Shade at the Stop

Build research questions from sources, observations, and their limits

11.6.R.1 "Students will find and comprehend information about a topic, using their own viable research questions."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB As you read, underline information a researcher could get from published sources and circle information volunteers would need to collect. Number two details that limit what those sources or observations could prove.

Where Should Route 6 Find Shade?

1 On a July afternoon, two bus stops can feel like different cities. At one, a broad tree shades the sidewalk; at the other, sunlight strikes dark pavement beside a glass shelter. Dark surfaces absorb solar energy and can become much hotter than nearby air. Trees block sunlight and cool the air as water evaporates from their leaves, a process called transpiration. Yet shade at a stop changes as the sun moves, and a glass roof may block rain without blocking much sunlight. A photograph taken at noon, therefore, cannot establish how comfortable either stop remains during an entire afternoon.

2 In the fictional city of Alder, a neighborhood group wants to know where to seek shade improvements along Route 6. Its transit agency posts stop locations and scheduled arrival times online; a city tree inventory lists tree locations, species, and trunk sizes. Neither source records the shade falling on a waiting area at 4 p.m. Volunteers could visit a small set of stops during the same late-afternoon hour on several clear days and note whether the waiting space is shaded. They could also record the air temperature with the same thermometer, held out of direct sun at each stop.

3 Even careful observations would not show whether shade alone caused a temperature difference. Traffic, wind, buildings, and the type of pavement also vary between stops. A stop with a large tree may still expose riders to the sun if the tree stands across the street. To decide where changes would help most, the group would also need to learn when people actually wait there. The transit agency's schedule describes planned service, not the number of riders. A count of waiting passengers during the observation period could add that missing detail, while protecting riders' privacy by recording totals rather than names.

2 ANSWER WITH EVIDENCE

Use the passage

1. Write an answerable question about whether trees listed near Route 6 stops shade the waiting areas at 4 p.m. What published source and volunteer observation would help answer it?

2. A researcher asks, "Which stops have the most riders waiting in the sun during the late afternoon?" What two observations would help answer this question?

3. Could the proposed stop visits establish that trees alone cause lower air temperatures? Explain using two other factors named in the passage.

4. If you wanted to compare planned service frequency at Route 6 stops, which source would you use? What could a passenger count tell you that this source cannot?

3 YOUR TURN

Your own words

Write a new, answerable research question about Route 6 that combines a published source with information volunteers could collect. In three sentences, state your question, identify the source and observations, and explain one limit on what the findings could prove.

ANSWER KEY

Shade at the Stop

GRADE 11 · 11.6.R.1

PART 1 · READ AND MARK

As you read, underline information a researcher could get from published sources and circle information volunteers would need to collect. Number two details that limit what those sources or observations could prove. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Write an answerable question about whether trees listed near Route 6 stops shade the waiting areas at 4 p.m. What published source and volunteer observation would help answer it?	**Which Route 6 stops with nearby trees in the city inventory have shaded waiting areas at 4 p.m.? Use the tree inventory and volunteers' observations of shade at the stops.**
2	A researcher asks, "Which stops have the most riders waiting in the sun during the late afternoon?" What two observations would help answer this question?	**Volunteers would need to record whether each waiting area is in the sun and count the riders waiting there during the observation period.**
3	Could the proposed stop visits establish that trees alone cause lower air temperatures? Explain using two other factors named in the passage.	**No. The visits could show temperature differences, but factors such as wind and pavement type also vary between stops, so they could not establish that trees alone caused a difference.**
4	If you wanted to compare planned service frequency at Route 6 stops, which source would you use? What could a passenger count tell you that this source cannot?	**Use the transit agency's scheduled arrival times to compare planned service. A passenger count would show how many riders waited at a stop during the observation period.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

How does the scheduled time between Route 6 buses relate to whether a stop's waiting area is shaded at 4 p.m.? I would calculate intervals from the transit agency's schedule and have volunteers record shade at each stop on several clear days. The results could show a relationship between scheduled intervals and observed shade, but not how long riders actually waited.

Accept other viable questions that can be investigated with a source and observations described in the passage. For Part 3, the stated limit should match what the proposed evidence cannot establish.