NAME_____

Module 5 **Decimal Operations, Exponents, and Powers**
Lesson 7 **Scientific Notation**

Independent Practice 5.7

Write as a power of 10.

1. 100,000
10^5

2. 0.0001
10^{-4}

3. 1,000,000
10^6

4. 0.001
10^{-3}

Evaluate.

5. 10^8
100,000,000

6. 10^{-5}
0.00001

7. 10^{-1}
0.1

8. 10^4
10,000

Multiply.

9. 4.5×10^5
450,000

10. $1{,}231 \times 10^{-5}$
0.01231

11. 608.9×10^{-2}
6.089

12. 0.02×10^7
200,000

Write in expanded form.

13. 7.143
$7 \times 10^0 + 1 \times 10^{-1} + 4 \times 10^{-2} + 3 \times 10^{-3}$ or $7 + 0.1 + 0.04 + 0.003$

14. 42.71
$4 \times 10^1 + 2 \times 10^0 + 7 \times 10^{-1} + 1 \times 10^{-2}$ or $40 + 2 + 0.7 + 0.01$

Is the expression written in scientific notation? If not, write it in scientific notation.

15. 50×10^{-5}
No: 5.0×10^{-4}

16. 1.2×10^{9}
Yes

17. The wavelength of x-rays is about 10^{-10} m. Write this number in standard form.
0.0000000001 m

18. The length of the Great Wall of China is about 6,400 km. Write this number in scientific notation.
6.4×10^{3} km

Write each expression as a number in standard form.

19. $(5.3 \times 10^{4}) + (6.6 \times 10^{-2})$
53,000.066

20. $(7.9 \times 10^{-2}) + (2.3 \times 10^{3})$
2,300.079

Journal

1. Explain how to write an integer power of 10.
2. Explain how to evaluate 10^{n} for any integer n.
3. Explain how to multiply by a power of 10 with an integer exponent.
4. Explain how to convert a number in standard notation to scientific notation.

Cumulative Review

Order each set of numbers from least to greatest.

1. 0.54, -0.51, -0.54, $\frac{56}{100}$
-0.54, -0.51, 0.54, $\frac{56}{100}$

2. -0.65, -0.81, -0.35, $-\frac{6}{10}$
-0.81, -0.65, $-\frac{6}{10}$ -0.35

Add.

3. 6.78 + 0.4
7.18

4. 4.66 + 1.21
5.87

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Subtract.

5. 2.3 – 0.23
2.07

6. 7.11 – 3.345
3.765

Evaluate each expression and check for reasonableness of the answer.

7. 3.9 × 8.1
4 × 8 = 32
3.9 × 8.1 ≈ 32
3.9 × 8.1 = 31.59

8. 14.5 × 0.77
15 × 1 = 15
14.5 × 0.77 ≈ 15
14.5 × 0.77 = 11.165

9. 42 ÷ 96
40 ÷ 100 = 0.4
42 ÷ 96 ≈ 0.4
42 ÷ 96 = 0.4375

10. 55.4 ÷ 2
56 ÷ 2 = 28
55.4 ÷ 2 ≈ 28
55.4 ÷ 2 = 27.7

Evaluate.

11. -4^2
-16

12. $(-3)^4$
81

13. 6 to the 2^{nd} power
36

14. 2 to the 6^{th} power
64

15. $5^2 - 3^3$
-2

16. $-95(7 - 8)^{11}$
95

Possible Journal Answers

1. **To write a power of 10 greater than or equal to one, I count the number of zeros in the number and use that number as the exponent. To write a power of 10 that is less than one, I count the number of places after the decimal point and use the opposite of that number as the exponent.**

2. **To evaluate 10^n for an integer n greater than or equal to zero, I write one followed by n zeros. To evaluate 10^n for integer n less than zero, I write one in the nth decimal place, preceded by as many zeros as necessary.**

3. **To multiply by a power of 10 with a nonnegative integer exponent, I move the decimal point one place to the right for every power of 10. To multiply by a power of 10 with a negative integer exponent, I move the decimal point one place to the left for every negative power of 10.**

4. **To write a number in scientific notation, I move the decimal point so only one nonzero digit appears to the left of the decimal point. I count the number of places I moved from the original decimal point. The number of places I counted is the exponent of 10. If I counted to the right of the first nonzero digit, the exponent is positive. If I counted to the left of the first nonzero digit, the exponent is negative.**