

Reteach · Trace energy transfer

K4-D-B · Matched 100 g samples begin at 10°C in 22°C surroundings. Cups/lids,15 min, exposure and procedure match; sleeves are complete designs. Covered liquid water; no active heating/cooling, ice, phase change, direct sunlight or meaningful evaporative cooling. Room, cup, lid and supporting surfaces are at the stated surrounding temperature; it stays constant. Readings represent the sample temperature with a consistent procedure. This is a paper scenario, not apparatus instructions.

One supplied comparison

Constructed teaching data: these values were invented for this activity, not collected in an experiment.

Setup	Start (°C)	After 15 min (°C)
No sleeve	10	18
Sleeve V	10	14

Fictional response 1: “Cold entered through the cup.” Fictional response 2: “Sleeve V made cold.” Fictional response 3: “V stopped all energy transfer.”

K4-B1. For each statement, ask what the speaker means. Which readings and scientific idea would help check it?

K4-B2. Explain V’s change. Draw or describe the net-transfer arrow and revise the stopped-transfer claim. Explain how limiting warming differs from cooling.

Words alone may be imprecise. Show the parts and direction before deciding whether the idea is misunderstood.

Fresh recheck · Trace a new case

K4-D-Bc · Fresh 100 g covered sample with a sleeve in 21°C surroundings. Covered liquid water; no active heating/cooling, ice, phase change, direct sunlight or meaningful evaporative cooling. Room, cup, lid and supporting surfaces are at the stated surrounding temperature; it stays constant. Readings represent the sample temperature with a consistent procedure. This is a paper scenario, not apparatus instructions.

New sample readings

Constructed teaching data: these values were invented for this activity, not collected in an experiment.

Sample	Start (°C)	After 10 min (°C)
Sleeved W	33	29

K4-B3. Explain this temperature change and the direction of net energy transfer. Does the sleeve generate cold or stop all transfer? Use the record and set a limit.