Chapter 14

Personal Care and Healthy Behaviors

Lesson 1
Healthy Skin, Hair, and Nails

Lesson 2
Care of Teeth and Mouth

Lesson 3
Eye Care

Lesson 4
Ears and Hearing Protection
Using Visuals. Many routine tasks, such as brushing and flossing your teeth or caring for your skin, are behaviors that positively affect your long-term health. What are some simple behaviors you can practice each day to protect your health?
Healthy Skin, Hair, and Nails

VOCABULARY
epidermis
dermis
melanin
sebaceous glands
sweat glands
melanoma
hair follicle
dandruff

YOU'LL LEARN TO
• Examine the structure of the skin.
• Identify the functions of the skin.
• Examine the effects of health behaviors on skin, hair, and nails.
• Relate the importance of recognizing warning signs that lead to the early detection of skin diseases and prompt individuals of all ages to seek health care.

Divide a sheet of paper into three columns labeled “Skin,” “Hair,” and “Nails.” Record how much time you spend over the course of one day on personal grooming in these areas. How do these personal grooming habits affect your health?

Beads of perspiration form on your forehead while you are exercising or when you are outside on a hot day. Your skin, the largest organ of your body, produces perspiration in order to help keep your body cool. Skin is the main organ of the integumentary system, which also includes hair, nails, and glands found in your skin. Your skin serves as a physical barrier between the outside world and your internal organs. It shields them from injury, and it is the first line of defense against pathogens entering your body.

Structure and Function of the Skin

The skin consists of two main layers, as shown in Figure 14.1. The epidermis is the outer, thinner layer of the skin that is composed of living and dead cells. The dermis is the thicker layer of the skin beneath the epidermis that is made up of connective tissue and contains blood vessels and nerves.

The epidermis is composed of several layers. The top layer consists of dead cells that are constantly being shed and replaced. In the deeper layers of the epidermis, living cells continually divide and replace dying cells, which are pushed toward the surface layer.

Washing your face regularly keeps skin free of dirt, bacteria, and perspiration. How does keeping your face and hands clean affect your overall health?
**Structure of the Skin**
The two main layers of skin, the epidermis and the dermis, are attached to bones and muscles by the subcutaneous layer, a layer of fat and connective tissue located beneath the dermis.

- **Epidermis**
- **Dermis**
- **Subcutaneous Layer**

Certain cells in the epidermis make a substance called keratin, a protein that toughens nails. These same cells also produce substances called lipids, which make your skin waterproof. This waterproofing helps the body maintain a proper balance of water and electrolytes. Other cells produce **melanin**, a pigment that gives the skin, hair, and iris of the eyes their color—the more melanin, the darker the skin. People with fair skin have less melanin and are at risk of damage from harmful ultraviolet (UV) radiation.

The dermis is a single thick layer composed of connective tissue, which gives the skin its elastic qualities. **Sebaceous glands**, structures within the skin that produce an oily secretion called sebum, are also found in the dermis. Sebum helps keep skin and hair from drying out.

Blood vessels in the dermis supply cells with oxygenated blood and nutrients and facilitate the removal of cellular wastes. These blood vessels also function in temperature regulation. When body temperature begins to rise, the blood vessels in the skin dilate. This allows heat to escape through the skin’s surface. If body temperature begins to drop, the blood vessels in the skin constrict, decreasing the amount of blood and heat loss at the skin’s surface. **Sweat glands**, structures within the dermis that secrete perspiration through...
ducts to pores on the skin’s surface, also are involved in temperature regulation. Sweat glands produce perspiration on the surface of the skin. Body heat is lost as the sweat evaporates.

Touch a hot stove, and your hand immediately pulls back. Why? The skin is a major sense organ. Nerve cells in the dermis act as receptors, which are stimulated by changes in the outside environment. These receptors enable you to feel sensations such as pressure, pain, hot, and cold.

Healthy Skin

Keeping your skin healthy should be an important part of your daily routine. Wash your face every morning and evening with mild soap and water. Daily washing, bathing, or showering helps remove and slow the growth of bacteria that cause body odor. Avoid touching your face with your hands. This can introduce new bacteria to the skin’s surface. Carefully choose personal skin care products, such as moisturizers, shaving cream, or cosmetics, to help keep your skin from becoming irritated or having an allergic reaction. Follow a well-balanced diet that is rich in vitamins and minerals. Foods such as milk, green and yellow vegetables, and liver are rich in vitamin A—a vitamin that is particularly important for healthy skin.

