

Helping With Math

USA
GRADES

Order of Operations (PEMDAS)

Suitable for students
aged 9-11



This pack is suitable for learners aged 9-11 years old or 5th to 6th graders (USA). The content covers fact files and relevant basic and advanced activities involving order of operations (PEMDAS).

The presence of different grouping symbols and operations makes math problems more challenging. With that, grouping symbols are characterized as an organization in algebraic problems that contains multiple groups.

- **Parentheses ()** -- these are used to group numbers or variables. Always perform first the operation inside the parentheses.
- **Brackets [] and braces { }**
 - *Brackets* and *braces* also are used to group numbers or variables. In general, they are used after parentheses. Parentheses are to be used first, then brackets, and then braces: $\{[()]\}$.

Example:

Evaluate: $7 + (6 \times 5^2 + 3)$



EXAMPLES

- ❖ A mathematical expression that uses parentheses as grouping symbol would look like this:



$$(4 \times 1) + 6$$

- ❖ A mathematical expression that uses parentheses and brackets as grouping symbols would look like this:



$$[3 + (4 \times 1)] + 6$$

- ❖ A mathematical expression that uses parentheses, brackets, and braces as grouping symbols would look like this:



$$3 \{ 2 + [2 (4 + 1)] + 6 \}$$

Note: Improper use of grouping symbols may result to wrong answer.

ORDER OF OPERATIONS

- Operation is a mathematical process. There are four fundamental operations in mathematics namely: addition, subtraction, multiplication, and division.
- **PEMDAS** is an acronym made to help remember the order of operations when dealing with mathematical expressions.
- **PEMDAS** stands for Parentheses, Exponent, Multiplication, Division, Addition or Subtraction.



SAMPLE/APPLICATION

Trivia:

- In the UK they say BODMAS (Brackets, Orders, Divide, Multiply, Add, Subtract)
- In Canada they say BEDMAS (Brackets, Exponents, Divide, Multiply, Add, Subtract).
- It all means the same thing! It doesn't matter how you remember it, just so long as you get it right.



Evaluate: $7 + (6 \times 5^2 + 3)$

→ Start with numbers and operations inside the **Parentheses**

$$7 + (6 \times 5^2 + 3)$$

→ Evaluate 5^2 first because it has an **Exponent**. 5^2 is equal to 25.

$$7 + (6 \times 25 + 3)$$

→ **Multiply** 6 and 25. The product is 150.

$$7 + (150 + 3)$$

→ There is no need to divide numbers. Proceed with **Addition**.

$$7 + (153) = 160$$

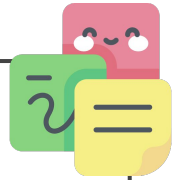
$$\text{Thus, } 7 + (6 \times 5^2 + 3) = 160$$



SAMPLE/APPLICATION

Illustrative Example:

PEMDAS



- Evaluate the values in the Parentheses first

CORRECT WAY! : $2 \times (6 + 5) = 2 \times 11 = 22$

WRONG WAY! : $2 \times (6 + 5) = 12 \times 5 = 55$

- Exponents (Powers, Roots) before Multiply, Divide, Add or Subtract

CORRECT WAY! : $5 \times 3^2 = 5 \times 9 = 45$

WRONG WAY! : $8 \times 3^2 = 24^2 = 576$

- Multiply or Divide before you Add or Subtract

CORRECT WAY! : $2 + (6 \times 5) = 2 \times 30 = 60$

WRONG WAY! : $2 + (6 \times 5) = 8 \times 5 = 40$

- Or, you can solve it from left to right

CORRECT WAY! : $30 \div 5 \times 3 = 6 \times 3 = 18$

WRONG WAY! : $30 \div 5 \times 3 = 30 \div 15 = 2$



TABLE OF ACTIVITIES

Ages 9-10 (Basic) <u>5th Grade</u>	
1	Working From Home Task 1
2	Selecting the Best Choice
3	Work and Solve
4	Online Meeting Password
5	Complete Me
Ages 11-12 (Advanced) <u>6th Grade</u>	
6	Meeting ID
7	Coffee Break
8	Seat Exercise
9	Multi-tasking
10	Sign Out



WORKING FROM HOME TASK 1

G5
Basic

Look at our work from home task 1. The goal is to determine which of the following statements are correct by writing TRUE. Otherwise, correct the statement.

1. In PEMDAS operation , E stands for Extracting.
2. In PEMDAS rule , parenthesis should be performed first.
3. When you solve for the value of $[(6^2) + 5] - 4$, The value would be 37.
4. In PEMDAS rule,the multiplication/division should be the second to perform after the parenthesis.
5. When you evaluate $10 + (4 - 2)$ the answer would be 12.
6. When you perform an operation using PEMDAS , you should solve the problem from right to left.

