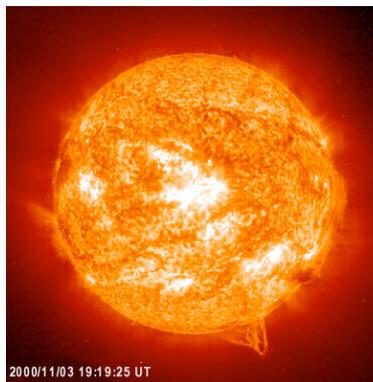# Scientific notation II

Physicists and astronomers almost always use very small or very large numbers in the calculations or measurements.

Scientific notation is the best, and most compact, way to work with very large and small numbers.

This activity will review how to divide numbers in this form.

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$$\text{Density of Sun} = \frac{1.9 \times 10^{33} \text{ grams}}{1.38 \times 10^{33} \text{ cubic cm}}$$

Scientific Notation simplifies calculations with large or small numbers.

➤ Scientific Notation provides an easy means to divide large and small numbers together.

Now you try!

Here's how to do it!

State the problem: $7.5 \times 10^{-11} / 4.5 \times 10^{+20}$

Group the factors: $(7.5 / 4.5) \times (10^{-11} / 10^{+20})$

Subtract the exponents: $1.67 \times 10^{(-11 - (+20))}$

Answer: 1.67×10^{-31}

Perform these divisions using scientific notation.

1) **Density of a star in grams/cc:**
$$2.1 \times 10^{33} / 3.1 \times 10^{32}$$

2) **Speed of solar wind in km/sec:**
$$1.47 \times 10^{8} / 2.7 \times 10^{5}$$

3) **Density of a proton in grams/cc:**
$$1.64 \times 10^{-24} / 3.7 \times 10^{-38}$$

4) **Speed of Sun around Milky Way in centimeters/second:**
$$2.7 \times 10^{23} / 6.3 \times 10^{15}$$