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## Excerpt from "How Do We Know the Climate Is Changing?"

by NASA: Climate Kids NASA's Eyes on the Earth  
Lexile: 850 | Word Count 563

### So what if Earth gets a tiny bit warmer?

The sky is still blue. Trees are still green. Wind still blows. Clouds are still white and fluffy. Rain still pours from the sky. Snow falls and it still gets really cold sometimes in some places. Earth is still beautiful.

### So what is the ... fuss about climate change and global warming?

Well, after observing and making lots of measurements, using lots of NASA satellites and special instruments, scientists see some alarming changes. These changes are happening fast...

Global air temperatures near Earth's surface rose almost one and one-half degrees Fahrenheit in the last century. Eleven of the last 12 years have been the warmest on record. Earth has warmed twice as fast in the last 50 years as in the 50 years before that.

One and one-half degrees may not seem like much. But when we are talking about the average over the whole Earth, lots of things start to change....

### How can so little warming cause so much melting?

Water can soak up a lot of heat. When the oceans get warmer, sea ice begins to melt in the Arctic and around Greenland. NASA's Earth satellites show us that every summer some Arctic ice melts and shrinks, getting smallest by September. Then, when winter comes, the ice grows again.

But, since 1979, the September ice has been getting smaller and smaller and thinner and thinner.

Date: \_\_\_\_\_

## Excerpt from "Tomorrow's Weather"

by Science World  
Lexile: 1050 | Word Count 462

### TOO MUCH OF A GOOD THING

After sunlight hits Earth's surface... heat energy radiates back up toward the atmosphere. But this energy doesn't make a quick getaway into space. Instead, it collides with molecules of greenhouse gases such as water vapor, carbon dioxide, methane, and ozone. Some of the heat energy radiates back toward Earth, and some radiates higher into the atmosphere, eventually escaping into space. The energy that returns to Earth heats the planet's surface and gets recycled over and over before finally escaping into space....

The trouble starts when unusually large amounts of greenhouse gases build up in the atmosphere. Then the heat cranks way up. Human activities—such as the burning of fossil fuels, like coal and petroleum—release billions of tons of greenhouse gases into the atmosphere every year. And deforestation (clearing of forests) removes the trees that would otherwise absorb carbon dioxide. Most climate scientists agree: The accumulation of gases is causing warming on a global scale....

### REAL-LIFE DRAMA

Climate change might not come in the form of mammoth storms and widespread destruction. Even so, the changes could alter your way of life. Residents of the island village of Shishmaref, Alaska, know firsthand.... In Alaska, the [temperature] has soared four degrees. That might not sound like much, but it's caused a 4- to 10-inch rise in sea levels. That's because as seawater warms, it expands. Water from melting glaciers also adds to the ocean's volume....

Shishmaref is eroding into the sea. Rising sea levels, melting sea ice, and warmer air that holds more moisture are a recipe for brutal sea storms that have already washed away chunks of shoreline.... The native population's way of life depends on the sea freezing over at the right time. With warming temperatures, "we don't freeze up until about two months later now," says Vice Mayor Stanley Tocktoo. "By that time, the fish that we subsist on are way up in the river and we're not able to catch many."

### IS IT TOO LATE?

Even if humans were to stop releasing additional greenhouse gases, global warming would continue while the oceans slowly respond to the buildup of gases already in the atmosphere....

What can you do to curb global warming? Since most of our home energy is generated by power plants that burn fossil fuels, we can cut down on our share of greenhouse-gas emissions with simple energy-saving measures. Turn off the TV, computer, and other electrical devices when you're not using them. And if you plug these devices into a surge protector strip, make sure to switch it off too. Otherwise, the vampire-like gadgets continue to suck electricity from the lines. And flick out the lights when you leave a room. You can even help slow global warming by taking shorter showers....

Excerpt from “How Do We Know the Climate Is Changing” continued...

Glaciers are another form of melting, shrinking ice. Glaciers are frozen rivers. They flow like rivers, only much slower. Lately, they have been speeding up. Many of them flow toward the ocean, then break off in chunks--sometimes huge chunks....

