

Name _____

How Much is a PPM?

The current amount of carbon dioxide in the atmosphere is about 414 parts-per-million (ppm). That means that there are 414 molecules of carbon dioxide for every million molecules of gas in the air. Parts-per-million is a unit just like inches or miles or meters.

We can also write parts-per-million as a fraction. Look at the three fractions below:

$$1 \text{ percent (1\%)} = \frac{1}{100} \quad 1 \text{ ppm} = \frac{1}{1,000,000} \quad 414 \text{ ppm} = \frac{414}{1,000,000}$$

One percent pollution would mean 1 molecule of pollution for every 100 molecules of air. 1 ppm is 1 molecule of pollution for every 1,000,000 molecules of air, so 414 ppm is 414 molecules of pollution for every million molecules of air.

414 ppm seems like a big number, but parts-per-million is a pretty small unit. How small is it really? Think how long one day is. One day in a million is the same as one day in 2,737 years, so 414 parts per million is like 1 year in 2,413 years!

How much carbon dioxide is in our jar?

Think about our atmosphere in a jar. If we want to show how much carbon dioxide is in our atmosphere, we would need to put 414 beans in a jar with a million beans. But our jar has far fewer than a million beans in it! In fact, our jar only has about 5,000 beans. So how many beans of carbon dioxide do we need to put in our jar?

How many carbon dioxide beans should go in our jar?