

Heat, Shade, Solutions

Explain how cooling strategies work and why their limits matter.

CCSS.ELA-Literacy.W.9-10.2 "Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content."

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline one cause-and-effect link in each paragraph. Circle a phrase that limits a claim.

Two Ways to Reduce Urban Heat

- ① A roof and a tree can both affect heat, but they work differently. Sunlight absorbed by surfaces becomes heat. A cool roof reflects more sunlight than a conventional roof and releases absorbed heat efficiently. Less heat passes into the building, which can reduce demand for air conditioning. The benefit depends on the building and climate. In a cold winter, reflecting sunlight can increase heating needs, so an explanation of energy savings must consider the whole year.
- ② Trees can shade pavement and buildings, reducing the sunlight that reaches those surfaces. Water also moves through plants and is released as vapor; evaporation uses heat and contributes to cooling. These are different mechanisms: shade limits incoming solar energy, while evaporation uses energy as water changes state. Trees require suitable growing space and care. A newly planted tree does not immediately provide the shade of a large canopy, so a planting proposal needs a maintenance plan and time to develop.
- ③ Combining strategies can address different places and needs. A reflective roof can reduce heat entering a building but does not directly cast shade over a sunny walkway. A tree beside that walkway can provide shade as it grows, yet it cannot be placed wherever there are utilities or inadequate growing space. A plan should connect each measure to its location and explain its limits. The strongest explanation shows how the mechanisms complement one another instead of claiming that one change solves every heat problem.

2 ANSWER WITH EVIDENCE Use the passage

- 1 Trace the causal chain from a reflective roof to reduced demand for air conditioning. Why does paragraph 1 qualify the energy claim?

- 2 How does paragraph 2 distinguish shade from evaporation instead of treating them as the same process?

- 3 Explain how the walkway example in paragraph 3 develops the idea that strategies can complement one another.

3 YOUR TURN Your own words

Write a developed informative explanation for a school newsletter: How could cool roofs and trees work together to reduce heat around a school? Use only the supplied information for factual claims. Organize three or four paragraphs with an introduction, explanations of both mechanisms, a comparison of their limits, and a closing synthesis. Explain at least three relevant details rather than listing them. Use transitions and define an unfamiliar term in context.

Plan the explanation

Choose a clear focus, group the details you will explain, and note one limit for each strategy.

Write the explanation

Develop three or four connected paragraphs. Explain how and why the selected details support your focus. Reread for clear organization and accurate claims.

This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

PART 1 • READ AND MARK

Underline one cause-and-effect link in each paragraph. Circle a phrase that limits a claim. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	Trace the causal chain from a reflective roof to reduced demand for air conditioning. Why does paragraph 1 qualify the energy claim?	More sunlight is reflected, less heat is absorbed/transferred into the building, and less cooling may be needed. In cold seasons reduced solar heating can increase heating demand, so annual savings depend on conditions.
2	How does paragraph 2 distinguish shade from evaporation instead of treating them as the same process?	Shade reduces sunlight reaching a surface. Evaporation uses heat as water becomes vapor. Both can reduce heating or temperature, but through different processes.
3	Explain how the walkway example in paragraph 3 develops the idea that strategies can complement one another.	The roof helps the building, while a suitably placed tree can shade the walkway. Each addresses a different location and limitation, so combining them has a reason beyond simply adding two measures.

PART 3 · YOUR TURN (SAMPLE ANSWER)

A school can address heat in both its buildings and its outdoor spaces by combining cool roofs with trees. These measures work through different processes, so their usefulness depends on where they are placed and what conditions they face.

A cool roof reflects more sunlight than a conventional roof. That reflection reduces the heat entering a building and can reduce the need for air conditioning. However, the effect on energy use must be considered across seasons because less solar heating can increase winter heating needs.

Trees offer another kind of protection. Their canopies shade surfaces, while evaporation, the change of liquid water into vapor, uses heat and contributes to cooling. Trees therefore affect heat differently from a reflective surface. They also need suitable space, care, and time to develop a large canopy.

Together, the two strategies could serve different school spaces. A reflective roof could help a building, while a tree could eventually shade a walkway that the roof does not shade. This combination would still require attention to planting space and seasonal effects; it would not eliminate every heat problem.

Evaluate actual multi-paragraph explanatory writing: clear focus, grouped ideas, accurate mechanisms, analysis of at least three relevant details, limits, transitions, a defined term, and a closing synthesis. Accept other effective organizations. No research beyond the supplied passage is required. Editorial source basis: US EPA, Using Cool Roofs to Reduce Heat Islands; Benefits of Trees and Vegetation; Community Member Tree Planting Efforts. The newsletter scenario is hypothetical; do not invent school measurements or guaranteed savings.