Skin and the Sun

Understanding the effects of UV radiation on the skin and knowing some preventive behaviors can help you protect your skin now and throughout your life. When skin is exposed to UV rays, whether from the sun, a tanning booth, or another source, melanin production is increased. This self-protective mechanism is the skin’s attempt to protect its cells from UV rays. Fair-skinned people whose skin has little melanin, and thus little natural protection from UV radiation, burn in the sun. People with more melanin will tan. The symptoms of sunburn will disappear, and a tan will fade. The long-term effects, however, are cumulative and the damage is permanent. Prolonged exposure to UV rays damages the genetic material in skin cells and causes it to undergo changes. These changes can eventually result in the formation and growth of cancerous cells. Exposure to UV radiation is the leading cause of certain types of skin cancer. UV radiation also breaks down the elastic fibers that support your skin and allows it to be flexible yet retain its shape. The skin will become wrinkled or hard and leathery with repeated exposure to UV radiation.

**Q&A**

What are UVA and UVB radiation?

Ultraviolet rays come in different wavelengths—UVA and UVB. UVB rays cause most sunburn; thus, most sunscreens block these rays. However, UVA rays penetrate the skin more deeply than UVB, causing more damage. Now that dermatologists know about UVA, they recommend sunscreens that block both UVA and UVB rays.
PROTECTING YOUR SKIN FROM UV RAYS

Protecting your skin from the damaging rays of the sun is as simple as adopting a few health behaviors.

► Always wear sunscreen on exposed areas of skin. Use an SPF 15 or higher sunscreen that blocks both UVA and UVB rays. Apply it 15 to 30 minutes before going outside. Use it even on cloudy days and while participating in winter sports.

► Wear protective clothing. Hats, long-sleeved shirts, and long pants can help prevent sun exposure. Don’t forget your sunglasses. Exposure to UV rays can damage the eyes, causing burns, cataracts, and even blindness. Avoid outdoor activities when sunlight is most intense, between 10:00 a.m. and 4:00 p.m.

Body Piercing and Tattooing

Ear piercing and tattooing are practices that have been around for thousands of years. Unlike decorating the body with makeup or changing hair color, however, these changes to the body are permanent, and both carry potential health risks.

Both procedures result in the physical barrier of the skin being broken, so the possibility of bacteria or viruses entering the body increases. Bacteria that are normally found on the surface of the skin can cause a localized infection if they enter deeper layers of tissue. New bacteria can be introduced through nonsterile needles. Of special concern is the transfer of bloodborne pathogens such as the viruses hepatitis B, hepatitis C, and HIV through nonsterile needles used during tattooing.

Tattooing and piercings can threaten your social health as well. Imagine dating someone who is tattooed with the name of a past boyfriend or girlfriend. Body piercings may make a poor impression on a future employer or in-law.

A tattoo can be removed by using a laser procedure. However, the procedure can cause skin discoloration and infection and can leave scars. Consider the long-term consequences when you think about tattooing and piercing.

For more information on these communicable diseases, see Chapter 24, page 638. For more information on HIV and other sexually transmitted diseases, see Chapter 25, page 646.
Skin Problems

Many problems of the skin are not life threatening. They can, however, affect a person’s self-image. Some common skin problems include:

- **Acne**, a common skin problem among teens, is caused when pores in the skin get clogged and the sebum produced by sebaceous glands cannot reach the skin’s surface. One type of bacteria normally found on the skin thrives in the trapped sebum. The surrounding area becomes inflamed, and pus may form. Washing your face gently twice a day, applying over-the-counter treatment creams, and avoiding the use of oily products can help control breakouts. Touching and picking at acne only aggravates the condition and may cause scarring.

- **Warts** are caused by a virus that infects the surface layers of the skin. They are usually noncancerous growths that can appear anywhere on the body, but they are most commonly found on the hands, feet, and face. The virus that causes warts can be acquired through contact with infected skin.

- **Vitiligo** is a skin condition in which patches of skin have lost all pigment. For reasons not yet known, the melanin-producing cells in the affected areas of the skin are destroyed. With no melanin, these patches of skin are extremely susceptible to burning when exposed to UV light. Sunscreen should be applied or protective clothing should be worn over these areas to avoid severe sunburn. Although treatments involving repigmentation are available, there is no known cure for vitiligo.

- **Boils** form when hair follicles become infected with bacteria that are normally found on the surface of the skin. The tissues around a boil become inflamed, and pus forms. Treatment can include draining the pus and taking a course of antibiotics. Some boils may heal without treatment. Never squeeze or burst a boil because this can spread the infection. Keeping skin clean can help prevent boils.

- **Moles** are spots that contain extra melanin. They can appear anywhere on the body; most moles are harmless. Certain types of moles may develop into melanoma, the most serious form of skin cancer, which can be deadly. Early detection of warning signs and treatment are critical to controlling the spread of skin cancer throughout the body. Monitoring the appearance of moles, as described in Figure 14.2, and seeking health care by reporting any changes to a dermatologist are essential to the early detection of melanoma.
Your Hair

Except for the palms of your hands and the soles of your feet, you have hair on almost every skin surface. You have between 100,000 to 200,000 hairs on your head alone! Although hair itself is composed of dead cells that contain keratin, living cells in the epidermis make new hairs and cause hair growth. A hair follicle is a structure that surrounds the root of a hair. Hair helps protect the skin, especially the scalp, from exposure to UV radiation. The eyes are protected from dust or other particles by the eyebrows and eyelashes. Hair also reduces the amount of heat lost through the skin of the scalp.

