Cooling by Numbers

Turn temperature measurements into tables and written comparisons

11-12.RST.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 each temperature and time stated in the passage. Circle the table headings that tell you what each measurement represents.

Does a Sleeve Slow Cooling?

1. To test whether a sleeve slows cooling, a student filled two identical metal cups with equal amounts of hot water. Both started at 70 °C. One cup stayed bare; the other wore a thick felt sleeve that covered its sides. A thermometer recorded each cup's water temperature every five minutes for twenty minutes.

WATER TEMPERATURE IN BARE AND FELT-SLEEVED CUPS

Time (minutes)	Bare cup (°C)	Felt-sleeved cup (°C)
0	70	70
5	62	66
10	55	62
15	49	59
20	44	56

2. In a separate ten-minute test, a paper-sleeved cup fell from 70 °C to 59 °C, while a wool-sleeved cup fell from 70 °C to 64 °C. Both cups held the same volume of water and started in the same room. These measurements come from a different test than the felt-sleeve readings in the table.

3. The student then tested how quickly bare cups cooled in three rooms kept at different air temperatures. After ten minutes, water in a 15 °C room measured 52 °C; in a 20 °C room, 55 °C; and in a 25 °C room, 58 °C. All three cups started at 70 °C.

2 ANSWER WITH EVIDENCE

Use the passage

1. Turn the paper-and-wool test into a two-row table. Include the sleeve material, starting temperature, and temperature after ten minutes.

2. Using the table, describe how much each cup cooled between 10 and 20 minutes.

3. Translate 70 °C − 56 °C = 14 °C into a sentence about the felt-sleeved cup.

4. At which recorded time was the temperature gap between the bare and felt-sleeved cups greatest? State both temperatures and the gap in words.

3 YOUR TURN

Your own words

Use the three-room test to complete the table. Calculate the water's temperature drop in each room, and include units in your entries.

ROOM AIR (°C)	WATER AT START (°C)	WATER AFTER 10 MINUTES (°C)	WATER TEMPERATURE DROP (°C)

Cooling by Numbers

PART 1 · READ AND MARK

Underline each temperature and time stated in the passage. Circle the table headings that tell you what each measurement represents. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Turn the paper-and-wool test into a two-row table. Include the sleeve material, starting temperature, and temperature after ten minutes.	**Paper: 70 °C at the start, 59 °C after ten minutes. Wool: 70 °C at the start, 64 °C after ten minutes.**
2	Using the table, describe how much each cup cooled between 10 and 20 minutes.	**The bare cup cooled by 11 °C, from 55 °C to 44 °C. The felt-sleeved cup cooled by 6 °C, from 62 °C to 56 °C.**
3	Translate 70 °C − 56 °C = 14 °C into a sentence about the felt-sleeved cup.	**The water in the felt-sleeved cup cooled by 14 °C over twenty minutes.**
4	At which recorded time was the temperature gap between the bare and felt-sleeved cups greatest? State both temperatures and the gap in words.	**At twenty minutes, the bare cup was 44 °C and the felt-sleeved cup was 56 °C, a gap of 12 °C.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

ROOM AIR (°C)	WATER AT START (°C)	WATER AFTER 10 MINUTES (°C)	WATER TEMPERATURE DROP (°C)
15 °C	70 °C	52 °C	18 °C
20 °C	70 °C	55 °C	15 °C
25 °C	70 °C	58 °C	12 °C

Accept equivalent table layouts and wording. For temperature drops, subtract each final temperature from its starting temperature.