

# 12.4 Phases and Eclipses

## Sun, Earth, and Moon

### Student Resources:

Student Edition pages 144–145  
Science Notebook 12.4A–B

Connect

Construct

Investigate

Extend

Assess

### Materials

- Compass, astrolabes (*Introduction*)
- 1 Styrofoam ball 5 cm (2 in.) diameter or greater, per student; Styrofoam ball 15 cm (6 in.) diameter or greater; lamp with a 100-watt lightbulb and no shade (*Directed Instruction*)

### Vocabulary

**crescent** ('kre-sənt) the moon phase in which less than half of the moon's sunlit side is visible

**gibbous** ('ji-bəs) the moon phase in which more than half, but not all, of the moon's sunlit side is visible

**wax** ('waks) to grow

**wane** ('wān) to shrink

**lunar eclipse** ('loo-nər i-'klips) an event that occurs when Earth passes directly between the sun and the moon, causing Earth's shadow to block the sun's light from the moon

**solar eclipse** ('sō-lər i-'klips) an event that occurs when the moon passes directly between the sun and Earth, causing the moon's shadow to block the sun's light from a portion of Earth

### Supplemental Materials

BLM 12.1B  
BLM 12.4A  
TM-12.4A

## Objective

Students will identify and model moon phases. They will illustrate lunar and solar eclipses.

## Content

The moon is only visible from Earth because it reflects sunlight. It rises in the east and moves westward to set. Each day the moonrise is 50 min later than the day before. Because it rises later each day, the moon seems to move eastward after several days when observed at the same time. As it revolves around Earth, only its near side is visible from Earth. The far side never faces Earth because the moon both rotates and revolves in the same amount of time—29.5 days around its own axis as well as around the earth. The appearance of the moon changes as it moves position in relation to the earth and the sun. The moon's angle to the sun changes from Earth's perspective and causes people to view the moon's phases. When the moon is directly between the earth and the sun, it is a new moon, which cannot be seen from Earth since only its far side is lit at this time. As the moon moves counterclockwise around Earth, its visible portion begins to grow, or wax. It transitions from the waxing crescent phase to the first quarter (one-fourth of the way in its revolution) phase to the waxing gibbous phase. This process of apparent growth continues until the full moon. Then the full moon appears to shrink, or wane, which means that the illuminated portion is on the left, as viewed from the Northern Hemisphere. This waning continues until the next new moon. The moon can be observed anywhere on Earth during certain daylight or nighttime hours, as weather permits.

The relative positions of the sun, the earth, and the moon can also cause eclipses. When the moon moves directly between the sun and the earth, it casts a shadow on part of the earth, blocking the sun's light and causing either a partial or total solar eclipse. When the earth is directly between the moon and the sun, the earth's shadow blocks sunlight from the moon, causing either a partial or total lunar eclipse.

## Introduction

If the moon is visible, go outside with a compass and students' astrolabes. Find the angle and discuss the direction of the moon. Upon returning to class, direct students to record this data on their **BLM 12.1B Moon Observations** sections. Post a section on the class calendar. Discuss patterns they have seen. (**Possible answers: I could not see anything because it was cloudy; the moon rose later and farther east each evening; its shape changed.**)

## Directed Instruction

### Student Edition page 144

Read the text. Discuss the images and captions and give students time to study the different phases. Ask what a **crescent** moon is. (**Less than half of the moon's near side appears illuminated.**) A **gibbous** moon? (**More than half, but not all, of the moon seems to be sunlit.**) To help students remember the definition of **wax**, tell them that repeatedly dipping a candle in wax makes it bigger. Give a sample sentence for **wane**, such as *His interest in the topic waned the longer the speech continued.* Ask what a **waning** moon is. (**one that appears to be shrinking**)

Place the lamp in the center of a darkened room. Distribute materials and ask students to stick their pencils into their Styrofoam balls (moons). Have them hold out the pencils at arms' length, facing the lamp (sun). Have them place their moons just above the bulb's light. Model each step of this activity with your larger Styrofoam ball. Ask what they see. (**Possible answers: no light, a new moon**) Now have students turn about 45° to the left. They should see a portion of the right side of their Styrofoam balls illuminated—a waxing crescent. Continue to 90°. What does this represent? (**a first quarter moon**) Each subsequent 45° turn should illustrate the following: waxing gibbous, full, waning crescent, third quarter (three-quarters around the circle), waning gibbous, and another new moon. At the 180° full moon phase, students' heads may block the light from the lamp. Encourage them to hold their arms up higher to avoid this lunar eclipse.

