Shade Smart Routes

Read connected texts to build knowledge about urban heat and shade.

7.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 As you read the three related texts, underline one detail in each text that adds to your understanding of how trees reduce city heat. Circle canopy, transpiration, and heat exposure, then write a brief meaning or clue above each word.

How Trees Cool Cities

1. Text 1, Shade: On a sunny afternoon, pavement can become much hotter than a nearby park. Dark asphalt absorbs sunlight and releases stored heat slowly, even after sunset. Trees change this pattern. Their leaves cast shade, so less sunlight reaches streets and sidewalks. A group of tree crowns is called a canopy. In neighborhoods with a thick canopy, people may find cooler places to walk, wait for buses, or play. Shade does not cool every surface equally, but it can lower surface temperatures considerably.

2. Text 2, Moving Water: Trees also cool air through transpiration. Roots take in water, which travels to leaves. When water vapor leaves tiny openings in the leaves, it carries heat away, much as sweat helps cool a person. This process works best when trees have enough water and healthy leaves. Scientists studying urban heat measure both air temperature and surface temperature because they do not always change by the same amount. A shaded bench may feel cooler immediately, while changes in the surrounding air can be smaller.

3. Text 3, Planning for Shade: City planners use this knowledge when deciding where to plant and care for trees. In many cities, neighborhoods differ in tree cover because of past building choices, street width, and unequal investment. Places with fewer trees can have more exposed pavement and fewer shaded routes. Planting young trees is not an instant solution, since they need years to develop broad crowns. Still, protecting mature trees, watering new ones, and adding shade at bus stops can reduce heat exposure, especially for people who must travel or work outdoors.

2 ANSWER WITH EVIDENCE

Use the passage

1. How do the three texts build knowledge in order? State the main focus of Text 1, Text 2, and Text 3.

2. Using clues from Text 2, what does transpiration mean?

3. Why might a shaded sidewalk feel cooler even when the surrounding air temperature changes only a little?

4. Name two actions city planners can take to reduce heat exposure. Why are mature trees especially useful?

3 YOUR TURN

Your own words

Write exactly three sentences recommending one way your school could make a walking route cooler. Use evidence from at least two texts and use two vocabulary words from your markings correctly.

ANSWER KEY

Shade Smart Routes

GRADE 7 · 7.DSR.D

PART 1 · READ AND MARK

As you read the three related texts, underline one detail in each text that adds to your understanding of how trees reduce city heat. Circle canopy, transpiration, and heat exposure, then write a brief meaning or clue above each word. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	How do the three texts build knowledge in order? State the main focus of Text 1, Text 2, and Text 3.	**Text 1 explains how tree shade reduces sunlight on surfaces. Text 2 explains how transpiration can cool air. Text 3 explains how cities can use this knowledge to reduce heat exposure.**
2	Using clues from Text 2, what does transpiration mean?	**Transpiration is the process in which water vapor leaves tree leaves and carries heat away.**
3	Why might a shaded sidewalk feel cooler even when the surrounding air temperature changes only a little?	**Shade blocks sunlight from reaching the sidewalk, lowering its surface temperature, while the surrounding air may change less.**
4	Name two actions city planners can take to reduce heat exposure. Why are mature trees especially useful?	**Possible actions include protecting mature trees, watering new trees, and adding shade at bus stops. Mature trees are useful because they already have broad crowns, while young trees need years to grow.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

To make the walk to our school cooler, the school should protect the mature trees along the sidewalk and add new trees near the bus stop. A wider canopy would shade pavement, while transpiration from healthy leaves could cool the air. Because young trees need years to grow, regular watering would help them provide more shade in the future.

Accept accurate paraphrases supported by the texts. For Part 3, check for a clear recommendation, evidence from at least two texts, exactly three sentences, and correct use of two vocabulary words.