

# Investigation One – Comparing Earth and the Moon

## Standard I

Students will understand that the shape of Earth and the moon are spherical and that Earth rotates on its axis to produce the appearance of the sun and moon moving through the sky.

## Objective 1

Describe the appearance of Earth and the moon.

## Intended Learning Outcomes

1. Use science process and thinking skills
2. Manifest scientific concepts and principles
3. Understand science concepts and principles
4. Communicate effectively using science language and reasoning

## Standard I

## Objective

## Background Information

Earth is a small planet, third from the sun in our solar system. Earth's shape is spherical, the result of gravity pulling Earth's material toward a common center. Earth's surface is mostly rock, with three-fourths of the surface covered in water. The gravitational pull of Earth's mass is enough to hold onto an atmosphere of natural gases. This atmosphere has evolved as a result of changing conditions on Earth's surface and the evolution of plant life. The atmosphere on Earth is a major Component of our global ecosystem. Water exists as liquid, solid, and gas.

The moon is about  $\frac{1}{4}$  the diameter of Earth. Craters, bowl-shaped depressions formed where meteorites have struck, mark its landscape. Rough, mountainous highlands and flat plains are its basic surface regions. The moon's surface reflects light from the sun.

## Pre-Assessment/Invitation to Learn

Read the first riddle clue to the class (or have individual cards made for each clue), and have them write down what they think it might be. Read the next clue and have them write down what they think it might be. Continue doing this until you have read all of the clues. Discuss their final answer.

### Riddle

This object is smaller than Earth.  
It shines in the sky.  
It can be seen during the day or night.  
It has holes called craters on its surface.  
It goes around Earth  
It is higher than the clouds.

# Instructional Procedure

## Materials

- Riddle
- My Moon Book
- Poster of the moon and Earth
- *What the Moon is Like* by Franklyn M. Branley

## Activity 1

1. Hand out “My Moon Book”. (Note to teacher: the moon book will be an ongoing journal throughout Standard I)
2. Have students write down what they think the moon is made of on page 2 in their moon journals. What do they think is on the moon?
3. Divide the class into small groups and have them look at the poster of the moon and Earth and list the ways they are alike and different in their moon book.
4. Read *What the Moon is Like* to the whole class and then have them work with their groups (or as a whole class) to add items they learned from reading the book in their moon books.

## Materials

- Watercolors
- Art paper
- Books: *Earth Dance*, by Cynthia Pratt Nicolson and *Goodnight Moon* by Margaret Wise Brown
- My Moon Book

## Activity 2

1. Read aloud *Earth Dance*. Point out the illustrations in this book.
2. Read *Goodnight Moon* or another book about the moon.
3. Ask students: How do Earth and moon appear? How are they similar? How are they different?
4. Have students write down their answers on page 3 of their journals.
5. Tell children they are going to paint the planet Earth or moon in space. (You may wish to let students choose which they draw or assign half the class to one or the other.)
6. Share photos and artworks and videos depicting Earth and the moon in space.
7. Model painting the spherical shape, colors, and atmosphere.

## Curriculum Extensions

### Math –

- Show different types of geometric shapes. Ask which one is like the moon and Earth. Have them brainstorm why Earth and moon are round like a sphere. (*Standard III, Objective 1*)
- Help students determine the relative size of Earth, the moon, and sun as viewed from space. (*Standard II, Objective 2*)

### Language Arts –

- Have the students write a story if Earth was another shape. Have them tell of problems there might be living on Earth if Earth was that shape. What would have to change? (*Standard VIII, Objective 6*)
- Write Earth and moon poems. (*Standard VIII, Objective 6*)
- Write a story about a student’s week on the moon. (*Standard VIII, Objective 6*)

## Assessment Suggestions

- Response Questions
  1. What is on the moon?
  2. How are the moon and the Earth alike? Different? (use a Venn Diagram and the complete page 3 in their moon books.)
  3. What shape are the moon and Earth?
- Check for accuracy on pages of their journals.

