Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Powers of 10 Resource Page Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |
| --- | --- | --- |
| NBT.2: Powers of 10  **Explain** patterns in the number of zeros of the product when multiplying a number by powers of 10.  **Explain** patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. | | |
|  | | 100 = 1  101 = 10  102  = 100  103 = 1,000  104 = 10,000 |
| Strategies:  Multiplying Numbers by Powers of 10:  1. “B” for bigger  2. Decimal moves to the right  3. Exponent tells how many places the decimal moves  B  B  5 x 102 = 50 2.3 x 102 = 230.      B  B  8 x 103 = 800 47.71 x 103 = 47,710. | Multiplying Numbers by Powers of 10:  36 × 10 = 360 36 × 101 = 360  36 × 10 × 10 = 3,600 36 × 102 = 3,600  36 × 10 × 10 × 10 = 36,000 36 × 103 = 36,000  36 × 10 × 10 × 10 × 10 = 360,000 36 × 104 = 360,000 | |
| Explanation Example:  I noticed that every time I multiplied by 10, I placed a zero to the end of the number. That makes sense because each digit’s value became 10 times larger. To make a digit 10 times larger, I have to *shift* it one place value to the left. | |
| Strategies:  Dividing Numbers by Powers of 10:  1. “S” – quotient is “smaller”  2. Decimal moves to the left  3. Exponent tells how many places the decimal moves  S  S  45.3 ÷ 103 = .0453 984.2 ÷ 102 = 9.842 | Explanation Example:  When I multiplied 36 by 10, the 30 became 300. The 6 became 60 or the 36 became 360. So I had to place a zero at the end to have the 3 tens represent 3 one-hundreds (instead of 3 tens) and the 6 ones represents 6 tens (instead of 6 ones). | |