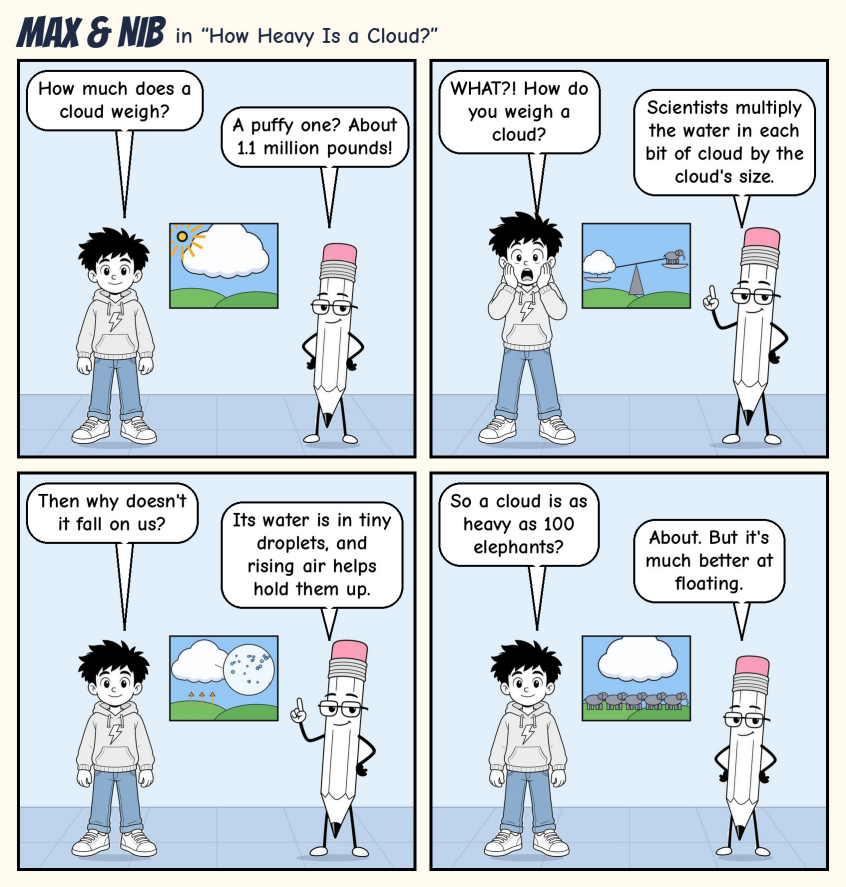


Name: _____ Date: _____

How Much Does a Cloud Weigh?

Earth Science · Grades 3–6 · About 15 minutes · Max & Nib

Cool facts

How much does a cloud weigh? Clouds look light and fluffy, but they are made of water, and water has weight. A cloud is made of trillions of tiny water droplets floating in the air. The U.S. Geological Survey (USGS) did the math for a typical puffy cumulus cloud about 1 kilometer (about 0.6 mile) wide, tall and deep. It holds about 1.1 million pounds of water. That is about as heavy as 100 elephants! So why doesn't it fall? Its water is spread out in super-tiny droplets, the damp cloud air is a little lighter than the dry air around it, and rising warm air helps hold it up. When the droplets grow big and heavy enough, they fall as rain. (Every cloud is different, so this is an estimate.)

Cool Fact A puffy cloud has only about **half a gram** of water in each cubic meter of air. It weighs so much because it is so **big**. (USGS)

Questions

1. What is a cloud made of?

2. About how much does a typical puffy cumulus cloud weigh?

3. Give one reason a heavy cloud doesn't fall out of the sky.

4. A cloud holds about 1,100,000 pounds of water. A big elephant weighs about 11,000 pounds. About how many elephants would weigh the same as the cloud?

Show your work

Write about it

Imagine you are one tiny water droplet in a cloud. Describe your day, from floating up high to falling down as rain.

How Much Does a Cloud Weigh? — Answer Key

Grades 3–6 · For teacher or parent use

Answers

1. What is a cloud made of?

   Trillions of tiny water droplets floating in the air.

2. About how much does a typical puffy cumulus cloud weigh?

   About 1.1 million pounds (about 500,000 kilograms) of water.

3. Give one reason a heavy cloud doesn't fall out of the sky.

   Any one: its water is spread out in super-tiny droplets; the damp cloud air is a little lighter than the dry air around it; rising warm air helps hold it up.

4. A cloud holds about 1,100,000 pounds of water. A big elephant weighs about 11,000 pounds. About how many elephants would weigh the same as the cloud?

   About 100 elephants (1,100,000 ÷ 11,000 = 100).

Writing prompt: Imagine you are one tiny water droplet in a cloud. Describe your day, from floating up high to falling down as rain.
Accept any reasoned answer for the writing prompt. For adults: the USGS Water Science School estimate uses a liquid-water density of about 0.5 gram per cubic meter for a cumulus cloud and a volume of 1 cubic kilometer (1 billion cubic meters): 1,000,000,000 × 0.5 g = 500,000,000 g = about 500,000 kg = about 1.1 million pounds. The “100 elephants” comparison comes from NCAR scientist Peggy LeMone (also used by the Smithsonian National Air and Space Museum); adult African savanna elephants average about 6,100 lb (females) to 13,000 lb (males), so 11,000 lb is a round number for a big elephant. Real clouds vary a lot in size and water content.

Sources

- USGS Water Science School: How Much Does a Cloud Weigh? — https://www.usgs.gov/water-science-school/science/how-much-does-a-cloud-weigh
- Smithsonian National Air and Space Museum, How Things Fly: How much does a cloud actually weigh? — https://howthingsfly.si.edu/ask-an-explainer/how-much-does-cloud-actually-weigh
- San Diego Zoo Wildlife Alliance: African Elephant Fact Sheet — https://ielc.libguides.com/sdzg/factsheets/african_elephant/characteristics

Word Record **Droplet**: a very small drop of liquid.

Word Record **Cumulus**: a puffy, white cloud with a flat bottom, often seen on sunny days.