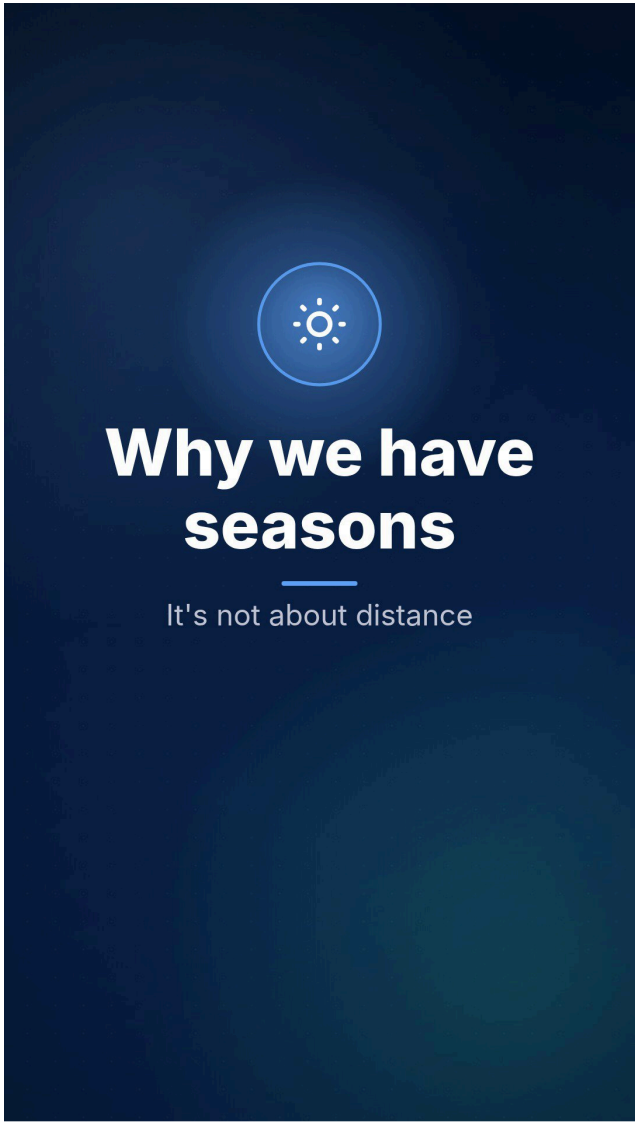


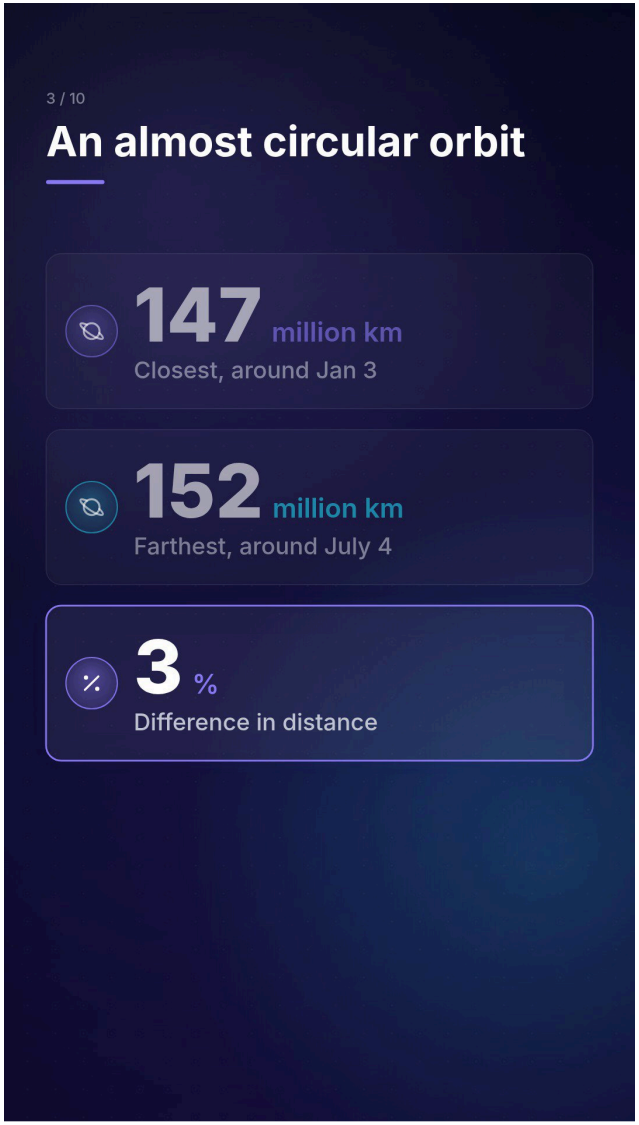
1 / 10 · Why we have seasons

Why is summer warm and winter cold? By the end of this video, you'll know the real reason, and why the most popular answer is wrong.



2 / 10 · The distance myth

Many people think summer is warm because Earth is closer to the Sun. It sounds reasonable, but it's wrong. In fact, Earth is closest to the Sun in early January, right in the middle of the Northern Hemisphere's winter.



3 / 10 · Distance barely changes

Earth's orbit is almost a circle. At its closest, around January 3, Earth is about 147 million kilometres from