1.	2.
3.	4.
5.	6.

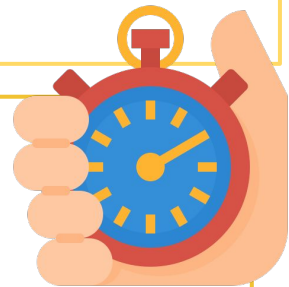


SELECTING THE BEST CHOICE

G5
Basic

Another task given to your team is to select the correct or best answer among these choices. Encircle your answer. Note: If a question requires a solution, you need to write it on the space provided.

- PEMDAS has ___ fundamental Operations
A. 6 B. 4 C. 5
- When you encounter this problem $3 \times 4 + (16 - 6)$, what operation should you perform first?
A. Addition B. Parenthesis C. Multiplication
- What is the missing number in this problem $3^2 + 5 - (\text{___} - 1) = 12$.
A. 4 B. 6 C. 3
- The value of six raised to two times five plus Eighteen is.
A. 157 B. 179 C. 198
- The value of 10 raised to 2 plus eight divided by 2 is.
A. 195 B. 204 C. 104
- What is the missing number in this problem $\text{___} + 2^2 \times 3 = 110$.
A. 98 B. 79 C. 109



WORK AND SOLVE

G5
Basic

Do not stay too long sitting at your working space! Let's solve some math problems! Use $<$, $>$, or $=$ to compare the values.

1.) $6^2 + 4 \times 3$ ___ 37



2.) 78 ___ $(55 + 43) - 70 \div 5$

3.) 67 ___ $70 \times 2 - (34 + 1)$

4.) 344 ___ $15 \times (30 - 5) + 6$

5.) 190 ___ $9^2 + 6 \times (33 - 21)$



ONLINE MEETING PASSWORD

G5
Basic

Decode the online meeting password by applying the principle of PEMDAS. Solve the following items then form the password by listing down the ones digit

1.) $15 - (3 \times 4) + 5$

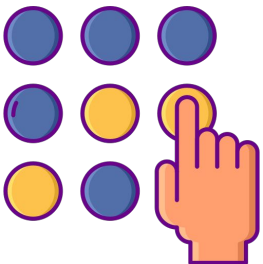
2.) $(27 - 5) \times 5 - 3$

3.) $8^2 - (55 \div 5)$

4.) $65 + 5 \div 1 + (6 - 2)$

5.) $18 + 55 - 15 - (3 - 1)$

6.) $2^3 + (19 - 6) \times 2$



The meeting's password is:



COMPLETE ME

G5
Basic

To continue working on your online task, supply the missing element/s of each sentence/equation.

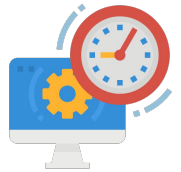


1. $[(\quad + 5) + 20] - 5 = 41$
Choices : 21 , 15 , 10

2. $\quad - (50 \div 2) = 39$
Choices: 6^2 , 3^2 8^2

3. $(59 - \quad) \times 7 - 3 = 221$
Choices : 46 , 27 , 20

4. $\quad \times \quad - \quad = 159$
Choices . 7 , 25 , 4^2



5. \quad should be the first operation to perform.
Choices : Parenthesis , Multiplication , Exponents

6. Solving PEMDAS should be in order from \quad .
Choices : Middle to Ends , Left to Right , Right to Left.



MEETING ID

G6
Advanced

Solve the following mathematical equations by determining which value will complete each. Encircle your choice. Afterwards, use the letters of your choices to reveal the meeting ID.

1. $5 \times 2 + (\quad + 7) = 26$

A. 6 B. 2 C. 9

2. $(2^2 + 5) + 8 = \quad$

A. 22 B. 17 C. 18

3. $3^2 + (5 + 2) - \quad = 0$

A. 16 B. 10 C. 3

4. $\quad - (10 - \quad) \div 2$

A. 5^2 , 8 B. 4^3 , 5 C. 5^3 , 8

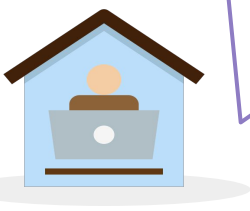
5. $70 \div 5 + 16 + 10 = \quad$

A. 55 B. 40 C. 0

6. $\quad \div (4 + 1) \times 2 = 34$

A. 85 B. 76 C. 33

The meeting ID is:



COFFEE BREAK

G6
Advanced

After a four-hour shift, you deserve a cup of steaming coffee latte to maintain your alertness at work. What do you think are the values of the following expressions? Solve them and get your latte for free!

