

## Science

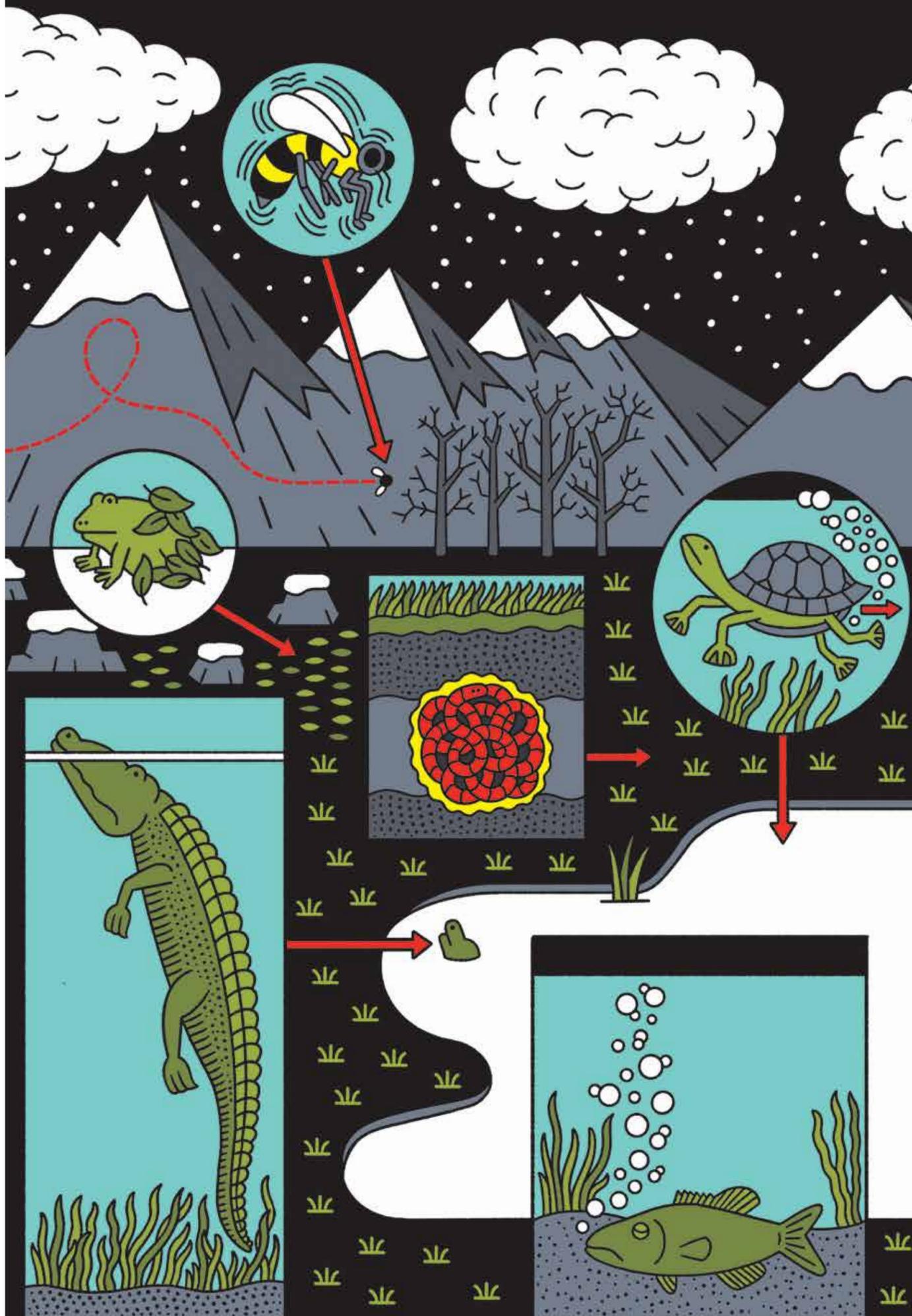
# COLD? NO PROBLEM

HOW 6 ANIMALS WINTERIZE THEMSELVES

BY LAUREL NEME • ILLUSTRATION BY SERGE SEIDLITZ

**WINTER IS HERE!** This means shorter days, colder nights, layered sweaters and hot chocolate — at least for us humans.

For animals, the season can be really tough: Cold weather and snow make it harder to find food, keep warm and stay out of danger. We all know that bears hibernate and birds migrate south, but what about other animals? Here are a few wild ways some of them get through the coldest months of the year.



