Global warming doesn't just mean more hot days in summer and fewer icy roads in winter. Warmer temperatures over the entire globe have already caused surprising changes in polar ice, weather patterns, and the behavior of the oceans. One change leads to another, and, like falling dominoes, these changes affect the lives of many plants and animals, including humans. Normally, Earth’s climate changes slowly and predictably. Global warming, however, causes big changes to happen fast. This worries us because we can’t always predict what will happen.
The temperature of Earth is rising. Driving cars, burning the rainforests, and other human activities send gases into the atmosphere where they trap heat. This causes global warming. But why is the warm-up such a big deal?

Ice Caps Melt
Global warming is most noticeable in the coldest places on Earth. In the Arctic, spring comes earlier. Summer lasts longer. Winter is warmer. Water from melting glaciers flows into the ocean. In a place where the temperature in winter can go down to -60 degrees Fahrenheit, a little warmth might sound like good news, but a change this big has many effects.

In the Antarctic, penguins are feeling the heat, especially species that eat only one kind of food. Adélie penguins live on krill—small shrimplike creatures. Krill feed on algae that grow under the sea ice. Less sea ice means less algae, fewer krill, and a shrinking population of Adélie penguins.
Polar bears have adapted to life in a very cold, snowbound world. Their thick, white coats and five-inch layer of fat keep them warm. Their wide, oarlike feet are good for walking on ice and paddling through the water. During winter and spring, the bears live out on the ice pack catching seals to eat. But now, the ice pack doesn’t grow as large and breaks up earlier, so the feeding season is shorter. The bears use lots of energy swimming longer distances between ice floes, and they are losing weight and producing fewer cubs. In late summer and fall, hungry bears waiting for the sea to freeze over raid garbage dumps in coastal villages. In Churchill, Manitoba, Canada, nuisance bears are kept in a Polar Bear Jail until the ice forms again.

The shorter feeding season for bears means other animals go hungry, too. Polar bears often eat only the most nourishing part of a seal—its blubber and skin—leaving the rest for Arctic foxes and sea birds. They, too,
now have less seal meat to eat and must look for other sources of food. But melting ice caps don’t affect just these remote, cold areas.

Scientists worry that fresh water from melting ice could change the movement and temperature of ocean currents. Currents are like wide rivers in the oceans, always on the move along regular courses. The Atlantic Gulf Stream, for example, carries warm water—and warm weather—from the tropics to northern Europe. On the way, some of the warm water in this current evaporates, leaving the remaining water saltier. Heavier than the water below, the saltier water slowly sinks and starts its journey back to the equator. There, water from rivers and tropical rainstorms dilutes it, making it less dense. It rises and flows north again. Changes in the Gulf Stream’s pattern will affect the climate in Europe and America.

**Sea Levels Rise**

The more polar ice that melts, the faster it melts. Land and ocean water uncovered when ice melts are darker in color than the ice
From space, southern Florida looks broad and green in the blue sea. If the seas rise, blue water might cover much of the green land.

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As more ice melts, the water rises. Also, warm water takes up more room than cold water does. This leads to another worry: rising sea levels. Coastlines all over the world will change as sea levels rise. Some low islands could disappear. In North America, large areas of Florida and Louisiana could flood. Salt water could destroy wetlands and pollute drinking water. High tides could cause erosion.

Rising sea levels could make life harder for people all over the world. The flat delta of the Ganges River in Bangladesh is one of Earth's most fertile regions. This densely populated area produces most of that nation's food. The people there are poor, and they suffer when ocean storms flood the delta. Rising seas could cause Bangladesh to lose as much as one-tenth of its land, destroying crops and increasing hunger and poverty.

**Weather Surprises**

The temperature of the oceans affects the temperature of the air above them. When large masses of air are different...
temperatures, they move around: Warm air tends to go up, and cold air tends to go down. This causes Earth's weather. The warming of the oceans will cause the air masses above them to change, which will affect weather everywhere. Some areas will become rainier; others drier. Storms will be more frequent and more powerful.

Warmer temperatures mean that some places will get rain instead of snow during the winter. Just a slightly warmer temperature in winter has led to a higher snowline in the mountains, which leaves less snow to melt in spring. Winter snow is like money in the bank. The water is there as runoff when it is needed in the spring to moisten new growth. Trees, grasses, animals, birds, insects, and humans all depend on this moisture. Water from melting snow feeds the rivers and keeps the forests healthy. Without it, dry forests are at a greater risk for wild fires.

**Life at Risk**

We can make some predictions about which animals and plants will do better than others in a warmer world. However, because all life forms depend on one another in intricate ways, we simply don't know how global warming will affect every one.

Many plants and animals can live only where conditions are exactly right for them. When things change, they have trouble adapt-
If the climate changes and some plants die off, specialized animals that depend on them will lose their sources of food. For instance, changes in ocean currents affect fish and other sea creatures whose life cycles depend on the temperatures, movement, and salt content of the water. On land, global warming will cause forest boundaries to change. As Earth warms, trees will be able to grow farther north into the tundra and higher up the mountains. But it will take time for these new forests to mature so that they can support the animals that depend on them.

Along with polar bears and penguins, other specialized animals like pandas and koala bears will be losers if the leaves that they eat die out. Giraffes and elephants are probably in trouble, too, and that means lions, hyenas, and jackals will have nothing to eat.

**Who Can Survive?**

A sudden warming of the climate favors life forms that don't have special needs—plants and animals that are generalists. Dandelions are a good example: They do well in different kinds of soil. Many insects pollinate them. The wind spreads their seeds.

Animals that eat a wide range of food—omnivores, like ourselves—would do well. Black bears eat lots of seeds, berries, nuts, and grubs. Raccoons and coyotes have already adapted to a changing world. Where cities have taken over their habitat,
Creatures and plants with fewer specialized needs will be able to adapt better if the climate changes.

they’ve moved into urban parks and they forage in garbage cans. Flying insects with short life cycles can adapt to change faster than animals that live longer. Indeed, many insects would survive. And we would be losers if this included pests or insects that spread disease. For example, mosquitoes are already finding more places to lay their eggs in a warmer, wetter world.

**Putting on the Brakes**

Weather changes suddenly. Climate, on the other hand, happens over a long period of time, and it changes gradually. But global warming is causing major climate changes to happen very fast.

Because human activities cause global warming, changing our ways can slow down the warming trend. But can we keep up with the speed of climate change?

That’s another reason scientists are worried.

Adapting requires a lot of work. Many people already ride bikes to work, or use energy-efficient lightbulbs, or reduce, recycle, and reuse.

And some countries are coming up with plans for dealing with our changing climate. These are all good starts to reduce the worries of global warming.
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