

The New York Times

For Kids

EDITORS' NOTE: THIS SECTION SHOULD NOT BE READ BY GROWN-UPS



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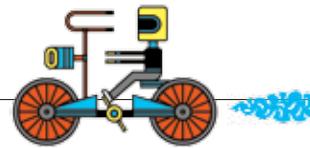
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HOW SCIENTISTS MADE THE NEW FLU SHOT

BY CHELSEA LEU • ILLUSTRATION BY GIACOMO GAMBINERI

ASK ANY DOCTOR, and you'll be told that the coolest thing you can do right now is to get the flu shot. The flu is a contagious virus, and if it infects you, your throat hurts, you feel feverish and achy and your nose won't stop running. At its worst, the infection can send you to the hospital with life-threatening complications. The flu season extends from October through early spring, and last year's was particularly severe: The Centers for Disease Control and Prevention estimate that 48.8 million people were infected, the most cases seen since 2009. The C.D.C. estimates that in total, 48,000 kids under 18 had to go to the hospital, and 618 died.

That's scary, but the best way to protect yourself is easy: by getting the flu shot. A vaccine helps your body build defenses against the virus in case you encounter it, so you'll be less likely to be infected — and less likely to spread it to others. "It's not only to protect yourself, but also members of your family," says Charles Chiu, an infectious-diseases doctor at the University of California, San Francisco. That includes babies and adults over 65, who are especially vulnerable to the flu.

The American Academy of Pediatrics recommends that everyone older than 6 months get a flu shot. You should get the flu shot, unlike other vaccines, every year, because the flu virus can mutate, or change, quickly. Scientists try to keep up by making a new vaccine for every flu season. Here's how they do it.



HOW I BECAME AN

ASTRONAUT



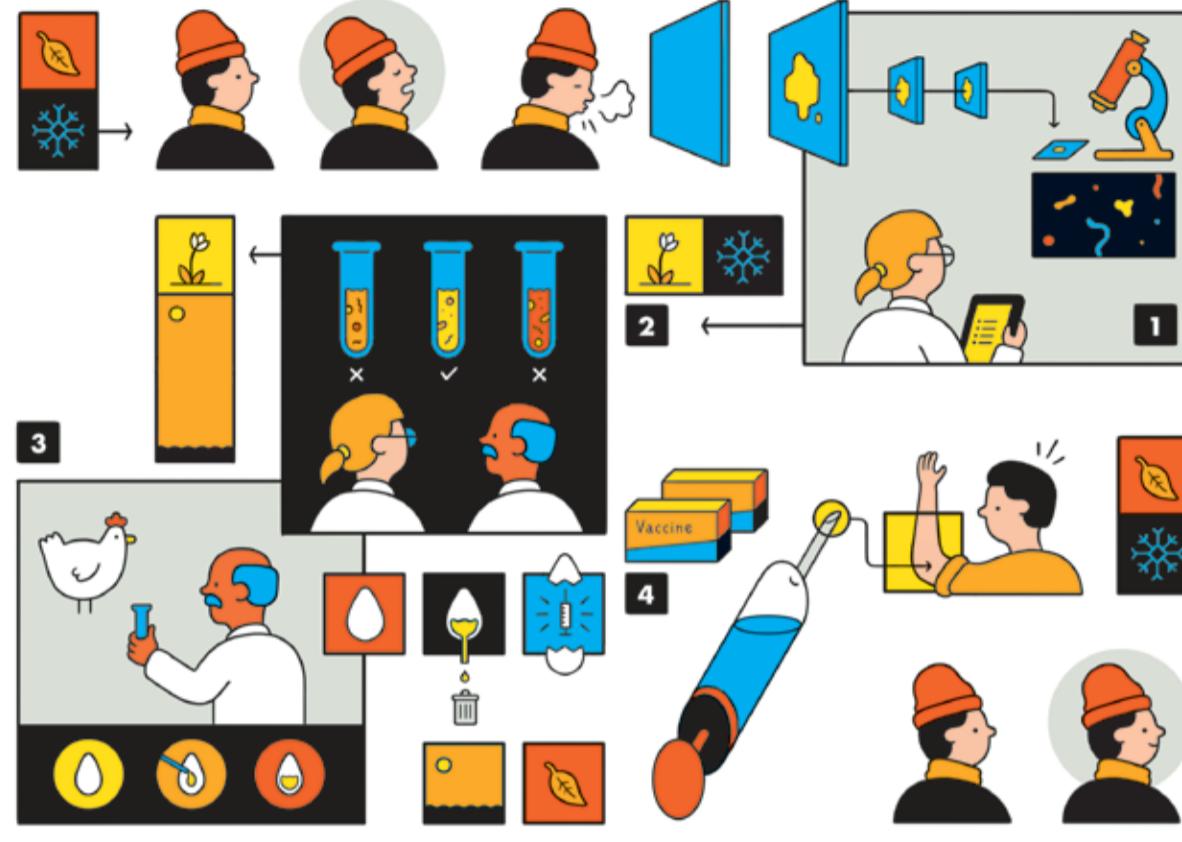
BY JOE ACABA

MY VERY FIRST introduction to NASA and the space program was when I was little, and my grandfather showed me his old reel-to-reel film of the Apollo astronauts walking on the moon. It looked as if they were having a great time exploring. Later, I got my undergraduate degree and a master's in geology. After school, I became a hydrogeologist — I studied how groundwater moves through soil and rocks. And then I decided to join the Peace Corps, a volunteer program. After that, I was a math and science teacher in Florida.

