ES – Activity #27

The Shadow Knows

QUESTION: What does the angle the sun shines on Earth have to do with Earth's seasons?

MATERIALS:

crayons
flashlight
graph paper
protractor

PROCEDURE:

1. Place the graph paper on the desk and turn on the flashlight.
2. **ALWAYS HOLD THE FLASHLIGHT 25 CM ABOVE THE DESK.**
3. Shine the flashlight straight down on the graph paper at a 90º angle.
4. Outline in red the area the light shines on the graph paper. Count the complete squares inside the outlined area. Record this data in the chart.
5. Repeat step 3 and 4 two more times.
6. Shine the flashlight on the graph paper at a 75º angle.
7. Outline the area the light shines on the graph paper in green. Count the complete squares inside the outlined area. Record data.
8. Repeat this process with angles of 60º, 45º, 30º, and 15º. Outline each area in a different color and count the complete squares. Record the data.
9. Construct a bar graph of your data.

DATA:

ANGLE	TRIAL 1 AREA COVERED	TRIAL 2 AREA COVERED	TRIAL 3 AREA COVERED	AVERAGE AREA COVERED
90º				
75º				
60º				
45º				
30º				
15º				

QUESTIONS:

1. How does the angle of the flashlight affect the area covered by the light?

2. If the flashlight represents the Sun, which angle would represent the warmest temperatures? Which would represent the coolest temperatures?

3. How does this activity demonstrate why we experience seasons on Earth?

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