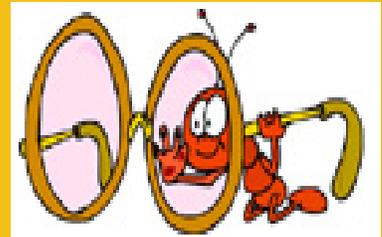
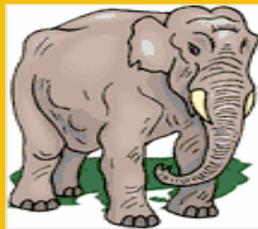


2nd Grade



Teacher Resource Book

Activities for the New 2010 Science Core

SECOND GRADE

STANDARD 2

Earth and Space Science

OBJECTIVE 2

Observe and record the recognizable objects
and patterns in the night sky

Activity 1

I See The Moon

LESSON: I See the Moon

INSTRUCTOR: Mary Gladell Weidner and Verneita Hunt

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DISTRICT: Granite School District

GRADE LEVEL: 2

CORE CURRICULUM

Science Standard 2: Earth and Space Science

Objective 2: Observe the recognizable objects and patterns in the night sky.

Intended Learning Outcomes

- (P) When science investigation is done the way it was done before, we expect to get a very similar result.
- (N) Sometimes people aren't sure what will happen because they don't know everything that might be having an effect.
- (C) In doing science, it is often helpful to work with a team and to share findings with others. All team members should reach their own individual conclusions, however, about what the findings mean.

Lesson Objective 1.2.1: Observe, describe, and record patterns in the appearance and apparent motion of the moon in the night sky.

Content Connections:

Writing, Literature Connections, and Math

INTRODUCTION

Teachers need to have a basic understanding of the moon's relationship to the Earth. They also need to have some background about the Earth's moon. Within the last century, a great deal and new information has been gathered about the moon. We now know that it is made out of rock. Recent experiments have shown that the moon does have water on it (2009 Moon Probe Findings). Teachers will instruct students about the light of the sun reflecting on the moon. A basic understanding of the moon's phases is needed for this assignment.

The moon orbits around the Earth about once every 29 days. The moon seems to change shape as it circles the Earth. In reality, the moon only *appears* to change shape because of the relative position of the Moon to the Earth and Sun. The shape we see, or the light we see, is the sunlight reflected off the moon's surface back to use here on Earth.

Vocabulary definitions needed for this lesson: sun, earth, phases of the moon, new moon, waxing crescent moon, first-quarter moon, waxing gibbous moon, full moon, waning gibbous, last-quarter moon, waning crescent, reflection.

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The best time to view the moon for these activities is during the full moon phase. An Internet site that can inform you when a full moon will be in the sky is <http://stardate.org/nightsky/moon/>.

INVITATION TO LEARN

- Read the following riddles about the moon or make up your own. Have students guess the subject of these riddles.
 1. A long time ago, people thought I was a powerful God or Goddess.
 2. Sometimes you can see me in the day and sometimes you cannot.
 3. My name in the Latin language is Luna.
 4. I am about one-fourth the size of the Earth.
- After students have guessed the answer is the moon, place a large piece of lined chart paper in the front of the room. Have it labeled with a black marker “Things I Know About the Moon.”
- Ask students to tell things they know about the moon.
- Record their answers on the chart paper. Use different colored markers for each idea.
- Praise the students for their great answers.
- Inform students tomorrow they will study and draw the moon. Ask students to look at the moon at night with their family as part of their homework. Students will take home the *Dear Parents #1* sheet so a family member may help students at home. Ask students to observe the moon; can they see anything on the moon? What does it look like? If they have binoculars or a telescope available, they can see the moon even better.

My Moon Book

- Prepare “My Moon Book” for each student. (See *My Moon Book* sheets.)
- To introduce the topic of the moon, read *The Moon Book*, by Gail Gibbons.
- Discuss the information in the book about the moon.
- Introduce “My Moon Book: by handing out copies to the students. Discuss with them. that this booklet will be their scientific journal as they research the moon.
- On the front cover, students should write “My Moon Book” in the top area.
- Have students fill in their name and the date.
- On the first page, let students write all they know about the moon. Label this page, “Moon Things I Know.” This can serve as a pre-assessment.
- Students may draw a picture of them and their families looking at the moon the night before.

