

- Discuss the effect that the Earth's gravity has on the moon and vice versa. Based on this discussion, talk about how sailors might have relied on the moon for charting courses and maneuvering vessels before the technological age.
- Have students explain why the moon appears illuminated at night but not during the daytime.
- Reflecting on the information presented in this program, ask students if they would like to live on the moon someday and what they would need to do so.

### Follow-up Activities

- Have students chart the moon for a month, creating a poster that illustrates the phases of the moon throughout the 29½-day lunar cycle.
- There are many moons in our solar system—each one is unique. Have students conduct research to find out how many moons are actually in our solar system and gather assorted information on each.
- Ask students to explore the origins of the words “moon” and “lunar.” Research the many cultures that have included the Earth's closest neighbor in their myths and legends over the centuries.
- Based on information students find through the print and Internet resources provided, have them write journal entries as if they were Apollo 11 astronauts, detailing the first landing on the moon's surface.

### Suggested Internet Resources

Periodically, Internet Resources are updated on our web site at [www.LibraryVideo.com](http://www.LibraryVideo.com).

- [starchild.gsfc.nasa.gov/docs/StarChild/solar\\_system\\_level1/moon.html](http://starchild.gsfc.nasa.gov/docs/StarChild/solar_system_level1/moon.html)  
NASA's “StarChild” site is a great place for a young astronomer to learn more about the Earth's satellite, the moon.
- [www.esa.int/esaKIDSen/SEMxR6WJD1E\\_OurUniverse\\_0.html](http://www.esa.int/esaKIDSen/SEMxR6WJD1E_OurUniverse_0.html)  
This website from the European Space Agency presents concise explanations about the birth of the moon, lunar exploration, phases of the moon and lunar eclipses. (Continued)

- [www.kidseclipse.com/pages/a1b3c1d0.htm](http://www.kidseclipse.com/pages/a1b3c1d0.htm)

The teaching section of the “KidsEclipse” site offers a lively lesson plan that details what an eclipse is and why it happens. Features vocabulary, animated examples and suggested activities to try in the classroom.

### Suggested Print Resources

- Dyson, Marianne J. *Home on the Moon: Living on a Space Frontier*. National Geographic Society, Washington, D.C.; 2003.
- Hehner, Barbara. *First on the Moon: What It Was Like When Man Landed on the Moon*. Hyperion Books for Children, New York, NY; 2000.
- Simon, Seymour. *The Moon*. Simon & Schuster Children's Publishing, New York, NY; 2003.

### TEACHER'S GUIDE CONSULTANT

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### TITLES

- ALL ABOUT STARS
- ALL ABOUT THE PLANETS
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## All About The Moon

Grades K-4

This guide is a supplement, designed for teachers to use when presenting the program *Space Science For Children: All About The Moon*.

**Before Viewing:** Research in learning suggests that it is important for the teacher to discover what the students know — or think they know — about a topic, at the start of a new unit, so that their accurate conceptions can be validated and reinforced, and their misconceptions identified and corrected. Therefore, after reviewing the pre-viewing discussion questions provided for your class, create a “Everything We Know About...” list. Preview key vocabulary words and have students raise additional questions they hope will be answered by this program. Most importantly, students should be told that as “science detectives” they must listen closely, so that after viewing the program, they will be able to tell whether or not the facts/beliefs they had put on their list were scientifically accurate.

**After Viewing:** After a brief discussion about the program, challenge your “science detectives” to prove or disprove the accuracy of the facts that they had put on their “Everything We Know About...” list. Discuss what else they learned and use the follow-up questions and activities to inspire further discussion. Encourage students to research the topic further with the Internet and reading resources provided.



## Program Summary

Even though it's some 239,000 miles away, the moon is the Earth's closest neighbor in space. Even before Galileo viewed the moon's surface through the newly invented telescope almost 400 years ago, the mysterious body that appears in our sky intrigued humankind. Over the years, scientists have studied the moon from the Earth and — beginning with Apollo 11 in 1969 — from the moon itself. Scientists have learned about eclipses and tracked the various phases of the moon. We know that gravity keeps the moon in orbit around the Earth, and even though its force is much less, the moon does affect our planet by exerting its gravitational pull on the Earth's oceans, which causes tides. When Neil Armstrong took that first giant leap the doors to colonizing the moon were opened, yet in comparison to the Earth, the moon is a place that, while fun to visit, would be a difficult place to live.

## Vocabulary

The following words are included for teacher reference or for use with students. They are listed in the order in which they appear in the video.

