

Scientific Notation Application (8/2 rule)

Big Idea: Scientific Notation helps to compare and calculate extremely small and large numbers.

**If it is unknown what operation to use, substitute the larger number with 8 and the smaller with 2. Find the answer with those simpler numbers, to find the operation used. Use the same operation for the numbers in scientific notation.

Example:

The planet Mercury is at a distance of about $\overset{2}{5.8 \times 10^7}$ km from the sun. Saturn is about $\overset{8}{1.4 \times 10^9}$ km from the sun. About how many times greater is the distance from Saturn to the sun than that of Mercury to the sun?

$$\frac{1.4 \cdot 10^9}{5.8 \cdot 10^7} = 0.24 \cdot 10^2 \rightarrow 2.4 \cdot 10^1$$

The planet HD209458b, now known as Osiris, was discovered by astronomers in 1999 and is at a distance of 150 light-years from earth. (1 light-year = $\underset{8}{9 \times 10^{12}}$ kilometers) How many kilometers away is Osiris from earth?

$$\underset{2}{(1.5 \cdot 10^2)} (\underset{8}{9 \cdot 10^{12}}) = 13.5 \cdot 10^{14} \rightarrow 1.35 \cdot 10^{15}$$