

Adapted from Newsela:

Here's how giant pumpkins get so big



Giant pumpkins can become really big. But while they grow very wide, they don't get very tall. Gravity simply keeps them grounded.

In the story of Cinderella, the princess rode away in a giant pumpkin. Unfortunately, pumpkin vehicles like this don't exist (unless you count the pumpkin boating contest). But massive pumpkins are very real.

Every year, farmers around the country compete. They see who can grow the biggest pumpkin. But these aren't the pumpkins we carve into jack-o'-lanterns. The really big ones are Atlantic giant pumpkins.

In 2016, a German farmer grew the world's heaviest pumpkin. It weighed 2,624.6 pounds (1,190 kilograms)! That's more than some small cars. Scientists are trying to find out how these pumpkins can get so big.

Plant Transport

Jessica Savage is a botanist. This is a Scientist who studies plants. She works at the University of Minnesota. Several years ago, she saw photos of giant pumpkins at a fair. It made her wonder how they could grow so large.

She explained that pumpkins are a kind of fruit. Fruits need to move water inside themselves to grow. Giant pumpkins need a lot of water, and fast. A typical giant pumpkin grows from a seed to a huge fruit in only 120 to 160 days. At peak growth, it's putting on 33 pounds (15 kilograms) every day.

Savage wanted to figure out how this happens. So she asked farmers to share tiny slices of their pumpkins with her. She also grew some pumpkins on her own.

When pumpkins grow, the first thing they do is produce sugar in their leaves. They do this through photosynthesis. This is a process by which plants use sunlight to produce foods from carbon dioxide and water.

Inside the pumpkin, vessels move these sugars to the fruit and the roots. All of the food they need ultimately moves through their stems, too.



Savage wondered if Atlantic giant pumpkins made more sugar than other pumpkins. If so, they would have to push a lot more sugar through their stems.

But her experiments showed something else. Giant pumpkins do not produce more sugars. Instead, they have more tissue to move sugars through the fruit. Tissues are found in living things. They are groups of cells. Savage and her colleagues shared these findings five years ago in a scientific journal.

Pumpkin Or Pancake?

Giant pumpkins usually do not have a round shape. They're saggy, said David Hu. He is a mechanical engineer. This is someone who studies motion and the properties of materials. Hu works at the Georgia Institute of Technology.

Hu said that giant pumpkins get flatter as they expand in size. This is due to gravity. This is a force that pulls objects with mass towards each other. (Mass is the amount of matter, or stuff, in an object.)

Hu wanted to create a model for how a giant pumpkin spreads out and flattens as it grows. A model is a tool that represents something that can take place in the real world. So, Hu took giant pumpkin samples. He also squashed normal-sized pumpkins. He wanted to see how much weight they could take.

He found that small pumpkins can support up to 50 times their own weight. But "big ones can barely support their own weight," he said.

However, if you could grow a giant pumpkin in outer space or under water, it would not flatten, Hu said. Ultimately, all of the flattening forces are due to Earth's gravity. In 2011, Hu and his colleagues published these findings.

Savage said that a pumpkin carriage is not a realistic way to travel. However, giant pumpkins only need hollowing out to make canoes. In fact, there's a yearly boat race in Canada that's open to giant pumpkins only.