

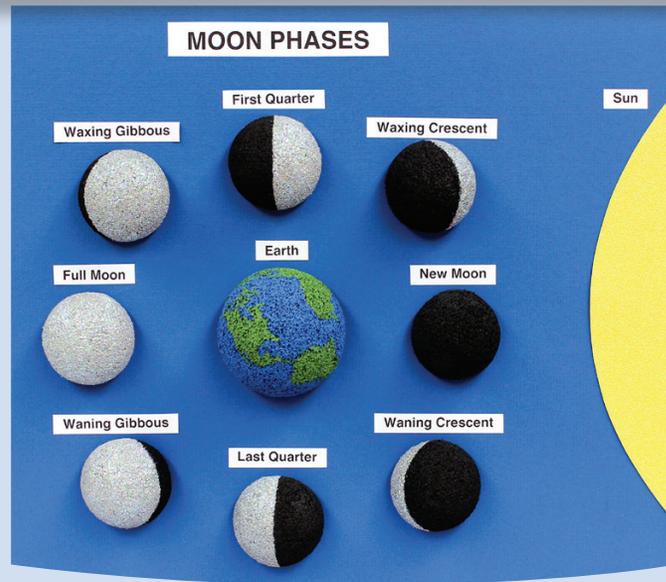
Shine On Moons

MATERIALS

FOR STUDENT:

(one per group of students unless otherwise noted)

- FloraCraft® Make It: Fun® Foam Balls, four 2 ½" diameter (moons) and one 3 ½" (OR 3") diameter (Earth)
- Matboard, blue, 15" x 18" (can get four per 30" x 40" sheet)
- 12" x 12" glitter cardstock, yellow
- Circular platter or large tray, ideally 12" diameter (to trace edge of Sun)
- Toothpicks, nine
- Rubber bands, two medium
- Paintbrushes, one small (for earth details) and three larger
- Plastic cup of water
- Scissors
- Pencil
- Ruler
- Glue stick
- Thick white tacky glue
- Paper plates, two small and one large
- Paper towels, two - three
- Ziploc bag
- Paint apron per student



FOR TEACHER:

- Acrylic paint: Lamp Black, Shimmering Silver, Victoria Blue, Hauser Medium Green and Crystal Glitter (twinkles)
- Serrated knife
- 12" paper cutter
- Large 36" paper cutter OR craft knife, metal ruler and cutting mat (or stack of newspapers)
- Scissors, ruler, pencil
- Glue gun (for teacher only)
- Old newspapers or plastic tablecloth (optional)
- Plastic-lined garbage can
- Paper towels
- Bucket of water
- Small empty squeeze bottle
- Wet wipes
- Drying area
- Computer, printer and paper

TEACHER PREPARATION

Note: Read through all the instructions first and check out the TIPS! Plan for two class sessions with drying time in between them. Have a glue gun plugged in and ready to use (ideally set on low temperature) but out of student reach. This can give you immediate adhesion when you're in a hurry to help students. Be sure that the glue has cooled before returning the projects to students (takes a minute or so.) It is also recommended that you paint a few moons first, before preparing the materials for any others, since knowing the process, first hand, might affect how you prepare.

[1] Use a serrated knife to cut four 2 ½" and one 3 ½" foam balls in half (which will provide enough for two groups). Optional: Create a cutting guide by wrapping a rubber band around the ball so that one edge is in the middle. Rotate the foam ball to make it even all around. Then cut along that line, rotating the foam ball as you cut. Repeat with each foam ball until you are comfortable in knowing where they should be cut.

[2] Look on the Internet for an illustration of the Moon Phases and another of the green and blue Earth (with North America and South America). Print out one of each for each group.

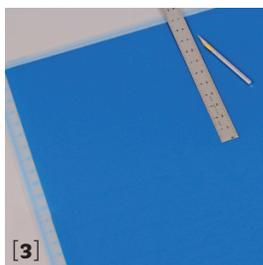
Type and print the following captions for each group: MOON PHASES, Sun, Earth, First Quarter, Waxing Gibbous, Full Moon, Waning Gibbous, Last Quarter,

Waning Crescent, New Moon, and Waxing Crescent.

Use a paper cutter to cut them apart and put them into a plastic bag for each group. Also cut a small piece of paper upon which students can write their names and attach to the back of their board.

[3] Use a large paper cutter or a craft knife and metal ruler on a cutting mat (or stack of newspapers) to cut each group a 15" x 18" blue piece of matboard.

[4] At each group's place, set two of each: small plates, cups of water, and paper towels. Set four paintbrushes, a pencil, two rubber bands, one plate of eight small ball halves and one large ball half, along with the Moon Phases and Earth illustrations. (Wait to give the plastic bag of captions.)



