Snapshot of Space

SCIENCE

Standards Supported

- **NGSS Science and Engineering Practices: Planning and Carrying Out Investigations:** Make observations and/or measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon. (4-ESS2-1)
- **NGSS Connections to Nature of Science: Science Addresses Questions About the Natural and Material World:** Science findings are limited to questions that can be answered with empirical evidence. (5-ESS3-1)

Resources

- Projectable PDF or interactive digital magazine
- Beyond Our Solar System poster (Teacher's edition)
- Test the Science: Stomp Rocket poster (Teacher's edition)
- Content Assessment Master (page 14)
- Article Test (page 17)

Science Background

It has been 50 years since man first stepped on the moon. Since then, a combination of curiosity, determination, and ingenuity, have taken mankind beyond the moon, through the solar system, and into the vast unknown of interstellar space.

People haven't made most of these journeys themselves. Rather, they have built spacecraft that can land on asteroids and orbit planets. Components on the spacecraft take samples and shoot photos. They transmit the data or bring actual samples back to Earth for scientists to study. The results teach us about the universe so we better understand our tiny place within it.

Click here for the Kahoot! quiz:
https://play.kahoot.it/#/k/
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ENGAGE

Encourage students to flip through the article and turn and talk with a partner to discuss what they see. Invite students to ask questions or share what they already know about exploring outer space.

EXPLORE

Display the **"Snapshot of Space" article** with the projectable PDF or the interactive digital magazine. As a class, brainstorm a list of objects the person in the photo might see as he looks through his telescope. Challenge students to list items people could see with a stronger telescope.

EXPLAIN

After reading, remind students that it's been 50 years since humans first walked on the moon, but people began exploring space long before that. **Say:** *As new technologies have been developed, people have been able to explore space in new ways. We've explored further out and closer up than ever before.* Have students turn and talk to discuss how technology has allowed people to observe the moon, Mars, asteroids, Jupiter, Pluto, and beyond. Challenge them to identify what and how we have learned about each celestial body.

ELABORATE

Display and review the **"Beyond Our Solar System" poster**. Have students identify each spacecraft and discuss what the images, data, and other information it sent back helped scientists discover about space. Then display and review the **"Test the Science: Stomp Rocket" poster**. Provide supplies and have students conduct the experiment with a partner. Rejoin as a class to analyze the results. Encourage students to explain how their rockets performed under different conditions. Discuss how understanding the principles of force helps scientists launch huge rockets into space.

EVALUATE

Have students complete the **Content Assessment** for this lesson. Then have them take the **Article Test**. Encourage them to share and compare their results in small groups.

Name _____ Date _____

CONTENT ASSESSMENT: Snapshot of Space

Make a checkmark to show if you think each sentence is true or false.
Use information from the article to explain your answers.

Sentence	True	False	Explanation
1. Scientists have proven that Earth's mantle and the moon's mantle are made of the same substances.			
2. People have felt "marsquakes" on the surface of Mars.			
3. It is possible for spacecraft to bring materials from space back to Earth for study.			
4. Satellite photos revealed that Jupiter has large gas belts on its north and south poles.			
5. Spacecraft that landed on the surface of Pluto proved its mountains were made of water-ice.			
6. The spacecraft New Horizons, launched in 1977, is now studying interstellar space.			

Name _____ Date _____

ARTICLE TEST: Snapshot of Space

Read each question. Fill in the circle next to the correct answer and then write your response on the lines.

1. When did people first walk on the moon?
   - Ⓐ 30 years ago
   - Ⓑ 40 years ago
   - Ⓒ 50 years ago

2. Which of these space objects does not orbit the sun?
   - Ⓐ planets
   - Ⓑ moons
   - Ⓒ asteroids

3. How do scientists know there are vast, swirling storms at Jupiter's poles?
   - Ⓐ A manned fight landed on Jupiter's surface.
   - Ⓑ An unmanned spacecraft landed on Jupiter and took samples.
   - Ⓒ A spacecraft flew by and took pictures.

4. What are Voyager 1 and Voyager 2 now exploring?
   - Ⓐ marsquakes
   - Ⓑ New Horizons
   - Ⓒ interstellar space

5. How can studying asteroids in space potentially help people living on Earth?

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ANSWER KEY

Snapshot of Space

1. False: Scientists have just started to study rocks from the moon's mantle so they don't know what it's made of.
2. False: People have never been on the surface of Mars. Only spacecraft have felt "marsquakes" at this time.
3. True: Currently spacecraft are bringing samples from asteroids back to Earth for study.
4. False: The pictures revealed gas belts everywhere on Jupiter except for the poles.
5. False: Spacecraft flying by took photos that showed that the mountains were made of water-ice.
6. False: New Horizons launched in 2006. Voyager 1 and Voyager 2 launched in 1977 and are now exploring interstellar space.

Article Test, page 17

1. C; 2. B; 3. C; 4: C; 5. By studying asteroids, we learn what they are made of. Asteroids may have valuable minerals we could mine someday.