

MATH 6 UNIT 4: Order of Operations

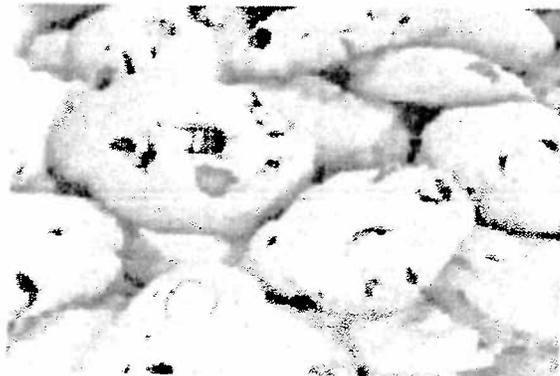
IMPORTANT DATES: _____

NAME: _____

Best Chocolate Chip Cookies!

Oh, no!!! I'm having a Halloween party in an hour and I've dropped my cookie recipe. It's all out of order. Help me put the recipe back in the correct order so I can have a yummy treat at my party.

- Dissolve baking soda in hot water. Add to batter along with salt. Stir in flour, chocolate chips, and nuts (optional).
- Drop by large spoonful's on to ungreased pans.
- Cream together the butter, white sugar, and brown sugar until smooth.
- Bake for about 10 minutes in the preheated oven, or until edges are nicely browned.
- Beat in the eggs one at a time, then stir in the vanilla.
- Preheat oven to 350° F (175° C).



Math 6: Order of Operations Vocabulary

Parentheses:

Exponent:

Multiplication:

Division:

Addition:

Subtraction:

Operation:

Order:

ORDER OF OPERATIONS



P _____

E _____

MD _____

(_____)

AS _____

(_____)

LET'S TRY SOME!

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Mini Poster

LET'S GET CREATIVE! We can do lots of things to remember order of operations: sing and dance, write and draw a cartoon. What will you do?

On this page, either come up with lyrics to your own song for PEMDAS, Write a Poem or Story, or Draw a Cartoon.

P= Parenthesis "()"

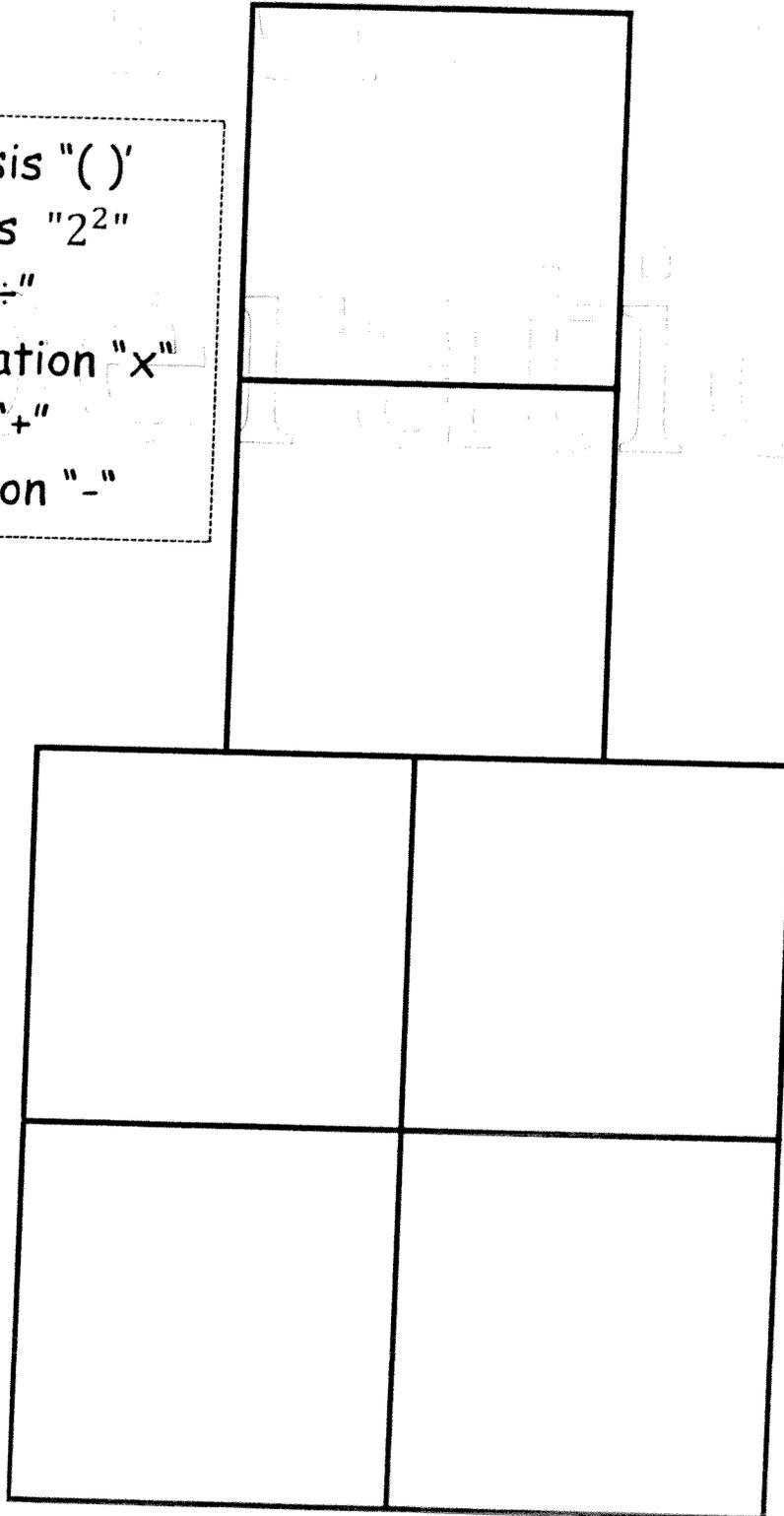
E= Exponents " 2^2 "