**Doesn't rising sea level just bring us closer to the beach?**

As more sea ice and glaciers melt, the global sea level rises. But melting ice is not the only cause of rising sea level. As the ocean gets warmer, the water actually expands! Sea level has risen 6.7 inches in the last 100 years. In the last 10 years, it has risen twice as fast as in the previous 90 years....

**How does climate change affect other species?**

Life is a web, with every strand connected to every other strand. One species of plant or animal changes, and a whole chain of events can follow involving many other species.

For example, herds of caribou live in cold, Arctic locations. Caribou hate mosquitoes. In the past few years, warmer temperatures in summer have allowed mosquito populations to explode. So the caribou spend a lot more energy swatting away the mosquitoes. All this swatting leaves the caribou less energy to find food and prepare for the next long winter. Female caribou are especially troubled because it takes so much energy to give birth and raise their young.

Animals that hibernate in the winter also suffer from warming temperatures. Marmots, chipmunks, and bears are waking up as much as a month early. Some are not hibernating at all. These animals can starve if they stay awake all winter, because they can't find enough food. If they wake up too early because it feels warm enough to be spring, the days may not be long enough to signal the plants to start their spring growth. So, again, the wakeful animals go hungry....

**Standard RI.6.9****I can compare and contrast the claims and evidence presented by two authors.****1**

DOK 1

According to the article, “How Do We Know the Climate Is Changing” why are marmots, chipmunks, and bears waking up early?

- a. Life is a web, with every strand connected to every other strand.
- b. The animals are confused by the warming temperatures, thinking it’s spring.
- c. Animals are struggling to adapt to the rapidly changing climate.
- d. The mosquito population is exploding, causing a decrease in food surplus.

**2**

DOK 1

Which evidence from the article, “Tomorrow’s Weather” supports the article’s reasoning for the **effects** of global warming? Mark **all** that apply.

Evidence	Check if the Evidence Fits the Claim
“... as seawater warms, it expands. Water from melting glaciers also adds to the ocean’s volume. . .”	
“Turn off the TV, computer, and other electrical devices when you’re not using them.”	
“The native population’s way of life depends on the sea freezing over at the right time. With warming temperatures. . . the fish that we subsist on are way up in the river.”	
“Even if humans were to stop releasing additional greenhouse gases, global warming would continue while the oceans slowly respond to the buildup of gases already in the atmosphere.”	

Read the text excerpt taken from the article, “How Do We Know the Climate Is Changing?”:

*Global air temperatures near Earth's surface rose almost one and one-half degrees Fahrenheit in the last century. Eleven of the last 12 years have been the warmest on record. Earth has warmed twice as fast in the last 50 years as in the 50 years before that. . .*

*As more sea ice and glaciers melt, the global sea level rises. But melting ice is not the only cause of rising sea level. As the ocean gets warmer, the water actually expands!*

