

# Seasons Lab 2

Names:

## Purpose

The goal of this activity is to for you to think about seasonal motions and to make predictions about the changing seasons.

Prizes will be awarded for the most accurate predictions.

## Activity

### Spread of Sunlight

Now consider the "sunlight spread-meter" I showed you. The square that the light passes through is  $100 \text{ cm}^2$ . How much area was that sunlight spread over when we measured?

## Sun Angle

You're going to use the length of the shadow of the sun from our gnomon to figure out its elevation angle. To start with, draw a diagram of the gnomon and its shadow. Label the elevation angle  $\theta$ , the height of the gnomon  $h$ , and the shadow length  $s$ :

In terms of  $h$  and  $s$ , what is the elevation angle,  $\theta$ ? (Hint: use right triangles and functions that go with them!)

Now record the time of measurement and the actual, raw measurements of the length and height.

What's the elevation of the sun now?

## Size of the Sun

OK, how about the image of the Sun in the Astroscan telescope? What was the diameter of the Sun's image on the screen today? (You'll have to do the measurement.)

## Putting it Together

Look back at your earlier measurements (and your predictions). Comment on how close you were in predictions:

Also, what have you noticed about the length of the day since the first observations in September?

Now comment on why the values trended the way that they did. How does this relate to seasons and the weather?

Your write-up this time will be a short letter to your grandparent(s) explain why seasons happen. You can include your observations (either numbers or just the trends you found). Explain why the seasons happen clearly to them. (If your grandparents are scientists, imagine writing to your *other* grandparents.)