Name(s)	Project Number
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Project Title
What Is the Relationship between the Angle of the Sun and the Time?

Abstract

Objectives/Goals
The objective is to determine the rate of change in the angle of the Sun.

Methods/Materials
A flagpole that measured 150 centimeters was set perpendicular to the ground. The length of the shadow measured and recorded at 2:00 pm every five minutes until 2:30 pm for ten days. The angle of the Sun that produced each length was then calculated using trigonometry.

Results
Each day the shadows were shorter and the angles were greater. This suggested that a day was shorter than 24 hours and so the earth would rotate more than a full rotation 24 hours later. The angle of the Sun changed at an average of .145 radians per hour (2d radians is a full rotation). If the angle of the Sun changes at this rate, it would be too slow to turn a full rotation in 24 hours. There must have been a flaw in the experiment to cause this.

Conclusions/Discussion
I think the reason my experiment did not turn out the way I had expected it to was because I was thinking that the Sun moves across the sky when actually the Earth is rotating. This alone was not the cause of the error; the Sun is moving across the sky relative to where I am on the surface of the Earth. The problem is that the rate of change would vary with the seasons caused by the tilt in the Earth's axis. Another varible is the longitute of the location where the experiment takes place. I believe that the closer you are to the equator, the closer to my hypothesis the results will be. Farther from the equator the rate of change would be different. If this is true, it would also be reasonable to suggest that if you tried this experiment many times and collected the data, trying the experiment again in a random location would show what longitute the experiment is taking place on.

Summary Statement
I tried to find how many radians the sun appears to move across the sky every hour.

Help Received
Mrs. Shah gave me the project board. My grandmother helped me take a few measurements when i had other activities and could not get home.