

# Grade 5

Unit	Unit Title	Lesson	Day
<b>5.5</b>	<b>Working with Numerical Expression Order of Operations</b>	<b>1 of 2</b>	<b>1 – 3</b> (NOTE: more time is needed for this unit; min 5 days per lesson)
<b>Lesson Focus</b>			
1. Standards Addressed	2. Content to be Learned	3. Mathematical Practices	4. Essential Question
5.OA.1 Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.	<ul style="list-style-type: none"> <li>• Use parentheses ( ), brackets [ ], or braces { }, called grouping symbols, in numerical expressions, and evaluate (using order of operations) expressions with these symbols.</li> <li>• Understand that you evaluate the expression within the grouping symbols as the first order of preference in order of operations.</li> <li>• Understand that when an expression is written using all three of the grouping symbols (parentheses, brackets, braces) you solve first what is in the parentheses, then the brackets and finally the braces. Though all three symbols are seldom used at one time.</li> </ul>	<b>SMP4</b> Model with mathematics.  <b>SMP6</b> Attend to precision.	<ul style="list-style-type: none"> <li>• In what order must operations be evaluated to find the solution to a problem?</li> <li>• In what order must operations be evaluated to find a solution when the expression uses all three grouping symbols; parentheses, brackets, and braces?</li> </ul>
5. Prerequisite Knowledge	6. Essential Vocabulary	7. Possible Misconceptions	8. Necessary Materials
Evaluate expressions using the order of operations for addition, subtraction, multiplication and division. (Multiply and divide from left to right, then add and subtract from left to right).	Order of operation Evaluate Numerical expressions Grouping symbols: Parentheses ( ) Brackets [ ] Braces { }	When using the Mnemonic PEMDAS to remember the order of operations many students and adults forget to include multiply and divide <b>from left to right</b> and add and subtract <b>from left to right</b> . You do not do all the multiplication (then divide) or addition (then subtract), solve which comes first (M or D) then (A or S) from left to right.	<b>OnCore Lesson 1 &amp; 2</b> pages 1 – 4 <b>Investigations Snap-in</b> Unit 1 Session 2.4A pages C2 – C5 Unit 7 C103 <b>K-5 Math Resources</b> <a href="#">Target Number Dash</a> <b>Game 24</b> ( <i>like Target Number Dash</i> ) <a href="http://en.wikipedia.org/wiki/24_Game">http://en.wikipedia.org/wiki/24_Game</a> Directions using playing cards. Game may also be purchased on-line and at Lakeshore Learning.
<b>Instruction</b>			

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<b>9. Instruction Practices (What are the teachers doing)</b>	<b>10. Learning Practices (What are the students doing)</b>
<p>Teachers will guide students to use parentheses, brackets, or braces (also called grouping symbols) in numerical expressions. Students should be familiar with using the order of operations for multiplication, division, addition and subtractions but will need to be reminded that they multiply and divide from left to right and then add and subtract from left to right. This often causes misconceptions. Teachers will explain to students that when evaluating expressions, parentheses is the first order of operations in the rule PEMDAS (exponents will be included next year). They will show students that when using all three of the grouping symbols (parentheses, brackets or braces) you solve first what is in parentheses, then the brackets and finally the braces { [ ( ) ] }. Though all of these three symbols are seldom used at one time. Teachers will use OnCore Lesson 1 &amp; 2, the Investigations Snap-in 2.4A (which also includes a few examples for Lesson 2 CCSS 5.OA.2). There does not appear to be enough time allocated for this standard, but for those teachers who have completed the lessons earlier they may want to include the K-5 Math Number Dash or the Game 24 (which is very similar). The directions to 24 using playing cards have been included or the actually game can be purchases. I think you will find it a worthwhile investment.</p>	<p>Students will use parentheses, brackets, or braces (also called grouping symbols) in numerical expressions. Students should be familiar with using the order of operations for multiplication, division, addition and subtractions but will need to be reminded that they multiply and divide from left to right and then add and subtract from left to right. This often causes misconceptions. They will learn that when evaluating expressions, parentheses is the first order of operations in the rule PEMDAS (exponents will be included next year). Students will understand that when using all three of the grouping symbols (parentheses, brackets or braces) you solve first what is in parentheses, then the brackets and finally the braces { [ ( ) ] }. Students will practice using OnCore and the Investigations Snap-in student pages. If time allows teachers will introduce the students to the K-5 Math Number Dash or the Game 24 (which is very similar). Students will find this game very challenging until they begin to learn and use strategies that they about factors of 24.</p>

