Timing and materials

Launch Day 1; Days 2–5 take 2 minutes

Minutes	Move
0–5	Wonder and blank pressure diagram.
5–12	Teacher-only cup/card prediction and observation.
12–25	Build or hypothetical observation fallback.
25–35	Guided Q1–Q3.
35–47	Winnipeg data, Q4–Q5.
47–55	Q6 discussion.
55–60	E1–E2.
Days 2–5	2 minutes only: record comparison and conditions.

- Per group: 1 stable unbreakable rigid jar; 1 teacher-prepared balloon membrane; 1 rubber band; 1 drinking straw; tape; 1 paper pointer; 1 paper scale; ruler; marker.
- Days 2–5: 2 minutes to compare with the prior reading and record conditions.

For the teacher demonstration: 1 plastic cup, cool water, 1 stiff card larger than the cup opening, and 1 deep catch tray. Use a towel for spills.

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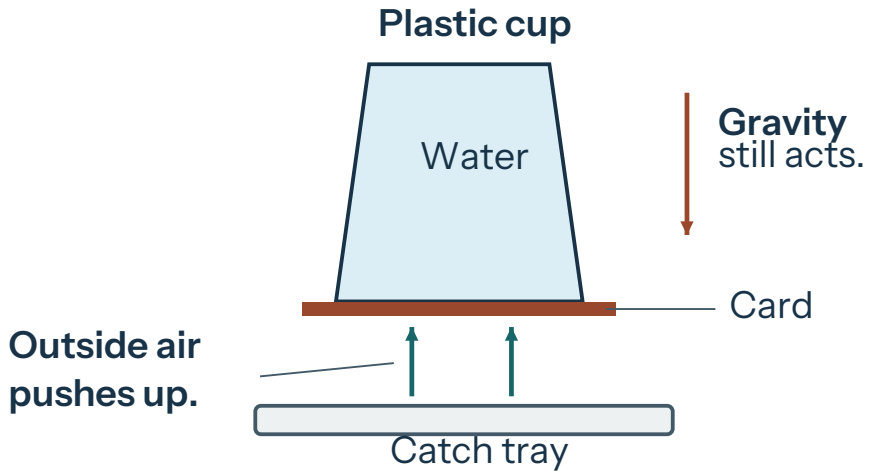
Setup and cup demonstration

Prepare before learners arrive

- Check latex allergies; use no-build route if needed.
- If using glass, teacher handles it. No needles, toothpicks, piercing, or hot water.
- Stretch membrane tight; secure rubber band; straw at centre and on rim; pointer free over edge.
- Put model in a steady shaded location. Add scale. Learners do not touch after Day 1.

Before class, test the demonstration over a tray. Fill a plastic cup nearly to the top with cool water. Cover it with a stiff card larger than the opening. Hold the card flat with one hand and the cup with the other. Invert over the tray. After learners predict, slowly remove the hand under the card. Record what actually happens; do not promise the card will stay. Keep learners back from spills.

After observation: outside air can push upward on the card; the wet seal matters; gravity still acts on the water. Do not call this proof that gravity stops.



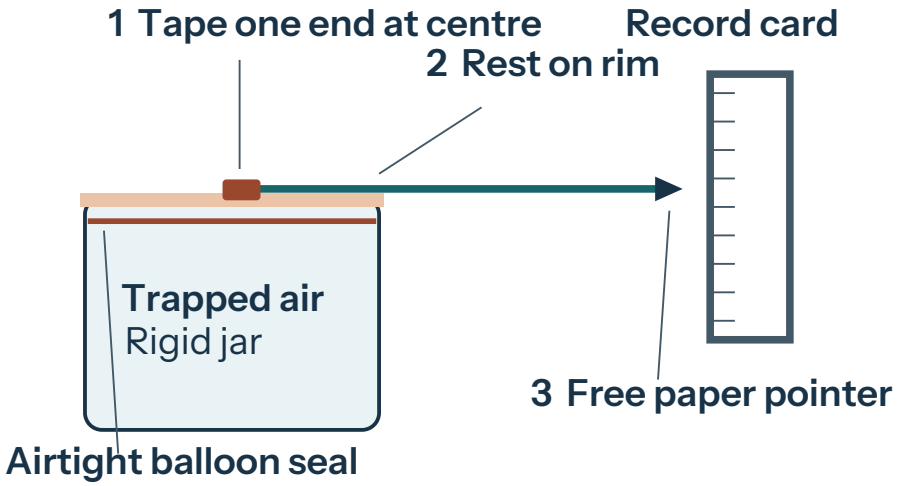
Teacher-only plastic cup and card over a tray. Predict before any explanation.

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Mechanism and daily use

Teacher explanation after guided checks

Air pressure is a push in all directions. The membrane has air on both sides. Higher outside pressure can push it down; with this rim-pivot model the free pointer end can tip up. Lower outside pressure can let the pointer tip down.



Assembly check: centre tape fixes one straw end; the straw rests lightly on the rim; the paper pointer hangs free over the edge. Pre-flight: gently confirm the pointer is clear of the record card before learners mark Day 1.

- Q1: name membrane and air on both sides; air pushes in all directions.
- Avoid “air pulls.”
- A qualitative jar model can change with leaks, temperature, membrane stretch and straw position.

Day 1 is the 60-minute launch and baseline. On Days 2–5, read without touching; compare with the prior mark; record sky/wind and room-temperature changes. Do not call a pointer movement a forecast.

Optional launch file: Air-Pressure-Model.html. Use it only as a teacher-guided model introduction or discussion prompt; it is not a new mandatory lesson or source of observations.

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30-minute no-build fallback

Observation and data route

Minutes	Move
0–4	Wonder; blank air-push diagram.
4–9	Cup/card observation or teacher description.
9–15	Diagram plus hypothetical record: Day 1 at the starting mark; Day 2 below that mark; room warmer.
15–23	Q1–Q3.
23–28	Winnipeg table; Q4–Q5.
28–30	E1 or E2.

Say clearly that the record is hypothetical. Learners practise cautious explanation; they do not report it as class evidence.

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Teacher-only key and sources

Shared key; do not print with learner pages

- Q1: air pushes on the membrane from all directions; the membrane has air on both sides.
- Q2: higher outside pressure can push membrane down; free pointer end can tip up.
- Q3: lower outside pressure can let membrane rise; free pointer end can tip down.
- Q4: January, 0.8 kPa higher.
- Q5: NOAA standard is a sea-level reference; Winnipeg station pressure is measured at 238.7 m, and a 1991–2020 normal is not the same kind of value. Both altitude and normal-versus-standard make an exact match unnecessary.
- Q6: down can mean outside pressure fell OR the air inside became warmer; compare to baseline and conditions, so one reading is not a forecast.
- E1: (b). E2: supports a cautious pressure-trend claim; cannot forecast or give cause alone.
- https://www.edu.gov.mb.ca/k12/framework/english/science/docs/sci_gr5_eng.pdf
- https://climate.weather.gc.ca/climate_normals/results_1991_2020_e.html?climate_id=5023222&dispBack=1
- https://www.noaa.gov/jetstream/atmosphere/air-pressure
- https://www.boulder.noaa.gov/wp-content/uploads/2023/08/Make-Weather-Instruments.pdf
- https://www.scienceworld.ca/resource/cup-and-card/

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