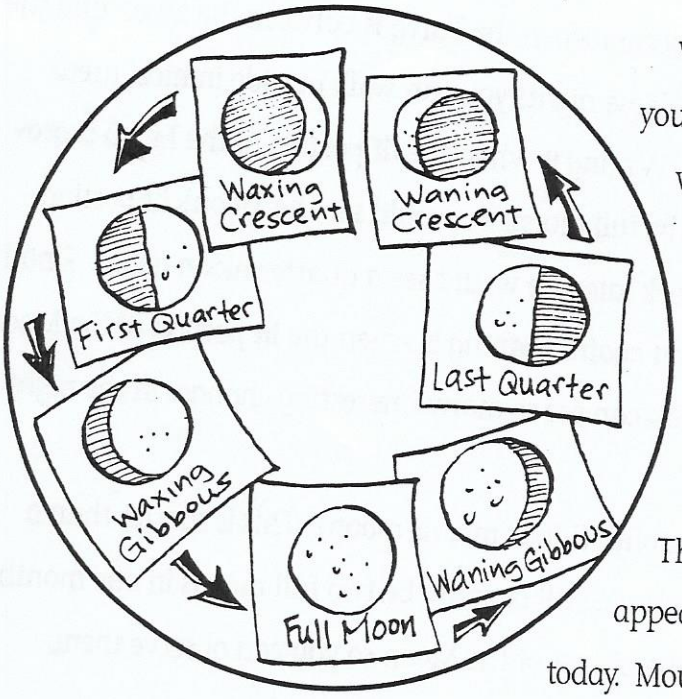
Phases of the Moon



What do you see when you look at the Moon? Do you see a man in the Moon? Some people think that what they see looks like a man's face. What they are noticing are the light and dark patches of the Moon. Scientists used to think that the dark patches were filled with water and named them seas. After astronauts visited the Moon, we discovered that there is no water on the Moon. These dark areas are just lower, flat plains that appear in shadow. However, they are still called seas today. Mountains and craters surround some of these dark areas. That is what makes some people think they see a man's face.

Maybe you have noticed that on some nights there is a full moon and on other nights you can only see a sliver of it. What happened? The different shapes of the Moon are related to the positions of the Moon, the Earth, and the Sun. The Moon does not produce any of its own light. What you are really seeing is the reflection of the Sun's light. It takes the Moon about one month to revolve around the Earth. At the same time, the Moon is rotating, or turning around. Throughout the month, you will notice that the portion of the Moon that is lit up changes the shape of the Moon in the sky. These changes are called the Moon's phases.

Let's begin on a cloudless night when you cannot see the Moon. This phase is called a new moon. This occurs when the Moon is between the Earth and the Sun. The side of the Moon that is not lit up by the Sun faces the Earth at this time. This makes the Moon look dark. Sometimes, we can see a faint outline of the new moon. This is caused by sunlight that is reflected from the Earth back to the Moon. However, most of the time we do not see anything when there is a new moon. A few days later, you would see a crescent moon. By the end of the week, you would see half of the Moon's surface lit up. This is called a quarter moon. A few days later, you could see an area of the Moon's surface that is larger than half of the Moon but less than a full moon. This is called a gibbous moon. Two weeks into

the cycle you would see a full moon. A full moon occurs when the Earth is between the Moon and the Sun. These are the brightest nights of the month. These nights you can walk outside in most areas and see in front of you without using a flashlight! Waxing is when the lit portion of the Moon is growing. Waxing means appearing. A few days after the full moon, we would see the Moon's lit portion decrease. This forms a gibbous moon again. A week later, we would see a quarter moon again. Finally, at the end of the month, we would see a new moon again. Waning is when the lit portion of the Moon is shrinking. Waning means going away. Wow! You can see so many interesting changes in the night sky throughout the month!

The Moon's phases take place in a lunar month (lunar means moon). This is shorter than a month on our calendar. So, every couple of years there will actually be two full moons in one month. This is called a blue moon. Some calendars list the phases of the Moon so you can observe them. You can also get that information in a daily newspaper or on the Internet.

Sometimes when the Earth passes between the Sun and the Moon, the Earth blocks the Sun's light. This creates a shadow over the Moon. When this happens, we cannot see the Moon. This is called a lunar eclipse. This occurs only at the time of a full moon. In a solar eclipse (solar means sun), the Moon passes between the Earth and the Sun and blocks the light of the Sun from hitting Earth for a short time. The Moon's shadow falls on the Earth. A solar eclipse only occurs at the time of a new moon.