 (**The moon can be seen during the day or night, depending on the phase it is in, the weather, and the time.**)

## Preparation

Print 2 **BLM 12.4A More Moon Observations** for each student.  
(Science Notebook 12.4A–B)

## Alternatives

Share data from the U.S. Naval Observatory website if the moon is not visible.

If you do not have Styrofoam balls, students can use their fists to represent the moon.

## Student Edition page 145

**D** Ask what *lunar* and *solar* mean. (**relating to the moon and sun, respectively**) Read the text and *Quick Fact*. Allow time for students to study the images and captions silently. Darken the room and ask two students to model a **lunar eclipse** using a globe, Styrofoam ball, and lamp. (**globe in between the lamp and the ball, blocking light from the moon**) Request that two more volunteers illustrate a **solar eclipse**. (**ball in between lamp and globe, casting a shadow onto part of Earth**) Have students refer to the moon phases diagram on the previous page. Ask why a solar eclipse only occurs during a new moon. (**because the moon is directly between the sun and the earth**) Why does a lunar eclipse only happen during a full moon? (**because Earth is directly between the sun and the moon**) Clarify that eclipses do not occur every full or new moon. There are two to seven lunar eclipses per year and two to five solar eclipses during the same period.

## Science Notebook 12.4A–B Moon Phases and Lunar and Solar Eclipses

Read the directions. Allow students to use their textbooks. Direct students to complete the activity, and collect for assessment to check for understanding.

Distribute two copies of **BLM 12.4A More Moon Observations** to each student. Explain that students will add the moon's direction to their recordings. Demonstrate on the board how to record the moon diagrams from the last three days. Have students use this paper to make and record observations daily at the same time for a month, instead of the previous BLM 12.1B sections, and complete the exercises at the end of each week.

## Lesson Review

Display **TM-12.4A Moon Phases**. Read the captions. Ask what determines whether an eclipse is partial or total. (**whether or not the sun, the earth, and the moon are directly lined up**)

## Safety

Caution students not to look directly into the bright bulb of the lamp.

## Extensions

Using the data taken from the U.S. Naval Observatory's website, have students graph on graph paper the moonrises (in blue) and moonsets (in red) from day to day. Direct them to place hours and minutes on the x-axis and dates on the y-axis. This will depict the changes in time of the moon's rising and setting.

## Further Discussion

Explain that the moon's rising times follow a general pattern. For instance, a new moon rises at sunrise and a full moon at sunset. A first quarter moon can be expected to rise at noon and a last quarter moon at midnight.

### PHASES AND ECLIPSES

#### VOCABULARY

**crescent** (kre-sant) the moon phase in which less than half of the moon's sunlit side is visible

**gibbous** (ji-bas) the moon phase in which more than half, but not all, of the moon's sunlit side is visible

**wax** (waks) to grow

**wane** (wan) to shrink

**lunar eclipse** (loo-nar i-'krips) an event that occurs when Earth passes directly between the sun and the moon, causing Earth's shadow to block the sun's light from the moon

**solar eclipse** (so-lar i-'krips) an event that occurs when the moon passes directly between the sun and Earth, causing the moon's shadow to block the sun's light from a portion of Earth

As the moon revolves around Earth and rotates on its axis, people see portions of its sunlit side. The shapes indicate which phase the moon is in. Each phase results from the positions of the earth, the moon, and the sun. Eight main phases are the new, first quarter, full, and third quarter moons, as well as two crescent and two gibbous moons. A **crescent** moon is similar in shape to the letter C. A **gibbous** moon is larger than a semi-circle but is not a complete circle of light. When the moon is directly between Earth and the sun, it is called a **new moon**, which cannot be seen. As the moon travels counterclockwise around Earth, it appears to grow, or **wax**. When all of the near side is illuminated, it is called a **full moon**. After a full moon occurs, it appears to shrink, or **wane**, as it returns to a new moon. The moon's near side always faces Earth while most of its far side faces away from Earth.

When can the moon be seen on Earth?

Although the part of the moon that faces the sun always receives sunlight, we cannot always see the sunlit side from Earth.

#### QUICK FACT

During a total lunar eclipse, the earth blocks sunlight from the moon. However, some light from Earth's atmosphere is reflected by the moon, causing the moon's color to range from gray to a copper color.

When the earth and moon are in line with the sun, they occasionally block sunlight from each other. These events are called **eclipses**. There are two types of eclipses—lunar and solar. A **lunar eclipse** occurs when Earth blocks the sun's light from the full moon. For this to happen, Earth must be between the sun and the moon. A **solar eclipse** blocks sunlight from a portion of the earth. This takes place when the moon passes directly between the sun and the earth during a new moon phase. The moon's color and brightness during an eclipse varies because of the amount of light refracted or bent by the earth's atmosphere.

During a total solar eclipse, the moon blocks sunlight from the Earth.

