Ferrofluid Spike Show

TEACHER DEMO | RUN AT 12:40 | 15 MIN

The point

The field in **three dimensions**: a liquid full of iron dust leaps into spikes along the field lines — and collapses the instant the field leaves.

Materials

- Sealed ferrofluid display bottle
- Strong neodymium disc (teacher's)

Steps

1. Show the bottle at rest — a lazy black liquid. **Shake and tilt**; it sloshes like oil.
2. Predict: what will it do when the magnet comes close?
3. Bring the disc **slowly to the glass wall** — the fluid leaps into a hedgehog of spikes. Hold. Let them stare.
4. **Drag the magnet around the bottle** — the spiky creature follows, climbing and reshaping.
5. **Pull the magnet away** — instant collapse. Repeat: field near = spikes; field gone = puddle.

> *Say: "The spikes stand up along the field lines — the same invisible loops the filings showed us this morning, now with a liquid climbing them."*



Fig. 6 — spikes where the field is strong; flat where it's gone

TEACHER PREP

Keep the bottle hidden until 12:40 — it steals attention on sight. Test your disc's striking distance through the glass once beforehand.

SAFETY

The bottle stays SEALED, always — ferrofluid stains skin, clothes, and carpet permanently. Short holds against the glass (parked fluid can stain the inner wall). Keep the disc well away from the filings bag and the wands bin while this is out. Magnets nowhere near electronics.

What to watch for

- The instant, total collapse when the field leaves
- A child connecting it to the morning's filings unprompted

EXPECTED RESULT

Spiky peaks that **track the magnet exactly** and vanish without it — the field is real, three-dimensional, and only there while the magnet is near.