The foundation of healthy hair is a well-balanced diet. Hair can become thin and dry without proper nutrients. Regular shampooing is a must to keep your hair healthy. Daily brushing keeps dirt from building up and helps distribute the natural hair oils evenly. Limit the use of treatments such as permanents, dyes, or bleach. Overexposure to these harsh chemicals can cause hair to become dry and brittle.

Hair Problems

Normally, oil produced by sebaceous glands protects the skin from drying out and keeps hair soft and shiny. Dandruff is a condition that can occur if the scalp becomes too dry and dead skin cells are shed as sticky, white

THE ABCDs of Melanoma

Regularly checking the appearance of your moles for warning signs is important for the early detection of melanoma.

A = Asymmetry
An imaginary line drawn through the center of the mole does not produce matching halves.

B = Border irregularity
Noncancerous moles have smooth edges. Suspect moles often have irregular edges.

C = Color
Look for moles that are intensely black, possibly with a bluish tint, or that have an uneven color.

D = Diameter
Check for moles that are wider across than a pea.

Give your hair daily attention to keep it clean and healthy. How do you choose hair care products that are right for your hair?
flakes. Dandruff can usually be treated by washing hair with an over-the-counter dandruff shampoo. If itching or scaling persists, consult a health care professional.

Head lice are tiny parasitic insects that live in the scalp hair of humans. They feed on blood by biting through the skin of the scalp. Lice are transmitted mainly by head-to-head contact and can infect anyone. They can also be acquired by using objects such as combs or hats that have been used by an infected person. These insects can be eliminated by washing hair with a medicated shampoo that kills the organisms. Washing sheets, pillowcases, combs, and hats in hot water with soap can help prevent the spread of head lice or a repeat infection.

Your Nails

Your fingernails and toenails are made of closely packed dead cells that contain keratin. Nails function to protect and support the tissues of the fingers and toes. Keeping your nails healthy should be part of your daily routine. Good care includes keeping nails clean and evenly trimmed. Use a nail file to shape and smooth nails, and keep cuticles pushed back. Trim toenails straight across and just slightly above skin level to reduce the risk of infection and ingrown nails.

Lesson 1 Review

Reviewing Facts and Vocabulary

1. Define the terms epidermis and dermis.
2. Why is early detection of skin cancer important to your overall health?
3. What is a hair follicle?

Thinking Critically

4. Applying. Consider your daily activities in the sun. Compose a list of ways you can protect your skin from the sun for each activity.
5. Synthesizing. Explain how your overall appearance makes a statement about how you care for your skin, hair, and nails.

Applying Health Skills

Decision Making. With a partner, role-play deciding whether to get a tattoo. Include the steps of the decision-making model in a discussion on why someone might want a tattoo and discuss the consequences to physical health. Include some dialogue on tattoo removal.

INTERNET RESOURCES

Find information about the complexities of tattoo removal in Health Updates at health.glencoe.com.
Maintaining healthy teeth is important not only for your appearance but also for your overall health. Your teeth allow you to chew foods properly and help form the shape and structure of your mouth. In this lesson you will learn about the structure and function of the teeth and how to prevent tooth decay.

Your Teeth

You may remember losing your teeth when you were younger, only to have new, permanent teeth grow in their place. Although your permanent teeth have different shapes, depending on their exact role in chewing food, they all have the same structure.

Parts of a Tooth

The periodontium (per-ee-oh-DAHN-tee-uhm) is the area immediately around the teeth. It is made up of the gums, periodontal ligament, and the jawbone. The structures of the periodontium support the teeth and hold them in place.

A tooth is made up of three main parts: the crown, neck, and root, as shown in Figure 14.3 on page 368. The crown is the visible portion of the tooth. It is covered with enamel, a hard substance made of calcium that protects the teeth.
Beneath the enamel is dentin, a layer of connective tissue that contributes to the shape and hardness of a tooth and acts as a barrier to protect the pulp. The **pulp** is the tissue that contains the blood vessels and nerves of a tooth. Pulp extends into the root canal and provides nourishment to the tooth.

**Healthy Teeth and Mouth**

Thorough, regular oral hygiene is necessary for healthy, clean teeth. One of the main threats to the health of your teeth is the bacteria that inhabit your mouth and live on the sugar found in foods you eat.

**Plaque** is a sticky, colorless film that acts on sugar to form acids that destroy tooth enamel and irritate gums. As plaque coats a tooth, it prevents your saliva, which has substances that protect teeth from bacteria, from reaching the tooth surface. In areas where plaque accumulates, bacteria thrive and the acids from the bacteria break down enamel. If the breakdown of enamel continues, a hole, or cavity, is formed in a tooth. The tooth can continue to decay to the pulp and may have to be removed if left untreated.

