Sunset High School
Chemistry

Name:
Date:
Period:

Worksheet: Scientific Notation

Consider: $10^1 = 10$
$10^2 = 10 \times 10 = 100$
$10^3 = 10 \times 10 \times 10 = 1000$

When you multiply a decimal by 10, you move the decimal point one place to the right ($2.34 \times 10 = 23.4$)

Consider: $10^{-1} = 1/10$ or 1 divided by 10
$10^{-2} = 1/100$ or 1 divided by 10×10

When you divide a decimal by 10, you move the decimal point one place to the left (23.4 divided by 10 = 2.34)

In scientific notation, 1×10^2 means multiplication: $1 \times 10 \times 10 = 100$
1×10^{-2} means division: 1 divided by $10 \times 10 = 0.01$

Examples: $3 \times 10^1 = 30$ $\quad$ $2.4 \times 10^{-1} = 0.24$
$5.2 \times 10^2 = 520$ $\quad$ $3.2 \times 10^{-2} = 0.032$

Now consider changing decimal numbers to scientific notation.

If you move the decimal place to the left, you are setting up a multiplication factor as follows:

$265840 = 2.6584 \times 10^5$ $\quad$ To get back to the original number, move the decimal point to the right five spaces.

If you move the decimal place to the right, you are setting up a division factor as follows:

$0.000465 = 4.65 \times 10^{-4}$ $\quad$ To get back to the original number, move the decimal point to the left four spaces.

Examples: $0.0078 = 7.8 \times 10^{-3}$ $\quad$ $2689 = 2.689 \times 10^3$

PRACTICE:

Convert to scientific notation:

1. 0.0067 6.7×10^{-3}
2. 4500 4.5×10^3
3. 0.00000059 5.9×10^{-7}
4. 67.89 6.789×10^1
5. 483000000 4.83×10^8
6. 456.9 4.569×10^2

Convert to decimals:

1. 5.78×10^{-8} 0.00000005 78
2. 7.8×10^4 78,000
3. 9.13×10^{-2} 0.0913
4. 3.5×10^4 35,000
5. 7×10^{-3} 0.007
6. 9×10^3 9,000