the Sun. At its farthest, around July 4, it's about 152 million. That's only a 3% difference, far too small to explain the seasons.



4 / 10 · Opposite hemispheres

And if distance were the cause, both hemispheres would have summer at the same time. They don't. When it's summer in Canada, it's winter in Australia.



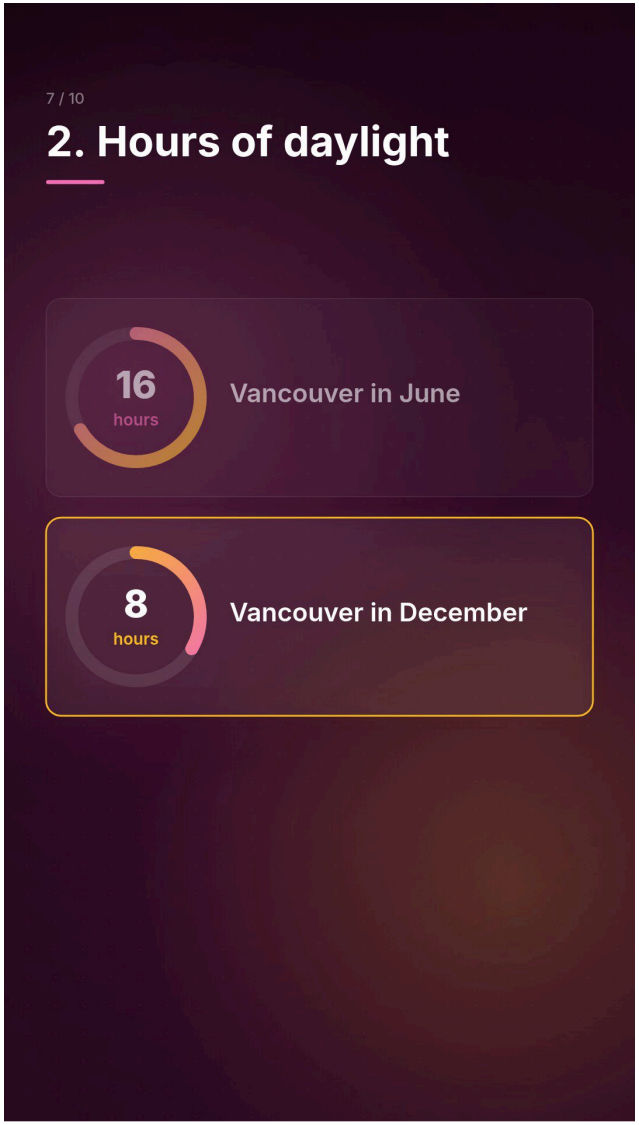
5 / 10 · A tilted Earth

Here's the real reason: Earth's axis is tilted about 23.4 degrees. As Earth orbits, the axis keeps pointing the same way in space, toward the North Star. So for half the year the Northern Hemisphere leans toward the Sun, and for the other half it leans away.



