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| **NC.5.OA.2****Expression Sets** |
| **Domain** | **Operations and Algebraic Thinking** |
| **Cluster** | **Write and interpret numerical expressions** |
| **Standard(s)** | **NC.5.OA.2** Write, explain, and evaluate numerical expressions involving the four operations to solve up to two-step problems. Include expressions involving:* Parentheses, using the order of operations
* Commutative, associative and distributive properties
 |
| **Materials** | Paper and pencil |
| **Task** | Choose one set of expressions. Set A Set B Set C Set D1 + 2 + (3 + 4) 1 x 2 x (3 x 4) 1 + 2 x (3 + 4) (1 x 2) + 3 x 4(1 + 2) + 3 + 4 (1 x 2) x 3 x 4 (1 + 2) x 3 + 4 1 x 2 + (3 x 4)1 + (2 + 3) + 4 1 x (2 x 3) x 4 1 + (2 x 3) + 4 1 x (2 + 3) x 41 + 2 + 3 + 4 1 x 2 x 3 x 4 1 + 2 x 3 + 4 1 x 2 + 3 x 4* Find the value of each expression. What patterns do you notice? What impact does the position of the parentheses have on the value of the expressions?
* Find a partner who chose a different set than the one you chose. What did they notice about their expressions?
* Why do we use parentheses in mathematical expressions? When is it important to use parentheses? When are parentheses not necessary?
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| **Rubric** |
| **Level I****Not Yet** | 1. **Level II**

**Progressing** | **Level III****Meets Expectations** |
| * Student is not yet able to solve the expressions in the set they have selected.
* Student is not yet able to engage in a mathematical discussion with their partner.
 | * Student correctly solves the expressions in the set they have selected.
* Student is unclear about when parentheses are necessary and when they are not but still engages in a mathematical discussion with their partner.
 | * Student correctly solves the expressions in the set they have selected.
* Student engages in a discussion with their partner about when parentheses affected the outcome and when they didn’t.
* Answers will vary.
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| **Standards for Mathematical Practice** |
| 1. **Makes sense and perseveres in solving problems.** |
| 2. Reasons abstractly and quantitatively. |
| 3**. Constructs viable arguments and critiques the reasoning of others.** |
| 4. Models with mathematics. |
| 5. Uses appropriate tools strategically. |
| 6. Attends to precision. |
| 7. Looks for and makes use of structure. |
| 8. **Looks for and expresses regularity in repeated reasoning.** |

**Expression Sets**

Choose one set of expressions.

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| **Set A** | **Set B** | **Set C** | **Set D** |
| 1 + 2 + (3 + 4) | 1 x 2 x (3 x 4) | 1 + 2 x (3 + 4) | (1 x 2) + 3 x 4 |
| (1 + 2) + 3 + 4 | (1 x 2) x 3 x 4 | (1 + 2) x 3 + 4  | 1 x 2 + (3 x 4) |
| 1 + (2 + 3) + 4 | 1 x (2 x 3) x 4 | 1 + (2 x 3) + 4 | 1 x (2 + 3) x 4 |
| 1 + 2 + 3 + 4 | 1 x 2 x 3 x 4 | 1 + 2 x 3 + 4 | 1 x 2 + 3 x 4 |

* Find the value of each expression. What patterns do you notice? What impact does the position of the parentheses have on the value of the expressions?
* Find a partner who chose a different set than the one you chose. What did they notice about their expressions?
* Why do we use parentheses in mathematical expressions? When is it important to use parentheses? When are parentheses not necessary?