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- Instruct students that a scientist who studies the moon, galaxies, and other celestial bodies is called an astronomer. Post the astronomer char from Wikipedia.org/wiki/astronomer/.
- On a *Moon Lined Page* in their moon book, have students write “astronomer” and its definition. Label this page “Moon Words.”
- Let students pretend they are astronomers whose job it is to study the moon. Astronomers are always asking questions about the moon, sun, or stars.
- Inform students they will be learning facts about the moon.
- Discuss with students the definition for “fact”: Something that has really happened or is true. Post the *Fact* chart. On the “Moon Words” page, have students write “fact” and its definition. Wikipedia.org/wiki/fact/
- Hand out a sticky note to each child. Have students write their first name on it.
- As astronomers, you are curious about the moon. Have students write a question they want to know about the moon.
- While students are writing their questions, place another large chart paper in the front of the room. This chart should be labeled: “Questions We Have About the Moon.”
- Walk around the room ad help students write questions as needed.
- Once questions have been written, have students place their sticky notes on the large chart paper.
- Read a few of the questions to the class. Tell students they will learn many facts as astronomers studying the moon. Note: There are still things real astronomers do not know about the moon.
- One of the first things astronomers do is look at the moon in the night sky. This is why students looked at the moon with their families last night as part of their homework.
- On another *Moon Drawing Page* of their moon books, have students use their crayons to illustrate what they moon looked like the night before. Help students remember the details of the moon by showing them a few pictures from websites (see websites below).
- Students should write below their picture using this prompt: “This is what the full (or nearly full) moon looked like last night. I learned...”
- Then have a discussion with the students about what the moon looks like. Using moon pictures from the websites listed below, make a PowerPoint presentation for students to examine the moon up close and through the eyes of astronomers and astronauts. Include some of teh Apollo 11-17 360° panorama pictures with the voices of astronauts describing what they are doing and seeing. The Apollo 11 has the sound bite of Neil Armstrong’s famous words, “That’s one small step for man; one giant leap for mankind.” Be sure to include a variety of moon pictures, as this is a great teaching opportunity for students to look close at the moon and its surface. At times, pause the presentation and

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and explore the thoughts and ideas students have.

- As you proceed with the discussion, write a word bank on the white board for students to refer to when they write in their moon books. You may want to have students add these words to their “Moon Words” page.
- When the PowerPoint presentation is over, have students draw a picture on another *Moon Drawing Page*. You may want to pick a few of the students’ favorite presentation moon pictures for referral as they draw.
- As astronomers, have students write a few things they have learned about the moon.
- Let students draw and write for at least ten minutes.

INSTRUCTIONAL PROCEDURES

Phases of the Moon

- The moon orbits around the Earth about once every 29 days. The moon seems to change shape as it circles the Earth. In reality, the moon only *appears* to change shape because of the relative position of the moon to the Earth and sun. The shape we see, or the light we see, is the sunlight reflected off the moon’s surface back to us here on Earth.
- Post the *Moon Phases* chart and its meaning in the front of the room. Phases: The light part of the moon as seen by people on Earth.
- Have students title a *Moon Lined Page*, “Moon Phases.” As you proceed in this lesson have students write vocab words and various facts.
- Wikipedia.org shows a time-lapse phase sequence under the heading “Moon Phases.” Click on the button below the picture to enlarge the image on your projector. This site also shows two excellent diagrams explaining the moon phases.
- Use the following websites to show students how the moon shows the various phases: moonconnection.com/moon_phases and science.howstuffworks.com/milky-way-pictures
- Frequently use these vocabulary words during the lessons of the moon phases: new moon, waxing crescent, first-quarter, waxing gibbous, full moon, waning gibbous, last-quarter moon, waning crescent, reflection.
- Create a demonstration of the moon phases by the following method. Emphasize the moon phase vocabulary during the activity. Include the number of days it takes for the moon to go around the Earth - 29 days.
 1. Darken the classroom as much as possible or move to a room that can be darkened, such as the stage or other room without windows.
 2. Use a brightly shining, narrow-angled flashlight; 10-12” playground ball; 14-16” playground ball; and a dark-colored 12” round balloon.