D= Division " \div "

M= Multiplication " \times "

A= Addition " $+$ "

S= Subtraction " $-$ "



Purple Elephants May Destroy A School

Name: _____

Use the order of operations to find the correct answers.

1. $(10 \div 5) \times 5 - 4$	9. $14 \div 7 \times (6 \div 2) \times 10$
2. $7 + 3 + (11 - 3) \times (4 \div 2)$	10. $16 \div 4 + 4 \times 5 - 3 - 10$
3. $9 \div 3 + 7 + (20 - 13)$	11. $10 \div 2 \times 8 - 7$
4. $4 \div 2 + 18$	12. $5 + 2 \times 5 + (2 \times 4)$
5. $4 \times 5 - (5 + 6)$	13. $6 \div 3 \times 3 + 10$
6. $9 - 6 + (8 - 3) \times 7 - 3$	14. $(3 + 1 + 3) \times 3 - 4$
7. $5 \times 3 + (6 \times 5)$	15. $(16 \div 2) + 3 \times 5$
8. $5 \times (3 + 4) - 6$	

HOMEWORK

Just: Practice

Order of Operations Test (Level 2)

Name _____

(First and last)

Date _____

Evaluate each expression. Be sure to show all steps.

1. $4^2 - (8 - 3) + 15$

2. $3^3 \div 9 \times (4 - 2)$

3. $6 + 4 \times 6 \div 3$

4. $10 \div 2 \times 6 + (5 \times 2)$

5. $3 \times 8^2 + 6 \div 2$

6. $8 \times 5 - (2^3 + 2) + 4$

7. $5^2 \times (5 - 3) + 7$

8. $26 - 2^2 \times 2 + 4$

Bonus: Place parentheses in this problem to make the solution correct. Work out the problem to show your solution.

$$7^2 - 10 + 5 \times 2 = 19$$

Bell Ringer:

Name:

Date:

Block:

① What is the Order of Operations? Explain:

P
E
MD
AS

② Evaluate each expression. Use PEMDAS!

a) $10 - (3 + 4) =$

f) $2 \times 9 - 4^2 =$

b) $15 \div 3 + 4 =$

g) $7 + (8 - 7 + 2)^4 =$

c) $18 - 3 \cdot 6 =$

d) $(6 + 5) \cdot (8 - 6) =$

h) $6 + 2(9 \cdot 4 - 1) =$

e) $35 \div 5 + 56 \div 7 =$

1-3**Study Guide and Intervention****Order of Operations**

Use the **order of operations** to evaluate numerical expressions.

1. Do all operations within grouping symbols first.
2. Evaluate all powers before other operations.
3. Multiply and divide in order from left to right.
4. Add and subtract in order from left to right.