One day, a fellow teacher told me that NASA was looking to hire educators to become full-time astronauts. We went in for a whole week of testing — everything from medical and psychological testing to more hands-on testing for robotics and spacewalking. The big event was a one-hour interview in front of the astronaut selection board. Thousands of people applied, and they picked only 11 of us.

After I got into the NASA program, I went through about two years of astronaut training. You learn how to fly in the back seat of a T-38 jet, the basics of spacewalking robotics and about the systems of the Space Shuttle and the International Space Station. Then you can be assigned to a flight. After that, it's two years of studying for your mission. It's a lot, but when you love something, it doesn't feel like a job.

My first flight was in 2009 on the Space Shuttle Discovery. We went on a 13-day mission to the I.S.S. In 2012, I went back there on a Russian Soyuz vehicle. On my most recent mission, I was traveling with the Russians and in space for more than 5 months. In total, I have spent about 300 days in space. It's superbusy. At any given time, you're working on more than 200 experiments on behalf of scientists from around the world. But being able to wake up in microgravity and float across the laboratory and look out and see the earth a couple hundred miles below you — it's an incredible experience. As told to Elise Craig



FOUR STEPS TO THE FLU SHOT

1. Scientists at flu centers and laboratories in more than 100 countries collect thousands of samples of the flu virus (usually from people's snot) all year to track which strains, or varieties, of the virus are making people sick.
2. Early in the year, often around February, scientists meet to look at which strains are most likely to spread in the next flu season so they can make a matching vaccine. Each flu shot

usually works against three or four strains, but it's impossible to know exactly how effective it will be — it depends on how much the viruses in the wild change after the vaccines are made and whether the strains in the shot match the ones people are actually catching.

3. To make the vaccines, manufacturers inject those strains of the flu into developing chicken eggs, which are kept warm for a few days to let the viruses multiply. The manufacturers

then separate out the viruses, kill them with chemicals and collect the dead virus parts to put into the vaccines — they are what prompt your body to create flu-fighting molecules. (And don't worry: The shot itself might sting, but it won't give you the flu.)

4. By August or September, millions of vaccine doses are mixed, packaged into syringes and vials and shipped across the country to pharmacies and doctors' offices. By then, scientists are already looking ahead to the next flu season. ♦

SO YOU'VE FOUND AN ANCIENT RELIC

BY ED WINSTEAD

HAVE YOU EVER tripped over a rock or felt something hard at the bottom of a lake? The next time you do, stop and take a closer look: Pieces of the past, like the remains of ancient civilizations and fossilized animals from millions of years ago, are all around us. And it's not just archaeologists and other experts who find them — these kids recently made amazing discoveries.



PRE-VIKING SWORD

Saga Vanecek, 8, was playing in a lake in Sweden this summer when she felt something sharp in the mud. "I actually thought it was a stick or something," she says. She was going to pull it up and throw it, but what she actually pulled out of the lake was a 1,500-year-old sword. "I was pretty shocked," she says. Her dad was, too. "I said, 'Daddy, I found a sword!'" Then he just came running and took it out of my hands. He was like, 'O.K., this is serious.'" She gave the sword to a local history museum.



MEDIEVAL TREASURE

This January, Luca Malaschnitschenko, 13, went with his teacher, an amateur archaeologist, to an island north of Germany to see what they could find with a metal detector. While there, Luca located something under the ground: a silver coin. It was the first of hundreds of coins and pieces of jewelry, the rest of which were excavated by a team of archaeologists. The treasure dated back more than 1,000 years to the reign of Harald Gormsson, the king who brought Christianity to Denmark.



PREHISTORIC SKULL

One afternoon in November 2016, Jude Sparks, 9, was hiking through the New Mexico desert when he tripped on something and fell. When he opened his eyes, he was looking at the lower jaw of a huge skull. "It was like three times the size of a cow skull," he says. "It was crazy." It was a Stegomastodon, a prehistoric relative of the elephant that lived over a million years ago. His parents called a local biologist, and Jude helped the team that arrived to dig the skeleton up.