#### LUNAR ECLIPSE

Occurs at Full Moon

Viewing the moon from Earth, people can experience a partial lunar eclipse when the moon passes through the lighter part of Earth's shadow. A total lunar eclipse occurs when the moon passes through the darker part of the shadow.

#### SOLAR ECLIPSE

Occurs at New Moon

Viewing the sun from Earth, people can experience a partial solar eclipse when the earth passes through the lighter part of the moon's shadow. A total solar eclipse occurs when the earth passes through the darker part of the shadow.

# Science Notebook Answer Key: Chapter 12

## 12.4A Notebook Moon Phases

Complete the following activity and exercises.

- Place the letter of the image on the line next to the correct moon phase. Assume you are looking at the moon from the earth's Northern Hemisphere.

E full moon  
A new moon  
D waxing gibbous  
C first quarter

B waxing crescent  
G third quarter  
H waning crescent  
F waning gibbous



- Draw and label the sun, the earth, and the moon lining up during a new moon phase.



- Draw and label the sun, the earth, and the moon lining up during a full moon phase.

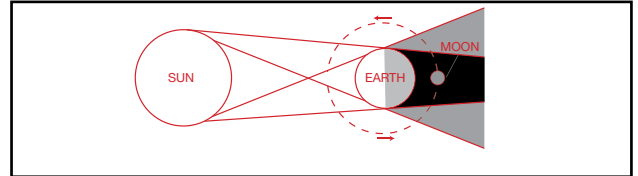


- Give two reasons why the different shapes of the moon are visible from Earth.  
**See Additional Answer Section at end of Answer Key.**

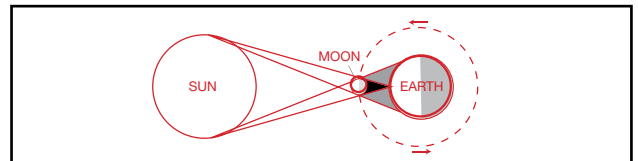
## 12.4B Notebook Lunar and Solar Eclipses

Use your textbook, if necessary, to answer the exercises below.

- During what phase of the moon does a lunar eclipse occur?  
**full moon**
- Draw a sketch of a lunar eclipse. Color your drawing to include the areas of the sun and the earth's shadows.



- Why does the moon have a colored hue during a lunar eclipse?  
**The color and brightness of the moon during an eclipse depends on the amount of light refracted, or bent, by the earth's atmosphere.**
- During what phase of the moon does a solar eclipse occur?  
**new moon**
- Draw a sketch of a solar eclipse. Color your drawing to include the areas of the sun and the earth's shadows.



- What is the main difference between a total and a partial eclipse?  
**A total eclipse occurs when the earth or the moon blocks the sun's light completely. This is the dark part of the resulting shadows. A partial eclipse occurs when the earth or the moon blocks the sun's light partially. This is the lighter part of the shadow.**

## 12.5A Notebook Ins and Outs of Tides

Fill in the blanks to finish the following sentences. You may use your textbook as a reference. Then unscramble the circled letters to complete the word at the bottom of the page.

- Water bulges at two points on Earth at a time because of the moon's g r a v i t y.
- Even though the sun has a greater m a s s than the moon, the moon's gravitational pull on different parts of Earth is the main cause of the ocean's tides.
- A t i d e is the periodic rising and falling of the surface level of ocean water.
- The moon is c l o s e r to the earth than the sun is.
- Most places on Earth experience t w o high tides and t w o low tides each day.
- A h i g h tide occurs at the point on Earth that is closest to the moon, as well as the location opposite of that point.
- Suppose you drew a line from one high tide to the other and then drew another line connecting the two low tide areas on Earth. The lines would be p e r p e n d i c u l a r to each other.
- In about a 12-hour cycle, ocean waters in most locations on Earth rise for s i x hours and fall for s i x hours.

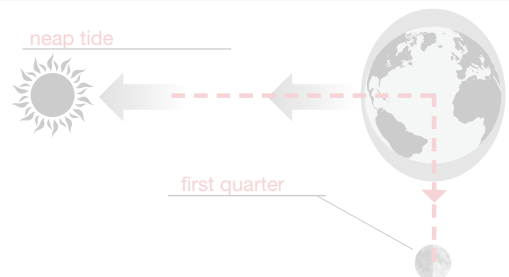
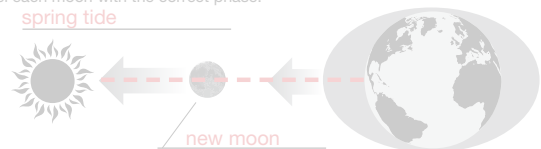
### BONUS:

Ocean waters do not b u l g e as much in the polar regions as they do at the equator.