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3. Have a person represent Earth by standing in the middle of the room with the 10-12" ball held just above his/her head.
 4. Have a student represent moon by holding the balloon just above his/her head and standing about three feet away from Earth.
 5. A student representing sun should stand about 10-12 feet away from the Earth person. Before the room lights are turned off, the sun should turn on the flashlight and point it at the Earth ball.
 6. Turn on the sun light and turn off the room lights.
 7. The rest of the students should observe the moon, allowing enough space for the moon to comfortably go around Earth.
 8. The moon should very slowly walk counter-clock wise around Earth, showing the various phases the moon goes through during the 29-day cycle.
 9. Earth, still holding the ball just above his/her head, should slowly turn with the moon to see the moon phases on the balloon.
 10. Rotate students through the various positions so everyone gets a chance to see how the moon looks in the various phases.
- Still acting as astronomers, discuss the demonstration after the classroom lights are turned on. Include the following questions.
 1. What did you see?
 2. What shape is the lit part of the moon?
 3. Does that shape change?
 4. What did you learn about the moon going around the Earth?
 5. How long does it take for the moon to go completely around the Earth?
 6. Where does the moon light come from?
 7. How does the sun make the moon shine?
 8. What are the names of the various moon phases?
 - Have students label the Earth and moon phases on the *Phases of the Moon* page in their moon books.
 - Have students draw one phase of the moon in their moon book and write two things they have learned about phases of the moon.
 - For a home connection activity, send home the *8 Moon Phases* page for students to draw the eight phases, labeling them on the lines below the pictures. Students should return the page and it should be added to their moon book.

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Moon Research

- Read the first 9 pages of *If You Decide to Go to the Moon* (through “You will shoot right through it into space”).
- Briefly discuss what’s happening in the book and what students think will happen for the rest of the story.
- Divide the students into eight groups by numbering off one through eight.
- Have a variety of moon books ready for students to research (see book list below).
- Give a moon book to each group.
- Let the students group read or browse through the books.
- On a Moon Lined Page in their books, students should number the lines from one to eight.
- Have students write one fact they have learned about the moon from each book.
- Set a timer for five minutes for each book. When the timer dings, rotate the books around to the next group.
- Give this activity at least 40 minutes to complete.
- Have students go back to their tables and share some of the things they have learned with their table groups. If there are no table groups, have students share with a partner information they learned about the moon.
- Have students draw a different picture of the moon on that same page in their moon book.

A Month of Moon Pictures

- Review the phases of the Moon using the book, *The Moon*, by Margaret Carruthers, pages eight and nine. The pages can be more easily seen using a document camera connected to a digital projector.
- Hand out the *Month of Moon Pictures* sheet.
- Review the phases of the moon.
- Show the current moon calendar from the following website:
http://www.moonconnection.com/moon_phases_calendar.phtml
- Tell students they will be making a calendar of moon phases at home with their family. Send home the Dear Parents #2 sheet, stating students will observe the moon and draw what they observe each day. Some days there will be nothing to observe; do not draw anything on those evenings. Students may observe the moon partially or lightly covered by clouds; students should draw what they see of the moon. Students should discuss what they are learning about the moon with their family.
- Students should return their *Month of Moon Pictures* after they have observed and drawn the moon on the last day of the month. Add this page to their moon books.

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LESSON MATERIALS

- Two large lined chart papers
- Black Marker
- Colored markers
- Parents #1 note, class set
- My Moon Book, consisting of the following pages:
 1. *Moon Cover*
 2. *Four Moon Drawing Pages*
 3. *Five Moon Lined Pages*
 4. *Diagram of Moon Phases*
 5. *Phases of the Moon*
 6. *8 Moon Phases*, to be added after returned for homework
 7. *Month of Moon Pictures*, to be added after returned for homework
- *The Moon Book*, by Gail Gibbons
- Pencils
- Crayons
- Markers
- *Fact* chart, enlarged if possible
- *Astronomer* chart, enlarged if possible
- Sticky notes, 4" x 3"
- Moon pictures from websites listed below
- PowerPoint presentation using website information listed below
- White board markers and eraser
- *Moon Phases* chart, enlarged if possible
- Flashlight, bright and narrow-angled
- 10"-12" playground ball
- 14"-16" playground ball
- Balloon, dark 12"
- *If You Decide to Go to the Moon*, by Faith McNulty
- Seven different moon books; see list below
- Timer
- *Month of Moon Pictures* sheet
- *Dear Parents #2*

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ASSESSMENT SUGGESTIONS

- For a post assessment, have students write in their moon books new facts they have learned. Label this page “New Moon Facts.”
- Enlarge pictures of the moon phases, cut them out, and have students unscramble them.
- Use the 8 Moon Phases sheets, putting various moon phases in each box and have students label them using a word bank you post/write on the board.

