On the left is a diagram from a point in space showing the orientation of the Earth and the Sun. In the upper right is a diagram showing the parallel beams of light from the Sun as they reach the Earth, with a person on the Earth at his local noon time. By dragging the person, you can put him (or her) at different latitudes. In the lower right corner is a diagram from the Earth, showing the angle of the beams of light as they hit the surface of the Earth. Notice that a small circle is shown on the pictures of the Earth, showing the point directly in line with the Sun.

Explore the simulation. Learn how to change the observer’s latitude and the time of year. Then answer the following questions.

1. What does the “sun’s altitude” mean in the lower right window?

2. Place the observer at the equator (or as close to it as you can get). Let the simulation run through a year. What is the largest and smallest altitude that the sun reaches, and when does it reach those points? Explain why the sun’s altitude is what it is at those points.

3. Place the observer at Seward’s latitude, roughly 40° North. Now what is the largest and smallest altitude that the sun reaches, and when does it reach those points? Explain.

4. Now for the big finish. Experiment with the observer at various latitudes at various times of year. Explain the relationship between the observer’s latitude and the sun’s altitude on the equinoxes, on the summer solstice and on the winter solstice.