Scientific Notation

Objectives:

…to represent numbers using scientific notation
...to convert numbers written in scientific notation to standard notation

Assessment Anchor:

8.A.1.1 – Represent numbers in equivalent forms.

NOTES

Scientific notation: a way to write numbers using a power of ten (which our number system is based on)

****** Usually used to express very large or very small numbers!!***

Key parts: 7.54×10^{7} 2.8×10^{-4}

Part #1	Part #2	Part #3
a number that is less than 10, but at least 1	"× 10"	exponent which may be + or –

*** **Positive** exponents are for **LARGE** numbers (10 or more)
*** **Negative** exponents are for **SMALL** numbers (less than 1)

****That means: The exponent to use for a number that is at least 1, but less than 10.... is..... _____.

Scientific Notation

To write a number in scientific notation:

1. **Locate the decimal point**
2. **Move it to a location that will give you a number between 1 and 10 (or 1 exactly)**
3. **Write this new number down, followed by "× 10"**
4. **COUNT how many times you had to move the decimal point …use this number as your exponent**
5. **Decide the sign of the exponent.**
    a. **Large number makes exponent positive.**
    b. **Small number makes exponent negative.**
    c. **Number less than 10 but at least 1 makes an exponent of zero.**

EXAMPLES

1) Write 3,500,000 in scientific notation.

3,500,000 --------> 3.5×10^{6}

2) Write 0.000467 in scientific notation.

0.000467 --------> 4.67×10^{-4}

3) Write 0.00000506 in scientific notation.

4) Write 83,040,000,000 in scientific notation.

5) Write 46.2 in scientific notation.

6) Write 3 in scientific notation.

Scientific Notation

To write a number in standard notation:

1. **Use the exponent to determine if the number is LARGE OR SMALL**
2. **Determine which way to move the decimal point**
3. **Move the decimal point the number of times the exponent says to**
4. **Write the number you now have**

MORE EXAMPLES

7) Write 4.59×10^{7} in standard form.

4.59×10^{7} --------> 45,900,000

8) Write 2.14×10^{-3} in standard form.

2.14×10^{-3} --------> 0.00214

9) Write 5.01×10^{-5} in standard form.

10) Write 8×10^{8} in standard form.

11) Write 2.97×10^{-2} in standard form.

12) Write 4.25×10^{11} in standard form.

Scientific Notation

MORE PRACTICE PROBLEMS

Scientific Notation	Standard Notation
7.28×10^{10}	
3.409×10^{-3}	
	0.00000581
9.1×10^{4}	
	9,081,000,000
	27.58
1.54×10^{-5}	
	5.31
6×10^{5}	
	0.007009
	0.000000004
8.4×10^{-6}	
6.02×10^{8}	
	56,090,000
4×10^{0}	