### ALLIGATORS SNORKEL

To save energy, alligators slow down most of their bodies' processes during the winter. That means they don't need to do much besides breathe. On warm winter days, the big reptiles bask in the sun or rest in tunnels they dig in the swamp. When temperatures dip, though, they may dangle just below the water's surface, poke their snouts up for air and let the water freeze around them.

### FISH SINK

Although some fish tolerate or even prefer the cold, others don't. That's why some freshwater fish, like smallmouth bass, swim to the bottom of lakes and streams, where the water is warmer in the winter. Since their bodies don't need as much food or oxygen when the weather gets cold, they spend most of their time down there just chilling.

### TURTLES BREATHE THROUGH THEIR BUTTS

For turtles, breathing takes a lot of effort: They have hard shells, and their ribcages can't expand. To not use up all their energy, North American eastern painted turtles pump water through their cloaca: an opening under their tail where blood vessels take up oxygen. This allows them to "breathe" through — yes, that's right — their butts.

### EARTHWORMS GET SLIMY

Some earthworms find new winter homes as far as six feet under the soil, where temperatures are much warmer than at the surface. There, they curl into a slime-coated ball and go into a dormant state. The mucus covering them acts like a thick, insulating blanket — just another reason slime rules.

### WOOD FROGS FREEZE SOLID

As it grows colder, wood frogs bury themselves under leaves and then freeze solid. They don't even need to breathe, because their heart stops beating. How do they survive? The frogs make glucose (a kind of sugar) that seeps into their cells and protects them from dehydration and damage. When temperatures warm up, the frogs simply thaw out.

### HONEY BEES DANCE

It's up to the worker honey bees to keep their colonies warm. To do that, the bees on the outskirts of the hive do a special dance: They keep their wings still and vibrate their flight muscles to generate heat. Think of it as shaking and shivering, but for bees. That keeps everyone, including the queen, happy. ♦



## 12 MONTHS IN

### WHAT WE'VE LEARNED ABOUT COVID-19

BY DONALD G. MCNEIL JR.

**WHEN THE CORONAVIRUS** appeared in Wuhan, China, last December, there was almost no information about it. Now we're 12 months in, and experts know a lot more — about how the virus works, whom it affects and what we can do to stop it. A timeline of major moments in coronavirus news follows. What things have changed? What haven't?

**JANUARY:** A dangerous virus spreads quickly throughout China and to more than a dozen other countries, including the United States. Public health officials don't know much about it except that it attacks the respiratory system.

**FEBRUARY:** The number of coronavirus cases continues to go up. Scientists learn that older people and those who already have health problems are the most likely to get sick. Health officials ask people to wash their hands and keep a distance of six feet from one another.

**MARCH:** Cities around the world go under lockdown, and government officials ask citizens to stay home. Hospitals become overwhelmed with patients, and there are shortages of masks, gloves and other personal protective equipment.

**APRIL:** In the United States, the Centers for Disease Control and Prevention tries to get more Americans tested. They also suggest that people wear masks in public spaces.

**MAY:** The United States is still in its first wave of illnesses, and more than 100,000 people have died. Americans come out of their houses — often wearing masks they made themselves. President Trump, who refuses to wear a mask, announces Operation Warp Speed, a program to make vaccines in record time.

**JUNE:** Scientists continue to learn about the coronavirus, including that people are less likely to catch it when they are outside. Although the virus does not affect kids in the same way as adults, experts see a small number of children and teenagers getting very sick.

**JULY:** Cases continue to rise. New data from the government shows that Black and Latino Americans are three times more likely to become infected and nearly twice as likely to die from the disease as compared with white Americans. Experts think that's because they're more likely to have jobs they cannot do from home.

**AUGUST:** More research reveals that asymptomatic people — those who do not show signs of being sick — contribute to the spread of the virus.

**SEPTEMBER:** Doctors have become better at saving lives: They now give the sickest patients drugs proven to help their bodies fight the infection.

**OCTOBER:** "Covid fatigue" has set in, and many people do not want the country to go into lockdown again. President Trump tests positive for the virus; he is hospitalized but recovers with the help of special medicine that is not available to most Americans.

**NOVEMBER:** Two drug companies announce that their vaccines have been 95 percent effective in clinical trials. People are feeling optimistic: It looks as if the pandemic will end sooner than expected. The C.D.C. announces that masks are even more important because they prevent sick people from spreading the virus and protect people from catching it.

**DECEMBER:** On Dec. 11, a vaccine from the companies Pfizer and BioNTech becomes the first to be approved in the United States. Fleets of trucks begin delivering millions of doses to hospitals in all 50 states, and the shots are offered first to health care workers and nursing home residents. But things are not looking good: As of Dec. 17, more than 300,000 Americans have died. ♦