POSSIBLE EXTENTIONS/ADAPTATIONS/INTEGRATION

- Write a poem about the moon, memorize it, and recite it for the class. **Parents** could be invited for this activity.
- Write a **Haiku poem** after reading *Flower Moon Snow: A Book of Haiku*. Illustrate the poem with a picture and add it to student moon books.
- As an extension for the **moon phase experiment** with the balloon and flashlight, send home a balloon with children and have them show their family what they learned.
- Challenge **high ability students** to write a one-page research paper about the Apollo Lunar Landings, including names of astronauts, dates and what they found.
- Help **ELL students** by pairing them with dual language children.
- As a **physical movement activity**, go to the gym and have students move in tandem as the moon in all eight major phases around a student representing the Earth.
- Make arrangements for a **field trip** to the Clark Planetarium at the Gateway in Salt Lake City.
- Invite someone from a **local college or university** to show models of the Moon and give demonstrations about the Moon.
- Make **papier-mâché model** of the Moon with mountains and craters. This can be a classroom activity or a **home and family connection**.

RESOURCES: BOOKS, MEDIA, ARTICLES, WEB SITES, AND ORGANIZATIONS

BOOKS

The Moon Seems to Change, by Franklyn Branley, ISBN: 0-06-445065-1
The Moon Book, by Gail Gibbons, ISBN: 0-8234-1364-0
The Moon, by Margaret Carruthers, ISBN: 0-531-12281-6

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If You Decide to Go to the Moon, by Faith McNulty, ISBN: 0+590+48359-5
Flower Moon Snow: A Book of Haiku, by Kazue Mizumura, ISBN: 0-690-01291-8

Other Books

Moon, Sun, and Stars, by John Lewellen, ISBN: 0-516-01637-7
The Moon; A Spaceflight Away, by David Darling, ISBN: 0-87518-262-3
The Moon, by Jenny Tesar, ISBN: 1-57572-579-7
Moon, by Steve Tomecek, ISBN: 0-7922-5123-7
Experiments With the Sun and Moon, by Salvatore Tocci, ISBN: 0-516-22605-3
What the Moon Is Like, by Franklyn Branley, ISBN: 0-06-445185-2
Walking on the Moon, by Deborah Shearer, ISBN: 0-7368-1145-1
Phases of the Moon, by Gillia Olson, ISBN: 0-7398-6340-0
So That's How the Moon Changes Shape, by Allan Fowler, ISBN: 0-516-049177-8
The Moon, by Seymour Simon, ISBN: 0-689-83563-9
Henry and Mudge Under the Yellow Moon, by Cynthia Ryland, ISBN: 0-440-84462-2

MEDIA

ARTICLES

WEB SITES

Retrieved from the World Wide Web on February 15, 2010:
<http://space.about.com/od/moon/ig/Moon-Pictures-Gallery/>
Awesome moon pictures

Retrieved from the World Wide Web on February 15, 2010:
<http://www.netaxs.com/~mhmyers/moon.tn.html>
More awesome moon pictures

Retrieved from the World Wide Web on February 15, 2010:
<http://www.panoramas.dk/moon/mission-apollo.html>
Astonishing Apollo 11-17 moon pictures with 360° talking panoramas

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Retrieved from the World Wide Web on February 15, 2010:

<http://stardate.org/nightsky/moon/>

Best site for finding a full moon for this lesson

Retrieved from the World Wide Web on February 15, 2010:

<http://tycho.usno.navy.mil/vphase.htm>.

Best site for showing specific moon phase for a specified day

Retrieved from the World Wide Web on February 15, 2010:

<http://science.howstuffworkds.com/milky-way-pictures.htm>

Great moon and other celestial body pictures

Retrieved from the World Wide Web on February 15, 2010:

www.moonconnection.com/moon_phases.phtml

Great moon phase explanation and diagram

Retrieved from the World Wide Web on February 15, 2010:

www.astro.wisc.edu/~dolan/java/MoonPhase.html

Great moon phase animation - use Top View and Earth View

Use the Animate and Stop buttons to show the phases and how they look to us on Earth.