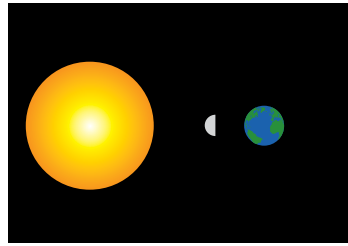
## 12.5B Notebook Spring and Neap Tides

You may use your textbook as a reference to complete the diagrams and exercises below.

- Label each diagram below *spring tide* or *neap tide*.
- Use a red pen or colored pencil to draw a dotted line on each diagram that shows how the sun, the moon, and the earth line up.
- Label each moon with the correct phase.

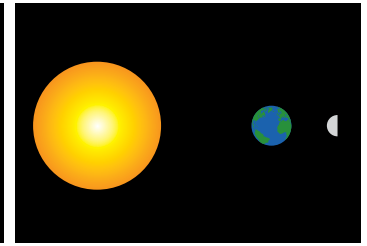


- Explain the difference between a spring tide and a neap tide.  
**See Additional Answer Section at end of Answer Key.**
- How many times per month do spring and neap tides occur?  
**two times per month**
- What location on Earth experiences the largest difference between sea levels of high and low tides?  
**the Bay of Fundy in Canada**



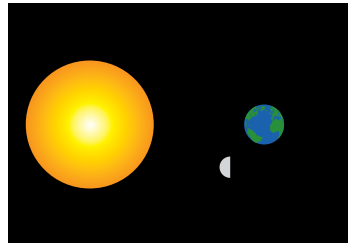
### **New Moon**

The visible moon is not illuminated by direct sunlight.



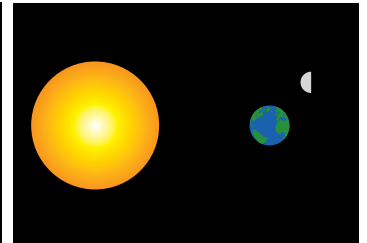
### **Full Moon**

The visible moon is fully illuminated by direct sunlight.



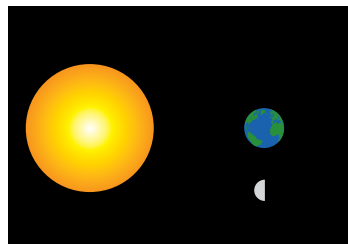
### **Waxing Crescent**

Less than half the moon is partly illuminated, but the illuminated part is increasing.



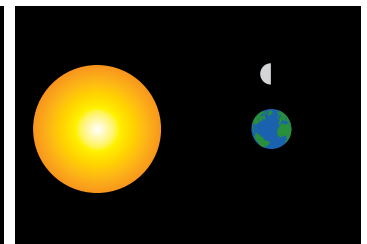
### **Waning Gibbous**

More than half the moon is partly illuminated, but the illuminated part is decreasing.



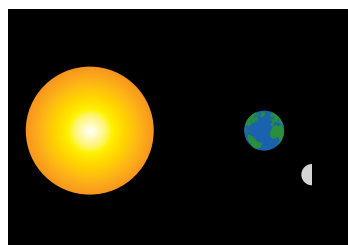
### **First Quarter**

One-half of the moon appears illuminated by direct sunlight, while the illuminated part is increasing.



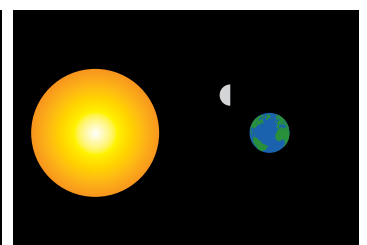
### **Third Quarter**

One-half of the moon appears illuminated by direct sunlight, while the illuminated part is decreasing.



### **Waxing Gibbous**

More than half the moon is partly illuminated, and the illuminated part is increasing.



### **Waning Crescent**

Less than half the moon is illuminated, and the illuminated part is decreasing.

### Student Resources:

Student Edition pages 160–161  
Science Notebook 13.5A–B

Connect

Construct

Investigate

Extend

Assess

### Materials

- School photographs of students with missing teeth (*Introduction*)
- Several samples of juice boxes and sports drinks (*Directed Instruction*)
- Crayons, markers, or colored pencils (Science Notebook 13.5A)
- Small ziplock bags, dental floss, toothpaste, plaque disclosing tablets (Science Notebook 13.5B)

### Vocabulary

**wisdom teeth** ('wiz-dəm 'tēth) the third molars, usually the last teeth to appear

**cavity** ('ka-və-tē) an area of tooth decay caused by prolonged exposure to bacteria

### Supplemental Materials

TM-13.5A

## Objective

Students will label the basic structures of a tooth and evaluate their own oral hygiene habits. They will also distinguish between primary and permanent teeth.

