

Earth, Sun, Moon & the Solar System

Fill in each part when its number appears on the slide.

PART 1 · TARGET

I can use a model to explain patterns caused by Earth's rotation and orbit and describe the scale of the solar system.

PART 2 · WARM-UP

1. Where does the Sun rise, and where does it set?

Key: It rises in the east and sets in the west.

2. What is the difference between a day and a year on Earth?

Key: A day is one full spin (rotation) of Earth, about 24 hours. A year is one trip around the Sun (revolution), about 365¼ days.

3. Draw your shadow at noon and at 5 p.m. Which is longer? Why do you think so?

Key: The 5 p.m. shadow is longer because the Sun is lower in the sky.

PART 3 · PREDICTION

This morning the Sun was in the east. At dismissal it will be in the west. What moved?

Circle one: ☐ The Sun moved ☐ Earth spun ☐ Both moved

PART 4 · VOCABULARY

Word	Meaning
Rotation	Spinning on an axis. Earth rotates once about every 24 hours.
Revolution / orbit	Traveling around another object. Earth orbits the Sun in about 365 days.
Axis	An imaginary line through Earth from pole to pole; it is tilted about 23.5°.
Moon phase	The shape of the lit part of the Moon we see from Earth.

PART 5 · ROTATION MAKES DAY AND NIGHT

Earth **ROTATES** on its axis once every 24 hours. This causes **DAY AND NIGHT**.

Check: Why does the Sun seem to move across the sky?

Circle one: (A) Clouds push the Sun (B) Earth rotates (C) The Sun orbits Earth (D) Earth revolves once a day

Key: (B) Earth rotates. Earth spinning makes the Sun appear to move.

PART 6 · SHADOWS CHANGE DURING THE DAY

Shadows are **LONGEST** in the morning and evening and **SHORTEST** near noon, when the Sun is **HIGHEST**.

Check: At 8 a.m. the Sun is in the east. Which way does a flagpole's shadow point?

Circle one: (A) North only at night (B) West (C) East (D) Straight down

Key: (B) West. Shadows point away from the Sun.

PART 7 • TILT CAUSES SEASONS

Seasons are caused by Earth's TILTED axis. When Indiana tilts TOWARD the Sun, it is summer.

Check: What causes summer in Indiana?

Circle one: (A) Northern Hemisphere tilts toward the Sun (B) Earth is closest to the Sun (C) The Sun gets hotter (D) The Moon blocks cold air

Key: (A) Northern Hemisphere tilts toward the Sun. Tilt, not distance, causes seasons.

PART 8 • THE MOON REFLECTS SUNLIGHT

The Moon REFLECTS sunlight. One full cycle of phases takes about 29.5 days.

Check: Why do we see Moon phases?

Circle one: (A) We see different parts of the lit half as it orbits (B) Earth's shadow covers it (C) The Moon changes shape (D) Clouds cover part of it

Key: (A) We see different parts of the lit half as it orbits. Phases come from our changing view of the lit half.

PART 9 • WORKED EXAMPLE

1. Imagine Earth spinning on its axis, with Indiana marked by a dot.
2. Step 1: When Indiana faces the Sun, it is daytime (noon when it faces it directly).
3. Step 2: As Earth keeps spinning west to east, Indiana turns away: sunset, then night.
4. Step 3: One full spin takes 24 hours: one day.
5. Step 4: Earth also orbits the Sun once a year, always tilted the same way. Tilt toward the Sun = summer.

PART 10 • WE DO

At 7:00 a.m. a tree's shadow is long and points west. Predict its length and direction at 6:00 p.m.

Answer: Long and pointing east

PART 11 • YOU DO

Which pattern is caused by Earth's REVOLUTION around the Sun, not its rotation?

Circle one: (A) Day turns into night (B) The seasons change over a year (C) The Sun rises every morning (D) Shadows change during one day

Key: (B) The seasons change over a year. One revolution takes a year; the tilted axis during that orbit causes seasons.

PART 12 • WORK TIME: GRAND TOUR OF THE SOLAR SYSTEM

Write each code piece as you earn it: Stop 1: O Stop 2: R Stop 3: B Stop 4: I Stop 5: T

Final code: ORBIT

PART 13 • WRAP-UP

Was your prediction in Part 3 right? One thing I learned today:

Key: The 5 p.m. shadow is longer because the Sun is lower in the sky.