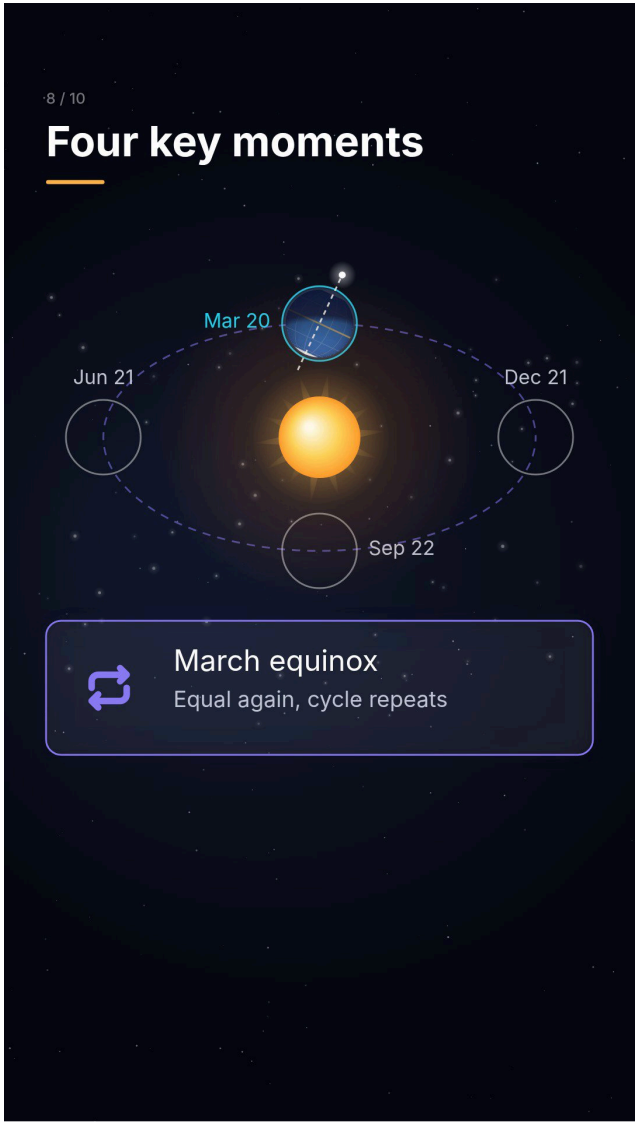
6 / 10 · Direct versus slanted light

Tilt changes two things. First, how directly sunlight hits the ground. A high Sun shines straight on, concentrating energy on a small area. A low Sun spreads the same beam over a much larger area, so each square metre gets less heat. Picture a flashlight pointed straight down versus at a steep angle.