**moon** — A solid body which orbits the Earth and is our closest neighbor in space. Other planets have moons, too.

**planet** — A large body of solid rock, liquid or gas that revolves around the sun.

**astronauts** — Men and women who travel to space in rocket-powered vehicles to study the solar system.

**orbit** — The continuous path of an object around another body; the moon orbits the Earth, as the Earth and the other planets orbit the sun.

**Luna 3** — The Russian spacecraft which took photos of the dark side of the moon in 1959.

**phases of the moon** — The repeating pattern of views of the moon's surface as we see it from the Earth, caused by the amount of the moon's surface illuminated by the sun at different times during a 29½-day cycle.

**new moon** — The phase of the moon when we are unable to see it because the sun is shining on its other side; also known as “no moon.”

**first quarter** — The phase of the moon that we see when half of its surface is illuminated.

**full moon** — The phase of the moon that we see when its entire surface is illuminated.

**solar eclipse** — A natural occurrence when the moon's orbit places it directly between the Earth and the sun, temporarily blocking out the view of the sun from the Earth.

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**lunar eclipse** — A natural occurrence when the moon's orbit places it directly in the shadow of the Earth. With the Earth between the moon and the sun, the moon seems to disappear, as viewed from the Earth.

**telescope** — An instrument used to view distant objects in space.

**craters** — Indentations in the surface of the moon caused by meteorites crashing into its surface.

**Apollo 11** — The first NASA mission to land on the moon on July 20, 1969.

**atmosphere** — The layers of gases that surround a planet.

**lunar rover** — A vehicle used by astronauts to travel and explore the moon's surface.

**oxygen** — The gas in the Earth's atmosphere which all animals breathe in order to survive.

**meteoroid** — Small pieces of rock and/or metal that speed through space. It is called a meteorite when it hits the Earth's surface.

**gravitational pull** — The pull of gravity, or gravitational attraction, between planets, moons and stars.

**tides** — The daily rise and fall of ocean water on the Earth, caused by the gravitational pull of the moon.

**micro-gravity training chair** — A special device used by astronauts to train for the low gravity on the moon.

## Pre-viewing Questions

Before students generate their list of “Everything We Know About...” this topic, stimulate and focus their thinking by raising these questions so that their list will better reflect the key ideas in this show:

1. Does the moon always look the same to us? Why or why not?
2. How is the moon alike or different from the Earth?
3. What is the moon made of?
4. Does the moon affect the Earth in any way? If so, how?

After the class has completed their “Everything We Know About...” list, and before watching the show, ask them what other questions they have that they hope will be answered during this program. Have students listen closely to learn if everything on their class list is accurate and to hear if any of their own questions are answered.

## Focus Questions

The key questions raised in this program, and answered during the “Mission Report,” are as follows:

1. Why does the moon seem to change shape throughout the month?
2. What does the moon look like up close?

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3. What is it like to walk on the moon?
4. Would it be possible for humans to live on the moon someday?

Other questions you may wish to ask your class to assess their comprehension of additional points presented in this show are as follows:

1. How big is the moon in comparison to the Earth?
2. Why do we only see one side of the moon from the Earth?
3. How and when did humans first see and photograph the dark side of the moon?
4. What are the phases of the moon?
5. What is the difference between a solar eclipse and a lunar eclipse?
6. Why do we refer to the large flat areas on the moon as seas if we know they do not contain water?
7. Why are there more craters on the moon's surface than on the Earth's surface?
8. Why was the Apollo 11 mission so important?
9. Who were the first astronauts to set foot on the moon?
10. How is it possible that the footprints from the Apollo 11 astronauts still exist on the moon?
11. What is the difference between a meteoroid and a meteorite?
12. Why is the moon's gravity less than the Earth's? Why could you jump six times higher on the moon than the Earth?

## Follow-up Discussion

The most important part of this segment is to examine both the facts and beliefs generated by the class in their “Everything We Know About...” list. Research indicates that students will retain their previous misconceptions — in preference to the new information — until they actively recognize and correct their own errors. Because of this, it is important to lead students to the correct ideas while identifying and correcting any misconceptions from the class list. After reviewing the list, encourage students to share the answers they got to the questions raised before viewing the program.

Raising a thought-provoking question is a good way to assess the overall depth of understanding. A couple of suggestions are listed below:

- Discuss the ways that a moon is different from a planet such as the Earth, focusing on the importance of an atmosphere in the development of life.

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