

SEASONS DAY 4: SUN-ANGLE AND ENERGY

I. Modeling light from the Sun:

Using the flashlight + grid paper, model what happens when sunlight hits the ground at different angles.

Explore how Sun angle affects the amount of ground illuminated by the Sun, and therefore, the energy we receive from the Sun (and therefore, temperature).

A) PROCEDURE:

1. Place the graph paper on your desk. Use a protractor (or half-Sun tracker) to position the meter stick pointing straight up, at 90° . This represents a Sun angle of 90° .
2. Turn off the room lights and turn on the flashlight. Use a pencil to draw an outline of the illuminated part of the grid. Label the outline with the Sun angle.
3. Repeat step 2 at 60° , 30° , and 10° , using the protractor (or half-Sun tracker) to measure the angle. It will help to keep the tip of the meter stick near the top of the paper for each trial.
4. Turn on the lights when everyone is finished.
5. For each Sun angle, count the number of squares illuminated by the flashlight, estimating if some squares are only partially lit. Record data in the table. (To save time, you can calculate the area of a rectangle inside the lit up area and then add the count of additional squares around the rectangle.)
6. For each Sun angle, determine the fraction of light striking each square and record in the table. For example, if the flashlight illuminated 15 squares, then each square receives $1/15$ of the light.

B) COLLECT DATA:

Complete this table with your group:

Sun Angle (in degrees - $^\circ$)	Number of Squares Illuminated (Area in cm^2)	Fraction of Light Received By Each Square (units)
90°		
60°		
30°		
10°		

