Sidewalk Heat Claim

Evaluate evidence before accepting a scientific conclusion.

CCSS.ELA-Literacy.RST.11-12.8 "Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline the hypothesis, data, and conclusion. Circle each limit on the data, and put a star by the outside source that checks the conclusion.

Testing Tree Shade

1. A city engineering class tested whether tree shade lowers summer sidewalk temperatures. Their hypothesis predicted that shaded concrete would be at least 5°C cooler than unshaded concrete at midday. On six clear July days, pairs of students used the same infrared thermometer to measure ten shaded and ten sunny sidewalk spots at 1:00 p.m. They avoided wet pavement and recorded cloud cover. The sites were chosen along two blocks near their school.

2. The shaded spots averaged 31°C, while sunny spots averaged 43°C. Because the difference was 12°C on every sampling day, the class reported support for its hypothesis. However, the sunny sites included newer, darker concrete, which absorbs more solar energy than lighter surfaces. The report did not list each measurement or show the thermometer's calibration. It also measured surface temperature, not the air temperature that pedestrians experience. These limits make the data useful but incomplete.

3. The class concluded that planting street trees would cool the neighborhood by 12°C. An Environmental Protection Agency overview states that trees and vegetation can lower surface and air temperatures through shade and evapotranspiration. This outside source supports the general idea that trees reduce heat, but it does not confirm the class's exact number or its two-block sample. A stronger study would compare matching pavement types, publish all readings, calibrate the thermometer, and measure air temperature as well as surface temperature.

2 ANSWER WITH EVIDENCE

Use the passage

1. Which result supports the hypothesis, and why?

2. What factor makes it hard to say that shade alone caused the temperature difference?

3. What two missing records make the measurements harder to verify?

4. How does the EPA overview evaluate the class's conclusion?

3 YOUR TURN

Your own words

Write exactly two sentences. In the first, state a revised conclusion using the class data and the EPA overview. In the second, name one change to the study and explain why it would improve the evidence.

ANSWER KEY

Sidewalk Heat Claim

HIGH SCHOOL · RST.11-12.8

PART 1 · READ AND MARK

Underline the hypothesis, data, and conclusion. Circle each limit on the data, and put a star by the outside source that checks the conclusion. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Which result supports the hypothesis, and why?	**Shaded concrete averaged 31°C and sunny concrete averaged 43°C, a 12°C difference that exceeds the predicted 5°C difference.**
2	What factor makes it hard to say that shade alone caused the temperature difference?	**The sunny sites had newer, darker concrete, which can absorb more solar energy than lighter surfaces.**
3	What two missing records make the measurements harder to verify?	**The report did not include every measurement or the thermometer's calibration.**
4	How does the EPA overview evaluate the class's conclusion?	**It supports the general claim that trees can reduce heat, but it does not confirm a 12°C neighborhood-wide effect or the small sample.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

The 31°C and 43°C averages, along with the EPA overview, suggest that shade can reduce heat, but they do not prove a 12°C neighborhood-wide cooling effect. Researchers should compare matching pavement types because darker concrete could otherwise explain part of the difference.

Accept revised conclusions that distinguish the supported general claim from the unsupported exact claim. The study change must address a stated limit, such as pavement type, raw data, calibration, sample size, or air temperature.