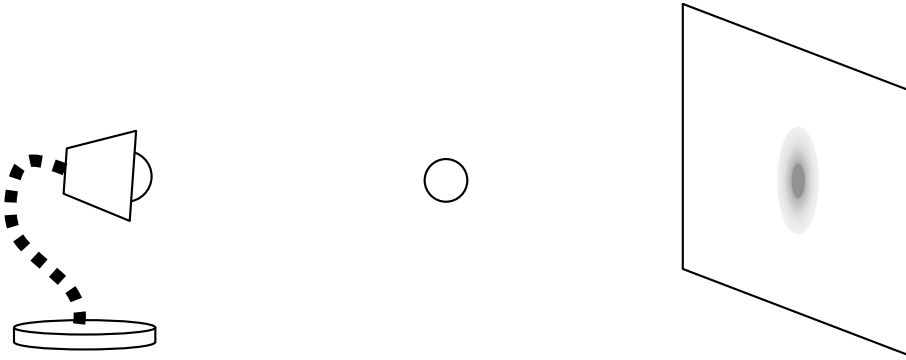


Activity for the Moon Unit:

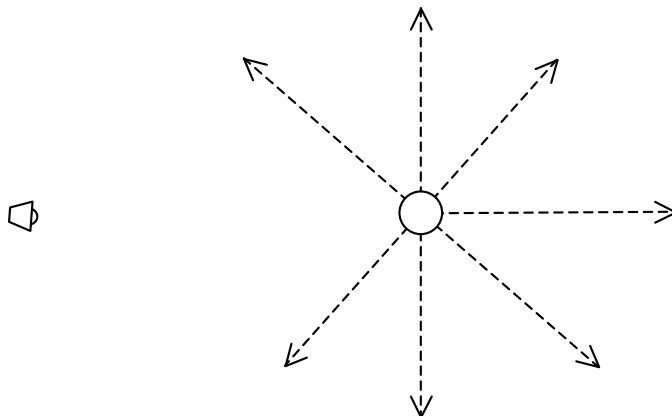
For this activity, you will need a light source (such as a small bright lamp or strong flashlight), a light-colored spherical object (a ball or an orange) and a relatively dark place.

1. Set the lamp up so that its light is cast on a clear patch of wall. Create a shadow on the wall with a pen, your hand, a ball (orange or apple) ... Can you see that the shadow has two parts, a very dark part and a less dark area around it? How does this change as you move the shadow-producing item closer to, or farther from, the wall?

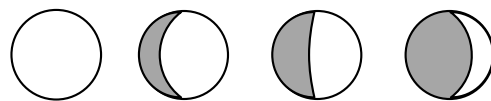


The dark central part of the shadow is the *umbra*; the outer part is the *penumbra*. If you put your head near the wall so that your eye is in the umbra, how much of the light bulb can you see? What happens if you move your head so that your eye is in the penumbra?

2. Set the lamp so that it illuminates the sphere from one side. Move around so that you see the sphere from different angles. Sketch what you see from each of the vantage points in the diagram below:



Your pictures probably look a bit like this:



Mark on the picture above where each of these is seen, interpreting white in the picture = bright in what you see, and dark in the picture = dark in what you see.