Scientific Notation

Scientific Notation is a way to express very large and very small numbers. A number in scientific notation is the product of two factors: the first, called the coefficient, is a number less than 10 and greater than or equal to 1; the second factor is a power of 10.

To convert a number in standard form to scientific notation, first move the decimal point to form the coefficient. Then multiply it by 10 with an exponent. The exponent will be the number of places the decimal point moves to make the coefficient. Numbers greater than or equal to 10 have positive exponents; numbers less than 1 have negative exponents.

Challenging Connection!

The distance from Annabelle’s house to her best friend’s house is $2×10^{2}$ km. The distance from Annabelle’s house to her pen pal’s house is $6×10^{4}$ km. How many times the distance to her best friend’s house is the distance to her pen pal’s house?

FIRST: Divide the distance to Annabelle’s pen pal’s house by the distance to her best friend’s house. $\frac{6×10^{4}}{2×10^{2}}$

NEXT: Divide the coefficients. $6÷2=3$

Divide the powers of 10. $ 10^{4}÷10^{2}=10^{4-2}=10^{2}=100 $

THEN: Multiply the quotient of the coefficients by the quotient of the powers of 10.

 $ 3×100=300$

The distance to the pen pal’s house is 300 times the distance to the best friend’s house.

TRY THIS ONE!! (Answer below… don’t peek! Wait until you have worked it out!!!)

The population of City A is $8×10^{3}.$ The population of City B is $4×10^{6}.$ How many times the population of City A is the population of City B?

FIRST: Divide the population of City B by the population of City A. $\frac{4×10^{6}}{8×10^{8}}$

NEXT: Divide the coefficients. $4÷8=0.5$

 Divide the powers of 10. $10^{6}÷10^{3}=10^{6-3}=10^{3}=1,000$

THEN: Multiply the quotient of the coefficients by the quotient of the powers of 10.

 $0.5×1,000=500$

The population of City B is 500 times the population of City A.