How to Read a What-If Claim

A what-if claim is a compressed argument: change one condition, let physics run, observe a result. Your job is to unpack it into three labels—**assumption**, **mechanism**, and **outcome**—before deciding whether the claim is sound.

1. Find the trigger

The trigger is the single changed condition. It usually appears after “what if” or “suppose.” Treat it as a starting state, not a prediction. Write it as one sentence and remove any hidden physics. For example, “What if the Moon vanished tonight?” means the Moon is gone at time zero; it does not yet say what gravity, tides, or rotation do.

2. List the assumptions

Assumptions are the conditions held fixed so the scenario can be calculated. List them explicitly, with units when possible. For the Moon scenario, useful assumptions include:

- Moon mass: 7.34 × 10^22 kg
- Earth–Moon distance: 384,400 km
- Earth remains at 1 AU from the Sun
- Earth’s initial axial tilt remains 23.4°
- No debris from the vanished Moon enters the atmosphere

An assumption can be physically impossible, such as instantaneous disappearance. Label it as a non-physical assumption rather than pretending it is a mechanism.

3. Identify the mechanism

The mechanism is the causal chain, stated with a law or proportionality. Avoid metaphors like “the Moon controls tides.” Instead, use tidal force scaling: tidal force is proportional to mass divided by distance cubed, M/r^3. Comparing the Sun and Moon gives a solar-to-lunar tidal force ratio of about 0.46, so the lunar term is roughly 2.2 times the solar term. That number is the mechanism’s backbone.

4. State the outcome separately

The outcome is what an observer could measure after the mechanism has acted. It must have a timescale. In the Moon scenario:

- Ocean tides fall to a solar-only level, which is roughly half of a typical spring tide range in many coastal locations, not zero.
- Earth's rotation rate does not instantly change; the tidal torque that currently lengthens the day by about 2.3 milliseconds per century simply stops.
- Long-term axial tilt behavior becomes less certain; do not present a sudden wobble as an immediate outcome.

5. Mark conservation-law violations

If the trigger removes mass, energy, or angular momentum without a sink, flag it. The Moon carries orbital angular momentum in the Earth–Moon system. If it "vanishes," the scenario has already broken conservation. That does not make the exercise useless, but it tells you which conclusions are scenario artifacts.

6. Add timescales

Separate immediate effects from delayed ones. "Tonight" gives an immediate tidal change, but climate, orbit, and rotation effects unfold over thousands to millions of years. A claim without a timescale is usually an outcome masquerading as a mechanism.

7. Assign confidence

Newtonian gravity gives high confidence for tide amplitude changes. Coupled climate, atmospheric, and biological responses deserve lower confidence. Label each part of the claim separately instead of giving one overall "true or false."

8. Rewrite the claim in A/M/O form

Use this template: **Assumption:** [changed condition]. **Mechanism:** [physical law or proportionality]. **Outcome:** [observable result with timescale].

Example: **Assumption:** The Moon, 7.34×10^{22} kg at 384,400 km, is removed at $t = 0$. **Mechanism:** Tidal force scales as M/r^3, and the solar tidal term is about 0.46 times the lunar term. **Outcome:** Within days, many coastal tide ranges fall to roughly solar-only levels; over centuries, the day stops lengthening by about 2.3 ms per century.

Checklist

- I can point to the exact trigger sentence.
- Every number is tied to an assumption or a measurement.
- The mechanism uses a physical law, not a metaphor.

- The outcome is observable and has a timescale.
- I separated “would” claims from “could” claims.
- I noted any conservation-law violation.
- I can state what evidence would falsify the claim.

Common errors

- **Confusing cause and effect:** “No Moon means no tides” ignores the Sun, whose tidal term is about 46% of the Moon’s.
- **Instant speed changes:** Removing tidal torque does not make Earth spin faster; it stops a slow braking process.
- **One global number:** Tide ranges vary by basin, so a single “tides drop by X meters” claim is usually false.
- **Hiding impossibility:** “Vanished” is not a physical process; mark it as an assumption.
- **Overstating confidence:** A clean gravity calculation does not automatically validate long-term climate outcomes.

Do today

Pick one what-if claim from your feed. Write the trigger, then label each sentence as assumption, mechanism, or outcome. Add one realistic number and one timescale, then rewrite the claim in A/M/O form.