



Name: \_\_\_\_\_

As the moon orbits around Earth, half of its surface is lit by the Sun. The rest of the moon's surface remains in darkness. The moon appears to change shape as different sections of the moon are lit by sunlight. When the moon is positioned between Earth and the Sun, the lit side faces away from Earth. In this "new moon" phase, the side facing Earth is dark.

However, as the moon continues its orbit around Earth, more of the lit part of the moon's surface becomes visible. First, there is a small crescent, or sliver, of light visible. It is shaped like a curved sword. As the sliver of light gets larger every night, the crescent gets larger. As the lit portion "waxes," or grows, each night, more of the surface seems to swell into view. This "gibbous," or humped or swollen, area grows until a full moon is visible about two weeks after the new moon.

The lit portion of the moon then appears to gradually shrink or "wane" through a gibbous stage and a crescent stage. Then, another new moon appears when no light is visible. Despite the changes in the amount of observable light, the same side of the moon is always facing Earth. The moon's schedule is the basis for the concept of a month. Some years there are 12 full moons. In others there are 13 full moons. It takes almost 30 days for the moon to go through all of its stages.



### What Did You Learn ?

- In what phase of the moon is the side facing Earth dark?
  - (A) crescent
  - (B) new moon
  - (C) gibbous
  - (D) both A and C
- Which word means "humped" or "swollen"?
  - (A) crescent
  - (B) gibbous
  - (C) new
  - (D) moon
- Which phase comes after the new moon?
  - (A) waxing crescent
  - (B) waning crescent
  - (C) waxing gibbous
  - (D) waning gibbous
- Which phase comes directly before a new moon?
  - (A) waning crescent
  - (B) full moon
  - (C) waning gibbous
  - (D) waxing gibbous

### What Am I ?

I look like a sliver of light in the night sky.

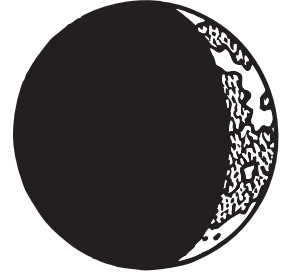
\_\_\_\_\_



Name: \_\_\_\_\_

**Directions:** Read the information. Respond to the questions below.

The moon goes through several phases during each month. When the lighted portion of the moon is growing larger, it is said to be *waxing*. When the lighted portion of the moon is growing smaller, it is said to be *waning*. The humped or swollen phase of the moon is called *gibbous*. The phase of the moon that is shaped like a curved sliver or sword is called the *crescent* phase. When no light is visible on the moon, it is in the *new moon* phase. When the moon is entirely round and lighted, it is in its *full moon* phase.



If the moon is shaped like a curved sword and growing, it is in its *waxing crescent* phase. If the moon is shaped like a curved sword and shrinking, it is in its *waning crescent* phase. If the moon is shaped like a swollen balloon and growing, it is in its *waxing gibbous* phase. If the moon is shaped like a swollen balloon and shrinking, it is in its *waning gibbous* phase. Another word for the stages of the moon's appearance is *phases*.

### Your Moon

1. What word means "to swell or grow larger"? \_\_\_\_\_
2. What term means "to shrink or grow smaller"? \_\_\_\_\_
3. Which word means "swollen"? \_\_\_\_\_
4. Which word refers to a curved sword or shape? \_\_\_\_\_
5. Of the many shapes mentioned above, which shape of the moon have you seen recently? Draw a picture to illustrate this shape.

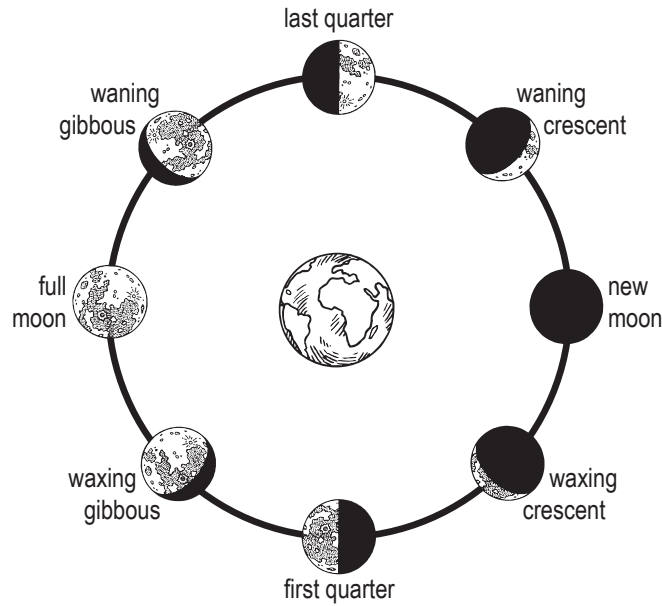
6. Have you seen the moon during the daytime? When? What shape was it?  
\_\_\_\_\_  
\_\_\_\_\_

7. The great scientist Isaac Newton said that his long studies of the moon gave him headaches. What do you think is complicated about studying the moon?  
\_\_\_\_\_  
\_\_\_\_\_

8. If you could go to the moon, what would you like to see or do? Why? \_\_\_\_\_  
\_\_\_\_\_



Name: \_\_\_\_\_



The moon is constantly seen from Earth through one of the phases shown above.

The moon goes through one complete cycle in about 30 days (exactly 29 days and 13 hours).