## Resources

### *Websites*

- [www.NASA.org](http://www.NASA.org)
- [www.earthsky.com](http://www.earthsky.com)
- [www.sciencecourt.com](http://www.sciencecourt.com)
- [www.askjeeves.com](http://www.askjeeves.com)
- [www.astronomy.com/content/static/AstroForKids](http://www.astronomy.com/content/static/AstroForKids)
- [www.childrenmuseum.org/cosmicquest](http://www.childrenmuseum.org/cosmicquest)
- [www.faahomepage.org/main.html](http://www.faahomepage.org/main.html)
- [www.jsc.hasa.gov/poa/students](http://www.jsc.hasa.gov/poa/students)
- [www.pbs.org/wbgh/nova/worlds](http://www.pbs.org/wbgh/nova/worlds)
- [www.moisd.k12.mi.us/Gen\\_Ed/Outreach/Starlab/plans.htm](http://www.moisd.k12.mi.us/Gen_Ed/Outreach/Starlab/plans.htm)
- [www.starchild.gsfc.nasa.gov/docs/StarChild/solar\\_system\\_level1/moon.html](http://www.starchild.gsfc.nasa.gov/docs/StarChild/solar_system_level1/moon.html)
- [www.seds.lpl.arizona.edu/nineplanets/luna.html](http://www.seds.lpl.arizona.edu/nineplanets/luna.html)
- [www.harmsy.freeuk.com/moon.html](http://www.harmsy.freeuk.com/moon.html)
- [www.fourmilab.ch/earthview/vplanet.html](http://www.fourmilab.ch/earthview/vplanet.html)
- [www.fearofphysics.com/SunMoon/sunmoon1.html](http://www.fearofphysics.com/SunMoon/sunmoon1.html)
- [www.moonlink.com](http://www.moonlink.com)
- [www.k-3space.com](http://www.k-3space.com)
- [www.utahskies.org](http://www.utahskies.org)

*Books:*

- *Earth Dance* by Cynthia Pratt Nicolson
- *Goodnight Moon* by Margaret Wise Brown
- *Full Moon* by Michael Ligh
- *Moon Game*, by Frank Asch
- *All About the Moon*, by Wes Lipschultz
- *When You Look Up at the Moon*, by Allan Fowler
- *So That's How the Moon Changes Shape!* By Allan Fowler
- *The Moon Seems to Change* by Franklin M. Branley
- *The Moon Book* by Gail Gibbons
- *Moonwalk the First Trip to the Moon* by Judy Donnelly
- *Magic Tree House Research Guide Space* by Will Osborne and Mary Pope Osborne
- *Magic Tree House Midnight on the Moon* by Will Osborne and Mary Pope Osborne
- *The Moon* by Seymour Simon
- *The Earth* by Seymour Simon
- *Jimmy Zangwow's Out-of-this-World Moon Pie Adventure* by TonyDiTerlizzi

*Video:*

- *Space Science for Children All About the Moon* Schlessinger

## **Homework & Family Connections**

- Students can tell their families how the moon and Earth are alike and different
- Read books about Earth and the moon
- Send home a list of web sites and encourage students to look them up with their families

8

Why do we see different star patterns in the night sky during the length of the night?

What is really happening?

1

# ***My Moon Book***

Name \_\_\_\_\_

2

What do you **think** the moon is made of?

Do you **think** there is anything On the moon?

What do you **think** is there?

What is the moon really made of?

Draw a picture of what is on the moon.

7

Why do the sun and moon seem to go across the sky?

What is really happening?

4

How do you **think** craters are formed on the moon?

Tell how craters are formed on moon.

5

Where do you **think** the moon on gets its light?

Draw how the moon gets its light.

6

How do you **think** we get day and night?

Tell how we get day and night.  
Draw a picture.

3

How are the moon and Earth **alike**?  
**Moon**                      **Earth**

How are the moon and Earth **different**?  
**Moon**                      **Earth**