Cool Roof Choices

Analyze how an explanatory text develops a practical solution.

CCSS.ELA-Literacy.W.8.2 "Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline each sentence that explains a benefit or limitation of a roof strategy, circle the detail that supports it, and number the transition words or phrases that organize the ideas.

Roofs That Cool Cities

1. On a sunny day, city neighborhoods can become hotter than nearby parks or rural areas. Dark roofs, asphalt streets, and parking lots absorb sunlight and release heat slowly. This effect, called an urban heat island, can raise nighttime temperatures as well as daytime temperatures. Higher heat can make homes uncomfortable, increase electricity use for air conditioning, and worsen health risks during heat waves. City planners use several strategies to reduce this trapped heat, including planting trees and changing roof materials.

2. One strategy is a green roof, which holds plants and a growing layer on top of a building. The soil and plants shade the roof surface, so it absorbs less solar energy. Plants also release water vapor through transpiration, a process that can cool the air nearby. Green roofs can capture some rainwater, reducing runoff that might otherwise flood storm drains. However, they cost more to install than standard roofs and may require a building to support extra weight. For these reasons, engineers inspect each building before recommending one.

3. Another option is a cool roof, coated or built with materials that reflect more sunlight than a dark roof. Because less energy enters the building, a cool roof can lower indoor temperatures and reduce air-conditioning demand. This choice is often simpler to add to an existing building than a green roof, but it does not provide the same rainwater benefits. A city can choose among these approaches by studying its climate, building conditions, budget, and residents' needs. Effective heat planning uses evidence rather than a single solution for every roof.

2 ANSWER WITH EVIDENCE

Use the passage

1. What problem does the first paragraph introduce, and which surfaces contribute to it?

2. How does the author explain that a green roof can cool an area?

3. How is the passage organized from beginning to end?

4. Which details support the author's idea that one roof solution will not work for every building?

3 YOUR TURN

Your own words

Choose a heat problem near your school, such as a hot bus area, blacktop playground, or uncovered walkway. Write a 120 to 150 word explanatory recommendation that introduces the problem, compares two possible solutions using relevant details, includes one limitation, and explains how decision makers should choose.

ANSWER KEY

Cool Roof Choices

GRADE 8 · W.8.2

PART 1 · READ AND MARK

Underline each sentence that explains a benefit or limitation of a roof strategy, circle the detail that supports it, and number the transition words or phrases that organize the ideas. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	What problem does the first paragraph introduce, and which surfaces contribute to it?	**It introduces the urban heat island effect. Dark roofs, asphalt streets, and parking lots absorb sunlight and release heat slowly.**
2	How does the author explain that a green roof can cool an area?	**Plants and soil shade the roof so it absorbs less solar energy, and plants release water vapor through transpiration, which can cool nearby air.**
3	How is the passage organized from beginning to end?	**It introduces the city heat problem, explains benefits and limits of green roofs, then explains cool roofs and concludes that cities should compare local needs and evidence.**
4	Which details support the author's idea that one roof solution will not work for every building?	**Green roofs capture rainwater but cost more and may need extra structural support. Cool roofs are often simpler to add but do not provide the same rainwater benefits.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

Lincoln Middle School should add shade near the west-side bus area, where afternoon sun heats the pavement while students wait. First, the school could plant drought-tolerant trees along the sidewalk. As the trees grow, their leaves would block direct sunlight and help cool the area through transpiration. Trees also make the waiting space more pleasant, but they need years to provide broad shade and require watering when young. Meanwhile, a shade canopy could protect students sooner. A canopy would cover a smaller area than mature trees, yet it would create immediate shade without changing the bus route. Using both options is sensible because the canopy addresses the current problem, while the trees provide longer-term cooling. The school should compare installation costs, maintenance, and available planting space before choosing a final design.

Accept responses that accurately identify the passage's explanations, supporting details, and comparison of trade-offs. For Part 3, accept varied solutions if the response is 120 to 150 words and clearly organizes relevant information, includes a limitation, and explains a reasonable decision process.