Tooth decay and other diseases can be easily prevented by practicing good oral hygiene. Brushing teeth after eating removes plaque from the surface of the teeth, before bacteria can produce the acid that harms teeth. Flossing between teeth removes plaque in areas that cannot be reached with the bristles of a toothbrush.
Regular visits to a dental care professional are the next most important part of maintaining dental health and ensuring early detection of dental problems. These professionals will clean your teeth and examine them for warning signs of decay.

Following a well-balanced diet that includes foods containing phosphorus, calcium, and vitamin C helps keep your teeth strong and your gums healthy. Reducing the number of sugary snacks eaten between meals also helps protect your teeth from decay. Avoid all tobacco products. These items stain teeth and cause gums to recede. They also increase the risk of oral cancer.
Applying Health Skills

Accessing Information. Research library or Internet resources to learn more about how braces can help a person with misalignment of the jaw or malocclusion. Collect brochures to share with the class.

INTERNET RESOURCES
Use Web Links at health.glencoe.com to get more information on how braces work and options for teens who wear braces.

Fluoride has been found to be an effective way to reduce tooth decay. Fluoride can be applied to teeth in several ways.
- Many communities add fluoride to water supplies.
- Brushing twice a day with a fluoride toothpaste applies fluoride directly to the teeth.
- Fluoride treatments can be applied directly to teeth in a dental office or be prescribed for home use.

reviewing Facts and Vocabulary
1. Define the terms periodontium and pulp.
2. How does plaque affect the teeth?
3. Examine the effects of health behaviors and list three that help prevent tooth decay and periodontal disease.

Thinking Critically
4. Evaluating. How can early detection of gum disease affect your long-term health?
5. Synthesizing. How might you be able to distinguish between a person who practices good oral hygiene and one who does not?

Problems of the Teeth and Mouth
Many oral problems are caused by poor hygiene. Others result from poorly aligned teeth.

- Halitosis, or bad breath, can be caused by eating certain foods, poor oral hygiene, smoking, bacteria on the tongue, decayed teeth, or gum disease. If halitosis is caused by tooth decay or disease, treatment by a dental professional is needed.

- Periodontal disease, an inflammation of the periodontal structures, is caused by bacterial infection. Often called gum disease, periodontal disease begins with the buildup of plaque. The hard, crustlike substance formed when plaque hardens is tartar. Plaque and tartar cause the gums to become irritated and swollen. In this early stage, called gingivitis, the disease is reversible through regular, thorough brushing and flossing. Early detection is important since, left untreated, periodontal disease can destroy the bone and tissue that support the teeth.

- Malocclusion means “bad bite.” Sources of a malocclusion include extra teeth, crowded teeth, and the misalignment of the upper and lower jaws. Malocclusion can lead to decay and disease, and it can affect a person’s speech and ability to chew. Some malocclusions can be corrected by wearing braces, which reposition teeth by exerting pressure on them.

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Lesson 3

Eye Care

Vocabulary
- lacrimal gland
- sclera
- cornea
- choroid
- retina

You’ll Learn To
- Identify the parts of the eye.
- Understand how the eye forms visual images.
- Examine the effects of health behaviors on the eye.
- Describe different types of eye problems.

Quick Start

Make a list of activities during which some type of eye protection should be worn. Consider both recreational and sport activities, such as playing hockey, and tasks such as mowing the lawn.

More than 70 percent of the sensory information your brain receives comes to it by way of your eyes. The function of the eye is to gather light. The images formed in the eye are sent to the brain, which interprets those images. The amount of light that enters the eye is controlled by the size of the pupil. When light hits the retina, light-sensitive cells are stimulated and an image is formed.

Your Eyes

Your eyes sit in bony sockets, called orbits, in the front of your skull. A layer of fat surrounds each eyeball and cushions it inside its socket. The eyebrows, eyelashes, and eyelids protect the eyes from foreign particles and bright light. Each eye has a group of structures that make and allow drainage of tears. One of these structures is the lacrimal gland, the gland that secretes tears into ducts that empty into the eye. As you blink, tears are moved across the surface of the eye. On average, most humans blink about 6,205,000 times a year! Tears keep the surface of the eyeball moist and clear of foreign particles. Tears consist of water, salts, and mucus that protect the eye against infection.

Like the click of a camera lens, in the blink of an eye images are formed in the process of vision. What structures help protect the eye?
**The Eye**

The optic nerve connects the eye with the brain to produce images.

**Parts of the Eye**

The eye is made up of two main parts, shown in Figure 14.4, the optic nerve and three layers of the eyeball wall.

- The outermost layer of the eye is made up of the sclera and the cornea. The **sclera** (SKLEHR-uh), the tough, white part of the eye, is composed of tough, fibrous tissue that protects the inner layers of the eye and supports and shapes the eyeball. At the front of the eye is the cornea. The **cornea** is a transparent tissue that bends and focuses light before it enters the lens.