EXAMPLE 1 Evaluate $(10 - 2) - 4 \cdot 2$.

$$\begin{aligned} (10 - 2) - 4 \cdot 2 &= 8 - 4 \cdot 2 && \text{Subtract first since } 10 - 2 \text{ is in parentheses.} \\ &= 8 - 8 && \text{Multiply 4 and 2.} \\ &= 0 && \text{Subtract 8 from 8.} \end{aligned}$$

EXAMPLE 2 Evaluate $8 + (1 + 5)^2 \div 4$.

$$\begin{aligned} 8 + (1 + 5)^2 \div 4 &= 8 + 6^2 \div 4 && \text{First, add 1 and 5 inside the parentheses.} \\ &= 8 + 36 \div 4 && \text{Find the value of } 6^2. \\ &= 8 + 9 && \text{Divide 36 by 4.} \\ &= 17 && \text{Add 8 and 9.} \end{aligned}$$

EXERCISES

Evaluate each expression.

1. $(1 + 7) \times 3$

2. $28 - 4 \cdot 7$

3. $5 + 4 \cdot 3$

4. $(40 \div 5) - 7 + 2$

5. $35 \div 7(2)$

6. 3×10^3

7. $45 \div 5 + 36 \div 4$

8. $42 \div 6 \times 2 - 9$

9. $2 \times 8 - 3^2 + 2$

10. $5 \times 2^2 + 32 \div 8$

11. $3 \times 6 - (9 - 3)^3$

12. 3.5×10^2

1-3**Practice: Skills****Order of Operations**

Evaluate each expression.

1. $9 - 3 + 4$

2. $8 + 6 - 5$

3. $12 \div 4 + 5$

4. $25 \times 2 - 7$

5. $36 \div 9(2)$

6. $6 + 3(7 - 2)$

7. $3 \times 6.2 + 5^2$

8. $(1 + 11)^2 \div 3$

9. $12 - (2 + 8)$

10. $15 - 24 \div 4 \cdot 2$

11. $(4 + 2) \cdot (7 + 4)$

12. $(3 \cdot 18) \div (2 \cdot 9)$

13. $24 \div 6 + 4^2$

14. $3 \times 8 - (9 - 7)^3$

15. $9 + (9 - 8 + 3)^4$

16. $3 \times 2^2 + 24 \div 8$

17. $(15 \div 3)^2 + 9 \div 3$

18. $(52 \div 4) + 5^3$

19. 26×10^3

20. 7.2×10^2

21. $5 \times 4^2 - 3 \times 2$

22. $24 \div 6 \div 2$

23. $13 - (6 - 5)^5$

24. $(8 - 3 \times 2) \times 6$

25. $(11 \cdot 4 - 10) \div 2$

26. $10 \div 2 \times (4 - 3)$

27. 1.82×10^5

28. $35 \div 7 \times 2 - 4$

29. $2^5 + 7(9 - 1)$

30. $12 + 16 \div (3 + 1)$

Name _____

Order of Operations

Parentheses

Exponents

Multiply and Divide from left to right

Add and Subtract from left to right

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
21	22	23	24	25

 $9 - 5 + 1$

 $6 \div 3 \times 4$

 $5 + 2 \times 9$

 $14 - 3 \times 1$

 $5 \times 2 + 3 \times 3$

 $(3 - 2 + 3)^2$

 $((3 + 3 \div 3) \times 3)$

 $10 \times 3 - 35 \div 7$

 $(16 - 5 \times 3)^2 + 9$

 $(2 + 3)^2 - (3^2 - 8)$

 $6 + (9 - 2)$

 $2^2 + (6 - 2 \times 3)$

 $(2^2)^2 + 2$

 $2(3 + 1) - 7$

 $(1 + 2 \times 3)^2 \div 7$

 $2 + 9 \div (2^2 - 1)^2$

 $2 + (18 - (3 + 2))$

 $6^2 - 2^2 \times 8 + 18$

 $12 - 2^3 \div 2^2 \times 3$

 $1 + 4^2$

 $1^2 + 2^2 + 3^2$

 $(7^2 - 3^2) \div (2^3 - 6)$

 $5^2 - 6 + 2$

 $4^2 - 3^2 - (2 + 3)$

 $(4^2 - 2^2 \times 3)^2 - 7$

How do you remember the Order of Operations?

