Multiplying scientific notation

When we multiply two numbers in scientific notation, we want to follow the same set of steps each time.

1. Multiply their decimal numbers.
2. Multiply their powers of 10. By the rules of exponents, we add the exponents when we do this.
3. Express the results together in proper scientific notation.

Let's do an example where we work through these steps.

Example

Find the product.

$$(3.4 \times 10^{-6})(2.14 \times 10^{13})$$

Let's follow the steps we outlined above. First, we'll multiply the decimal numbers.

$$3.4 \times 2.14 = 7.276$$

Now we'll multiply the powers of 10, adding the exponents.

$$10^{-6} \times 10^{13} = 10^{-6+13} = 10^{7}$$

Next, we'll multiply these two values together.

$$7.276 \times 10^7$$

This is already in proper scientific notation so we can leave it as is. But if there were two or more digits to the left of the decimal point, or if we had a 0 in the ones (units) place, the decimal point, then we'd have to express it in proper scientific notation.