

Earth, day, seasons and orbits

Grade 6 science (Year 7 · Class 6) · Lab answers

These model answers use the sample table. If your values differ a little, check that your pattern is the same: the smaller the angle, the larger the lit area and the weaker the light.

Level: Grade 6 science (Year 7 · Class 6) · **Curriculum:** MS-ESS1-2

Question 1 Pattern

The area increases from 12.6 cm² at 90° to 25.1 cm² at 30°. **The smaller the angle, the larger the area.**

Question 2 Brightness

Relative brightness falls from 1.00 to 0.50. The same light is spread over a bigger area, so each square centimetre gets less. **Brightness decreases.**

Question 3 Check a value

Area = $0.785 \times 8.0 \times 4.0 = 25.12 \text{ cm}^2$. **25.1 cm².**

Question 4 Link to seasons

In summer the Sun is high, like the 90° or 60° beam: strong, concentrated light. In winter the Sun is low, like the 30° beam: spread out and weaker. **High angle = summer, low angle = winter.**

Question 5 Predict

$4.0 \div 0.342 = 11.7 \text{ cm}$. **About 11.7 cm.**

Question 6 Errors

Reading the edge of a blurry spot: use a darker room and a sharper beam. Torch distance changing: mark the distance with a string. **Control distance and measure edges consistently.**

Question 7 Limits of the model

A torch does not show the Earth's curve, the changing day length or the atmosphere. **It shows only the angle effect.**