SCIENCE
GRADE LEVEL
SECOND – THIRD

COMPLETION TIME

- 45 minute session (2 hours minimum drying time)
- 45 minute session

OBJECTIVES

Students:

- Understand how the Earth blocks the sun, creating a certain amount of shadow on the moon
- Understand that the shadow amount is measured in moon phases, which have been identified and named
- Recognize the moon phases

STANDARDS

- Describe the Earth as one of several planets that orbit the sun and the moon as a satellite of the earth
- Observe patterns that result from the Earth's position relative to the sun and rotation of the Earth on its axis
- Recognize and describe the phases of the moon

LESSON INTRODUCTION

- Explain that the moon orbits around the Earth once in about 28 days. That affects the part of the moon that is lighted by the sun and how much of that part can be seen from the Earth. Show examples with a lamp and round objects, or photos. Then ask students to work in small groups of three to create a Moon Phases board.

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INSTRUCTIONS

[1] Just before students arrive, squeeze green and blue paint onto one plate. Squeeze black and silver paint onto the other. (Wait with the glitter paint.)

When students arrive, have them wear their aprons and roll up their sleeves, explaining that this paint will not wash out of clothes. Suggest to the students that each group have one student painting black on the moons, one painting silver on the moons and the other painting blue and green on the Earth.

But first, they'll need to draw guidelines for painting. For the moon painters, demonstrate how to wrap the rubber band around the ball half, positioning it exactly at the top and bottom of the ball. By leaving the band in the middle, they can draw a straight pencil line along the rubber band, that will work for both the first and last quarters. If they stretch the middle over to one side, they can draw a line along the rubber band that is curved and will work for the two crescents and two gibbous. (Full and new moons are painted solidly, either silver or black.)

Have moon painters begin drawing lines by referring to the Moon Phases illustrations, and then painting, keeping black brushes in the black paint and silver brushes in the silver paint.



[2] Show the Earth painters how to sketch the shape of North and South America by copying the Earth illustration. Then have them paint the green continents, wash out their brush and dry it on a paper towel before painting the blue water.



As students are finished, collect the brushes and put them into the bucket of water (until after class when they can

be washed out). Have the students write their names on the plates and move them into the drying area.

[3] Demonstrate and have the students set the circular tray onto one side of the yellow glitter cardstock and trace the edge with a pencil. Cut it out, to represent the Sun. Mention to students that the sun, Earth and moons are just representative and not the right sizes or distances to be according to the scale of the real objects.



[4] See if the surfaces of the silver paint on the moons are dry enough to lightly apply a coat of crystal glitter (twinkles) paint to make it sparkly. If not, wait a little longer but do it well in advance of the next session so that it can be completely dry.

NEXT SESSION

[5] Distribute the plastic bags of captions and blue matboard. Have students collect their plates of painted pieces and take them to their work areas. Have students start at the top with the MOON PHASES caption and below that, arrange all their moon and captions. Have each person in the group check the layout with the moon illustration to be sure that it's correct. Then, use the glue stick to attach the captions and yellow sun. Use tacky glue to attach the moons.

Have students use the small piece of paper to write their names and use the glue stick to attach it to the back of the matboard. Have students help clean up.



MODIFICATIONS

To simplify project:

- Use smaller foam ball halves for the moons and a printed drawing of the earth.
- Don't paint the crystal glitter to make the silver sparkly (but the kids sure love it!)

To expand project:

- Have students research and write about why we see the moon like this at different times.
- Go into more detail about the 28-day cycle of the moon's orbit around the Earth, discussing other planets and their moons.

For multiple ages:

- Younger and older students can work side-by-side with younger students painting moons and the older ones painting the Earth.
- Have older students research more on astronomy in general – gathering interesting information on the planets and speculation on life on other planets.

ADDITIONAL IDEAS

- As a class or group, make a jumbo Earth from a large foam ball and hang it from the center of the room. Then make large moons and hang them from the ceiling in proper positions.
- Create models of other planets and their moons.
- Research information about the distance between the moon and the Earth, relative to the sun. Create a way to illustrate that information by using very small foam balls and actual, real distance, so that students have a sense of scale.



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TIPS

- When cutting matboard, use a new blade and run it against a metal ruler. Score lightly first. Then press more firmly to cut deeper, with several passes of the knife.
- Before painting, show students how to compress the cut edges of the foam. Place the foam ball half at an angle, on the table. Press the edge down, to round it, rocking it back and forth a little and rolling it all around to get an even, circular edge.
- While students are drawing, their phases of the moons, call to their attention that the drawing of the curve of both crescent and both gibbous are all the same. They simply rotate them around to have them be in the correct positions. When they paint, both crescents can be painted the same as each other but one is rotated upside down. Similarly, both gibbous can be painted the same as each other, but one is rotated upside down. (They may figure this out when they are laying them out on the board and are startled if two seem to be the same... just have them rotate one upside down.)
- Before gluing moons, be sure students have closely checked their moons with the chart. It's easy to get confused.
- Prepare the painting area, covering the tables if needed. Allow for plenty of space for each student. Have a large plastic-lined garbage can ready.
- If the acrylic paint seems too thick, walk around with a squeeze bottle (not a squirt bottle) of water and put a few drops of water on each student's puddle of paint. Or, if you know it in advance, add a little water to the paint in the container and shake well, to thin the paint to the consistency of cream. This will go down into the pores of the foam more easily.

REFERENCES

- All About the Moon* by David Adler
The Moon by Melanie Chrismer
The Moon Book by Gail Gibbons
The Moon Seems To Change by Franklyn M. Branley