Heat Across the City

Read three connected texts to build knowledge about urban heat.

9.DSR.D "Regularly engage in reading a series of conceptually related texts organized around topics of study to build knowledge and vocabulary (These texts should be at a range of complexity levels so students can read the texts independently…"

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline each text's main idea, circle words whose meanings nearby sentences help you infer, and number details that connect one text to the next.

Why Some City Places Feel Hotter

1. Text 1, Field Notes: On a sunny afternoon, a student carried a thermometer from a shady park to a nearby parking lot. The pavement measured much warmer than the grass, even though both places were in the same neighborhood. Dark asphalt and building roofs soak up sunlight and release stored heat slowly. Trees cool an area in two ways. Their leaves cast shade, and water moving from leaves into the air, called transpiration, uses heat energy. When many paved surfaces replace plants, the warmer section of a city can become an urban heat island.

2. Text 2, Satellite View: Researchers use thermal images to map land-surface temperatures across whole cities. These images often show the hottest zones near wide roads, warehouses, and large parking areas. One reason is albedo, the share of sunlight a surface reflects. A pale roof with high albedo sends more solar energy away than a black roof with low albedo. Yet color is not the only factor. Concrete, asphalt, building height, wind, moisture, and tree cover also affect temperature. Because the images measure surface temperature, they do not always match the air temperature a person feels at street level.

3. Text 3, Planning Choice: City planners use this research when deciding where to spend limited money. In Phoenix, for example, shade can protect people waiting at bus stops, where pavement and direct sun raise heat exposure. Planners may prioritize trees, shade structures, or cooler paving in places used by people who walk, wait, or work outdoors. They also consider water supply, maintenance, and whether young trees will survive extreme heat. A solution that lowers a surface temperature is useful, but planners must ask another question: Does it reduce heat stress for residents? Combining maps, on-the-ground measurements, and community experience helps them make that decision.

2 ANSWER WITH EVIDENCE

Use the passage

1. How do the details in Text 1 help you infer the meaning of transpiration?

2. What does albedo mean in Text 2, and which roof comparison helps explain it?

3. How does Text 2 add to the explanation of city heat in Text 1?

4. Using the whole series, explain why planners might focus on heat near bus stops instead of only trying to cool empty pavement.

3 YOUR TURN

Your own words

Write exactly two sentences advising a school that wants to cool its sunny bus stop area. Use the term urban heat island, include one specific fact from Text 2, and include one planning consideration from Text 3.

ANSWER KEY

Heat Across the City

GRADE 9 · 9.DSR.D

PART 1 · READ AND MARK

Underline each text's main idea, circle words whose meanings nearby sentences help you infer, and number details that connect one text to the next. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	How do the details in Text 1 help you infer the meaning of transpiration?	**Transpiration is the movement of water from leaves into the air, a process that uses heat energy and helps cool an area.**
2	What does albedo mean in Text 2, and which roof comparison helps explain it?	**Albedo is the share of sunlight a surface reflects. A pale, high-albedo roof reflects more solar energy than a black, low-albedo roof.**
3	How does Text 2 add to the explanation of city heat in Text 1?	**Text 1 explains that pavement and fewer plants can create hotter city areas. Text 2 adds satellite evidence and explains that albedo and other factors, such as wind and tree cover, also affect temperature.**
4	Using the whole series, explain why planners might focus on heat near bus stops instead of only trying to cool empty pavement.	**Bus stops can expose people to direct sun and hot pavement while they wait outdoors. Text 3 explains that planners should consider whether a solution reduces heat stress for residents, not only surface temperature.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

To reduce the urban heat island effect around the school bus stop, the school should add shade trees and use a pale, high-albedo roof on the nearby shelter. The plan should focus on the stop because students wait there outdoors, while also considering water and maintenance so the trees survive.

Accept equivalent responses that accurately connect the texts and use passage evidence. For Part 3, require exactly two sentences, the term urban heat island, a Text 2 fact, and a Text 3 planning consideration.