

Dry Ice: Solid Straight to Gas

TEACHER DEMO · THE FINALE

RUN AT 1:40

10 MIN

The point

Some solids skip liquid entirely and go **straight to gas**. That is **sublimation** — and dry ice proves it beside a normal ice cube: one leaves a puddle, one leaves **nothing at all**.

Materials

- Dry ice chunk (bought **this morning** — see prep)
- Kitchen tongs + insulated gloves
- Big bowl of warm water · hard cooler (storage, lid loose)
- Plate with a normal ice cube (the comparison), set out early so it is already puddling

Steps

- 1 Point at the comparison plate: the ordinary cube is **melting** — solid to LIQUID; there's the puddle.
- 2 Gloves on. With **tongs**, hold up the dry ice. It smokes faintly and never drips. **"Watch the table under it — where's its puddle?"**
- 3 Lower it into the **warm water**: it roars into thick white fog that spills over the rim and **pours DOWN** off the table edge.
- 4 Precision moment: the fog you see is tiny water droplets from the air, chilled by the escaping gas — **the gas itself is invisible**. It pours down because cold gas is heavy.
- 5 Side-by-side verdict: ice cube → puddle (melting). Dry ice → fog and **no puddle ever** (sublimation). Say the big word together.
- 6 Leftover dry ice goes outdoors on a plate to finish sublimating — never down a sink, never in a closed box.

Say: "Watch the table under each one. The ice cube leaves a puddle — solid to liquid. The dry ice leaves nothing at all — solid straight to gas. That skip has its own name: sublimation."



Fig. 7 — one puddle, one nothing: melt vs. sublimate

SAFETY — READ BEFORE TOUCHING

Never bare skin — dry ice is -109°F and burns like fire; **tongs and insulated gloves only**, teacher's hands only. **Ventilate the room** (open a window; the invisible CO_2 sinks and pools low). **NEVER seal it in any airtight container** — building gas pressure bursts it. Kids stay seated an arm's length back; nobody leans a face into the fog.

TEACHER PREP — MORNING OF ONLY

Buy 2–4 lb the **morning of** (grocery dry-ice chest or welding-gas supplier — call ahead). It sublimates away in storage, so earlier = arriving with nothing. Transport and store in a hard cooler with the **lid resting loose, never latched**, windows cracked.

What to watch for

- Fog pours **down**, hugging the table — cold, heavy gas
- The dry table under the fog — no liquid stage, ever
- The warm water eventually grows a normal ice skin — the dry ice is that cold

EXPECTED RESULT

Roaring fog, no puddle, one unforgettable word. **Sublimation: solid → gas with no liquid in between.**