Checking Heat From Two Temperatures in One Cup

Scoring guide · one credit per question · review written work against each rubric

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Question 1

Choice (2)

The liquid is the same in both portions. The 6.0 g cool portion has more mass and needs more energy for the same rise.

Question 2

At 40 °C both portions would change by 20 °C. The warm portion loses energy proportional to 4.0 × 20 = 80, while the cool portion gains energy proportional to 6.0 × 20 = 120. The cup supplies no extra heat, so the larger cold portion pulls the final temperature below 40 °C.

Question 3

At 36 °C the warm portion loses an amount proportional to 4 × (60 − 36) = 96. The cool portion gains 6 × (36 − 20) = 96. The balance gives 36 °C.

Question 4

Place matched temperature probes near the top and bottom without stirring the liquid. Record both temperatures at the same time. If the readings differ, the top temperature cannot describe the whole cup. Repeat after stirring and check that the two readings agree.