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Unit <b>5.5</b>	Unit Title <b>Working with Numerical Expressions Order of Operations</b>	Lesson <b>2 of 2</b>	Day <b>4 &amp; 5</b> *(NOTE: more time is needed for this unit; min 5 days per lesson)
<b>Lesson Focus</b>			
<b>1. Standards Addressed</b>	<b>2. Content to be Learned</b>	<b>3. Mathematical Practices</b>	<b>4. Essential Question</b>
<p><b>5.OA.2</b> Write simple expressions that record calculations with numbers, and interpret numerical expressions without actually calculating them. <i>For example, express the calculation “add 8 and 7, then multiply by 2” as <math>2 \times (8+7)</math>. Recognize that <math>3 \times (18932 + 921)</math> is three times as large as <math>(18932 + 921)</math>, without having to calculate the product.</i></p>	<ul style="list-style-type: none"> <li>•Write numerical expressions to match the words (verbal expression).</li> <li>•Write words (verbal expression) to match the numerical expression.</li> </ul>	<p><b>SMP4</b> Model with mathematics.</p> <p><b>SMP6</b> Attend to precision.</p>	<ul style="list-style-type: none"> <li>•How can you write a numerical expression to describe a situation?</li> <li>•How do you write words (verbal expression) to match this numerical expression?</li> <li>•How do you write a numerical expression to match these words (verbal expression)?</li> <li>•Without performing any operations what can you tell me about the value of _____ expression?</li> </ul>
<b>5. Prerequisite Knowledge</b>	<b>6. Essential Vocabulary</b>	<b>7. Possible Misconceptions</b>	<b>8. Necessary Materials</b>
<ul style="list-style-type: none"> <li>•Understand the meaning of addition, subtraction, multiplication and division.</li> <li>•Understand the many uses of vocabulary for these operations. For example, you could read the following expression <math>(5 + 7)</math> as “five plus seven” or “the sum of 5 and 7”</li> </ul>	<p>Word (verbal expression) Numerical expression</p> <p><b>Note:</b> <i>The term verbal expression is not explicitly used in this standard but it is used to algebra to distinguish between a numerical (number) expression and word.</i></p>	<p>Writing directions from left to right instead of following the order of operations, even when writing verbal expressions.</p>	<p><b>Oncore Lesson 3</b> Student pages 5 &amp; 6</p> <p><b>K-5 Math Resources</b> <a href="#">Verbal Expressions</a></p> <p><a href="#">www.mathworksheetsland.com</a> Evaluating Expressions: <b>Guided Lesson</b>, Practice and Matching</p>
<b>Instruction</b>			
<b>9. Instruction Practices (What are the teachers doing)</b>	<b>10. Learning Practices (What are the students doing)</b>		

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Teachers will guide students to write simple expressions that record calculations with numbers, and interpret numerical expressions ***without actually calculating them***. They will help students to write numerical expressions to match the words (verbal expressions; term used in algebra but not required here) and to write words (verbal expressions) to match a numerical expression. Teachers will direct students to understand the many uses of vocabulary for the operations. For example you can read  $(5+7)$  as “five plus seven” or “the sum of 5 and 7”. Teachers should read the **Guided Lesson** that is included from [www.mathworksheetsland.com](http://www.mathworksheetsland.com) before instructing this lesson. They will gain an understanding of how to read an expression that is in parentheses, remembering that the parentheses tells you to complete that operation (find the sum, difference, product or quotient) before moving onto the next operation when solving an expression. Teachers will use OnCore, they may refer back to some of the Investigations student pages in Lesson 1 (CCSS 5.OA.1), the K-5 Math Resource and the Practice and Matching page that has been included form [www.mathworksheetsland.com](http://www.mathworksheetsland.com). Please note, more time will need to be considered for this unit for next year. Only 5 days \*has been allocated.

Students will write simple expressions that record calculations with numbers, and interpret numerical expressions ***without actually calculating them***. They will learn to write numerical expressions that match words (verbal expressions) and visa versa to write words (verbal expressions) that match a numerical expression. Students will be aware of the different vocabulary that is used to define the four mathematical operations. They will gain an understanding of how to read an expression that is in parentheses remembering that the parentheses tells you to complete that operation first (find the sum, difference, product or quotient) before moving onto the next operation when solving an expression. They will practice this standard using OnCore, K-5 Math Resources and the practice and matching pages from [www.mathworksheetsland.com](http://www.mathworksheetsland.com) as provided by their teachers and time allows.

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