Retrieved from the World Wide Web on February 15, 2010:

<http://www.nasa.gov/audience/forkids/kidsclub/flash/index.html>

Interactive NASA "kids site" exploring space themes - really fun!

ORGANIZATIONS

FAMILY CONNECTIONS

- Encouraging students to look at the moon at the beginning of the unit of moon activities will help parents know what students are learning at school.
- Calendar with the phases of the moon sent home as a home assignment with students will help involve parental support for researching the moon.
- Sending home the 8 Moon Phases will help students teach their family about the moon.
- Making a papier-mâché model of the moon, including mountains, craters, and possibly evidence of the lunar landings will be a project that will involve family members.
- Family members helping the students memorize their poems or Haikus will excite them to come to the students' performances at school.

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LESSON AND ACTIVITY (TIME SCHEDULE)

- Each lesson is 55 minutes
- Each activity is 30 minutes
- Total lesson and activity time is 90 minutes.

Dear Parents,

Note #1

Our class is learning about the Moon as part of our night sky study. Please help your child look at the Moon tonight. Ask your son or daughter to observe the Moon; what does it look like? What shape does the Moon appear to be? Can he or she see anything on the Moon? If you have binoculars or a telescope available, your child can see the Moon even better/ Sometimes the Moon may be behind a cloud or partially covered. Do the clouds move to reveal the Moon? Discuss your thoughts with your child.

Thanks for your support with this assignment. Our class will become astronomers and begin researching facts about the Moon.

Sincerely,

Dear Parents,

Note #1

Our class is learning about the Moon as part of our night sky study. Please help your child look at the Moon tonight. Ask your son or daughter to observe the Moon; what does it look like? What shape does the Moon appear to be? Can he or she see anything on the Moon? If you have binoculars or a telescope available, your child can see the Moon even better/ Sometimes the Moon may be behind a cloud or partially covered. Do the clouds move to reveal the Moon? Discuss your thoughts with your child.

Thanks for your support with this assignment. Our class will become astronomers and begin researching facts about the Moon.

Sincerely,

Dear Parents,

Note #2

Our class is continuing our study of the Moon. We are learning about the different phases of the Moon. Please help your child complete the calendar of what the Moon looks like each night for a month. Have your child draw a picture of the Moon when it is visible in the night sky in each of the appropriate calendar boxes. Leave the boxes blank on the nights you were not able to make any observation of the Moon. Sometimes the Moon may be behind a cloud or partially covered. Your student should draw the Moon just like they observe it.

Thanks for your support with this assignment. Please return the calendar at the end of the month. As a class, we will discuss our observations and what we have learned about the Moon, including the reasons the Moon may not be seen some nights.

Sincerely,

Dear Parents,

Note #2

Our class is continuing our study of the Moon. We are learning about the different phases of the Moon. Please help your child complete the calendar of what the Moon looks like each night for a month. Have your child draw a picture of the Moon when it is visible in the night sky in each of the appropriate calendar boxes. Leave the boxes blank on the nights you were not able to make any observation of the Moon. Sometimes the Moon may be behind a cloud or partially covered. Your student should draw the Moon just like they observe it.

Thanks for your support with this assignment. Please return the calendar at the end of the month. As a class, we will discuss our observations and what we have learned about the Moon, including the reasons the Moon may not be seen some nights.

