TEACHER KEY · LESSON WORKSHEET · GRADE 5 · 5-ESS1-1 · 5-ESS1-2

# 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: SHADOW CLOCK ESCAPE

Write each code piece as you earn it: Lock 1: E Lock 2: A Lock 3: R Lock 4: T Lock 5: H

**Final code: EARTH**

## 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.