT:****Paraphrase:****Essential Question:** What is the effect of inserting parentheses into a numerical expression?

Vocabulary

P → Parenthesis or grouping symbols
E → Exponents
M → Multiplication } whichever comes first – in order
D → Division } from left to right.
A → Addition } whichever comes first – in order
S → Subtraction } from left to right.

Example 1

a. Evaluate $12 - 2 \times 4$.

$$12 - 2 \times 4 = 12 - 8$$

$$= 4$$

Multiply 2 and 4.

Subtract 8 from 12.

b. Evaluate $7 + 60 \div (3 \times 5)$.

$$7 + 60 \div (3 \times 5) = 7 + 60 \div 15$$

$$= 7 + 4$$

$$= 11$$

Perform operation in parentheses.

Divide 60 by 15.

Add 7 and 4.

Your Turn

Evaluate the expression.

1. $7 \cdot 5 + 3$

2. $(28 - 20) \div 4$

3. $6 \times 15 - 10 \div 2$

Example 2

Evaluate $30 \div (7 + 2^3) \times 6$.

Evaluate the power in parentheses first.

$$30 \div (7 + 2^3) \times 6 = 30 \div (7 + 8) \times 6$$

$$= 30 \div 15 \times 6$$

$$= 2 \times 6$$

$$= 12$$

Evaluate 2^3 .

Perform operation in parentheses.

Divide 30 by 15.

Multiply 2 and 6.

Your Turn

Evaluate the expression.

4. $6 + 2^4 - 1$

5. $4 \cdot 3^2 + 18 - 9$

6. $16 + (5^2 - 7) \div 3$

Example 3

a. Evaluate $9 + 7(5 - 2)$.

$$9 + 7(5 - 2) = 9 + 7(3)$$

Perform operation in parentheses.

$$= 9 + 21$$

Multiply 7 and 3.

$$= 30$$

Add 9 and 21.

b. Evaluate $15 - 4(6 + 1) \div 2^2$.

$$15 - 4(6 + 1) \div 2^2 = 15 - 4(7) \div 2^2$$

Perform operation in parentheses.

$$= 15 - 4(7) \div 4$$

Evaluate 2^2 .

$$= 15 - 28 \div 4$$

Multiply 4 and 7.

$$= 15 - 7$$

Divide 28 by 4.

$$= 8$$

Subtract 7 from 15.

Your Turn

Evaluate the expression.

7. $50 + 6(12 \div 4) - 8^2$ **8.** $5^2 - 5(10 - 5)$ **9.** $\frac{8(3 + 4)}{7}$

Example 4

You buy foam spheres, paint bottles, and wooden rods to construct a model of our solar system. What is your total cost?

Item	Quantity	Cost per Item
Spheres	9	\$2
Paint	6	\$3
Rods	8	\$1

Use a verbal model to solve the problem.

cost of 9 spheres + cost of 6 paint bottles + cost of 8 rods

$$9 \cdot 2 + 6 \cdot 3 + 8 \cdot 1$$

$$9 \cdot 2 + 6 \cdot 3 + 8 \cdot 1 = 18 + 18 + 8$$

Multiply.

$$= 44$$

Add.

Your total cost is \$44.

Your Turn

A group of people visit a museum. What is the total admission price?

Age	Number of People	Admission Price per Person
65 and older	1	\$8
13–64	2	\$12
12 and under	4	\$4

Notes / Questions