Roof Claims Under Review

Use precise evidence to assess a building-design claim.

9-10.RST.1 "Accurately cite specific textual evidence to support analysis of science and technical texts, attending to accurate and relevant details of explanations or descriptions."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline two measured results, circle two details about how the test was conducted, and number two details that qualify the case for coating every roof. Use your marks to choose evidence for your answers.

Should Every Roof Be Cool?

1. On a sunny afternoon, two roofs can receive nearly the same sunlight but reach different temperatures. A dark asphalt roof absorbs much of the incoming sunlight and turns that energy into heat. A cool roof uses a light-colored coating or another reflective surface to send more sunlight back toward the sky. The roof may then transfer less heat into the rooms below. Reflection is not the only factor, however. Insulation, shade, and airflow also affect indoor temperature. A reflective coating changes the roof surface; it does not replace insulation or seal gaps around windows.

2. In a small field test, technicians coated one section of a flat warehouse roof white and left an equally sized section dark. Both sections had the same underlying insulation and were measured at noon on six clear summer days. The average surface temperature was 34 °C on the coated section and 52 °C on the dark section. Sensors beneath the roof found less heat moving through the coated section during those hours. The test measured roof temperatures and heat flow, not the warehouse's electricity use. A lower roof temperature alone cannot show how much money the building would save.

3. Climate complicates the decision to install a cool roof. In a hot region, reduced heat entering a building can lower the demand for air-conditioning, especially when a large roof sits in direct sun. In a cold region, reflecting winter sunlight can also reduce useful solar warming, although snow cover may already make a roof reflective. Trees and taller buildings can shade roofs, leaving less sunlight for a coating to reflect. Before coating every public building, a city could test roofs with different amounts of shade and compare heating and cooling energy use across seasons.

2 ANSWER WITH EVIDENCE

Use the passage

1. Which detail explains why a cool roof may reduce heat entering a building? Cite the detail and explain the connection.

2. What measured result supports the claim that the white section stayed cooler? Cite both temperatures and when they were measured.

3. A headline says the warehouse test proved that electricity bills fell. Which specific detail challenges that claim, and why?

4. How does the test make roof color a plausible explanation for the temperature difference? Cite two setup details and explain.

3 YOUR TURN

Your own words

A facilities director proposes coating every public roof white immediately. Write four or five sentences proposing a more careful plan, citing two specific details from different paragraphs, and explaining one trade-off that could affect the decision.

ANSWER KEY

Roof Claims Under Review

HIGH SCHOOL · 9-10.RST.1

PART 1 · READ AND MARK

Underline two measured results, circle two details about how the test was conducted, and number two details that qualify the case for coating every roof. Use your marks to choose evidence for your answers. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Which detail explains why a cool roof may reduce heat entering a building? Cite the detail and explain the connection.	**Paragraph 1 says a cool roof sends more sunlight back toward the sky. With less sunlight absorbed, the roof may transfer less heat into the rooms below.**
2	What measured result supports the claim that the white section stayed cooler? Cite both temperatures and when they were measured.	**At noon on six clear summer days, the coated section averaged 34 °C, while the dark section averaged 52 °C.**
3	A headline says the warehouse test proved that electricity bills fell. Which specific detail challenges that claim, and why?	**The test measured roof temperatures and heat flow, not electricity use. It therefore cannot establish a change in the warehouse's electricity bill.**
4	How does the test make roof color a plausible explanation for the temperature difference? Cite two setup details and explain.	**The sections were equally sized and had the same underlying insulation. Those shared conditions make the difference in surface color a more plausible explanation for their different temperatures.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

I would test a few public roofs before coating all of them. In the warehouse test, the coated section averaged 34 °C at noon, compared with 52 °C for the dark section on six clear summer days. However, the passage says reflecting winter sunlight in a cold region can reduce useful solar warming. The city should compare heating and cooling energy use across seasons on roofs with different amounts of shade before expanding the project.

Accept accurate quotations or close paraphrases that identify specific passage details and explain how those details support or limit a claim. For the open task, check for evidence from two different paragraphs and a relevant trade-off.