

Station Card: Seasons

Seasons are caused by axial tilt (not distance)

Dr. Anna Rosen

Name: _____ Section: _____

Date: _____

Station: _____ Group members: _____

Goal: Use the demo to make a claim supported by (1) at least one number/readout and (2) at least one sanity check.

Demo: /demos/seasons/

Demo setup: defaults → then click **June Solstice** and **December Solstice**.

Tip: Click **Station Mode** to add anchor-date rows and print/copy your table.

Your station artifact (fill in): 1) **Control(s):** tilt ε , day of year, latitude ϕ

2) **Observable(s):** day length, noon altitude, season labels

3) **Governing relationship:** write one sentence connecting $\varepsilon \rightarrow \delta \rightarrow$ day length

4) **Sanity check:** what happens when $\varepsilon = 0^\circ$?

5) **Connection sentence:** “This matters for eclipses/phases because...”

 Word bank + sanity checks

Word bank: - **Axial tilt ε (degrees):** tilt of Earth’s spin axis relative to its orbital plane. - **Solar declination δ (degrees):** the Sun’s “latitude” on the sky; it sets where the noon Sun is highest. - **Noon altitude (degrees):** the Sun’s height above the horizon at local noon. - **Day length (hours):** total daylight time in a day at a latitude. - **Equinox:** $\delta \approx 0^\circ$; day and night are about equal. - **Solstice:** $|\delta|$ is largest; one hemisphere has its longest day and highest noon Sun.

Sanity checks: - If $\varepsilon = 0^\circ$, then $\delta = 0^\circ$ all year → day length stays about 12 h (no seasons). - June vs December: at the same latitude, the hemisphere facing the Sun has longer days and a higher noon Sun. - Perihelion is in early January, so Earth–Sun distance does not line up with Northern Hemisphere summer.