

5 Basics

- 1) 3.05×10^9 2) 7.02×10^{-4} 3) 8.003×10^8
 $305,000$ $.000702$ $800,300,000$
- 4) 7.451×10^4 5) 5.91×10^0 6) 7.99×10^{-1}
 $74,510,000$ 5.91 $.799$
- 7) 8.9354×10^{10} 8) 8.1×10^{-9} 9) 4×10^{15}
 $89,354,000,000$ 1.0000000081 $4,000,000,000,000,000$
- 10) 0.0000456 11) 0.00001 12) $590,000,000$
 456×10^{-5} 1×10^{-5} 5.9×10^8
- 13) 0.0000000012 14) 0.000080436 15) 0.03021
 1.2×10^{10} 8.0436×10^{-5} 3.021×10^{-2}
- 16) $433 \times 10^{4^2}$ 17) $0.0042 \times 10^{-3^3}$ 18) $50,000,000,000$
 4.33×10^6 4.2×10^{-6} 5×10^{10}

7 Basic Pt. 2

$$1) \frac{1.4 \times 10^4}{2 \times 10^2} = 7 \times 10^2 = 7 \times 10 + 70$$

$$2) \frac{3 \times 10^{-12}}{2 \times 10^{-15}} = 1.5 \times 10^3 + 1500$$

$$3) (3.2 \times 10^{-2})(2.0 \times 10^2) = 0.4 \times 10^0 = 0.4 \quad (0.4 \times 1)$$

$$4) \frac{1.2072 \times 10^{-8}}{2.4 \times 10^{-12}} = 528 \times 10^4 = 5.28 \times 10^3 + 5280$$

$$5) (7.7 \times 10^5)(2.1 \times 10^2) = 16.17 \times 10^{7+1} = 1.617 \times 10^8 + 161700000$$

$$6) \frac{9.72 \times 10^8}{7.2 \times 10^{10}} = 1.35 \times 10^{-2} + 0.0135$$

$$7) (3.3 \times 10^5)(1.5 \times 10^{-4}) = 4.95 \times 10 + 49.5$$

$$8) \frac{3.3 \times 10^{-12}}{1.1 \times 10^{-14}} = 3 \times 10^2 + 300$$

$$9) \frac{4 \times 10^{-4}}{2.5 \times 10^2} = 1.6 \times 10^{-6} + 0.000016$$

$$10) 9(4.5 \times 10^{10}) = 40.5 \times 10^{10+1} = 4.05 \times 10^{11} \text{ BTU}$$

$$11) \frac{6.25 \times 10^9}{1.98 \times 10^9} \approx 3.16 \times 10$$

The quotient is about 3.16.

#8: Sci. Not. Mult./Div.

1) 7.3×10^7 2) 2.9×10^3 3) 9.921×10^{12}

$\frac{7.3}{73000000}$ $\frac{2.9}{2900}$ $\frac{9921}{982100000000}$

4) 3.54×10^{-1} 5) 7.3042×10^4 6) 4.208×10^{-6}

$\frac{3.54}{3.54}$ $\frac{73042}{73042}$ $\frac{4208}{4208000000000000}$

7) 1.0×10^{-19} 8) 2.78×10^4

$\frac{1}{10000000000000000000000000000000}$ $\frac{27800}{27800} = 127800$

9) 9.150000000000000000 10) 0.387 11) 845.320

$\frac{9.1500 \times 10^{11}}{9.1500 \times 10^{11}}$ $\frac{0.387}{0.387 \times 10^3}$ $\frac{845.320}{845.32 \times 10^5}$

12) 0.000000000814 13) 0.00009021 14) 0.003157

$\frac{8.14 \times 10^{-9}}{8.14 \times 10^{-9}}$ $\frac{9.021 \times 10^5}{9.021 \times 10^5}$ $\frac{3.157 \times 10^{-3}}{3.157 \times 10^{-3}}$

15) 30000 16) 0.000000000012 17) $50 \times 10^7 + 1$

$\frac{30000 \times 10^4}{30000 \times 10^4}$ $\frac{1.2 \times 10^{-11}}{1.2 \times 10^{-11}}$ $\frac{5.0 \times 10^8}{5.0 \times 10^8}$

18) $4740 \times 10^{5+3}$ 19) $0.670 \times 10^{-3-2}$ 20) $0.0057 \times 10^{3-3}$

$\frac{4740 \times 10^8}{474 \times 10^8}$ $\frac{7.0 \times 10^{-5}}{7.0 \times 10^{-5}}$ $\frac{5.7}{5.7 \times 10^0}$

