

Structured Discovery Lesson Plan:

Day and Night Cycle: Why does the sun appear to move across the sky?

Component 1 Preplanning Tasks:

- A. *Connection analysis:* TEK 5.8 – The student knows that there are recognizable patterns in the natural world and among the Sun, Earth, and Moon system. TEK 5.8C – The student is expected to demonstrate that Earth rotates on its axis once approximately every 24 hours causing the day/night cycle and the apparent movement of the Sun across the sky.
Benchmark: TEK 5.2 – The student uses scientific methods during laboratory and outdoor investigations. TEK 5.2C – The student collects information by detailed observations and accurate measuring.
Big Idea: TEK 5.3 – The student uses critical thinking and scientific problem solving to make informed decisions.
- B. *Content Analysis:*
 - 1. Principle – The rotation of the Earth on its axis approximately every 24 hours produces the night/day cycle.
 - 2. Prerequisite skill – How to record data and analysis in a science journal.
 - 3. Key terms – axial tilt, axis, rotate, solar arc, terminator
- C. *Objective:* Students will participate in an activity that models the rotation of the earth and its effects on the day and night cycle.
- D. *Objective Rationale:*
 - 1. The Sun is the main source of Earth’s energy. Understanding how direct and indirect light hit the Earth help in understanding the Sun’s effects on the Earth.
 - 2. Collection and analyzing data are key scientific process TEKS that can be applied in other areas of life where critical thinking skills are necessary.
- E. *Materials and Equipment:* (logistics) computer with internet access, overhead projection of the computer screen, cardstock (1 per group), flashlight, globe, Modeling Day and Night handout, Day and Night Survey, pencil or pen, Science Journal, Day and Night power point
- F. *Room Arrangement:* Students are in usual lab group seating arrangement.

Component 2: Lesson Set-Up

- A. Gain Attention: “Class.” Students are expected to respond with “Yes”. Let’s get started learning about day and night.
- B. Behavior Expectations: Students are expected to get in their seats, stay quiet, and have out their science journal. This is lab expectation number 1 in the classroom.

Component 3: Lesson Opening

- A. Build and Activate Background Knowledge.
 - 1. Ask students to name some places in the world that they think are experiencing night time.
 - 2. Show the website <http://www.daylightmap.com/index.php> to show the students a satellite image of where on Earth the night and day are currently occurring.
 - 3. Why is the day and night shown in a wave pattern?
- B. State the objective and the purpose:
 - 1. "Today we are going to find out why it appears that the Sun, stars, and moon appear to be moving across the sky."

Component 4: Lesson Body

- A. Set up the discovery (Day 1)
 - 1. Distribute handout *Modeling Day and Night* to all the students and pairs of resource cards.
 - 2. Review safety guidelines and clean-up procedures with the students before starting the activity.
 - 3. Give each student the handout of *Day and Night Survey*. Instruct students to complete the drawings on the handout in their science journal while they are doing the activity.
 - 4. Instruct students to follow the instructions on the handout *Modeling Day and Night*.
- B. Monitor the discovery (Day 1)
 - 1. Walk around to each table during the discovery process ensuring students are following directions and staying on task.
 - 2. Ensure students record data and analysis in their science journals.
- C. Review the discovery (Day 1)
 - 1. "What did you discover?"
 - 2. "What happens to light on the Earth's surface as the Earth is rotating?"
- D. Supervised practice (Day 1)
 - 1. Have students complete the handout Day and Night Survey.
 - 2. "Did you notice a pattern occurring?"
 - 3. Project the Day and Night power point slide by slide and review the information contained on each slide with the class.

Component 5: Lesson Closing

- A. Review: "Today you discovered why it is daylight on some parts of the earth while it is nighttime on other parts."
- B. Preview: "Tomorrow, we will learn about the apparent movement of the heavenly bodies around the Earth."

Component 6: Extended Practice

Have students reflect in their journal the information they have learned today. What conclusions can they draw about apparent movement so far? What did they learn today that they did not know before class started?

Component 7: Evaluation

The next day, ask students what they've learned about how the Earth's rotation affects night and day.