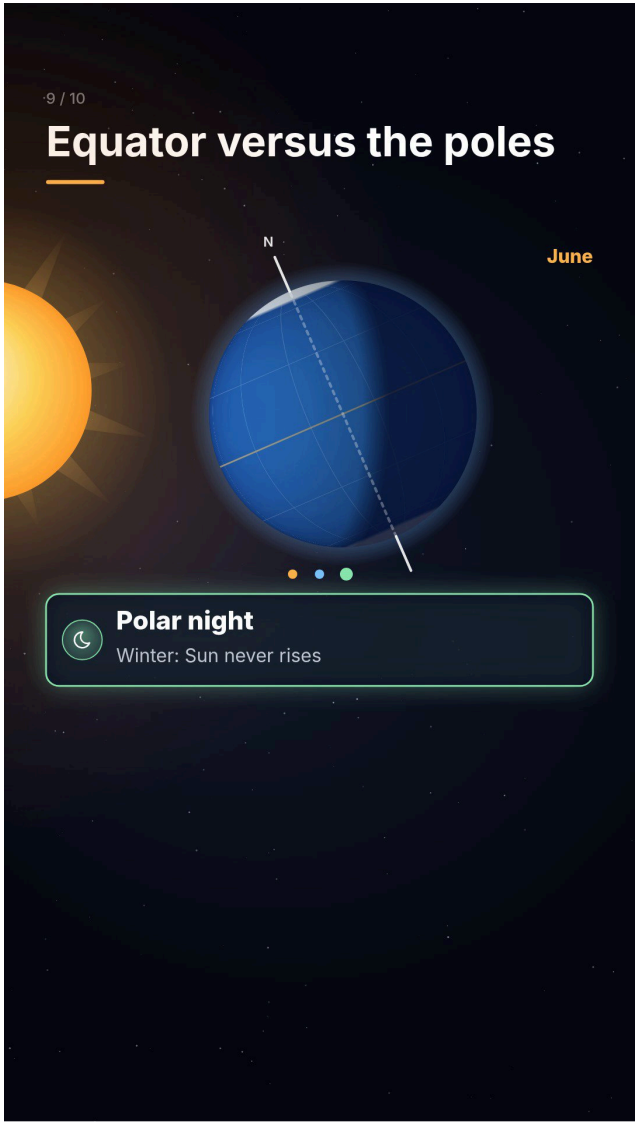
7 / 10 · Day length

Second, how long the day lasts. The hemisphere tilted toward the Sun gets long days and short nights, so the ground has more hours to warm up and fewer to cool down. In Vancouver, a June day has about 16 hours of daylight. A December day has only about 8.



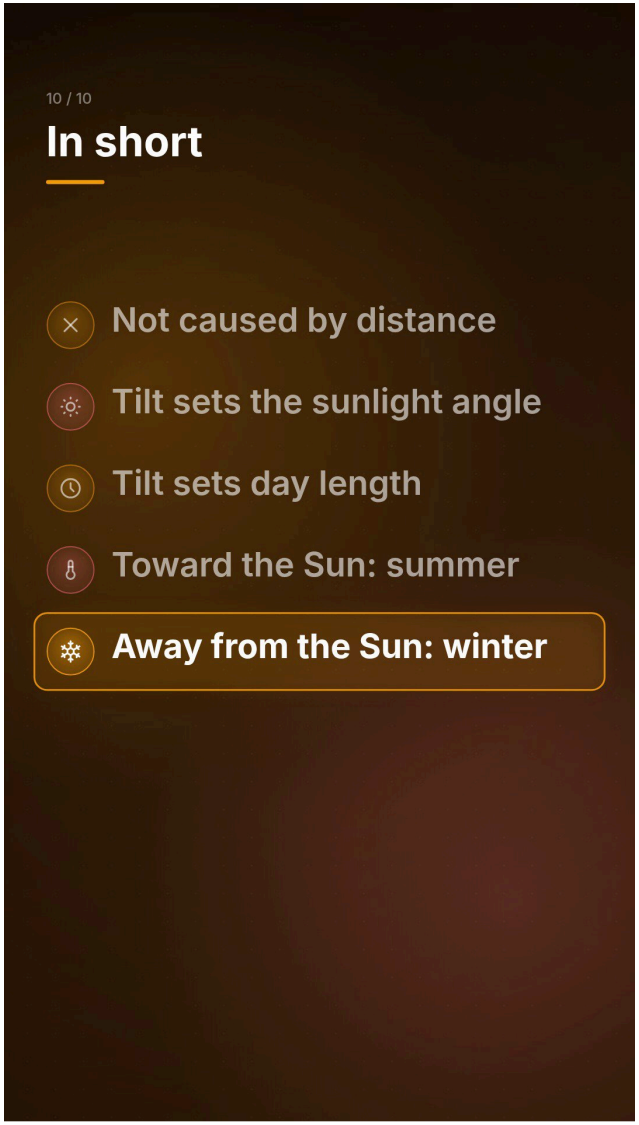
8 / 10 · Four key moments

Four moments mark the year. At the June solstice, around June 21, the north tilts most toward the Sun. At the September equinox, day and night are roughly equal everywhere. At the December solstice, the south leans in: summer in Australia, winter in Canada. And at the March equinox, it's equal again, and the cycle repeats.



9 / 10 · Equator and poles

Location matters too. Near the equator, the Sun stays high all year and day length barely changes, so seasons are often defined by rainfall instead. Near the poles, tilt is extreme: in summer the Sun never sets, the midnight sun, and in winter it never rises, the polar night.



10 / 10 · Recap

So, seasons aren't about distance. Earth's tilted axis changes how directly sunlight strikes each hemisphere, and how many hours of daylight it gets. Tilt toward the Sun, and it's summer. Tilt away, and it's winter.