- Within the middle layer of the eyewall is the **choroid** (KOHR-oid), a thin structure that lines the inside of the sclera. Also within the middle layer of the eye is the iris, the colored portion of the eye that contains the pupil. The pupil is the hole through which light reaches the inner eye. The muscles of the iris control the size of the pupil. In bright light the pupil constricts; in dim light it enlarges to let in more light.

- The **Retina** is the light-sensitive membrane on which images are cast by the cornea. The light-sensitive cells in the retina are called rods and cones, each named for its basic shape. Rods are very sensitive to light and allow us to see in dim light. Cones function in bright light and allow us to see color. When light stimulates these cells, a nerve impulse travels to the brain via the optic nerve, which is located at the back of the eye.
Behind the iris and the pupil is the lens of the eye. Like the cornea, the lens is transparent and functions to refine the focus of images on the retina. The area between the cornea and the lens is filled with a watery fluid called \textit{aqueous humor}. Aqueous humor provides nutrients to the structures of the eye. Between the lens and retina is a cavity that is filled with a gelatin-like substance called \textit{vitreous humor}. Vitreous humor helps the eyeball stay firm.

**Vision**

Image formation begins as light passes through the cornea, pupil, and lens and reaches the retina. Light rays are first focused by the curved cornea, and then the focus is refined by the lens. Muscles attached to the lens contract or relax to change its shape. The lens becomes more curved to focus the eye on a near object; it becomes flatter to focus the eye on a distant object. Light stimulates rods and cones in the retina, and a \textit{nerve impulse} is transmitted to the brain through the optic nerve. In humans both eyes focus on the same set of objects. This allows our brains to interpret depth and judge distances.

If your vision is normal, a sharp image will be produced on the retina. The sharpness of vision can be measured by reading an eye chart. If you have 20/20 vision, you can stand 20 feet away from an eye chart and read the top eight lines. If you have 20/60 vision, you can see the chart from 20 feet the way a person with normal vision would see it from 60 feet. In other words, a person with 20/60 vision is “nearsighted.” Reading an eye chart measures only one aspect of vision. Other components of vision include eye coordination, peripheral or side vision, and depth perception.

**Healthy Eyes**

There are several health behaviors you can practice every day to help keep your eyes healthy.

- **Follow a well-balanced diet.** Include foods that contain vitamin A. Deficiency in vitamin A could result in night blindness, reducing a person’s ability to see well in dim light.

- **Protect your eyes.** Wear safety goggles or a mask when participating in activities in which the eyes could be damaged. Keep dirty hands or other objects away from your eyes to reduce the risk of eye infections and injury. Wear sunglasses that block UV light, and never look directly into the sun or bright lights.

- **Have regular eye exams.** Routine eye exams allow certain eye diseases to be detected and treated in their early stages.
► **Rest your eyes regularly.** Take regular breaks while working on the computer or when reading. Looking up and away from close work every 10 minutes or so reduces eyestrain.

**Eye Problems**

Eye problems can occur, despite good health practices. These problems can be classified as vision problems or diseases of the eye.

**Vision Problems**

Two common vision problems reflect the inability of the eye to properly focus light on the retina. *Myopia*, or nearsightedness, results in a person not being able to see distant objects clearly. For a person diagnosed with *hyperopia*, or farsightedness, distant objects can be seen clearly; however, near objects appear blurry. These conditions can be corrected with glasses or contact lenses. In recent years, laser surgery has become an option for correcting vision problems. In this procedure, a laser is used to reshape the cornea in order to change its focusing power. Other vision problems include:

► **Astigmatism.** Because of an irregularly curved cornea or lens, the eye is not able to focus properly, resulting in images that appear blurry. This condition can usually be corrected with glasses, contact lenses, or laser surgery.

► **Strabismus.** If the muscles of the eyes are weak or don’t function properly, strabismus may result. One or both eyes may appear to be off-center, turned inward, or turned outward.

Treatment includes corrective lenses, vision therapy, or surgery.

**Diseases of the Eye**

Diseases of the eye range from easily treated infections such as sties and pinkeye to conditions that can threaten sight. A sty is an inflamed swelling of a sebaceous gland near the eyelash. *Conjunctivitis*, also known as pinkeye, is an inflammation of the conjunctiva, a thin membrane that covers the sclera lining of the eyelids.

A serious threat to vision results from a detached retina. This occurs if a portion of the retina is separated from the choroid as a result of natural aging or from an injury. Warning signs include blurred vision or seeing bright flashes of light. Treatment includes using a laser to repair a tear or surgery to reattach the retina. Three other serious eye diseases are described on the next page.
Applying Health Skills

**Accessing Information.** Research various community health services that provide vision screenings for all ages, such as Unite for Sight. Make a pamphlet that can be used as a reference on the availability and costs of these community services.

**Presenting Software**

Using presentation software, you can include art and graphics to make an electronic slideshow. See health.glencoe.com for tips on how to use presentation software.

