Roof Data Decoder

Translate measurements among tables, equations, and precise explanations.

CCSS.ELA-Literacy.RST.9-10.7 "Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline every starting or final temperature, circle each roof-sample name, and number the sentences that turn a measurement into words so you can connect the table, equation, and explanation.

Testing Roof Surfaces

1 At Brookside High, an environmental science class compared roof materials on a clear April afternoon. Students placed equal-sized samples in full sunlight for 30 minutes. Each sample began at 22°C. They then measured only the surface temperature, not the amount of solar energy absorbed. Their results appear in Table 1.

TABLE 1. FINAL SURFACE TEMPERATURES

Roof sample	Final surface temperature
White	31°C
Silver	35°C
Green	39°C
Black	46°C

2 Table 1 shows that the black sample had the highest final surface temperature, 46°C. Because every sample started at 22°C, the black sample's temperature rose 24°C. The white sample had the lowest final temperature. In this test, the darker black surface became hotter than the other tested surfaces.

3 Scientists can express a temperature change with an equation: change = final temperature – starting temperature. For the silver sample, the equation is 35°C – 22°C = 13°C. In words, its surface temperature increased by 13°C during the test. This calculation compares measurements, so it does not prove why one material became hotter.

2 ANSWER WITH EVIDENCE

Use the passage

1. Translate the table into one comparison sentence. How much hotter was the green sample than the silver sample at the end of the test?

2. Use the starting temperature in paragraph 1 and the green sample's final temperature in Table 1. Write an equation that shows the green sample's temperature change.

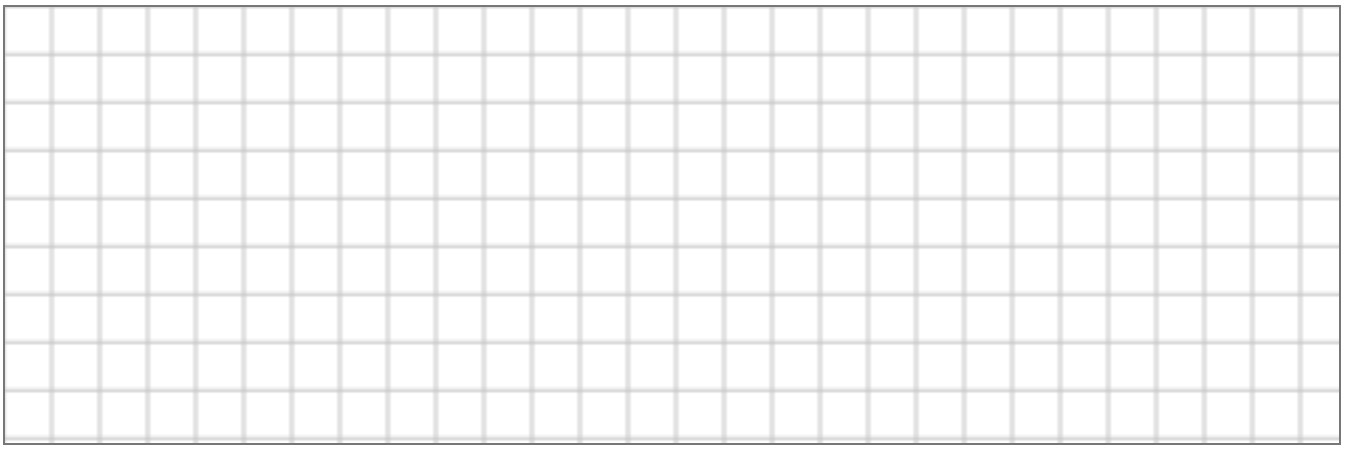
3. Translate the white sample's data into words. State its final temperature and the amount its temperature increased.

4. Translate this equation into words for the green sample: 39°C − 22°C = 17°C.

3 YOUR TURN

Your own words

Use Table 1 to create a bar graph of the final surface temperatures. Label the x-axis Roof Sample and the y-axis Final Surface Temperature (°C), use a scale that starts at 0°C and ends at 50°C, then write one sentence identifying the tallest bar.



ANSWER KEY

Roof Data Decoder

HIGH SCHOOL · RST.9-10.7

PART 1 · READ AND MARK

Underline every starting or final temperature, circle each roof-sample name, and number the sentences that turn a measurement into words so you can connect the table, equation, and explanation. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Translate the table into one comparison sentence. How much hotter was the green sample than the silver sample at the end of the test?	**The green sample was 4°C hotter than the silver sample.**
2	Use the starting temperature in paragraph 1 and the green sample's final temperature in Table 1. Write an equation that shows the green sample's temperature change.	**39°C − 22°C = 17°C**
3	Translate the white sample's data into words. State its final temperature and the amount its temperature increased.	**The white sample ended at 31°C, and its surface temperature increased by 9°C.**
4	Translate this equation into words for the green sample: 39°C − 22°C = 17°C.	**The green sample's surface temperature increased by 17°C during the test.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

Bar graph with bars for white, 31°C; silver, 35°C; green, 39°C; and black, 46°C. The x-axis is labeled Roof Sample, and the y-axis is labeled Final Surface Temperature (°C) with a scale from 0°C to 50°C. The black bar is tallest at 46°C.

Accept bars at 31°C, 35°C, 39°C, and 46°C with the correct sample labels. The y-axis scale must begin at 0°C and end at 50°C, and the sentence should identify black as the tallest bar.