

Magdeburg Hemispheres

KIDS HANDS-ON

RUN AT 12:55

15 MIN

The point

Take the air OUT of two joined bowls and the air still outside squeezes them together harder than the whole family can pull. No glue, no magnet — just sky.

Materials

- Magdeburg hemisphere set (toy) + its pump or valve
- Damp cloth (wipe the seal ring)

Steps

- 1 Show the halves apart: clap together, pull apart — **easy**. Nothing holds them.
- 2 Tell the story fast: **Magdeburg, 1654** — Otto von Guericke pumped the air out of two big metal bowls, and **two teams of horses** could not pull them apart.
- 3 Press the halves together and **pump the air out**.
- 4 Strongest kid pulls — fails. Two kids, **straight tug-of-war** — fails. Adults may strain too.
- 5 Ask: what is holding them? The missing air inside can't hold anything...
- 6 **Open the valve** — hisss — and the halves fall apart in your hands, all by themselves.

Say: "No glue. No magnet. No trick. Just the whole sky, pressing two little bowls together from every side — until we let the air walk back in."



Fig. 5 — muscle against sky — the sky wins

TEACHER PREP — THE DAY BEFORE

Wipe the seal ring with the damp cloth (a faintly moist ring seals best), find the pump/valve, and **dry-run one tug** so you know your set's grip.

What to watch for

- The same object, transformed only by removing the air inside
- The instant the valve opens, the "grip" vanishes
- Kids connecting it to the suction cups from this morning

EXPECTED RESULT

Pumped down, the halves resist a genuine two-kid tug; valve open, they fall apart. **The outside air pushes the halves together** once the inside push is gone — nothing sucks. Weak grip? Re-wipe the ring, pump to firm resistance, and pull straight, not sideways.