

AROUND THE EARTH

According to popular legend, many people feared that Columbus would sail off the edge of the earth. Actually, as early as the third century B.C., Eratosthenes, a Greek mathematician, not only knew the earth was round, he had calculated its circumference.

Eratosthenes' calculations was based on the difference between the angles of elevation of the sun taken at the same time of day at his home in Alexandria, Egypt, and at Syene, a town due south. Like Eratosthenes, you can compare such angles of elevation to estimate the circumference of Earth. To find an angle of elevation, measure the length of the shadow of an upright yardstick and use similar right triangles to determine the angle of elevation.

Contact a school at least 100 miles due north or due south of your school. With their help, determine the angle of elevation of the sun at both schools for the same time and on the same day. The ratio of the difference in the angle measurements to the number of degrees in a circle is equal to the ratio of the distance between schools to the circumference of Earth. Use your data and this relationship to calculate the circumference of Earth.

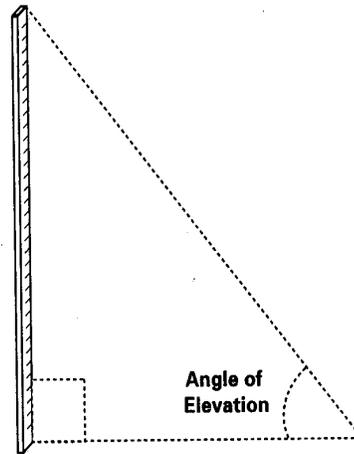
You May Need

- book on earth science
- calculator
- protractor
- yardstick

To Get Started

- Contact another school and describe the help you need from them.
- Don't look at the sun.
- Make a scale drawing of the yardstick and its shadow, and measure the angle of elevation.

Yardstick



Length of Shadow

Your Findings

Write a letter to the other school. Tell how you used their data along with yours to calculate the circumference of Earth. Compare your calculations with the calculations recorded in science books.

[From *Math Explorations and Group Activity Project, Grade 8* by Carole Greens, Linda Schulman, Rika Spungin, Suzanne Chapin, Carol Findell, and Art Johnson. © 1996 by Dale Seymour, an imprint of Pearson Learning, a division of Pearson Education, Inc. Used by permission.]