Weekly Lesson Plan: The Great Spin â€“ How Earthâ€™s Motion Creates Day and Night

Lesson Overview

Subject: Earth Science / Astronomy
Target Age: 12 Years Old (Grade 6)
Duration: 5 Days (Approx. 45â€“60 minutes per day)

Materials Needed

- A globe (or a large ball like a basketball)
- A strong flashlight or a desk lamp (to represent the Sun)
- Small stickers or pieces of masking tape
- A dark room (blinds or curtains closed)
- Science journal or notebook
- Markers and drawing paper
- A toothpick and a piece of clay (optional)

Learning Objectives

By the end of this week, the learner will be able to:

- **Explain** the difference between rotation and revolution.
- **Demonstrate** how Earthâ€™s rotation on its axis causes the cycle of day and night.
- **Describe** the "apparent motion" of the Sun across the sky.
- **Identify** the direction of Earthâ€™s rotation (West to East/Counter-clockwise).
- **Analyze** how different locations on Earth experience time based on rotation.

Day 1: Elicit & Engage â€“ The Mystery of the Moving Sun

Objective: To activate prior knowledge and spark curiosity about why the Sun "moves."

The Hook

Imagine you are sitting on a train. You look out the window and see the trees zooming past you. Are the trees actually running away, or is it you who is moving? Earth is exactly like that train!

Activities

- **Elicit:** Discussion Question: "If the Earth is spinning at 1,000 miles per hour, why don't we feel like we're on a spinning teacup ride at a theme park?" (Write down initial ideas in the science journal).
- **Engage:** Go outside (or look through a window) and note the position of the Sun. Place a "shadow stick" (a stick in the ground or a pencil in clay) on a piece of paper. Trace the shadow at the start and end of the lesson.
- **I Do:** Show a short clip of a 24-hour time-lapse of the sky.

Success Criteria: Student can explain that the Sun's movement is an "apparent" motion caused by our own movement.

Day 2: Explore â€“ The Model Method

Objective: To physically model the occurrence of day and night.

Activities (The "We Do" Phase)

- **Setup:** Place the lamp (Sun) in the center of a dark room. Hold the globe (Earth) a few feet away.
- **Modeling:**
  1. Place a sticker on the globe representing your current city.
  2. Turn the globe slowly from West to East (counter-clockwise if looking down from the North Pole).
  3. Observe when the sticker enters the light (Sunrise), is directly facing the light (Noon), and leaves the light (Sunset).
- **The "You Do" Challenge:** Have the student find three other cities on the globe (e.g., London, Tokyo, Rio de Janeiro). Predict which city will see the sun first and test it by rotating the globe.

Success Criteria: Student can successfully demonstrate one full rotation and identify the transition points between day and night.

Day 3: Explain â€“ The Science of the Spin

Objective: To define key terms and understand the mechanics of rotation.

Core Content (Tell Them What You're Teaching)

- **Rotation vs. Revolution:** Rotation is spinning on an internal axis (like a toy top); Revolution is traveling around another object (like a track star running around a track). **Rotation causes Day and Night.**
- **The Axis:** Earth isn't straight up and down; it's tilted at 23.5 degrees. This tilt stays the same as we spin.
- **The 24-Hour Cycle:** It takes 24 hours for one full 360-degree rotation.

Activity

Draw a diagram in the science journal. Label the Sun, the Earth, the Axis, the Day Hemisphere, and the Night Hemisphere. Use an arrow to show the direction of rotation.

Success Criteria: Student uses the terms "axis" and "rotation" correctly in their explanation.

Day 4: Elaborate â€“ Global Perspectives & Time Zones

Objective: To apply the concept of rotation to real-world time zones.

Activities

- **Scenario:** "Itâ€™s 8:00 AM here and you want to call your friend in Australia to say good

morning. Why might that be a bad idea?"
- **The "We Do":** Use the globe and flashlight. While it is "Noon" in your location, look at what is happening on the exact opposite side of the world (the Antipodes).
- **Math Connection:** If the Earth is a 360-degree circle and there are 24 hours in a day, how many degrees does the Earth spin in one hour? (Answer: 15 degrees). This is why we have time zones!

Success Criteria: Student can explain why different parts of the world have different times simultaneously.

Day 5: Evaluate & Extend â€“ The Expert Presentation

Objective: To assess understanding and explore "What If" scenarios.

Summative Assessment (The "You Do")

The student acts as a "Science Broadcaster." They must record a 2-minute video or give a live presentation using their model to explain:

1. Why we have day and night.
2. Why the Sun seems to rise in the East and set in the West.
3. One common misconception (e.g., "The Sun moves around the Earth").

Extend (For Advanced Learners)

The "Big Freeze" Scenario: Discuss or write a paragraph: What would happen to life on Earth if the Earth stopped rotating? (Consider temperatures, wind patterns, and the length of a "day").

Closure/Recap

Summarize the week: We learned that we are on a giant, spinning spaceship. Rotation on our axis creates the cycle of light and dark that governs our lives, our sleep, and our clocks!

Differentiation & Adaptability

- **For Visual Learners:** Use colored flashlights to show the "Golden Hour" (twilight) transitions.
- **For Kinesthetic Learners:** Have the student *be* the Earth. Put a "Me" sign on their chest and have them rotate slowly while a parent/teacher holds a lamp.
- **For Classroom Context:** Turn this into a "Station" activity where one station is the model, one is the math of time zones, and one is the journal drawing.