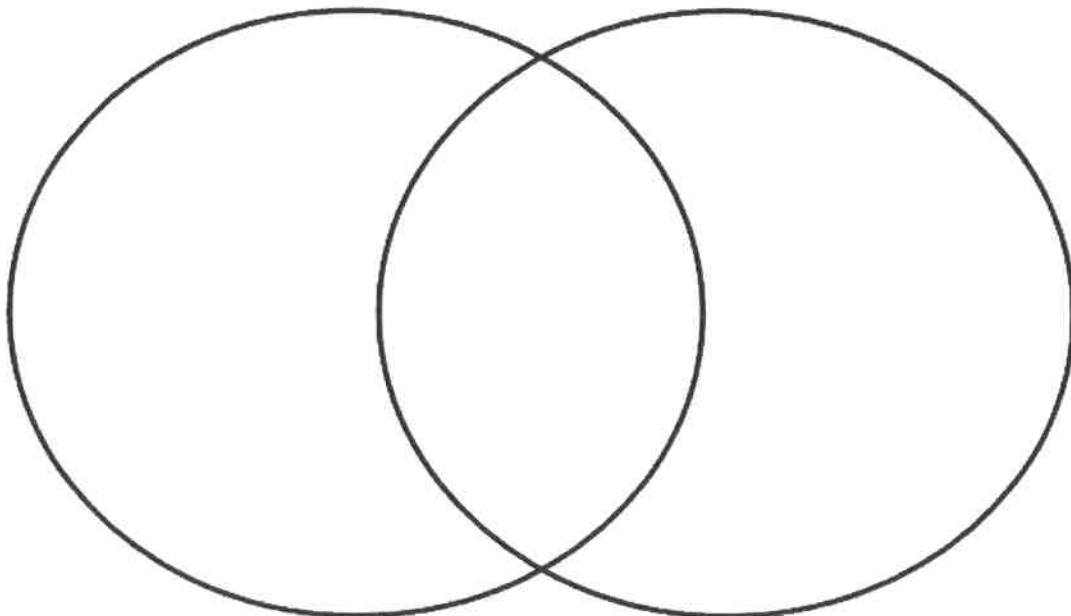
*Life is a web, with every strand connected to every other strand. One species of plant or animal changes, and a whole chain of events can follow involving many other species.*

Read the text excerpt taken from the article, “Tomorrow’s Weather”.

*The trouble starts when unusually large amounts of greenhouse gases build up in the atmosphere. Then the heat cranks way up. Human activities—such as the burning of fossil fuels . . . And deforestation. . . Most climate scientists agree: The accumulation of gases is causing warming on a global scale. . . .*

*What can you do to curb global warming? . . . Turn off the TV, computer, and other electrical devices when you're not using them. . . And flick out the lights when you leave a room. You can even help slow global warming by taking shorter showers. . .*

Each excerpt from the article discusses how global warming happens. What are the similarities and differences in how each article explains the reasons for global warming? Complete the Venn diagram by placing **one** idea from each excerpt in each section.



**Part 1**

How do the claims about the impact of global warming differ in the articles “How Do We Know the Climate Is Changing” and “Tomorrow’s Weather”?

- a. “How Do We Know the Climate Is Changing” provides detailed scientific information dating back to 1979 while “Tomorrow’s Weather” only focuses on scientific information spanning over the last year.
- b. “How Do We Know the Climate Is Changing” details the impact the freezing changes in weather has on the life cycle whereas “Tomorrow’s Weather” provides inaccurate information about greenhouse gases.
- c. “How Do We Know the Climate Is Changing” describes solutions like taking shorter showers while “Tomorrow’s Weather” focuses more on the impact the glacier melting icecaps have on the beaches.
- d. “How Do We Know the Climate Is Changing” describes the impact climate change can have on animals whereas “Tomorrow’s Weather” provides solutions to the problem.

**Part 2**

Which **two** pieces of evidence from the articles **best** support your answer to Part 1?

- a. “Turn off the TV, computer, and other electrical devices when you’re not using them. . . And if you plug these devices into a surge protector strip, make sure to switch it off too.” (“Tomorrow’s Weather”)
- b. “Life is a web, with every strand connected to every other strand. One species of plant or animal changes, and a whole chain of events can follow involving many other species.” (“How Do We Know the Climate Is Changing”)
- c. “With warming temperatures, we don’t freeze up until about two months later now, says Vice Mayor Stanley Tocktoo. By that time, the fish that we subsist on are way up in the river and we’re not able to catch many.” (“Tomorrow’s Weather”)
- d. “Eleven of the last 12 years have been the warmest on record. Earth has warmed twice as fast in the last 50 years as in the 50 years before that.” (“How Do We Know the Climate Is Changing”)
- e. “Climate change might not come in the form of mammoth storms and widespread destruction. Even so, the changes could alter your way of life.” (“Tomorrow’s Weather”)

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DOK 3

The articles “How Do We Know the Climate Is Changing” and “Tomorrow’s Weather” make a similar claim. What is the claim that can be found in **both** articles? How does each article support the claim differently? Use at least **two** pieces of supporting evidence, one from each article, in your response.

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