Go Over the Order of Operations

When first introducing the order of operations, explain that there is a specific order in which a complex mathematical statement should be solved. Instead of simply reading a problem left to right, the problem must be solved in the following order:

1. **Parenthesis** - Anything inside parenthesis or brackets should be solved first. You then move outside of the parentheses.
2. **Exponents** - Next, any exponents should be solved.
3. **Multiplication** - Solve any multiplication problems.
4. **Division** - Division problems are now solved.
5. **Addition** - Next, complete any addition problems within the statement.
6. **Subtraction** - Finally, complete any subtractions problems.

Step 1: Use simple examples to start, such as:

7 + 2 - 3 x 2 =

Step 2: Using the order of operations, there is nothing in parenthesis and there are no exponents, so the multiplication would be solved first. 3 x 2 = 6, so the problem now becomes:

7 + 2 - **6** =

Step 3: There is no division in this equation, so the next step would be to complete any addition. 7 + 2 = 9, so the problem now becomes:

9 - 6 =

Step 4: The final step is solving any subtraction, so the student would now complete the equation and come up with the following answer:

9 - 6 = **3**

Please Excuse My Dear Aunt Sally (PEMDAS)

Students who are just beginning to use order of operations may have a hard time remembering what order to solve equations in. Fortunately there is a mnemonic device that makes it easy to remember. You simply have the student take the first letter of each word in the order of operations sequence and come up with a sentence he can easily remember.

- **P** - Parenthesis
- **E** - Exponents
- **M** - Multiplication
- **D** - Division
- **A** - Addition
- **S** – Subtraction

Since PEMDAS is not a real word and thus not easily remembered, many people use the sentence, 'Please Excuse My Dear Aunt Sally,' to remember the first letters.

Abbreviation	Operation	Word to Associate
P	Parenthesis	Please
E	Exponents	Excuse
M	Multiplication	My
D	Division	Dear
A	Addition	Aunt
S	Subtraction	Sally

By learning this mnemonic device, when a student sees an equation like this, he will be able to solve it by going through the process:

$(8 + 5) \times 9^2 + 5 * 9 - (8 \times 3) =$

Grouping with Parenthesis

Every student learns differently. If a student is struggling with how to solve a math problem, you can teach him to use parenthesis and brackets to separate different equations. However, he must first understand the basic order of operations and should be familiar with PEMDAS for this method to be effective.

Parenthesis and brackets should be used in the order the operations occur. Here are a couple of examples:

6 + 7 * 3 -2 =

The first step that occurs in the order of operations is multiplication in this math statement, so the student would rewrite the problem like this:

6 + **(**7 * 3**)** - 2 =

6 + (21) - 2 =

The next step would be addition, so the student could then rewrite the equation like this:

[6 + (21)**]** - 2 =

[27] - 2 =

Finally, the student would simply solve the problem.

27 - 2 = 25

Simply using this process in the beginning stages can help the student begin to see how the order of operations is broken down step-by-step and prevent errors when longer and more complex equations occur.