## Content

In young children, the set of baby teeth are called *primary teeth*. In this set of teeth, the bicuspid and the back four wisdom teeth are missing. As the permanent teeth begin to emerge from the jawbone, they start to resorb, or dissolve, the roots of the primary teeth. The permanent teeth then emerge, totally replacing the primary teeth, from about the ages of 6 to 14. The wisdom teeth are the last to appear above the gum line. These teeth are fully functional grinding molars. If there is enough room in a person's mouth, they are useful. If not, they are often extracted. An adult who has all his or her permanent teeth has a total of 32. A young child has only 20. Oral hygiene is key for future oral health. Dentists recommend everyone brush after every meal with fluoride toothpaste, floss daily, and obtain biannual dental exams. Limiting the intake of carbohydrates is also important since carbohydrates interact with local bacteria to create acids, which break down tooth enamel.

## Introduction

Pass around the student photographs that you have collected. Ask if anyone is currently experiencing loose teeth. (**Answers will vary.**) Explain that children lose primary teeth until they are around 12 years old. Ask what they do when they have a loose tooth. (**Possible answer: I wiggle it with my tongue until it comes out.**) Emphasize that it is safe to wiggle loose teeth gently, but it is not wise to force teeth out prematurely. Have volunteers state if they have ever had teeth removed by a dentist or oral surgeon. (**Answers will vary.**)

## Directed Instruction

### Student Edition page 160

Read the *Quick Fact* and text aloud. Direct attention to the tooth diagram and allow time for students to study each part. Point out which part of the tooth is the root. The root canal is signified by the red line of pulp extending into the jawbone. What does the pulp contain? (**blood vessels and nerves**) What is another name for the third molars? (**wisdom teeth**) At approximately what age do the **wisdom teeth** break through the gum? (**17–21**) Display **TM-13.5A Tooth Structure and Permanent Teeth** and read the labels and captions.

**?** (**because they are usually the last molars to appear during adolescence, often after age 17, and because age is often associated with wisdom**) Emphasize that some people do not have wisdom teeth and others do not have enough room in their mouths for them.

Reiterate how bacteria in the mouth digest the carbohydrates from food and produce acid. Ask what the acid does. (**dissolves the enamel on the surface of the tooth**) What can this chemical reaction cause? (**tooth decay**) What is a **cavity**? (**tooth decay caused by prolonged exposure to bacteria**) Ask for the definition of *plaque*. (**a sticky coating on teeth**) Explain that plaque buildup can cause tooth decay as well as gum disease. Emphasize that sugar leads to plaque and remind students that carbohydrate molecules break down into sugar molecules. Regular brushing, along with limiting carbohydrate and sugar intake can greatly reduce the incidence of cavities. Hold up the juice boxes and sports drinks one by one and write the number of sugar grams each contains on the board. Ask what would be a healthier beverage alternative. (**Possible answers: water, milk, low-sugar fruit juices**)

### Student Edition page 161

Have a student read *In the Field*. Invite students to share their experiences involving orthodontists. Direct their attention to the image of the dental hygienist and read the caption. Highlight the importance of regular dental check ups, not only for keeping teeth and gums healthy but for spotting potential jaw or tooth alignment abnormalities.

Read the text. Discuss that oral health is important for social reasons as well as medical ones. Halitosis can be offensive to others. Explain that it is necessary to brush teeth in the morning and before bed.

### Preparation

Provide toothbrushes, dental floss, fluoride toothpaste, and plaque disclosing tablets. Put together individual kits in small plastic bags for each student. Invite 2 parent volunteers to help monitor students as they brush their teeth in the bathrooms. (Science Notebook 13.5B)

### Extensions

Invite a dental professional to visit your classroom. Request that your guest bring regular and panoramic X-rays and provide examples of primary, permanent, and wisdom teeth. Ask him or her to show students the proper way to floss and brush teeth.

Other ways to maintain good oral health are to brush after meals and to avoid eating too much sugar. Draw attention to the other image and read the caption aloud.

### Science Notebook 13.5A Teeth +

Display TM-13.5A again. Direct students to use it and their textbooks to complete the page.

### Science Notebook 13.5B Oral Care Investigation +

Distribute the oral hygiene kits that were prepared in advance. Read through the whole page together. Provide instructions regarding how many students should go to the restrooms or sinks to brush and floss at one time. Allow time for completion and follow up by discussing their conclusions.

