Heat at Stops

Read closely to compare ways a bus stop can feel cooler.

9-10.RI.10.a "Demonstrate proficiency in reading and comprehending grade-appropriate texts."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline one detail about what shade changes and one about what pale pavement changes. Circle a limitation of each approach so you can compare how well they serve riders.

What Makes a Bus Stop Cooler?

1 At a bus stop in Phoenix, a rider can feel heat rising from the sidewalk even when the weather report lists only the air temperature. Sunlight warms pavement, which then releases heat into the air and toward nearby people. A thermometer held above the ground and a sensor pressed against the sidewalk measure different things. That distinction matters: a surface can be far hotter than the surrounding air. It also explains why two stops on the same street may feel different. One might have a shelter that blocks direct sun; the other leaves riders beside exposed pavement.

2 Cities often plant trees to make walking routes more comfortable. Leaves shade both people and pavement, reducing the sunlight that reaches the ground. Trees also release water vapor through their leaves, a process that can cool nearby air. But a young tree may take years to cast useful shade, and roots need space that a narrow sidewalk may not offer. A shelter can provide shade sooner, although its roof does not cool the air in the same way a living tree can. Its placement matters, too: shade that falls behind the waiting area at rush hour does little for riders.

3 Some cities test pale pavement coatings because lighter surfaces reflect more sunlight than dark pavement. That can lower the pavement's surface temperature, but reflected light may reach a person's face or nearby windows. A coating may also wear down and need maintenance. For a bus stop, the most useful plan might combine shade over the waiting area with a pavement treatment chosen only after checking its effects on people. Officials could measure surface and air temperatures at the same times at treated and untreated stops, then ask riders about comfort. No single reading would show whether the stop works better for everyone.

2 ANSWER WITH EVIDENCE

Use the passage

1. Why might two stops on the same street feel different even if the air temperature is the same?

2. Why would a surface temperature reading alone not tell officials how comfortable riders feel?

3. Compare a tree and a shelter as ways to make a narrow sidewalk more comfortable. What advantage and limitation does each have?

4. A planner says, "Pale pavement is all this bus stop needs." Use two details from the passage to explain why that claim may be incomplete.

3 YOUR TURN

Your own words

A school courtyard has benches in afternoon sun, little room for tree roots, and windows facing the pavement. Propose two changes to make the benches more comfortable, explain one possible drawback, and describe how you would check whether your plan works using ideas from the passage.

ANSWER KEY

Heat at Stops

HIGH SCHOOL · 9-10.RI.10.a

PART 1 · READ AND MARK

Underline one detail about what shade changes and one about what pale pavement changes. Circle a limitation of each approach so you can compare how well they serve riders. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Why might two stops on the same street feel different even if the air temperature is the same?	**One stop may shade riders and pavement while the other leaves them beside pavement heated by direct sun.**
2	Why would a surface temperature reading alone not tell officials how comfortable riders feel?	**Surface and air temperatures measure different conditions, and a cooler surface could reflect light toward riders.**
3	Compare a tree and a shelter as ways to make a narrow sidewalk more comfortable. What advantage and limitation does each have?	**A tree can shade the ground and cool nearby air, but its roots need space and useful shade takes time to grow. A shelter provides shade sooner, but it does not cool air in the same way and must be placed where riders need shade.**
4	A planner says, "Pale pavement is all this bus stop needs." Use two details from the passage to explain why that claim may be incomplete.	**Pale pavement may lower surface temperature but reflect light toward riders. It also does not provide the direct shade that a shelter or tree can give people waiting at the stop.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

I would put a shelter where its shade covers the benches in the afternoon. I would also test a pale coating on a small section of pavement near them. The coating could reflect light into the classroom windows, so I would check for glare before using it across the courtyard. At the same time each afternoon, I would compare surface and air temperatures near the test area with temperatures beside untreated pavement. I would also ask students sitting on the benches whether they feel more comfortable.

Accept other passage-supported explanations that distinguish surface temperature from rider comfort. For Part 3, look for two plausible changes, a relevant drawback, and a check that goes beyond a single temperature reading.