1. $16 \times 2 + (19 - 8) = ?$

2. $10 - 3 + (5 - 3) = ?$

3. $6^2 - 9 + (2^2 \times 3) = ?$

4. $17 + (65 \times 4) - 10^2 = ?$

5. $60 - 15 + (44 \times 2) - 3^2 = ?$

6. $9^2 - 16 \times 3 - (5 \times 2) = ?$



SEAT EXERCISE

G6
Advanced

Avoid some muscle strains due to long period of sitting and facing your computer monitor. Do a math and seat exercise! Use $<$, $>$, or $=$ to compare each value.

1. $84 + (3^2 - 7)$ _____ 56

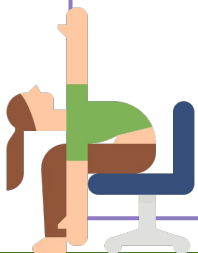
2. $(76 + 3^3) \times 2 - 9$ _____ 250

3. $3^3 \times 4 - (15 + 4)$ _____ 89

4. $28 + 44 - 3^2$ _____ 48

5. $85 + 37 \times 6 - 4^2$ _____ 266

6. $56 + 2^2 \times 7$ _____ 166



MULTI-TASKING

G6
Advanced

Are you a multi-tasked person? How many tasks can you do, at most, at the same time? Accomplish these math tasks below!

A. Modified TRUE or FALSE. Write TRUE if the statement is correct otherwise replace the underlined word to correct it.

_____ 1. Addition ALWAYS comes before exponent

_____ 2. The meaning of (P) in PEMDAS is "Periodic".

_____ 3. The answer in $56 + 2^2 \times 7$ is 78.

_____ 4. $5(4)$ and 5×4 are the same thing.

_____ 5. 4^2 is 16.

_____ 6. 7^2 is 14.



B. Rewrite these english sentences as mathematical sentences then solve.

1. The product of 2 and the cube of 3 minus the sum of seven and the square of 6.

2. The sum of nine hundred fifty-three and the square of 11 divided by the difference of the cube of 8 and twenty-five.



SIGN OUT

G6
Advanced

It's almost time to wrap up today's work. To completely accomplish all the tasks today, here's the last on your list. Do this so you can sign out of remote working.

$$1. (56 - 2^2) - 17 = ?$$

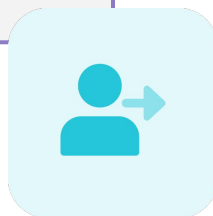
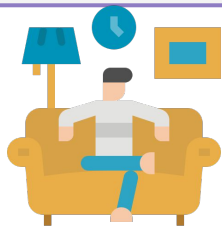
$$2. 88 + 15 \times 3 - 2^2 = ?$$

$$3. 9 \times 9 - 4^2 + 5 = ?$$

$$4. 66 + (44 - 6) - 2^2 = ?$$

$$5. 81 \times 2 - 4 - 4^2 = ?$$

$$6. 78 + 5 \times 6^2 = ?$$



ANSWER GUIDE

Activity 1

- | | |
|-------------|------------------|
| 1. Exponent | 4. Exponent |
| 2. True. | 5. True |
| 3. True. | 6. Left to right |

Activity 2

- | | |
|-------|-------|
| 1. A. | 4. C. |
| 2. B. | 5. C |
| 3. C. | 6. A. |

Activity 3

- | | |
|-------------|------------|
| 1. $48 > .$ | 4. <381 |
| 2. $< 84 .$ | 5. > 153 |
| 3. < 105 | 6. $486 >$ |

Activity 4

- | | |
|--------|-------|
| 1. 8 | 4. 74 |
| 2. 107 | 5. 56 |
| 3. 53 | 6. 34 |

Activity 5

- | | |
|------------|-------------------|
| 1. 21. | 4. 7 , 25 , 4^2 |
| 2. 8^2 . | 5. Parenthesis |
| 3. 27. | 6. Left to Right |



ANSWER GUIDE

Activity 6

1. C.
2. B.
3. A.

4. C.
5. B.
6. A.

Meeting ID: CBACBA

Activity 7

1. 43
2. 9
3. 39

4. 177
5. 124
6. 23

Activity 8

1. $86 >$
2. $197 <$
3. $89 =$

4. $63 >$
5. $291 >$
6. $84 <$

Activity 9

1. Parenthesis

2. Parenthesis

3. 84

4. TRUE

5. TRUE

6. 49

B. 1. $(2 \times 3^3) - (7 + 6^2) = 54 - 42 = 8$

2. $(953 + 11^2) \div (8^3 + 25) = 1074 \div 537 = 2$

Activity 10

1. 35
2. 129
3. 70

4. 100
5. 142
6. 258



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