Create your own acronym for the order of operations. We all know “Please Excuse My Dear Aunt Sally”, now it is time for you to come up with a catchy way to help you remember the Order of Operations.

Example

Pink Eggs May Dance At School!

1. Multiply and divide from left to right.
2. Add and subtract from left to right.

What Kind of TV Show Is Relaxing To Watch?

Simplify each expression, write your answer, then mark it in the answer columns. For each set of exercises, there is one extra answer. Write the letter of this answer in the corresponding box at the right.

2	6	4	8	1	5	7	3
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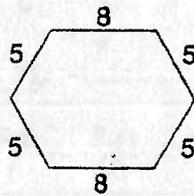
1	<p>a. $10 + 6 \div 2$</p> <p>b. $(10 + 6) \div 2$</p> <p>c. $30 - 3 \cdot 4$</p> <p>d. $(30 - 3) \cdot 4$</p>	<p>(N) 8</p> <p>(O) 18</p> <p>(R) 13</p> <p>(C) 10</p> <p>(D) 108</p>
2	<p>a. $3 \cdot 8 + 7$</p> <p>b. $3(8 + 7)$</p> <p>c. $10 \cdot 3^2 - 4$</p> <p>d. $\frac{20 + 30}{12 - 7}$</p>	<p>(A) 54</p> <p>(G) 45</p> <p>(P) 10</p> <p>(C) 31</p> <p>(E) 86</p>
3	<p>a. $50 + 24 \div 6 \cdot 2$</p> <p>b. $50 + 24 \div (6 \cdot 2)$</p> <p>c. $17 - 5 \cdot 4 \div 2$</p> <p>d. $(17 - 5) \cdot 4 \div 2$</p>	<p>(B) 58</p> <p>(R) 24</p> <p>(M) 16</p> <p>(Y) 52</p> <p>(J) 7</p>
4	<p>a. $5 \cdot 6 + 9 \cdot 4$</p> <p>b. $60 - 2^3 \cdot 5$</p> <p>c. $\frac{9}{3} + \frac{12}{4}$</p> <p>d. $\frac{9 + 12}{3 + 4}$</p>	<p>(F) 6</p> <p>(I) 7</p> <p>(U) 66</p> <p>(K) 3</p> <p>(N) 20</p>
5	<p>a. $4 + 5^2$</p> <p>b. $(4 + 5)^2$</p> <p>c. $32 - 16 \div 4 \cdot 2$</p> <p>d. $(32 - 16) \div (4 \cdot 2)$</p>	<p>(L) 81</p> <p>(O) 24</p> <p>(A) 11</p> <p>(E) 2</p> <p>(R) 29</p>
6	<p>a. $30 - [9 + 4(8 - 5)]$</p> <p>b. $11 - 3^2 + (11 - 3)^2$</p> <p>c. $\frac{10^2}{5} - \frac{6^2}{3}$</p> <p>d. $\frac{10^2 - 6^2}{5 - 3}$</p>	<p>(P) 66</p> <p>(Y) 32</p> <p>(N) 8</p> <p>(G) 9</p> <p>(S) 58</p>
7	<p>a. $2[5 + 2(8 - 6)]$</p> <p>b. $3[20 - 4(2 + 1)]$</p> <p>c. $6 + 4^3 - 1^8$</p> <p>d. $(6 + 4)^3 - 1^8$</p>	<p>(R) 18</p> <p>(L) 115</p> <p>(D) 69</p> <p>(E) 999</p> <p>(W) 24</p>
8	<p>a. $\frac{13 + 7^2 + 7}{9 - 20 \div 4 + 16}$</p> <p>b. $15 + (2^5 - 7) \cdot 3$</p> <p>c. $\frac{36}{2} + \frac{3 \cdot 21}{11 - 2}$</p> <p>d. $\frac{36 + 3 \cdot 21}{2 + 11 - 2}$</p>	<p>(N) 25</p> <p>(R) 90</p> <p>(X) 9</p> <p>(T) 22</p> <p>(S) 1</p>

1-3**Practice: Word Problems****Order of Operations**

1. FOOTBALL The middle school team scored three field goals worth three points each and two touchdowns worth six points each, including extra points. Write a numerical expression to find the team's score. Then evaluate the expression.