### Lesson Review

What is the difference between primary and permanent teeth? (**Young children have 20 primary teeth, which fall out and are replaced by permanent teeth.**) Name the main parts of a tooth. (**enamel, dentin, pulp, root, crown**) How can you improve your oral hygiene habits? (**brush more often, floss once a day, go to the dentist regularly, eat and drink less sugar**)

## Challenge Questions

*Are permanent teeth more yellow than primary teeth?* Yes, this is normal. However, sometimes permanent teeth can become yellow from medicine or beverage intake, fluoride overdose, smoking, or injury to a tooth or nerve.

## Notes:

## Worldview

Teeth are mentioned many times in the Bible. One commonly used phrase is *gnashing of teeth*, which denotes rage, despair, or sorrow. The Lord is always present and willing to help us in our times of need (Hebrews 4:16). He is able to give us a generous exchange—"a garment of praise instead of a spirit of despair" and "the oil of gladness instead of mourning" (Isaiah 61:3). However, God's Word clearly tells us that we are to take the initiative in putting off rage. Both Ephesians and Colossians instruct us to simply get rid of it. Galatians states that rage is an act of the sinful nature. With these scriptural commands in mind, we ought to take special note of our daily spiritual attitude, being careful to prayerfully take to the Lord those things that would prompt us to gnash our teeth.

### TEETH

#### VOCABULARY

**wisdom teeth** ('wiz-dəm tēz) the third molars, usually the last teeth to appear

**cavity** ('ka-və-tē) an area of tooth decay caused by prolonged exposure to bacteria

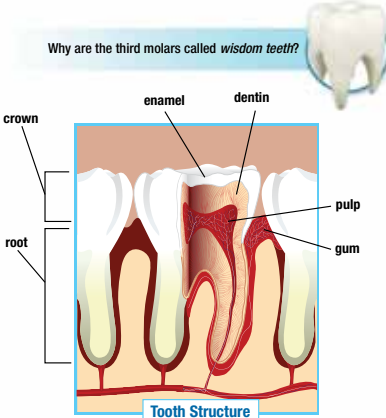
Just as your body goes through a transitional time, so do your teeth. Teeth are part of the skeletal system as well as the digestive system. Humans possess two sets of teeth during their lifetimes. The first to develop are the primary teeth. The permanent, or secondary, teeth replace the primary ones that fall out. This usually happens between the ages of 6 and 14. The last to break through the gums are typically the third molars, or **wisdom teeth**. They often appear during or after late adolescence—between 17 and 21 years of age.

A sticky coating on teeth is known as **plaque** and forms when food particles mix with bacteria. Bacteria digest the carbohydrates in food. This chemical process produces acids, which often dissolve tooth enamel and form **cavities**. If not treated, the decay can reach the dentin layer of the tooth. Fortunately, saliva helps protect the exposed tooth surfaces.

#### QUICK FACT

There are 53 facial muscles. It takes more muscles to form a frown than a simple smile. Five pairs of facial muscles play the largest role in smiling. Almost all of the muscles are involved in an exaggerated smile. Smiling and laughing have been scientifically proven to stimulate the immune system. These activities help restore homeostasis to the body by keeping the amount of a hormone called *cortisol* at a proper level. So, smile and laugh—it is good for you!

Why are the third molars called *wisdom teeth*?




**Tooth Structure**


Bacteria in the mouth can also cause bad breath. The scientific word for bad breath is *halitosis*. Brushing at least two times a day and flossing nightly often cures this odor. Many toothpastes and treated water contain fluoride, a mineral that helps make teeth strong and prevents cavities from forming.

Teeth serve several purposes. They allow you to chew and speak. They also greatly affect your appearance by adding shape and form to your face. Taking care of your teeth during adolescence may prevent serious problems later in life. It is important to see a dentist regularly for a thorough checkup. In addition, avoiding too many sugary snacks or starchy foods and brushing after meals is important. Teeth can also be knocked out accidentally. It is wise to wear a mouth guard when playing sports.

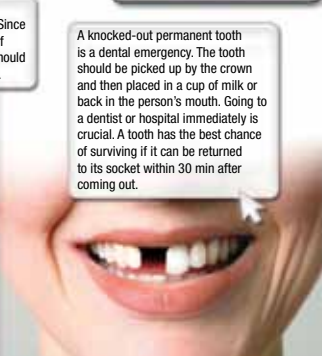
#### IN THE FIELD

Orthodontists are dental specialists who receive two more years of training after four years of dental school. Orthodontics is the branch of dentistry involving the correction of teeth and jaw alignment through the use of braces. Crooked teeth are more difficult to keep clean and, therefore, more likely to develop cavities. They may also interfere with proper chewing and facial development.





Dental hygienists clean, floss, and polish teeth. Since you only have one set of permanent teeth, you should take good care of them.