Now you are ready to go out and observe the Moon. You do not even need a telescope. You will now be able to identify which phase of the Moon is in the sky on almost any night. You can check to see if your prediction for the next night is correct by looking in your newspaper or on the Internet. If all of this fascinates you and you would like to look at patterns of the Moon's phases from the past, you can look in an almanac. If you are more interested in observations, lunar activity, eclipses, and the phases of the Moon, then one day you might want to become an astronomer.

Comprehension Questions

Literal Questions

1. What is a lunar eclipse? How is it different from a solar eclipse?
2. What is on the surface of the Moon? What can we see from Earth?
3. What are the phases of the Moon? Why do they change?
4. What resources could you look at to find out what phase the Moon will be in tonight? Where could you find out what the phase of the Moon was on that same date last year?
5. What do we call the phases of the Moon in which part is appearing or disappearing?

Inferential Questions

1. What mistake did scientists make years ago, which is a bit misleading today?
2. Why do we think we see images of a man's face when we look at the Moon?
3. Why don't we have eclipses more often?
4. Why do calendars list the phases of the Moon?
5. If there was a full moon last night, when do you predict you will see a gibbous moon?

Making Connections

1. What can you see on the surface of the Moon without looking through a telescope? If you had a telescope, what difference would it make?
2. Why is it important for you to learn about the phases of the Moon and why they change over time?
3. Would you ever want to travel into space and land on the Moon? Why or why not? What would you expect to see? How would you prepare for the trip? What materials would you need?
4. Astronomers make predictions, test their predictions through investigations, and then prove or disprove them. You read about a prediction that was made years ago, which has since been disproven. How are you like an astronomer in the sense that you have thought something would happen or was true, but you later found out that it wasn't?
5. Create a diagram or mobile to illustrate the phases of the Moon.

Sharpen Your Skills

1. The camp seemed as far away as the Moon.

   This sentence used _____ language.

   - ○ literal
   - ○ interpretive
   - ○ figurative
   - ○ abstract

2. Don't worry. I can carry the tent all by myself because it is so **light.** I do not even need a lantern, since it is so **light** outside.

   In these sentences, the word "light" is used as a _____.

   - ○ homonym
   - ○ homophone
   - ○ synonym
   - ○ simile

3. The Earth blocks the Sun's light and creates a shadow over the Moon.

   What does the word "blocks" mean?

   - ○ covers
   - ○ stands in the way of
   - ○ made of wood
   - ○ highlights

4. What is missing from the following sequence?

   crescent quarter _____ full

   - ○ waxing gibbous
   - ○ new moon
   - ○ waning gibbous
   - ○ crescent

5. Which word would finish this analogy?

   Waxing is to **appearing** as _____ is to **disappearing.**

   - ○ invisible
   - ○ gibbous
   - ○ waning
   - ○ wandering

6. Look at the list of types of moons: waning gibbous—crescent moon—waxing gibbous—new moon.

   Which type of moon does not belong with the others?

   - ○ waning gibbous
   - ○ crescent moon
   - ○ waxing gibbous
   - ○ new moon

7. If you wanted to learn more about the lunar month or the Moon itself, which resource would be the most helpful?

   - ○ dictionary
   - ○ encyclopedia
   - ○ atlas
   - ○ thesaurus

Name _____ Date _____

Get Logical

Last February, five different students in Mrs. Aguilar's class recorded the phases of the Moon. Each student was responsible for observing the Moon each night and watching for a particular phase. Every time students saw the Moon in their assigned phase, they recorded it in a notebook and on a chart at school. Sylvia, Courtney, Emily, Dylan, and Tobias participated in this project. The Moon phases they recorded included full moon, new moon, gibbous moon, waxing moon, and waning moon. Use the clues below to decide who recorded which phase of the Moon.

Clues

1. Dylan saw either all of the Moon or none of the Moon.
2. Courtney saw almost three-quarters of the Moon lit up.
3. The night was so bright on the night that Tobias recorded his observations. Wow!
4. Emily recorded her observations as the Moon was disappearing in the night sky and before Dylan recorded his observations.
5. Sylvia did not observe a full moon or a new moon on her observation nights.

Full Moon					
New Moon					
Gibbous Moon					
Waxing Moon					
Waning Moon					
	Sylvia	Courtney	Emily	Dylan	Tobias

Sylvia recorded the _____ phase.

Courtney recorded the _____ phase.

Emily recorded the _____ phase.

Dylan recorded the _____ phase.

Tobias recorded the _____ phase.