

Modeling Moon Phases

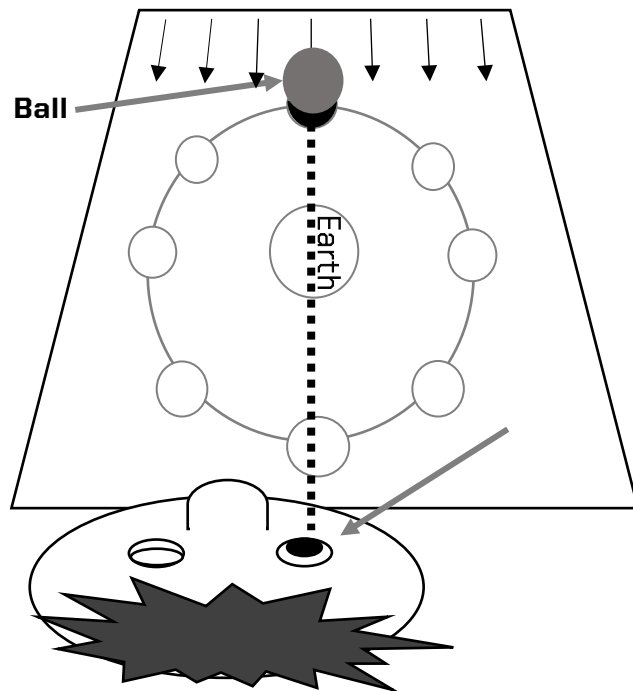
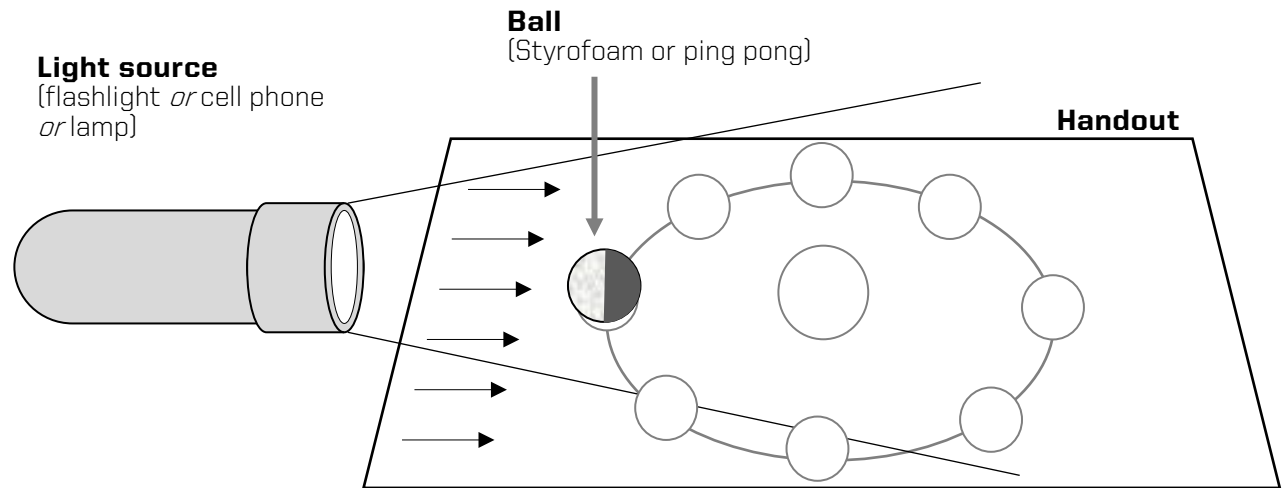
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In this activity you will use a ball and a light source to make a physical model and a drawn model. The ball represents the moon and the light represents the sun.

Place the "sun" to the left of this paper, so the light shines in the same direction as the arrows point. Then place the ball on the circle labeled **1** (see diagram to the right). Dim the room, then turn on the "sun."

Notice that half of the "moon" is lit and half is not. On the paper, shade in the half of the circle that **does not** receive light.

The **phase** of the moon we see from Earth changes depending on how the sun, earth, and moon are positioned. As the moon **orbits** (moves in a circle around the earth), our view from earth will change.



To model this, move your body so that your head lines up with the "Earth" printed on the paper and "moon" ball. See the diagram to the left. The dashed line in the diagram shows how the right eye lines up with the earth and moon. No need to draw this line - you can use the ruler to help you line these up if you need to. Turn on the "sun" and close your left eye. What do you see? Is the side of the ball facing you lighted or shadowed? For position 1, the side of the ball facing you should be shadow. When the moon is in this position, we say it is a **new moon**. When the sun, earth, and moon line up like this, you cannot see the moon at all.

The box next to each circle is where you draw what **you** see when you line your eye up with the "earth" and "moon." For the new moon, you can leave it blank. There is no moon visible in the sky!

Now you are ready to use the model to see what happens next. Move the "moon" to the circle labeled "2." Move the "sun" if needed so that the light shines straight on the "moon" (follow the arrows labeled "incoming sunlight" on the handout). Turn the "sun" on and notice the shadow. Shade in the half of the circle that is shadowed. Then line your eye up with the Earth and "moon." Draw what you see in the box beside the circle. Repeat for all 8 positions.

Where is the moon full? A crescent? A gibbous (more than half)?

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