

One Ice Cube, All Three States

TEACHER DEMO · THE CENTREPIECE

RUN AT 12:40

25 MIN

The point

One single ice cube climbs the whole ladder while the kids watch: **SOLID** → **LIQUID** → **GAS**. The same water, narrated across each threshold — and at the end the pan is dry because the water is **in the room's air**, not gone.

Materials

- Hot plate + small saucepan
- One ice cube (+ spares)
- Painter's-tape kid line on the floor
- Oven mitt · worksheet BACK + pencils

Steps

- 1 Kids seated behind the tape line. Hold up ONE cube: “**Follow this water. Don't lose it.**” Into the cold pan — **SOLID**.
- 2  **Worksheet moment:** kids circle their guess NOW (back, section 1) — where will the water be when the pan is dry?
- 3 Heat on. Watch it slump and slide — **MELT**, at 32 °F. Now it flows and lies flat: **LIQUID**.
- 4 Keep heating. Bubbles roar — **BOIL**, at 212 °F. Point at the **clear gap** just above the water: **THAT** is water vapor, the invisible gas. The white puff above it is tiny liquid drops.
- 5 IR gun on the pan as it climbs — kids call the numbers crossing 32 and 212.
- 6 Boil it to **bone dry**. Show the empty pan. “**Where is our ice cube?**” — in the air of this room, every bit of it, as invisible **GAS**.
- 7 Close the loop: cool it back down and it would be drops, then ice, again — and A-8 will do exactly that, later this year.

Say: “Nothing is gone. Every bit of that ice cube is flying around this room right now, invisible. Temperature ran it up the ladder — and temperature could run it all the way back down.”



Fig. 4 — one cube: solid, liquid, then invisible gas

SAFETY

Adult-only heat. Steam scalds silently — **kids stay seated behind the tape line**; only the teacher's mittied hand crosses it. Hot plate off and pan parked at the back before anyone stands up.

TEACHER PREP

Tape the kid line before lunch. Check the hot plate at its spot (induction needs a magnetic pan). A dry pan over heat is fine for the minute it takes to finish — but turn it off promptly at dry.

What to watch for

- Every change happens to **one traceable cube** — no swaps, no additions
- The water level falls as it boils — the gas is leaving the pan
- The clear gap vs. the white puff (gas is invisible)

EXPECTED RESULT

Cube → puddle → rolling boil → dry pan in ~15 minutes. **Temperature alone moved one batch of water through all three states.**