

What weighs more, a cloud or an elephant?

You can't weigh a cloud on a scale, so Peggy Lemone figured out another way. She measured the cloud's shadow and did the math from there. You can do the same!

Choose a sunny day with cumulus clouds in the sky. As soon as the sun is directly above a cumulus, drive to where its shadow shows on the ground. Once you reach the shadow's edge begin watching your car's odometer, noting the starting distance. (The odometer is the tool that shows the distance your car travels. You can find it on the dashboard of your car, usually near the steering wheel.) Once you reach the shadow's edge, note how far you have driven. This is the width of your cloud. A typical cumulus is about .6 miles or 1 kilometer. If your odometer measure kilometers, jot down the cloud's width in kilometers since Peggy, like most meteorologists, created her method according to the metric system. If your odometer measures in miles, don't worry. Jot down the cloud's width in miles, and we'll go from there.

Now that you know the cloud's width, you have all you need to figure out a cloud's weight. The rest is all math. Grab a calculator, and let's figure out whether your cloud is heavier or lighter than an elephant.

1. If your odometer measured the cloud's width in miles, convert your miles measurement into meters.

$$[\text{width of cloud in miles}] \times 1,609.344 = \underline{\hspace{2cm}} \text{ m}$$

If your odometer measured the cloud's width in kilometers, convert your kilometer measurement into meters.

$$[\text{width of cloud in kilometers}] \times 1,000 = \underline{\hspace{2cm}} \text{ m}$$

2. Normally cumulus clouds are about as tall as they are wide. So, to figure out a cumulus' volume, multiply the cloud's width in meters by its width again and by its width yet again.

$$[\text{width of cloud in meters}] \times [\text{width in meters}] \times [\text{width in meters}] = \underline{\hspace{2cm}} \text{ m}^3 \text{ (cubic meters)}$$

3. Now that you have your cloud's approximate volume you can multiply it by a cumulus' typical weight. Normally, a cumulus has .5 grams of water per cubic meter. So, to figure out your cloud's weight, multiply your clouds volume (that's your m³ measure above) by .5 grams.

$$[\text{volume of your cloud in m}^3] \times .5 \text{ grams} = \underline{\hspace{2cm}} \text{ grams}$$

4. That's how much your cloud weighs. That's a big number! Let's see what that is in kilograms.

$$[\text{weight of your cloud in grams}] / 1,000 = \underline{\hspace{2cm}} \text{ kilograms}$$

5. Wow! That's still a big number. Is that more or less than an elephant? Take a guess, then let's do the math! An average male Asian elephant weighs about 5,000 kilograms (11,500 pounds). To see how many elephants your cloud weighs, divide your cloud's weight by 5,000 kilograms.

$$[\text{your cloud's weight in kilograms}] / 5,000 = \underline{\hspace{1cm}} \text{ Your cloud's weight in elephants!}$$

It's amazing, isn't it!? If that many elephants were in the sky, they would tumble to earth. But since your cloud is made up of tiny water droplets that are spread over a really big space, they stay afloat.