

City Heat Choices

Notice how exact terms explain causes, limits, and effects.

9-10W2c "Use precise language and content-specific vocabulary to express the appropriate complexity of a topic."

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline each content-specific term that names a process, feature, or measurement, then number 1, 2, and 3 beside three terms whose exact wording helps explain a cause, limit, or consequence.

Cooling a Hot City

- ① On a July afternoon, an asphalt parking lot can become far hotter than nearby shaded ground. This difference is part of the urban heat island effect, in which buildings, pavement, and other dark surfaces absorb solar radiation and release stored heat slowly. A city block with little vegetation also has less evapotranspiration, the cooling process that occurs when water evaporates from soil and leaves. As a result, outdoor temperatures remain elevated after sunset, increasing the demand for air conditioning and exposing residents to heat stress.
- ② Urban foresters reduce this risk by expanding tree canopy, the layer of leaves and branches that shades streets and roofs. Shade limits the solar energy reaching pavement, while roots improve infiltration, or the movement of water into soil. Trees also cool air through transpiration, the release of water vapor from leaves. However, planners must select species that can tolerate compacted soil, limited rooting space, and periodic drought. A poorly matched tree may decline early, leaving the neighborhood without long-term cooling or stormwater benefits during intense summer weather.
- ③ Reflective roofs offer another intervention. Their high albedo, or ability to reflect incoming sunlight, keeps roof surfaces cooler than conventional dark roofing. Yet albedo alone does not determine a neighborhood's heat exposure. Residents who lack reliable air conditioning, live near major roads, or work outdoors may face greater health risks even when average temperatures fall. For that reason, an effective heat plan combines surface changes with cooling centers, shaded transit stops, and outreach that directs vulnerable residents to timely assistance. Precise planning connects a physical measurement to its unequal human consequences.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 Which term names the cooling process caused when water evaporates from soil and leaves? State what the term means in the passage.

2 What specific feature does *tree canopy* identify that the broader word *vegetation* does not? Explain why that feature matters for cooling streets.

3 Replace the phrase *poorly matched tree* with a more precise description based on the passage.

4 In paragraph 3, name the physical property of reflective roofs and give two conditions that can make heat risk greater for some residents.

3 YOUR TURN _____ Your own words

Write an 85 to 110 word explanatory paragraph about reducing stormwater runoff at a school. Explain how one intervention works and one limitation, using at least four of these terms: *permeable pavement*, *runoff*, *infiltration*, *drainage basin*, *vegetation*, *maintenance*.

PART 1 • READ AND MARK

Underline each content-specific term that names a process, feature, or measurement, then number 1, 2, and 3 beside three terms whose exact wording helps explain a cause, limit, or consequence. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	Which term names the cooling process caused when water evaporates from soil and leaves? State what the term means in the passage.	Evapotranspiration. It is the cooling process that occurs when water evaporates from soil and leaves.
2	What specific feature does <i>tree canopy</i> identify that the broader word <i>vegetation</i> does not? Explain why that feature matters for cooling streets.	Tree canopy identifies the layer of leaves and branches. That layer shades streets and roofs, limiting solar energy reaching pavement.
3	Replace the phrase <i>poorly matched tree</i> with a more precise description based on the passage.	A tree species that cannot tolerate compacted soil, limited rooting space, or periodic drought.
4	In paragraph 3, name the physical property of reflective roofs and give two conditions that can make heat risk greater for some residents.	The property is high albedo. Conditions include lacking reliable air conditioning, living near major roads, and working outdoors. Any two conditions are acceptable.

PART 3 • YOUR TURN (SAMPLE ANSWER)

Installing permeable pavement beside the school gym could reduce runoff during heavy rain. Unlike solid asphalt, this surface allows infiltration through openings and into a prepared gravel layer below. The system can slow the flow entering the drainage basin, which may reduce localized flooding. However, sediment and fallen leaves can clog the openings, so regular maintenance is necessary. Planting vegetation along the pavement would further stabilize the soil there, but the school must choose species that can survive foot traffic and intermittent dry periods in summer.

Accept equivalent precise explanations that accurately use the passage's terms and relationships. For the paragraph, look for a clear mechanism, a realistic limitation, and at least four correctly used content-specific terms.