2. BOOKS Juan goes to the schoolbook fair where paperback books are \$1.50 and hardback books are \$3.00. Juan buys 5 paperback and 2 hardback books. Write a numerical expression to find how much Juan paid for the books. Then evaluate the expression.

3. GEOMETRY The perimeter of a hexagon is found by adding the lengths of all six sides of the hexagon. For the hexagon below write a numerical expression to find the perimeter. Then evaluate the expression.



4. MONEY Aisha bought school supplies consisting of 6 spiral notebooks costing \$0.39 each, 2 packages of pencils at \$0.79 each, and a 3-ring binder for \$1.99. Write an expression to find the total amount Aisha spent on school supplies. Then evaluate the expression.

5. REASONING Use the order of operations and the digits 2, 4, 6, and 8 to create an expression with a value of 2.

6. NUMBER SENSE Without parentheses, the expression $8 + 30 \div 2 + 4$ equals 27. Place parentheses in the expression so that it equals 13; then 23.

7. MONEY Tyrone bought 5 postcards at \$0.55 each and a set of postcards for \$1.20. Write an expression to find the total amount Tyrone spent on postcards. Then evaluate the expression.

8. DINING Mr. Firewalks took his family out to eat. They ordered 3 meals costing \$8.99 each, 2 sodas at \$1.50 each, and 1 glass of tea for \$1.25. Write an expression to find the total amount the Firewalks family spent on dinner before taxes and tip. Then evaluate the expression.

Name: _____ Date: _____ Block: _____

Math 6: Order of Operations Study Guide
(SOL: 6.8)

Evaluate each question using order of operations. Make sure to **SHOW ALL WORK** (one step per line!!). Good luck, take your time, and check your answers!

1) $4 + (6 + 9) + 3$

2) $11^2 + 3(1 + 2)$

3) $54 + 3 \cdot 2 - 16$

4) $20 + 2^2 + (3 \cdot 12)$

5) Which is the first step in evaluating $14 - 8 \cdot 7 + 3(35 - 5^2)$?

A) $14 - 8$ B) $8 \cdot 7$

C) 5^2 D) $35 - 5^2$

6.) Look at the examples below. Which student used the correct steps for Order of Operations to evaluate the problem? Justify your answer.

Sue
 $10 - (6 + 1^3) + 5 \cdot 10$
 $10 - \frac{7}{1} + 5 \cdot 10$
 $1 + 5 \cdot 10$
 $6 \cdot 10 = 60$

Joe
 $10 - (6 + 1^3) + 5 \cdot 10$
 $10 - (6 + 1) + 5 \cdot 10$
 $10 - 7 + 5 \cdot 10$
 $10 - 7 + 50 = 53$
 $3 + 50 = 53$

_____ evaluated it correctly, because _____

7) What operation would be completed first to solve the following expression?

$$9 + 3 + 14(10 \cdot 8) - 60$$

A) addition

B) subtraction

C) multiplication

D) division

8) $26 + 15 - 21 + 3 \cdot 2$

9) $4 \cdot (2 + 1)^2 - 2^2$

10) $27 + 3 + 7 - 5(2)$

11) Identify the **second** step when evaluating the expression

$$(2 + 9) - 18 + 21 \times 2 - 9$$

A) $(2 + 9)$

B) 21×2

C) $9 - 18$

D) $2 - 9$

21

12) At the electronics store, each video is priced at \$10, each DVD is priced at \$15, and each CD is priced at \$25. Kyle buys 3 videos, 2 DVDs and 2 CDs. Set up an equation using order of operations to find his total cost without tax; then solve it.

13) $8 - 3 + 7 - 4 + 9$

14) $54 + 3 - 2(7 - 3) + 11$

15) $(16 + 4 - 2)^5 + 4^2 \cdot 10$

Partner A: _____

Partner B: _____

Rally Coach

Partner A: Explain to partner B how to solve each of the even problems.

Partner B: Explain to partner A how to solve each of the odd problems.

1) $11 - (3 \cdot 2)$	2) $\frac{25}{(9-4)}$
3) $8 - 4 + 3 \cdot 7$	4) $2 + 5 \cdot 5$
5) $3 + (10 - 5 + 1)^2$	6) $(4 + 3)^2 \div 7$
7) $6 \cdot (8 + 4) \div 2$	8) 8×10^3
9) $5^3 \div 5 - 3 \times 2$	10) $6 + 8 \cdot 2 - (9 - 5)$