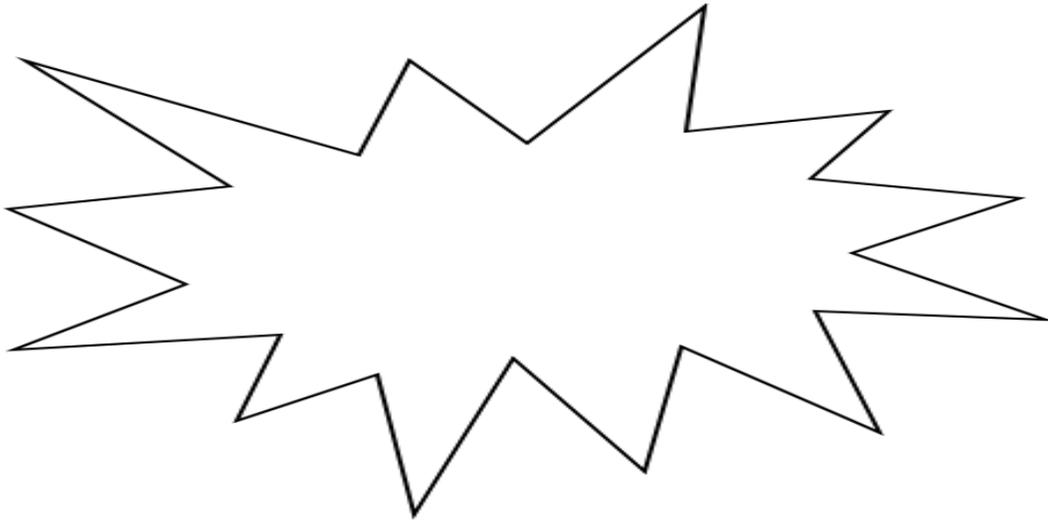
Sincerely,

Fact

**Something that has
really happened
or is true**

Moon Phases:

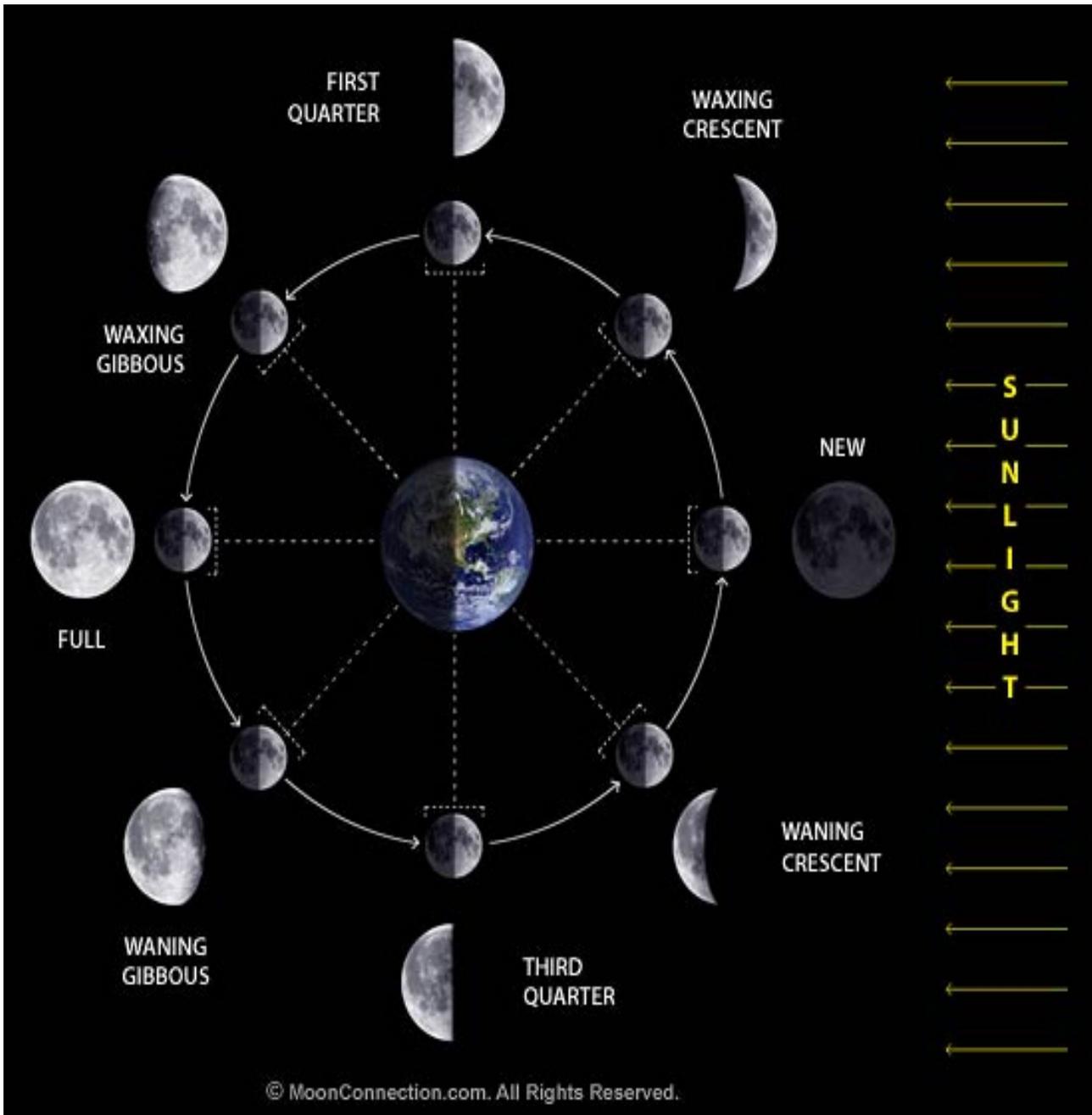
**The light part of
the moon as seen
by people on Earth**



