

## How Much Does a Cloud Weigh?

When Peggy LeMone was in middle school, a friend's dad pondered that question, and she kept it in the back of her mind for years. Now all grown up, Ms LeMone is a researcher at the National Center for Atmospheric Research, and she's figured out an answer.

You can too.

First, you need to know how dense the cloud is. Scientists have measured the water density of a typical cumulus cloud (the white, fluffy ones you see on a nice day) as  $1/2$  gram per cubic meter—about a small marble's worth of water in a space you and a friend could comfortably sit in. The density will be greater for different types of clouds.

Next, you need to estimate how big a typical cloud is. By measuring a cloud's shadow when the sun is directly above it, you can get an idea of its width. LeMone does this by watching her odometer as she drives under a cloud. A typical cumulus, she says, is about a kilometer across, and usually roughly cubical—so a kilometer long, a kilometer wide, and a kilometer tall, too.

OK, over to you. Use the data above to estimate how much a typical cloud weighs.