Shade and Storms

A source-based investigation of schoolyard design

11-12.W.7 "Conduct short as well as more sustained, focused research. Use appropriate methodology to demonstrate a thorough understanding of the subject under investigation."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline the research question, circle the three source titles, and number each finding the researcher takes from a source. Use your marks to track how the researcher reaches a conclusion without claiming more than the sources show.

What Can the Sources Tell Us?

(1) A student researcher asked, "Does a shaded sidewalk always have a lower heat index than an unshaded one?" She began by separating measurements people often confuse. In the Environmental Protection Agency's "Using Trees and Vegetation to Reduce Heat Islands," she found that trees cool surfaces by blocking sunlight and can cool nearby air as water evaporates from leaves. That source explains why pavement beneath a tree might be cooler. It does not, however, provide temperature readings for her school. The researcher recorded its finding as a general explanation, not proof of what happens on her campus.

(2) Next, she consulted the National Weather Service's "What Is the Heat Index?" The source explains that heat index combines air temperature and relative humidity to describe how hot conditions feel. Its calculation assumes shade; direct sunlight can make conditions feel hotter than the reported index. Comparing the sources gave the researcher a limited conclusion: shade can cool pavement, but a cooler pavement reading alone cannot establish a lower heat index. To test conditions at school, she would need air temperature and humidity readings from comparable locations at the same time. She would record pavement temperatures separately.

(3) The researcher kept notes for a different investigation, too. The Environmental Protection Agency's "Types of Green Infrastructure" explains that rain gardens collect runoff from hard surfaces and allow some water to soak into soil. It also describes permeable pavement, which lets water pass through rather than flow across its surface. Her earlier tree source explains a separate process: shade blocks sunlight before it reaches the ground. Neither EPA source reports results for this particular campus. Soil conditions, drainage, and available space would need checking before anyone could predict how well a proposed schoolyard design would work there.

2 ANSWER WITH EVIDENCE

Use the passage

1. Why did the researcher need a source about heat index in addition to the source about trees?

2. What conclusion could the researcher support from her two sources, and what stronger claim could she not support?

3. Which source would help you investigate where rainwater goes in a redesigned schoolyard? Name one finding from it that you would use.

4. Why would the researcher measure air temperature and humidity at comparable locations and times instead of relying on pavement temperatures?

3 YOUR TURN

Your own words

Conduct a short investigation using the two EPA source summaries in the passage: How might a schoolyard design address both hot pavement and rainwater runoff? Write a conclusion supported by a finding from each source, then identify one piece of local evidence needed before recommending the design.

ANSWER KEY

Shade and Storms

HIGH SCHOOL · 11-12.W.7

PART 1 · READ AND MARK

Underline the research question, circle the three source titles, and number each finding the researcher takes from a source. Use your marks to track how the researcher reaches a conclusion without claiming more than the sources show. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Why did the researcher need a source about heat index in addition to the source about trees?	**The tree source explains cooling of surfaces and nearby air, while the heat-index source defines a measure based on air temperature and humidity. She needed both to evaluate her question.**
2	What conclusion could the researcher support from her two sources, and what stronger claim could she not support?	**She could conclude that shade can cool pavement but that a cooler pavement reading alone does not establish a lower heat index. She could not claim that the shaded sidewalk at her school always has a lower heat index.**
3	Which source would help you investigate where rainwater goes in a redesigned schoolyard? Name one finding from it that you would use.	**The EPA's "Types of Green Infrastructure" would help. It explains that rain gardens collect runoff and allow some water to soak into soil, or that permeable pavement lets water pass through.**
4	Why would the researcher measure air temperature and humidity at comparable locations and times instead of relying on pavement temperatures?	**Heat index depends on air temperature and humidity, not pavement temperature. Comparable locations and times would make the readings more useful for evaluating differences.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

A school could consider adding trees near pavement and a rain garden beside a paved area. The EPA's "Using Trees and Vegetation to Reduce Heat Islands" explains that tree shade blocks sunlight from reaching surfaces, which could help keep the pavement cooler. The EPA's "Types of Green Infrastructure" explains that rain gardens collect runoff and allow some water to soak into soil. Together, these findings suggest ways to address both concerns, but they do not show how much either change would help at this school. Before recommending the plan, I would check whether the proposed rain garden's soil allows water to soak in.

Accept conclusions that accurately connect one finding from each EPA source to the proposed design. Students should distinguish a source-supported possibility from a measured result at their school.