Name _____

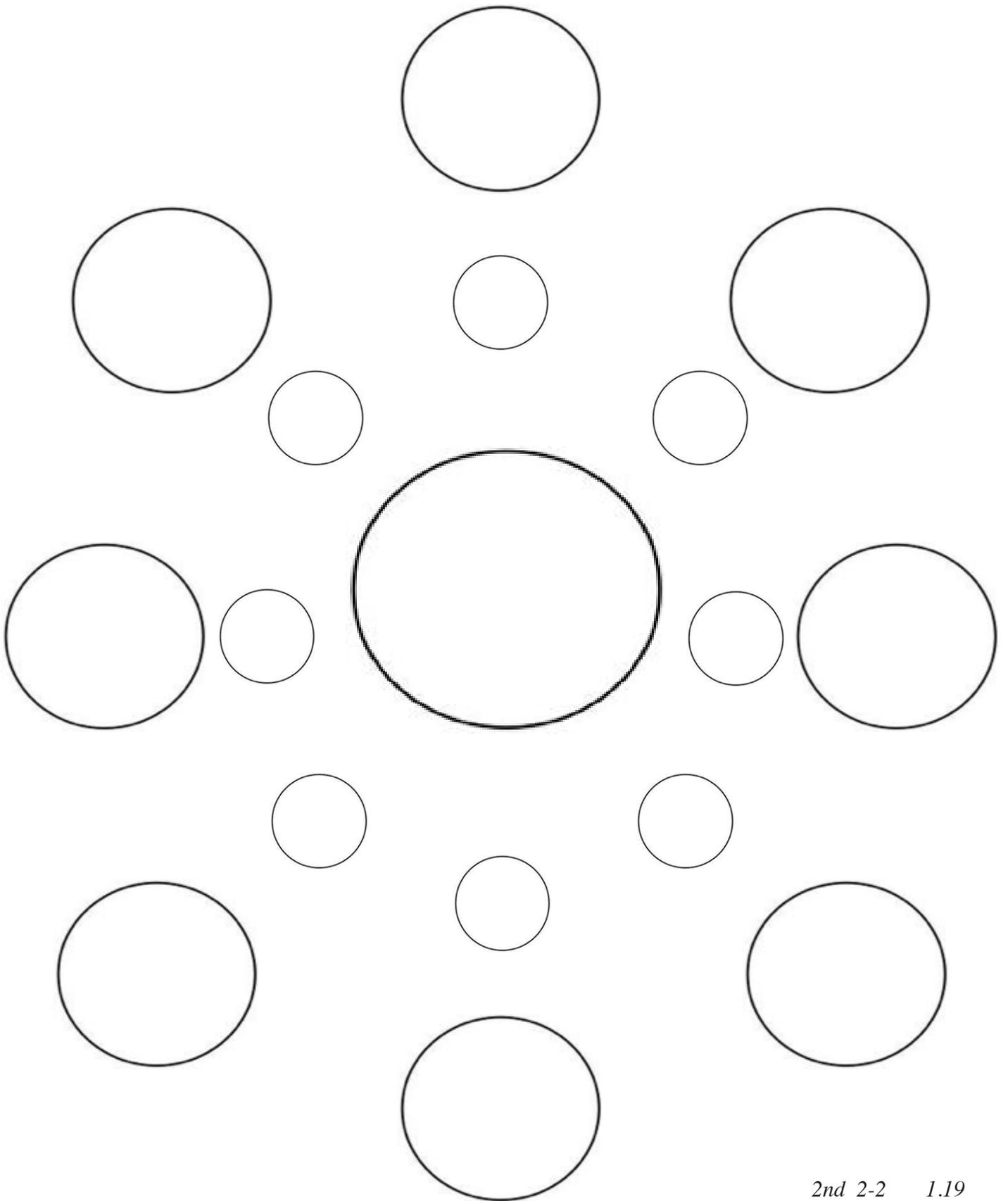
Date _____

Diagram of Moon Phases

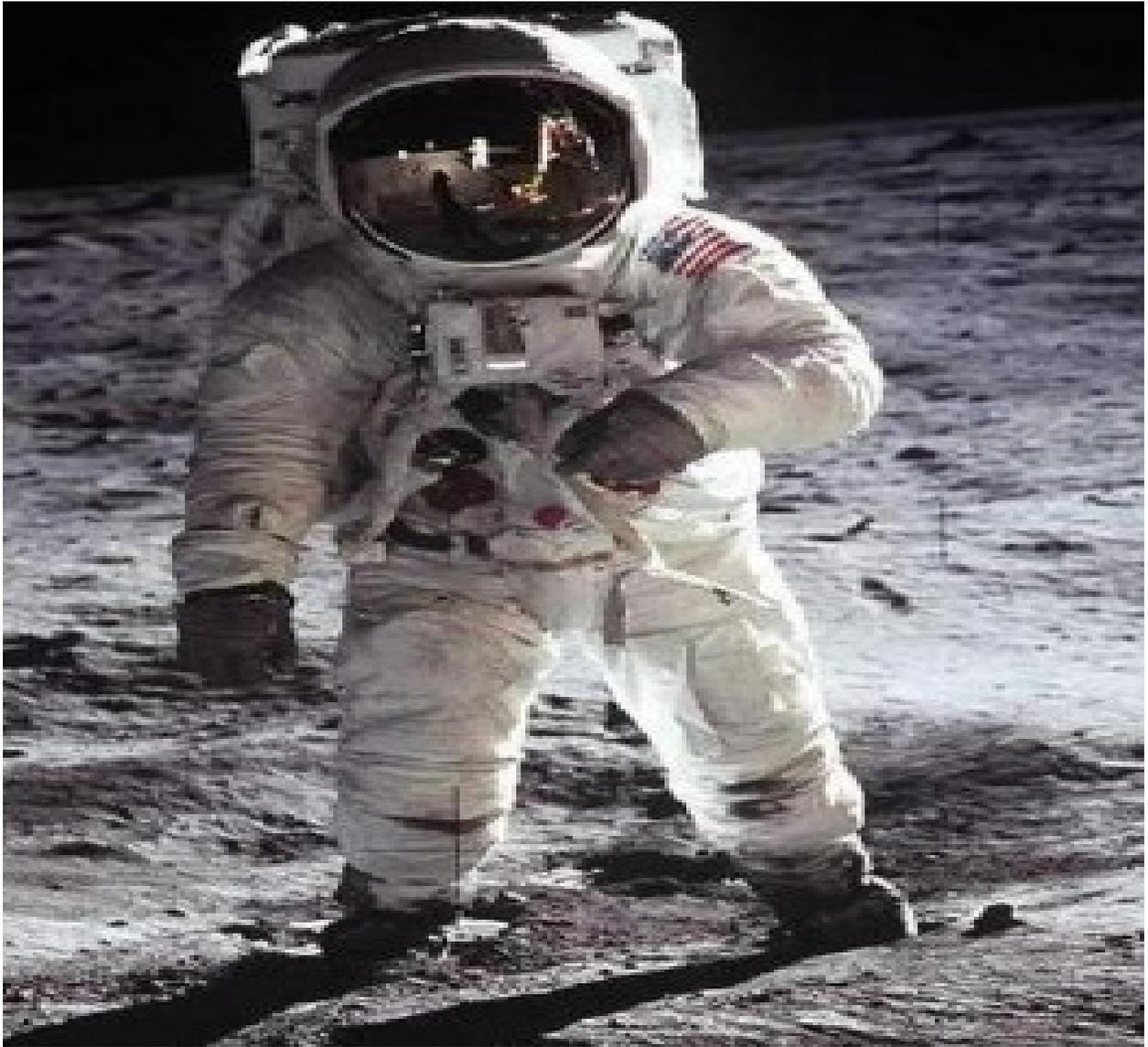


Retrieved from http://www.moonconnection.com/moon_phases.phtml

Phases of the Moon



Month of Moon Phases



8 Moon Phases