**Directions:** Use the information above to answer these questions.

1. In what phase is the moon not seen from Earth? \_\_\_\_\_
2. In which two phases is the least amount of the moon visible at night?  
\_\_\_\_\_
3. In which phase is the moon fully visible as a round ball? \_\_\_\_\_
4. In which two phases is the moon partially visible as a squashed or humped ball of light?  
\_\_\_\_\_
5. In what phase is it easiest to see at night for traveling? \_\_\_\_\_
6. Which moon phase do you like most? Why? What can you do best when the moon is in this phase?  
\_\_\_\_\_  
\_\_\_\_\_
7. About how many days does the moon remain in each phase? \_\_\_\_\_
8. What is the moon going to look like tonight? (Check your answer tonight.)  
\_\_\_\_\_

# Moon Facts and Figures

# Warm-Up 121



Name: \_\_\_\_\_

<b>Age of the moon:</b>	4.6 billion years (same as Earth)
<b>Diameter:</b>	2,160 miles
<b>Surface Gravity (compared to Earth):</b>	0.17 (17%)
<b>Time to orbit Earth:</b>	27.3 Earth days
<b>Time to rotate on its axis:</b>	27.3 Earth days
<b>Time from new moon to new moon:</b>	29 days, 13 hours
<b>Number of new moons in one Earth year:</b>	12 to 13
<b>Surface temperature:</b>	Low: -280°F High: +260°F Average: -100°F
<b>Distance from Earth:</b>	Maximum: 251,966 miles Minimum: 225,744 miles Average: 238,855 miles
<b>Amount of oxygen in the atmosphere:</b>	none
<b>Amount of water on moon's surface:</b>	none

## Knowing Your Moon

Use the information above to answer these questions.

1. What is the farthest distance the moon gets from Earth? \_\_\_\_\_
2. What is the closest distance the moon gets to Earth? \_\_\_\_\_
3. What is the difference between the farthest and closest distances? \_\_\_\_\_
4. What is the lowest surface temperature of the moon? \_\_\_\_\_
5. What is the highest temperature the moon reaches? \_\_\_\_\_
6. What is the total difference in temperature from high to low? \_\_\_\_\_
7. Do things weigh more or less on the moon than on Earth? (See surface gravity.) \_\_\_\_\_
8. What is the average temperature of the moon? \_\_\_\_\_
9. What conditions would make the moon an unlivable place to be? \_\_\_\_\_  
\_\_\_\_\_



### Page 120 What Is Your Weight on Mars?

	Percent	Weight on that Planet
Mercury	38%	38 lbs.
Venus	91%	91 lbs.
Earth	100%	100 lbs.
Mars	38%	38 lbs.
Jupiter	236%	236 lbs.
Saturn	92%	92 lbs.
Uranus	89%	89 lbs.
Neptune	112%	112 lbs.
Pluto	6%	6 lbs.

Try This: Answers will vary.

### Page 121 Distances in the Solar System

Planet	Distance in Scientific/Exponential Terms
Mercury	$36 \times 10$ to the 6th power
Venus	$67 \times 10$ to the 6th power
Earth	$93 \times 10$ to the 6th power
Mars	$142 \times 10$ to the 6th power
Jupiter	$4,837 \times 10$ to the 5th power
Saturn	$885 \times 10$ to the 6th power
Uranus	$1,784 \times 10$ to the 6th power
Neptune	$2,794 \times 10$ to the 6th power
Pluto	$3,672 \times 10$ to the 6th power

1. Uranus
2. Mars
3. Jupiter
4. Pluto
5. Uranus and Saturn
6. Most students will notice a near doubling between some of the outer planets until Neptune.

### Page 122 Asteroids: The Failed Planet

1. C
2. D
3. C
4. D

Who Am I? Gaspra

### Page 123 Solar System Word Study

Answers will vary.

## Unit 20

### Page 124 The Moon in Motion

1. B
2. B
3. A
4. A

What Am I? Crescent Moon

### Page 125 Waxing and Waning

1. waxing
2. waning
3. gibbous
4. crescent
- 5.–8. Answers will vary.

### Page 126 Phases of the Moon

1. new moon
2. waning crescent, waxing crescent
3. full moon
4. waning gibbous, waxing gibbous
5. full moon
6. Answers will vary.
7. about 4
8. Answers will vary.

### Page 127 Moon Facts and Figures

1. 251,966 miles
2. 225,744 miles
3. 26,222 miles
4.  $-280^{\circ}\text{F}$
5.  $260^{\circ}\text{F}$
6. 540 degrees
7. much less
8.  $-100^{\circ}\text{F}$
9. severe cold/no water/ no air

### Page 128 The Moon Word Study

Answers will vary.

## Unit 21

### Page 129 Rivers in the Ocean

1. D
2. D
3. C
4. D

What Am I? Gulf Stream

### Page 130 Who Lives in the Ocean Zones?

Sunlit	Twilight	Midnight
dolphins	sponges	sea spiders
jellyfish	sea stars	tube worms
porcupine fish	lanternfish	giant squid
seabirds	sea cucumbers	tripod fish
whales	viper fish	eelpouts
seals	whales	octopuses
manatees	flashlight fish	
sea dragons	anglerfish	
plankton	gulper eels	
lionfish	scaly dragonfish	
sunfish	sea slugs	
sharks	brittle stars	
coral	hatchfish	
	sharks	
	kelp plants	

### Page 131 Charting the Oceans

1. Pacific 60 million sq. mi.
2. Atlantic 29.6 million sq. mi.
3. Indian 26.5 million sq. mi.
4. Southern 7.85 million sq. mi.
5. Arctic 5.4 million sq. mi.

### Page 132 What Are Ocean Tides?

1. C
2. B
3. B
4. D