

Chapter 19

Medicines and Drugs

**Chapter 20**

Tobacco

**Chapter 21**

Alcohol

**Chapter 22**

Illegal Drugs

**UNIT PROJECT****Improving Your Community**

Using Visuals **Students Against Destructive Decisions**, also known as SADD, is a national organization that helps teens be positive role models. Their goal is to empower teens to abstain from destructive behaviors, such as drinking, drug use, and driving while impaired. Members educate their peers about the dangers of alcohol and drug use and provide prevention strategies.



To learn more about SADD, use this code to go to the Unit Web Project at glencoe.com.

Get Involved. Locate other organizations that discourage alcohol and drug use. Find out how teens in your community can volunteer to help their peers.



“It is our choices . . . that show what we truly are, far more than our abilities.”

—J. K. Rowling, author



Medicines and Drugs

Lesson 1

The Role of Medicines

BIG Idea Medicines are divided into classes and have different effects on different people.

Lesson 2

Using Medicines Safely

BIG Idea Medicines are safe only if they are used for the intended purpose and according to the directions on the label.



Activating Prior Knowledge

Using Visuals The teen and the pharmacist in this photo are discussing the appropriate way to take a medication. Write a short plan that describes ways that teens can find out how to use medicine properly. Be sure to discuss which sources of information are reliable.



Chapter Launchers

Health in Action

Discuss the **BIG** Ideas

Think about how you would answer these questions:

- ▶ What are reasons people take medicines?
- ▶ What are possible consequences of not following the instructions on a medicine label?

Watch the **Health eSpotlight** Video Series



The Lesson 2 video shows how important it is to check expiration dates of a drug before using it. Watch the other videos to learn about topics in this chapter.

Assess Your Health



QuickPass™ GH2011C19S

Visit glencoe.com and use this code to access chapter videos, Health Inventories, and other features.

LESSON 1



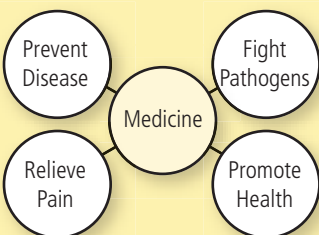
GUIDE TO READING

BIG Idea Medicines are divided into classes and have different effects on different people.

Before You Read

Create a Cluster Chart

Chart. Draw a circle and label it “Medicines.” Create four surrounding circles labeled “Prevent Disease,” “Fight Pathogens,” “Relieve Pain,” and “Promote Health.” As you read, fill in the chart with more circles and details about the kinds of medicines discussed in the lesson.



New Vocabulary

- ▶ medicines
- ▶ drugs
- ▶ vaccine
- ▶ side effects
- ▶ additive interaction
- ▶ synergistic effect
- ▶ antagonistic interaction

The Role of Medicines

Real Life Issues

Choosing Medicines Wisely. Grant has a cold with a cough and runny nose. He checks the medicine cabinet for any cold medications that will help him feel better. He finds more than one type of cold medicine in the cabinet. Grant is not sure which one he should take.



Writing Write a paragraph that explains what Grant should look for in a cold medicine. For example, what symptoms he wants to relieve, how much he should take, and how many hours a dose will last.

Types of Medicines

Main Idea Medicines are classified based on how they work in your body.

People use medicines to help restore their health when they are ill. **Medicines** are drugs that are used to treat or prevent diseases or other conditions. **Drugs** are substances other than food that change the structure or function of the body or mind. All medicines are drugs, but not all drugs are medicines. Drugs are effective in treating illness when taken as directed by a physician or according to the label instructions. Medicines that treat or prevent illness can be classified into four broad categories:

- Medicines that help prevent disease
- Medicines that fight pathogens
- Medicines that relieve pain and other symptoms
- Medicines that manage chronic conditions, help maintain or restore health, and regulate body's systems



■ **Figure 19.1** Many types of medications are available. *What was the last medication that you used, and for what purpose did you use it?*

Preventing Disease

Today, we have medicines that prevent disease. About 95 percent of children receive **vaccines**, a preparation that prevents a person from contracting a specific disease.

Vaccines Vaccines contain weakened or dead *pathogens* that cause the disease. When injected into your body, the vaccine produces antibodies that fight those pathogens. Your body also produces memory cells that recall how to make these antibodies. This provides you with long-lasting protection against these specific pathogens.

The protection from some vaccines, however, fades over time. The vaccines for tetanus must be given periodically. For other vaccines, like those that prevent the flu, a new vaccine is required every year.

