

Heat Data Detective

Translate measurements, equations, and a bar chart about surface heat.

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 number that gives a measurement. Circle each equation or graph label that helps explain what the measurement means, so you can decide which information could become a table, chart, or sentence.

Which Surfaces Hold Heat?

- ① On a July afternoon, students at Riverton High tested how surface materials heat up. At 3:00 p.m., they placed temperature sensors on three equal-sized squares: black asphalt, pale concrete, and grass. Asphalt measured 54°C , concrete measured 43°C , and grass measured 31°C . The air temperature was 30°C . The group recorded each reading after the squares had received direct sunlight for four hours. Their goal was to compare surfaces, not to measure the day's highest air temperature. All sensors were checked against the same shaded thermometer before the test began.
- ② To show how much hotter each surface was than the air, the class used the expression surface temperature minus air temperature equals temperature difference. For asphalt, $54^{\circ}\text{C} - 30^{\circ}\text{C} = 24^{\circ}\text{C}$. For concrete, $43^{\circ}\text{C} - 30^{\circ}\text{C} = 13^{\circ}\text{C}$. For grass, $31^{\circ}\text{C} - 30^{\circ}\text{C} = 1^{\circ}\text{C}$. These differences matter because a person standing near a hot surface can receive heat from it, even when the air feels cooler. The calculation does not show every factor that affects comfort, such as wind, shade, humidity, clothing, or how long someone remains outside.
- ③ The class displayed its results in this bar chart. Each block equals 1°C above the air temperature. Asphalt |  | 24°C . Concrete |  | 13°C . Grass |  | 1°C . The graph lets a reader compare the surfaces quickly, but it should not be used to claim that every asphalt street reaches 54°C . These measurements came from one sunny afternoon, at one school, using three test squares. Repeating the test on cloudy days or with wet surfaces could produce different results.

2 ANSWER WITH EVIDENCE _____ Use the passage

- 1** Turn the three surface readings in paragraph 1 into a two-column table labeled "Surface" and "Temperature at 3:00 p.m."

- 2** Use the concrete equation in paragraph 2 to write one sentence that explains the calculation in words.

- 3** Turn the bar chart information for asphalt and grass into one comparison sentence. Include both exact temperature differences.

- 4** Make a three-row table that shows each surface and how many degrees hotter it was than the air.

3 YOUR TURN _____ Your own words

Create a bar graph that compares the air temperature and the three surface temperatures from the investigation. Include a title, a scale, and exact number labels for all four bars.

PART 1 • READ AND MARK

Underline every number that gives a measurement. Circle each equation or graph label that helps explain what the measurement means, so you can decide which information could become a table, chart, or sentence. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	Turn the three surface readings in paragraph 1 into a two-column table labeled "Surface" and "Temperature at 3:00 p.m."	Surface Temperature at 3:00 p.m. Asphalt 54°C Concrete 43°C Grass 31°C
2	Use the concrete equation in paragraph 2 to write one sentence that explains the calculation in words.	Concrete was 13°C hotter than the air because its surface temperature of 43°C minus the 30°C air temperature equals 13°C.
3	Turn the bar chart information for asphalt and grass into one comparison sentence. Include both exact temperature differences.	Asphalt was 24°C above the air temperature, while grass was 1°C above it, so asphalt had a 23°C larger temperature difference.
4	Make a three-row table that shows each surface and how many degrees hotter it was than the air.	Surface Degrees hotter than air Asphalt 24°C Concrete 13°C Grass 1°C

PART 3 • YOUR TURN (SAMPLE ANSWER)

Surface Temperatures at 3:00 p.m. Key: ■ ≈ 5°C Air | ■■■■■■ | 30°C Grass | ■■■■■■ | 31°C Concrete | ■■■■■■ | 43°C Asphalt | ■■■■■■ | 54°C

Accept any accurate bar graph with four clearly labeled categories, a stated scale, and exact labels of 30°C, 31°C, 43°C, and 54°C. Bar lengths may be rounded when the student clearly states that the scale is approximate.