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|  **NC.3.OA.9****Patterns on the Multiplication Chart** |
| **Domain** | Operations and Algebraic Thinking |
| **Cluster** | Explore patterns of numbers. |
| **Standard(s)** | **NC.3.OA.9** Interpret patterns of multiplication on a hundreds board and/or multiplication table. |
| **Materials** | multiplication chart (following page), paper, pencils, manipulatives, white boards and dry-erase markers (optional) |
| **Task** | * Give each student a copy of the shaded multiplication chart (see attached).
* Briefly prompt students to look at the two shaded boxes containing 6’s (which are separated by the diagonal dotted line).
* Ask students to independently think about each question:
	+ What observations can you make about these two products?
* Have students analyze the remaining pairs of shaded boxes on the multiplication chart.
* Prompt students to respond in writing to the following questions:
	+ What equations can be used to represent each set of shaded numbers?
	+ Why can more than one equation be used to represent each product?
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| **Rubric** |
| **Level I**Not Yet | 1. **Level II**
2. Progressing
 | **Level III**Meets Expectation |
| * Student uses inappropriate solution strategy and does not achieve the correct answer.
 | * Student finds the correct answer, but there be inaccuracies or incomplete justification of solution ***OR***
* Uses partially correct strategy, but gets the wrong answer.
 | * Student notice that each set of numbers has the same factors. Student records correct equations to represent each set of numbers.
* Student correctly explains that factors can be reversed in an equation, while maintaining the same product (commutative property).
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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. |

**Patterns on the Multiplication Chart**

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| **x** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** |
| **1** | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| **2** | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 |
| **3** | 3 | 6 | 9 | 12 | 15 | 18 | 21 | 24 | 27 |
| **4** | 4 | 8 | 12 | 16 | 20 | 24 | 28 | 32 | 36 |
| **5** | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 |
| **6** | 6 | 12 | 18 | 24 | 30 | 36 | 42 | 48 | 54 |
| **7** | 7 | 14 | 21 | 28 | 35 | 42 | 49 | 56 | 63 |
| **8** | 8 | 16 | 24 | 32 | 40 | 48 | 56 | 64 | 72 |
| **9** | 9 | 18 | 27 | 36 | 45 | 54 | 63 | 72 | 81 |

**Adapted from *illustrativemathematics.org***