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**Lesson 3 Review**

**Reviewing Facts and Vocabulary**

1. List the structures that make up the three layers of the eyeball wall.
2. Give three examples of health behaviors you can practice to care for your eyes.
3. Explain the difference between myopia and hyperopia.

**Thinking Critically**

4. **Analyzing.** How might having night blindness affect a person’s activities?
5. **Applying.** How could you demonstrate the effect of cataracts on vision?

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**Glaucoma.** The pressure inside the eye is normally maintained by the aqueous and vitreous humor. In glaucoma, abnormally high pressure leads to irreversible damage of the retina and the optic nerve and can result in loss of sight. Regular eye checkups can lead to early detection and treatment to control the condition.

**Cataracts.** In this condition the normally transparent lens becomes cloudy. The formation of a cataract interferes with the lens’ ability to focus light rays, making images appear blurry or vision seem foggy. Treatment of a cataract is typically the surgical removal of the old lens and replacement of it with a new, artificial lens.

**Macular Degeneration.** This condition occurs when the light-sensing cells of the macula, the portion of the retina directly opposite the lens, begin to malfunction. Macular degeneration is the leading cause of vision loss for individuals over 60. There is no cure, and treatment is limited.

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**This simple test is used to identify people with color blindness. What other types of vision problems can be identified through regular eye exams?**
When you attend a sporting event, you can hear the crowd cheering, whistles blowing, athletes yelling, and music playing. All of these stimuli add to the excitement and perhaps to your enjoyment of the game. Your ears and brain, working together, allow you to hear and interpret sounds and form a response, such as turning your head when you hear a friend calling your name.

A health care professional will check your ears in a routine physical examination.

List any situations you've experienced in the last week that involved exposure to loud noises. Review your list, and then explain how you can protect your ears from the damaging effects of loud noise.

**Parts of the Ear**

The ear has three main sections, each with its own unique structures. The parts of the ear are shown in Figure 14.5.

- **The Outer Ear.** The outer ear begins with the visible part of the ear, the auricle. The auricle helps channel sound waves into the **external auditory canal**, a passageway about one inch long that leads to the remaining portion of the outer ear, the eardrum. The external auditory canal is lined with tiny hairs and glands that produce wax to protect the ear from dust and foreign objects. The eardrum, also called the tympanic membrane, is a thin membrane that acts as a barrier between the outer and middle ear.
INNER, MIDDLE, AND OUTER EAR

The ear has two functions: hearing and balance. Identify the parts of the ear involved in hearing.

The Middle Ear. Directly behind the eardrum are the auditory ossicles, three small bones linked together that connect the eardrum to the inner ear. The auditory ossicles are the smallest bones in the body. The middle ear is connected to the throat by the eustachian tube. This tube allows pressure to be equalized on either side of the eardrum when you swallow or yawn.

The Inner Ear. The inner ear, or labyrinth, consists of a network of curved and spiral passages with three main parts. The cochlea is the area of hearing in the inner ear. The vestibule and semicircular canals are where balance is controlled.

Hearing and Balance

When receptors in your inner ear are stimulated by a sound wave, a nerve impulse is sent to your brain. Your brain interprets the impulse as a sound. Sound waves enter the external auditory canal and cause the eardrum to vibrate. The vibrations cause fluid in the cochlea to move, which stimulates receptor cells to send a nerve impulse to the brain where sounds are interpreted. Receptor cells in the vestibule and the semicircular canals send messages to the brain about your sense of balance. Tiny hairs located in the ear sense movement and send nerve impulses to the brain. The brain then signals muscles to make adjustments to maintain balance.
Should Noise Levels at Concerts Be Controlled?

A major concern at concerts is the risk of hearing loss from exposure to loud music. Although outdoor sound levels are monitored by law enforcement to prevent a public nuisance, indoor sound levels usually go unchecked. Should indoor sound levels at public events be regulated?

Viewpoint 1: Kyle T., 16
From what I’ve learned about hearing loss, I feel a limit on indoor noise at concerts should be set. It’s impossible to talk to anyone with the music so loud. I have trouble hearing for hours afterward. I’d like to enjoy the music without worrying that my hearing might be permanently damaged. No wonder hearing loss among musicians is so high!

Viewpoint 2: Starr L., 16
I agree that loud noise can affect your hearing, but I think passing a law is extreme. Most hearing loss can be avoided if people use common sense. For example, you don’t have to sit or dance right in front of the speakers. If it’s really loud, I think dance organizers should make earplugs available. A lot of musicians and DJs wear earplugs, and they hear the music just fine.

Activities
1. Do you think sound levels inside establishments should be monitored to protect against hearing loss? Why or why not?
2. Should earplugs be made available at indoor events? Would teens use them?