21) $(5 \times 10^{-2})(2.3 \times 10^{12}) = 11.5 \times 10^{10+1} = 1.15 \times 10^{11}$

22) $(2.5 \times 10^{-3})(10 \times 10^{15}) = 15 \times 10^{12+1} = 1.5 \times 10^{13}$

23) $(9.9 \times 10^3)(4.2 \times 10^{-11}) = 16.38 \times 10^{-8+1} = 1.638 \times 10^{-7}$

24) $(4.0 \times 10^{-4})(3.1 \times 10^{-1}) = 14.20 \times 10^{-5+1} = 1.420 \times 10^{-4}$

$$25) \frac{3.12 \times 10^3}{1.56 \times 10^{-3}} = \boxed{2 \times 10^6}$$

$$26) \frac{6.72 \times 10^3}{4.2 \times 10^8} = \boxed{1.6 \times 10^{-5}}$$

$$27) \frac{1.17 \times 10^2}{5 \times 10^{-1}} = \boxed{23.4 \times 10^3} = \boxed{2.34 \times 10^2}$$

$$28) \frac{1.82 \times 10^5}{9.1 \times 10^7} = \boxed{2 \times 10^{-2}} = \boxed{2 \times 10^{-3}}$$

$$29) \frac{1.08 \times 10^4}{8.4 \times 10^{-4}} = \boxed{2 \times 10^{8-1}} = \boxed{2 \times 10^7}$$

$$30) \frac{2.15 \times 10^{-3}}{3.1 \times 10^2} = \boxed{0.5 \times 10^{-5}} = \boxed{0.5 \times 10^{-6}}$$

$$31) (5 \times 10^6)(5 \times 10^6) = \boxed{25 \times 10^{12}} = \boxed{2.5 \times 10^{13}}$$

$$32) \frac{4.778 \times 10^6}{1.14 \times 10^5} \approx \boxed{4.19 \times 10} \text{ or } \boxed{41.9}$$

Name: _____

Date: _____

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SWBAT apply operations to scientific notation.

- 1) Multiply and divide the numbers (5.6×10^4) and (1.4×10^2) . Express your answers in both standard form and scientific notation.

Multiply: $(5.6 \times 10^4)(1.4 \times 10^2) =$

$$7.84 \times 10^6$$

$$7840000$$

Divide:

$$\frac{5.6 \times 10^4}{1.4 \times 10^2} = 4 \times 10^2$$

$$400$$

- 2) If the number of molecules in 1 mole of a substance is 6.02×10^{23} , then how many molecules would be in 300 moles? Write your answer in scientific notation.

A) 1806×10^{23}

$$300(6.02 \times 10^{23})$$

B) 18.06×10^{25}

$$1806 \times 10^{23} \times 3$$

C) 1.806×10^{25}

$$1.806 \times 10^{26}$$

D) 1.806×10^{26}

- 3) There are about 7.2×10^9 people on our planet. If there are about 1.8×10^8 square miles on the planet, then what is the average number of people per square mile?

$$\frac{7.2 \times 10^9}{1.8 \times 10^8} = 4 \times 10 = 40 \text{ ppl/sq. mi.}$$

Remember to cross out any options that are not written in correct scientific notation!

- 4) In 2000, the population of Forest, Virginia, was about 8,000 people. Write this population in scientific notation.

$$8 \times 10^3$$

5)

Write 5×10^{-4} in standard form.

$$.0005$$

6)

Write 0.000346 in scientific notation.

A) 0.346×10^{-5}

B) 346×10^{-6}

C) 3.46×10^{-4}

D) 0.346×10^{-3}

7)

The number 0.156×10^{-2} is equivalent to

A) 156

B) 0.0156

C) 0.00156

D) 0.156

8)

If 0.0347 is written by a scientist in the form 3.47×10^n , the value of n is

A) -3

B) 3

C) -2

D) 2

9)

According to the 2000 census, the population of New York State was approximately 18,900,000. How is this number expressed in scientific notation? 1.89×10^7

A) 18.9×10^6

B) 1.89×10^7

C) 1890×10^4

D) 189×10^5

10)

The distance from Earth to the Sun is approximately 93 million miles. A scientist would write that number as

A) 93×10^7

B) 9.3×10^{10}

C) 9.3×10^8

D) 9.3×10^7

93000000

- 11) Find the product of 3.4×10^3 and 6.1×10^{14} . Write your answer in scientific notation.

$$(3.4 \times 10^3)(6.1 \times 10^{14}) = 20.74 \times 10^{17+1} = \boxed{2.074 \times 10^{18}}$$