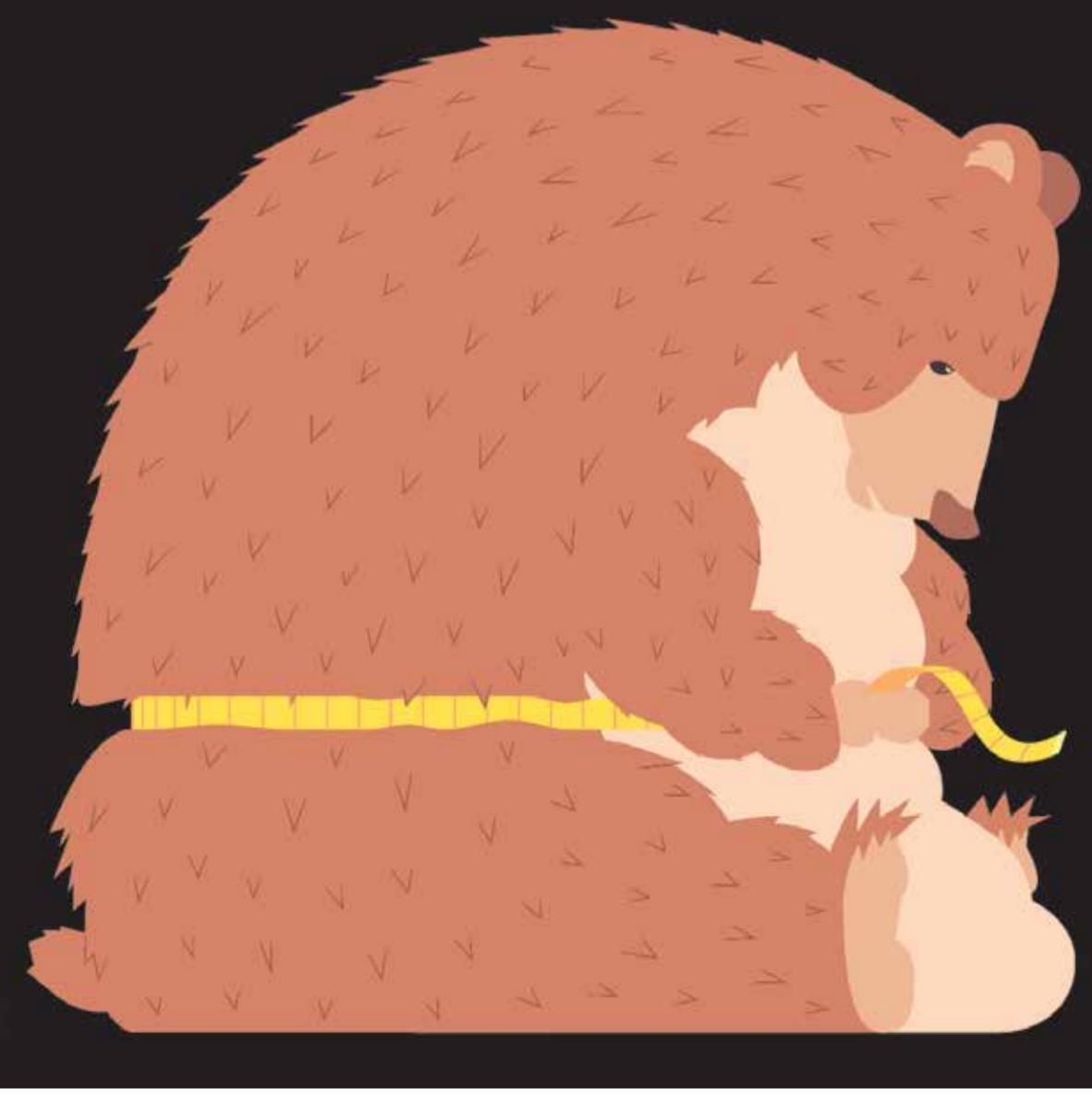


REALLY, REALLY OLD FOSSIL

Ryleigh Taylor, 11, was walking along the shore of a lake in Tennessee this spring when she spotted a strange-looking rock by the water. When she picked it up, she saw a black, shadowy shape embedded in the stone and knew it was something special. It turns out that she found a fossilized trilobite, a kind of arthropod that lived in the ocean until it went extinct 250 million years ago. Trilobites had hard shells, which are sometimes preserved. The one that Ryleigh found lived 475 million years ago. ♦

THE FATTEST BEAR WINS

BY MOLLY BENNET • ILLUSTRATION BY AAD GOUDAPPEL



EVERY YEAR, Katmai National Park in Alaska holds a "fattest bear" contest, asking the public to vote on which of its 2,200 brown bears looks as if it has packed on the most pounds during the summer and fall. In October, they crowned the winner: Bear 409, also known as Beadnose.

What does it take to win the title of fattest bear? Lots and lots of salmon. In early fall, bears in Alaska start eating like crazy in preparation for the long winter. They may consume more than 40,000 calories a day — equivalent to about 75 Big Macs — largely in the form of salmon from the Brooks River. Unlike most bears in the park, Beadnose is coordinated and

patient enough to catch salmon as they're jumping to the top of Brooks Falls. And she's one of only a few female bears willing to compete with bigger males at the river's best fishing spots, says Leslie Skora, a wildlife biologist at Katmai.

By the time you read this, Beadnose will likely have gone into a den to hibernate. She'll sleep there all winter, without any food or water, as her basic biology slows to a crawl (she may take only one breath per minute!). Bears lose as much as a third of their body weight during hibernation, and all that extra fat Beadnose put on will help her make it through. In other words, being the fattest bear in the fall means that you are winning at being a bear. ♦