Health Behaviors for Healthy Ears

To keep your ears healthy, clean them regularly and always protect the outer ear from injury and extreme cold. Wear protective gear such as batting helmets when playing sports. A hat that covers both the auricles and the earlobes should be worn in cold weather. Keep foreign objects, including cotton-tipped swabs, out of the ear. Ear infections can damage ear structures and should be treated immediately by a health care professional. Have your ears examined and your hearing tested to detect any problems.

An important step you can take to protect your hearing is to avoid loud noise. Exposure to loud noise over time can lead to temporary, and sometimes permanent, hearing loss or deafness.

deafness For more information on deafness, see Chapter 26, page 696.
Problems of the Ear

Hearing loss can be divided into two categories: conductive and sensorineural.

Conductive Hearing Loss

In conductive hearing loss, sound waves are not passed from the outer to the inner ear, usually because of a blockage or injury to the inner ear. For example, middle-ear infections may lead to rupture of the eardrum. Persistent buildup of fluid within the middle ear, often caused by infection, is most common in children.

Sensorineural Hearing Loss

Sensorineural hearing loss results from damage to the cochlea, the auditory nerve, or the brain. Tinnitus is a condition in which a ringing, buzzing, whistling, roaring, hissing, or other sound is heard in the ear in the absence of external sound. Tinnitus can occur as a result of natural aging, health conditions such as high blood pressure, or overexposure to loud noise. To protect your ears from this condition, lower the volume of the source of noise. Wear earplugs in noisy environments, when operating machinery, and at loud concerts or sporting events. Limit the length of time you are exposed to loud noise to reduce the chance of permanent damage.

Reviewing Facts and Vocabulary

1. Identify the three main parts of the ear and the structures that can be found in each part.
2. Define the term tinnitus.
3. Examine the effects of health behaviors on hearing: What effect can loud noises have on hearing?

Thinking Critically

4. Analyzing. What activities might cause the inner ear to send mixed messages to the brain and result in dizziness and nausea?
5. Synthesizing. Under what circumstances might you need to protect yourself from sensorineural hearing loss? How might you do so?

Applying Health Skills

Advocacy. Work with classmates to create a campaign that raises awareness about hearing loss. Brainstorm ways teens can reduce exposure to damaging noise levels and protect their hearing. Use effective strategies to promote hearing protection.

WORD PROCESSING Use a word-processing program to record ideas and plan your campaign. See health.glencoe.com for tips on how to get the most out of your word-processing program.
Sunscreen 101: The Basics

To decode the information on a sunscreen bottle, just look for a few key words.

- **There are two types of sunscreens:** chemical blockers (key ingredient: avobenzone, also called Parsol 1789) absorb ultraviolet (UV) rays; and physical blockers (key ingredients: titanium dioxide, zinc oxide) create a layer on top of the skin that deflects UV rays. Dermatologists recommend using either type.

- **There are two kinds of UV rays:** UVB (which causes sunburn and cancer) and UVA (which causes wrinkles). “A high sun protection factor (SPF) is good, but SPF only measures the UVB coverage,” says Yohini Appa, Ph.D., an executive at a major cosmetics company. “The most important thing to look for on the label is ‘broad spectrum protection,’ which means protection against both UVA and UVB rays.”

- **“Anything under an SPF 15 is like wearing sunglasses with no lenses. It’s not adequate protection,”** says dermatologist Patricia Wexler, M.D., who recommends at least an SPF 30 for extensive outdoor activity.

- **To cover your entire body,** use one ounce of sunscreen (so a 4-ounce bottle equals four applications). “If you don’t use enough, you’re not getting the level of SPF protection on the label,” explains Appa, who recommends increasing the SPF level and applying two coats to ensure complete coverage.

- **“Waterproof” doesn’t mean you don’t need to reapply at all.** Do so every two hours or after an hour in the water.

- **Sunscreens can’t guard against every problem**—dehydration, for example. “The sun’s heat depletes the natural moisture of the skin,” says Wexler. To replenish what you’ve lost, drink lots of water. When you get out of the sun, apply a lightweight oil or moisturizer that contains nourishing, skin-soothing ingredients like arnica, shea butter, or aloe vera. If you have a severe sunburn accompanied by swelling or blistering, consult a doctor immediately.

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**TIME to THINK... About Sunscreen**

Imagine you’re at the beach. Over the course of six hours, you cover yourself adequately three separate times from an 8-ounce tube of sunscreen. (Check back to the article for guidelines on adequate coverage.) How many total ounces of sunscreen must you use over those six hours? What percentage of the tube’s contents will you use?
1. **Communicating.** A young child refuses to have a bath or wash his or her hair. How can you encourage him or her to change this behavior? *(LESSON 1)*

2. **Goal Setting.** Set a goal to brush and floss your teeth every morning and every evening. Use the goal-setting steps to help you identify behaviors that will help you meet this goal. *(LESSON 2)*

3. **Accessing Information.** Imagine that you have just been told that you need corrective lenses. Research the advantages and disadvantages of glasses and contact lenses. Make a chart that lists the pros and cons of each. Use this information along with the decision-making steps to determine which you would prefer. *(LESSON 3)*

4. **Communicating.** You suspect that a close family member is experiencing hearing loss, but he or she is not asking for help. What clues might make you think this is the case? How can you talk to this person about what is happening? *(LESSON 4)*

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**Dental Hygienist**

Regular dental care includes more than just seeing the dentist. Most dental offices rely on dental hygienists to provide some routine dental care. A dental hygienist can take your dental and medical history, clean your teeth, and teach you how to achieve and maintain good oral health.