A knocked-out permanent tooth is a dental emergency. The tooth should be picked up by the crown and then placed in a cup of milk or back in the person's mouth. Going to a dentist or hospital immediately is crucial. A tooth has the best chance of surviving if it can be returned to its socket within 30 min after coming out.

# Science Notebook Answer Key: Chapter 13

## 13.4A Notebook Growing Your Vocabulary

Place the letter of the correct term from the Word Bank on the line under the description.

### Word Bank

- |                    |              |             |
|--------------------|--------------|-------------|
| a. pituitary gland | d. long bone | g. fracture |
| b. growth spurt    | e. gigantism | h. diabetes |
| c. hypothalamus    | f. obesity   | i. genetics |

the condition of being more than 20% overweight

1. f

a gland in the brain that releases growth hormone

4. a

increase in height and weight during puberty

7. b

a crack, shattering, or break in a bone

2. g

overproduction of growth hormone

5. e

a main factor that determines growth patterns, related to one's parents

8. i

a disease that involves blood sugar levels and the pancreas

3. h

a gland in the brain that signals the start of puberty

6. c

a part of the skeleton found in the arms and legs

9. d

## 13.4B Notebook Broken Bones Survey

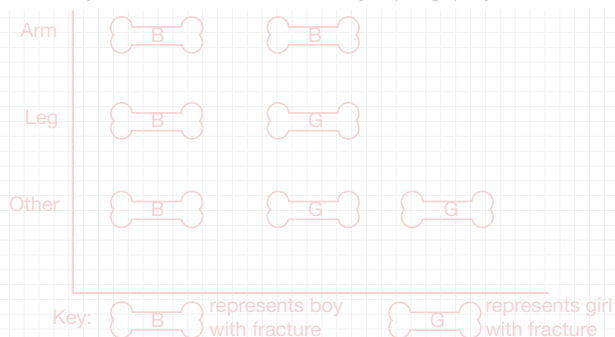
As your teacher polls the class, enter tally marks in the chart below.

Answers will vary.

site of fracture	number of boys	number of girls
arm	II	
leg	I	I
other	I	II

Brainstorm with your group the best way to illustrate this data with a pictograph. Then draw your pictograph below. Be sure to include a key that defines your symbols.

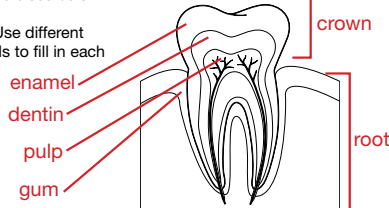
Hint: You may want to use more than one color for your pictograph symbols.



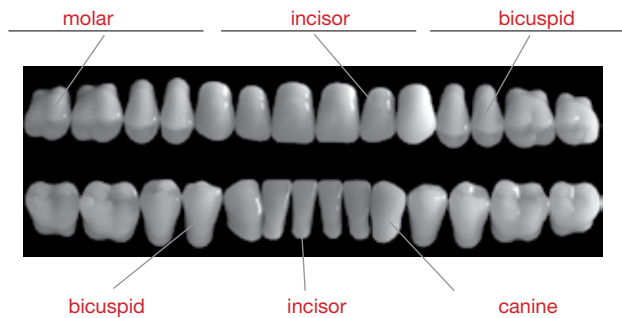
## 13.5A Notebook Teeth

Use your textbook to complete the exercises below.

1. Label the main parts of the tooth. Use different colored crayons, markers, or pencils to fill in each section of the tooth.



2. Write the different types of teeth on the lines.



3. Count the teeth above and write which teeth are not shown in the picture.  
wisdom teeth

4. About how old would a person with these teeth be? Example: probably a teenager

5. List three main functions of teeth.

- chew
- speak
- add shape and form to face

## 13.5B Notebook Oral Care Investigation



Goosey sweets can stick to the surface of your teeth for long periods of time. This microscopic image is of the sugar molecules that can cause plaque to form and build up. The sugar is digested by bacteria in your mouth and turned into acids that often decay tooth enamel.

Use the plaque disclosing tablets, a toothbrush, floss, and fluoride toothpaste to follow the directions below. The plaque disclosing tablets will show where plaque is present on your teeth.

### Question:

How clean are my teeth right now?

### Hypothesize:

1. How much plaque is in your mouth at this moment? Describe where you might see the tablets' color after chewing them.

I might see a little plaque on my molars near my gums.

### Test It:

- Chew one of the tablets and look in the mirror.
- Brush and floss your teeth.
- Chew another tablet and look in the mirror.

### Analyze and Conclude:

2. Describe what you saw when you looked in the mirror the first time. Tell how you felt about what you saw.

Example: I saw pink spots on my teeth near my gum. I didn't like the way my teeth looked.

