

Patterns in Space Study Guide

Vocabulary:

Rotation: The spinning of Earth on its axis.

Revolution: The travelling of Earth around the sun on its orbit.

Orbit: The path that Earth follows around the sun.

Season: The yearly pattern of sunlight and warmth.

Daytime: The part of the day where Earth is facing the sun.

Nighttime: The part of the day where Earth is facing away from the sun.

Constellation: A pattern created by nearby stars.

Big Ideas:

-The Earth spins on its axis (rotates) once every 24 hours, or one day. While Earth is rotating, the part of Earth facing the sun changes. This makes it seem like the sun is moving across the sky, but really Earth is moving toward or away from the sun. Rotation causes day and night.

-As Earth rotates it also changes the way that our shadows are shown. When the sun is low in the sky (morning or evening) our shadows are long and stretched out. When the sun is high in the sky (noontime), we have very little shadow. This is because of the way that the sun hits our body. When it is above us, our body blocks less of the sun's rays than when it is on our side.

-Shadows also move from west to east as the day goes on (the opposite of the way that the sun "moves" across the sky (east to west)).

-The Earth also revolves around the sun on its orbit. As Earth follows the path of its orbit, the tilt of Earth's axis causes one hemisphere to point towards or away from the sun. The side that is pointed away is experiencing less warmth and direct sunlight which causes winter. At the same time, the opposite hemisphere is pointed toward the sun, experiencing summer's increased warmth and direct sunlight. As Earth continues in its orbit, the hemispheres will get to a point where neither side faces towards or away, this is when it is fall or spring.

-Revolution + Tilt = Seasons

-One revolution is equal to one year or 365 days (or $365 \frac{1}{4}$ days).

-One thing that also changes with Earth's revolution is the constellations that we can see. Because Earth is changing its position in space, the part of the night sky that Earth can see also changes. Each season brings a new part of the night sky into view and with it different constellations. (Think Universe in a Box)

-There are four special "days" per year for each hemisphere related to the position of the Earth to the sun and the amount of daylight the hemisphere will receive

Winter Solstice (Dec 21/22) Northern hemisphere points farthest from Earth, shortest amount of daylight, first day of winter

Summer Solstice (June 21/22) Northern hemisphere points closest to Earth, longest amount of daylight, first day of summer

Vernal Equinox (March 20/21) Northern hemisphere is not point toward or away from sun, daylight and nighttime are equal

Autumnal Equinox (September 22/23) Northern hemisphere is not point toward or away from sun, daylight and nighttime are equal