To become a dental hygienist, you will need a high school diploma or its equivalent. After high school, hygienists complete a two-year training program in which they earn an associate’s degree. You can find out more about this and other health careers by clicking on Career Corner at health.glencoe.com.

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**Parent Involvement**

**Advocacy.** With a parent or guardian, learn more about the services available for hearing-impaired individuals in your community. Are there any services that are unavailable in your community? Discuss with family members the possible reasons for this lack. What can you do to raise awareness about services for the hearing impaired?

**School and Community**

**Volunteering.** Locate an agency that works with individuals with hearing or sight impairments. Ask whether there are any opportunities for volunteer work within the agency. Report to your class on what you have learned.
EXPLORING HEALTH TERMS

Lesson 1
Match each definition with the correct term.

- dermis
- epidermis
- dandruff
- hair follicle
- melanin
- sebaceous glands
- sweat glands
- plaque

1. A pigment that gives skin, hair, and eyes their color.
2. Structures within the skin that produce perspiration through ducts to pores on the skin's surface.
3. Structures within the skin that produce sebum.
4. A condition that can occur if the scalp becomes too dry and dead skin cells are shed as sticky, white flakes.

Lesson 2
Replace the underlined words with the correct term.

- periodontium
- pulp
- tartar
- plaque
- periodontal disease

5. Tartar is a sticky, colorless film that acts on sugar to form acids that destroy tooth enamel and irritate gums.
6. Periodontium is completely preventable.

Lesson 3
Fill in the blanks with the correct term.

- choroid
- cornea
- lacrimal gland
- retina
- sclera

The outer layer of the eyewall consists of the ( _7_ ), the white part of the eye, and the ( _8_ ), the transparent tissue in the front of the eye. The ( _9_ ) is the inner layer of the eyewall.

Lesson 4
Match each definition with the correct term.

- auditory ossicles
- labyrinth
- external auditory canal
- tinnitus

10. A passageway in the outer ear that leads to the eardrum.
11. Three small bones in the middle ear.
12. Another name for the inner ear.

RECALLING THE FACTS
Use complete sentences to answer the following questions.

1. Explain how the skin protects your body.
2. List three steps you can take to keep your skin healthy.
3. Why may getting a tattoo be hazardous to your health?
4. Name two functions of the teeth.
5. How do the foods you eat and your eating habits affect the health of your teeth?
7. How do the lacrimal glands contribute to the health of your eye?
8. Explain how the iris and pupil regulate the amount of light entering the inner eye.
9. Describe what 20/60 vision means.
10. What is the function of the eustachian tube?
11. List two actions you can take to keep your ears healthy.
12. What are three causes of hearing loss?
THINKING CRITICALLY

1. **Applying.** What strategies can you use to keep track of changes in the appearance of moles on your skin?

2. **Analyzing.** How could having advanced stages of periodontal disease affect other areas of your life?

3. **Evaluating.** Resting the eyes while reading or working on the computer can help reduce eyestrain. During which other activities should you periodically rest your eyes?

4. **Applying.** You have developed an ear infection from swimming. Examine the effects of health behaviors on the health of the ears. What precautions could you take to prevent reinfection?

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TAKS Test Practice

Read the paragraphs below and then answer the questions.

**Getting Hooked on Exercise**

(1) Many people start exercising in order to lose weight or look better, but once they begin a regular exercise program they find that exercising makes them feel good as well as look good. (2) Here are two simple steps to help you “get hooked” on exercise.

(3) Schedule your workout in the same way you schedule any important activity or part of your daily life. (4) Morning works best for most people. (5) For some, later in the afternoon is the time when they feel the need for exercise. (6) The important thing is to find the best time for you and stick to it.

(7) Second, discover which exercises you enjoy which ones you are best at, and which ones challenge you. (8) Then keep up with them. (9) Learn your limitations and avoid exercise that is beyond your strength or too tedious.

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1. What change, if any, should be made to sentence 3?
   - A) Insert the word *First* at the beginning of the sentence.
   - B) Delete the entire sentence.
   - C) Change *important* to *unimportant*.
   - D) Make no change.

2. What change, if any, should be made to sentence 7?
   - A) Change *discover* to *discovering*.
   - B) Insert a comma after *enjoy*.
   - C) Change *exercises* to *exercising*.
   - D) Make no change.

3. Write a column for a magazine or newspaper, suggesting a healthy exercise or personal care routine and describing the steps to begin it.