- 12) What is 4.4×10^7 divided by 1.1×10^4 ? Express your answer in scientific notation.

$$\frac{4.4 \times 10^7}{1.1 \times 10^4} = \boxed{4 \times 10^3}$$

13)

Find the product.

$$(1.9 \times 10^3)(4.5 \times 10^2) = 8.55 \times 10^5$$

- A. 8.55×10^1
B. 8.55×10^3
C. 8.55×10^5
D. 8.55×10^6

14)

Find the quotient.

$$\frac{2.89 \times 10^2}{3.4 \times 10^{-2}}$$

- ~~A. 0.85×10^8~~
~~B. 0.85×10^4~~

$$\begin{aligned} & 85 \times 10^{4-1} \\ & \rightarrow 8.5 \times 10^3 \end{aligned}$$

- C. 8.5×10^3
D. 8.5×10^5

- 15) The Andromeda Galaxy is about 2.3×10^6 light years away from Earth. One light year is equal to approximately 5.9×10^{12} miles. What is the approximate distance, in miles, between Earth and the Andromeda Galaxy?

- A. 1.357×10^{18}
B. 1.357×10^{19}
C. 8.2×10^{19}
D. 8.2×10^{60}

$$\begin{aligned} & (2.3 \times 10^6)(5.9 \times 10^{12}) = \\ & \rightarrow 13.57 \times 10^{18+1} = 1.357 \times 10^{19} \end{aligned}$$

#10

① $15,400,000$

1.54×10^7

② $3,598 \times 10^7$

3.598×10^7

$359,800,000$

③ French $\rightarrow 7.7 \times 10^7$

German $\rightarrow 1 \times 10^8$

More people spoke German
as their 1st language.

④ 1.004×10^8

$100,400,000$

$100,400,000$

⑤ $4.8 \times 10^7 \rightarrow 48,000,000$

$1.38 \times 10^8 \rightarrow 138,000,000$

$138,000,000$

$- 48,000,000$

$90,000,000$

$90,000,000$

⑥ $2.4 \times 10^8 \rightarrow 240,000,000$

$1.2 \times 10^5 \rightarrow 12,000$

$= 2000$

2×10^3

There are 3 extra exponents
in the numerator's that became
the exponent in the quotient

11

① $24,900 \rightarrow \boxed{2.49 \times 10^4}$

② 6.71×10^8

$\frac{6.71 \times 10^8}{1000000000}$
a) $\boxed{0.71 \text{ billion mph}}$

b) $\frac{6.71 \times 10^8}{40} = \boxed{11,933,333.33 \text{ miles}}_{\text{min}}$

c) $8.3 \left(\frac{11,933,333.33}{92921666.67} \right) =$

③ $5 \times 10^2 = 500 \text{ times larger}$

$1.2 \times 10^2 \rightarrow \frac{120}{500} = \boxed{.24 \text{ min}}$

④ $3(-7.6 \times 10^2) = \boxed{22,8 \times 10^{2+1}}$
 $\boxed{2.28 \times 10^3}$

⑤ $\frac{4.5 \times 10^4}{2.5 \times 10^5} = \boxed{1.8 \times 10^4 \text{ times}}$
 greater (18,000)

⑥ $\frac{2.808 \times 10^7}{1.04 \times 10^5} = \boxed{2.7 \times 10^2 \text{ times}}$
 bigger (270)

⑦ $\frac{4.576 \times 10^5}{1.585 \times 10^4} \approx 2.9 \times 10 = \boxed{29 \text{ times}}$
 more

$$\textcircled{8} \quad \frac{7 \times 10^9}{3 \times 10^6} \quad 2.3 \times 10 =$$

$2\frac{1}{3}$ times larger

$$\textcircled{9} \quad \frac{6.4 \times 10^9}{1.3 \times 10^9} \approx 4.9 \text{ times greater}$$

$$\textcircled{10} \quad \begin{array}{l} 4.4 \times 10^7 \rightarrow 44000000 \\ 4.9 \times 10^7 \rightarrow 49000000 \\ \hline 150000000 \end{array}$$

150,000,000 more people

$$\textcircled{11} \quad \begin{array}{l} 1,000,000 \\ 1 \times 10^6 \end{array}$$

$$\textcircled{12} \quad \frac{24 \times 10^6}{24 \times 10^0} \text{ hours} = 2400000 \text{ hrs}$$

$$\textcircled{13} \quad 1 \text{ million in} = \frac{833333\frac{1}{3} \text{ ft}}{5280}$$

≈ 15.78 miles