

LESSON 13

Why is it hotter at the equator than other places on Earth?

Adaptations for:

STEP 1: Observe patterns in average annual temperatures. (pg. 49)

STEP 2: Observe energy angles (pg. 50)

STEP 3: Think about the Sun's incoming energy (pg. 51)

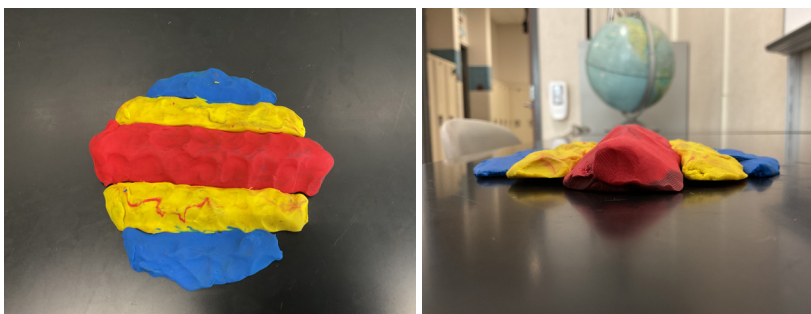
EXPLANATION:

The visuals and procedure for the tactile aren't accessible for students who are blind or have low vision or who have physical disabilities. The hands-on activities can be limiting for students with physical or motor disabilities.

ADAPTATIONS FOR STEP 1:

UDL Principle: [Multiple Means of Representation](#)

- Convert the visual into a 3D model using modeling clay.
 1. Shape the clay so that it slopes up from the poles to the equator, with the highest point at the middle of the model (to represent the warm, rising air at the equator).
 2. Try to keep the clay really smooth so there aren't bumps that might be misinterpreted as representing rising and falling air temperatures.
 3. As students feel the model, they should notice the clay sloping down toward the poles to represent cool, dense, sinking air (see images below).



Tactile model made of clay, top view (left) and side view (right). Note that while the clay looks bumpy in this model, this is unintentional. Different colors of clay have been used to represent the equatorial, midlatitude, and polar regions.

ADAPTATIONS FOR STEP 2:

UDL Principle: [Multiple Means of Representation](#)

- Create a larger version of the energy angles activity.
 1. Hang a large piece of chart paper vertically on the wall or use a stand.
 2. Lay the flashlight on the tabletop, pointed towards the chart paper.
 3. Change the angle of the chart paper by holding the bottom of the paper at different heights to create both the straight-on and tilted sunlight angles (similar to Step 3 in the original instructions).
 4. Provide an enlarged marker to trace the lighted area on the chart paper.
 5. Allow students to use a personal device to take pictures to record their observations. A built-in camera timer might be helpful.
 6. Adjust the instructions to reflect the setup changes, or use the Lesson 13, Step 2 Adapted Energy Angles Directions provided on the next page.



The flashlight shines straight-on at the chart paper, representing direct sunlight at the equator (left). The chart paper is held out at a 45 degree angle, representing dispersed sunlight on the Earth's surface when not at the equator (right).

ADAPTATIONS FOR STEP 3:

UDL Principle: [Multiple Means of Representation](#)

- Show pictures from Step 2 to connect the activity to the image (provided within the Adapted Step 3 Student Sheet). For each of the four sloped surfaces, include a number and the corresponding image that relates to the surface angle.

ADDITIONAL ADAPTATIONS FOR ALL THREE STEPS:

- Have students utilize text-to-speech and pinch-to-zoom digital features to navigate electronic copies of the student worksheet. Enlarge the text and diagrams if students will complete the activity on paper, and create adapted student pages with more space to record responses to the prompts.

ADAPTED MATERIALS:

[Lesson 13, Step 1 Adapted Student Sheet](#) (with 3D model images)

[Lesson 13, Step 2 Adapted Energy Angles Directions](#)

[Lesson 13, Step 3 Adapted Student Sheet](#) (with energy angle images)

IMPLEMENTATION NOTES:

Lessons should include a variety of ways to represent the information (e.g., visuals, audio, text, and models). Allow students to present their understanding of the information in a variety of ways (e.g., written, oral, digital, or hands-on). In addition, provide students with opportunities to reflect on their understanding, such as individually, in small groups, or in large groups. Provide clear criteria with chunking instructions to enable students to develop individualized progression goals.

MY STUDENTS' UNIQUE NEEDS:

My focal student has fine motor and vision impairments. My student needs adaptations to assist with writing answers in the student sheets and viewing the visuals. These resources may benefit all students and are not exclusive to students with a disability.

