

Warming Evidence Weigh-In

Evaluate causes and evidence behind long-term global warming.

S6E6.c "Construct an argument evaluating contributions to the rise in global temperatures over the past century."

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline evidence about a possible cause of warming, circle words that show whether the cause warms or cools Earth, and number the three main factors discussed.

What Is Driving the Temperature Rise?

- ① Earth's average surface temperature has risen by about 1°C since the early 1900s. To evaluate why, scientists compare possible causes with measurements. Carbon dioxide, a greenhouse gas, traps some outgoing heat. Its amount in the air increased sharply as people burned coal, oil, and natural gas for electricity, travel, and industry. Clearing forests also added carbon dioxide and removed trees that take it in. This evidence supports the claim that human activities have made a major contribution to recent warming.
- ② Other changes have affected temperature, but their patterns do not explain the long-term rise as well. The Sun's energy changes slightly over time, yet satellite measurements show no sustained increase large enough to cause recent warming. Volcanic eruptions can send particles high into the air. These particles reflect sunlight and usually cool Earth for a few years. Natural factors can cause short-term changes, but they do not match the steady warming measured over many decades.
- ③ Scientists also consider influences that partly offset warming. Burning some fuels releases tiny particles called aerosols. Many aerosols reflect sunlight, so they have a cooling effect that has hidden some greenhouse warming. This does not mean aerosols are the main cause of the temperature rise. An argument should weigh each factor's direction, size, and timing. The strongest explanation is that rising human-produced greenhouse gases drove the long-term warming, while aerosols and natural factors changed the amount of warming at particular times.

2 ANSWER WITH EVIDENCE _____ Use the passage

- 1** Name two human activities in the passage that increased carbon dioxide in the atmosphere. How did each activity contribute?

- 2** Why does the passage say changes in the Sun's energy are not the strongest explanation for recent warming?

- 3** How do volcanic eruptions affect Earth's temperature, and why do they not explain the long-term rise?

- 4** What is the passage's strongest explanation for long-term warming? Give two details from the passage that support it.

3 YOUR TURN _____ Your own words

Using evidence from the passage, write exactly four sentences that argue which factor made the largest contribution to long-term warming. Include two evidence details and explain why one other factor is a weaker explanation.

PART 1 • READ AND MARK

Underline evidence about a possible cause of warming, circle words that show whether the cause warms or cools Earth, and number the three main factors discussed. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	Name two human activities in the passage that increased carbon dioxide in the atmosphere. How did each activity contribute?	Burning coal, oil, and natural gas released carbon dioxide. Clearing forests added carbon dioxide and removed trees that take in carbon dioxide.
2	Why does the passage say changes in the Sun's energy are not the strongest explanation for recent warming?	Satellite measurements show no sustained increase in the Sun's energy large enough to cause recent warming.
3	How do volcanic eruptions affect Earth's temperature, and why do they not explain the long-term rise?	Volcanic particles reflect sunlight and usually cool Earth for a few years. This short-term cooling does not match the steady warming over many decades.
4	What is the passage's strongest explanation for long-term warming? Give two details from the passage that support it.	Rising human-produced greenhouse gases are the strongest explanation. Carbon dioxide increased sharply as fossil fuels were burned, and clearing forests added carbon dioxide while removing trees that take it in.

PART 3 • YOUR TURN (SAMPLE ANSWER)

Human-produced greenhouse gases made the largest contribution to the long-term temperature rise. Carbon dioxide increased sharply when people burned fossil fuels, and clearing forests added carbon dioxide while removing trees that absorb it. Satellite measurements show no sustained increase in solar energy large enough to explain the warming. Although aerosols cool Earth by reflecting sunlight, they only partly offset greenhouse warming.

Accept arguments that identify human-produced greenhouse gases as the largest contributor and use accurate passage evidence about fossil fuels, forests, or carbon dioxide. Students may explain that solar changes, volcanic effects, or aerosols are weaker explanations because their direction, timing, or size does not match the long-term warming.