3. Explain what you observed after you brushed and flossed your teeth. Is this what you expected?

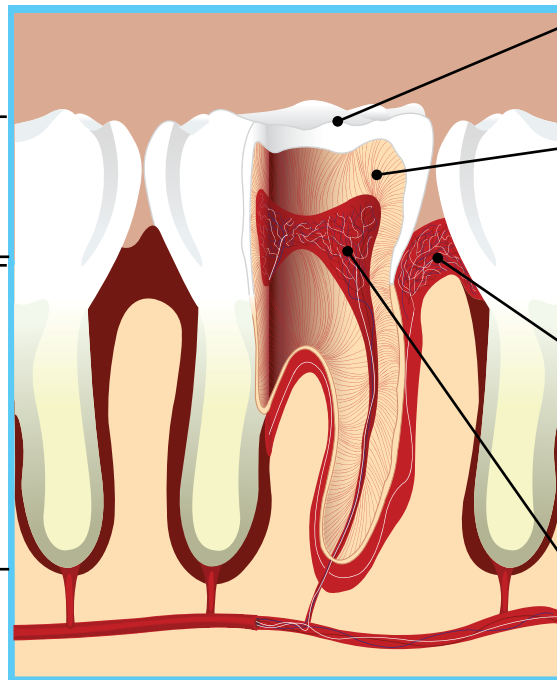
Example: Some of the pink spots were left, which I did not expect.

4. Will you change any daily habits based on what you have just learned? If so, what will you do differently and why? Example: I need to spend more time brushing and begin flossing my teeth.

## ***Tooth Structure***

**crown:** the visible part that sits above the gumline

**root:** the part that anchors the tooth to the jawbone



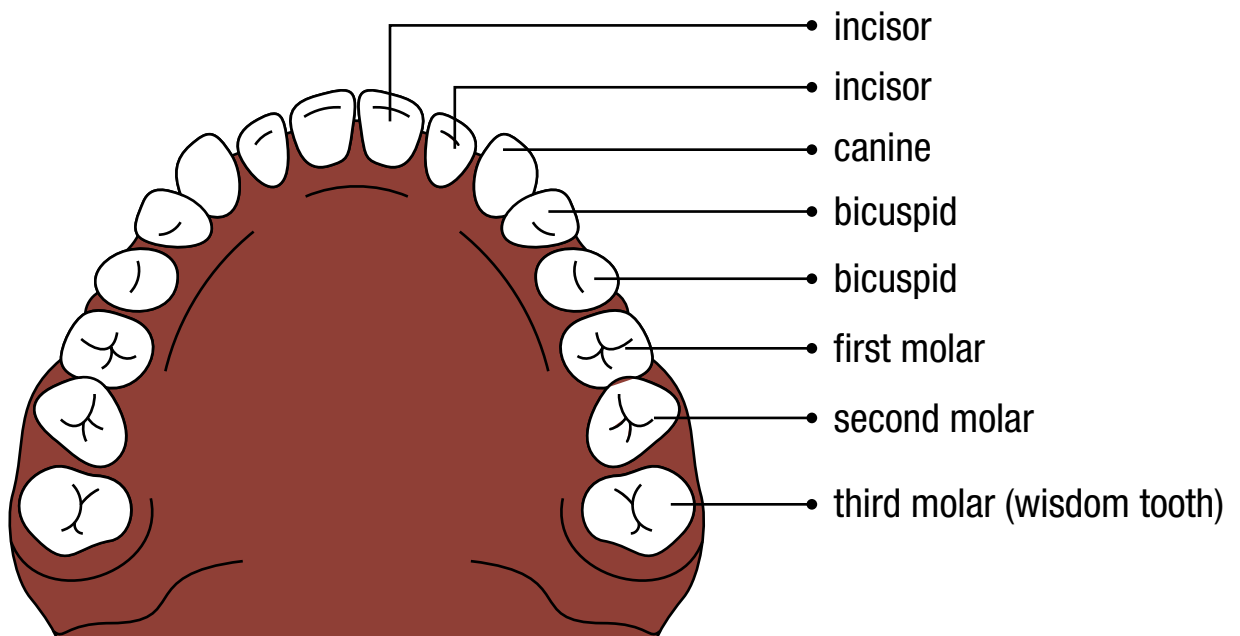
**enamel:** the outer covering of the tooth

**dentin:** the hard tissue located underneath the enamel

**gum:** the soft tissue around the bottom of the crown

**pulp:** the soft middle part of the tooth that contains blood vessels and nerves

## ***Permanent Teeth***



Most adults have 8 incisors, 4 canines, 8 bicuspids, and 12 molars. Very young children only have 20 primary teeth.