



**Activity Name:** Modeling the Phases of the Moon

**Submitted by:** Noreen Grice, You Can Do Astronomy LLC

**Target Subject(s):** Astronomy

**Purpose:** To simulate the phases of the Moon in a way that helps students visualize the cycle.

**Supplies:**

- One styrene/styrofoam ball (baseball size)
- One small container of puff paint (optional)
- Four-sided (pencil-size) stick
- A little glue
- Several jingle bells
- Three students (for the Sun, Moon and Earth)

**Preparation:**

For this activity, you will need to create a tactile Moon. In order to do this, apply a small amount of glue to one end of the stick and insert that end into the styrene/styrofoam (Moon) ball. Next, using the puff paint, apply dots to only one half of the ball (from top to bottom). Allow the puff paint to dry. [An alternate method is to carve a rough surface on the ball.]

**Activity Details:**

Begin the activity when the tactile Moon is dry. One student holds the Moon and a second student (the Earth) faces that person. The Earth student puts a hand on the shoulder of the Moon student. They practice, each person moving to the right, in a circle around an imaginary point between them (as if they were dancing). Eight steps should complete the circle. The Earth student's hand on the shoulder of the Moon student helps both students move as a unit and remain face to face.

Once both students are comfortable turning as a unit, the third student (located a few feet away) shakes the jingle bells. This person represents the Sun. The bells provide an audible reference to the direction of the Sun.

The Moon student stands so that his/her back is to the Sun. The Sun student's ringing bells should be heard in front of the Earth student. The tactile side of the ball represents

the illuminated part of the Moon and should face the Sun (not visible to the Earth student).

The Earth student puts his/her other hand on the Moon (ball). The student touching the Moon should use the palm of the hand to touch one side of the Moon. When the Sun, Moon and Earth are aligned in this way, the Moon is in *New Moon Phase*.

The Earth student takes one step to the right as the Moon student takes one step to the right. The bells should be heard in front of and to the right of the Earth student. Using the edges of the stick as a reference, the Moon student rotates the stick to the left, halfway to the next side of the stick so that the edge is facing the Moon (student). A small curve of tactile Moon is visible (to the Earth) on the right side of the ball. This is the *Waxing Crescent Moon*.

The Earth and Moon students each take another step to the right. The bells should be heard to the right of the Earth student. The Moon student rotates the stick to the left until the first side of the stick is reached. About half of the Moon should be visible to the Earth student on the right side. This is the *First Quarter Moon*.

The Earth and Moon students each take another step to the right. The bells should be heard from behind the right side of the Earth student. The Moon student rotates the stick to the left, to the next edge (more than half of the tactile Moon should be visible from the Earth) on the right side. This is the *Waxing Gibbous Moon*.

The Earth and Moon students each take another step to the right. The bells should be heard behind the Earth student. The Moon student rotates the stick to the left to reach the second side of the stick. The entire tactile Moon is visible from the Earth. This is the *Full Moon*.

The Earth and Moon students each take another step to the right. The bells should be heard from behind the left side of the Earth student. The Moon student rotates the stick to the left, halfway to the next side. Some of the tactile Moon has disappeared from the right. This is the *Waning Gibbous Moon*.

The Earth and Moon students each take another step to the right. The bells should be heard from the left side of the Earth student. The Moon student rotates the stick to the left, to the third side. Only the left half of the tactile Moon should be visible from the Earth. This is the *Last Quarter Moon*.

The Earth and Moon students each take another step to the right. The bells should be heard from the left front of the Earth student. The Moon student rotates the stick to the left to the next edge. Only a curve of tactile Moon should be visible on the left edge. This is the *Waning Crescent Moon*.

The Earth and Moon students each take another step to the right. The bells should again be heard in front of the Earth student. The Moon student rotates the stick to the left, to the final side of the stick. We have returned to the starting point, the New Moon. You have now completed a simulation of the Moon's phases!