Antitoxins Antitoxins, like vaccines, prevent disease. They can also help **neutralize** the effects of toxins. Antitoxins fight the bacteria that produce substances toxic to the body. Antitoxins are usually produced by injecting animals with safe amounts of a specific toxin. This stimulates the animal's immune system to produce antibodies. These antibodies are then used to make an antitoxin.

Fighting Pathogens

Medicines can also help your body fight the pathogens that cause illness.

Antibiotics *Antibiotics* are a class of drug that destroy disease-causing microorganisms, called *bacteria*. Antibiotics such as penicillin work either by killing harmful bacteria in the body or by preventing bacteria from reproducing.



Visit glencoe.com and use this code to complete the Student Web Activity on programs to vaccinate all children.

Academic Vocabulary

neutralize (*verb*): to counteract the effect of



Drug Check

Analyze. Go to glencoe.com and watch the video **Drug Check**. How much do you really know about the drugs in your medicine cabinet? Make a list of things you should be aware of and a list of possible resources where you can find the information you need.

When antibiotics were first introduced, they were considered a miracle drug because they saved so many lives. Some antibiotics, however, can cause nausea or stomach pain. Allergies are another side effect of antibiotic use. Tell your doctor if you experience any negative side effects of antibiotics, or if you know you are allergic to an antibiotic. Antibiotics can also lose their effectiveness. The bacteria that antibiotics kill have adapted to the drug over time.

Bacteria can develop a resistance in two ways: when antibiotics are overused, and when the patient does not finish taking the full prescription. If you do not finish taking all of a prescription, you may not kill all of the bacteria. The remaining bacteria may develop a resistance, or immunity, to treatment.

Antivirals and Antifungals Antibiotics are effective only against bacteria. They do not cure illnesses caused by viruses. Antiviral drugs are available to treat some viral illnesses, such as the flu. These medicines suppress the virus, but do not kill it. A person who takes antiviral medication for cold sores or fever blisters, which are caused by viruses, will still have the virus in his or her body. As a result, the person often has symptom-free periods followed by flare-ups when symptoms reappear. Like bacteria, viruses can develop a resistance to medications. Fungi are another type of pathogen that can infect the body. Antifungals can suppress or kill fungus cells, such as athlete's foot and ringworm.

Relieving Pain

The most commonly used medicines are *analgesics*, or pain relievers. Analgesics range from relatively mild medicines, such as aspirin, to strong narcotics, such as opium-based morphine and codeine. Aspirin is used to relieve pain and reduce fever. Other analgesics fight *inflammation*, or redness, swelling, and pain.

Even though aspirin is a widely used drug, it can cause stomach upset, dizziness, and ringing in the ears. Children who take aspirin when they have a fever are at risk of developing Reye's syndrome, a potentially life-threatening illness of the brain and liver. For that reason, aspirin should not be given to anyone under the age of 20 unless directed by a health care professional. Some people who are sensitive to aspirin take acetaminophen or ibuprofen. Acetaminophen is the recommended analgesic for children.

Pain Reliever Dependence Certain types of medicines that relieve pain can be addictive. These medicines, usually called narcotics, require a doctor's prescription. Patients who use these drugs can become physically or psychologically dependent on them.



READING CHECK

Describe Explain how vaccines prevent a person from getting a disease.

Managing Chronic Conditions

Some medicines are used to treat chronic conditions. These medicines maintain or restore health, and offer people with chronic diseases a higher level of wellness.

Allergy Medicines Antihistamines reduce allergy symptoms such as sneezing, itchy or watery eyes, and a runny nose. They block the chemicals released by the immune system that cause an allergic response. For people with allergies such as those to peanuts or bee stings, severe symptoms can appear suddenly. An allergic reaction can lead to death. Individuals who know they are allergic to substances that cause severe reactions can ask a doctor to prescribe a single-dose shot of epinephrine. The medication is designed to slow down or stop an allergic reaction. The patient is taught to self-administer a shot with a single-dose injector.

Body-Regulating Medicines Some medicines regulate body chemistry. Insulin used by people with diabetes regulates the amount of sugar in their blood. Asthma sufferers may take medicines every day to control symptoms and prevent attacks. They may also use inhalers during an asthma attack. Cardiovascular medicines are taken to regulate blood pressure, normalize irregular heartbeats, or regulate other functions of the cardiovascular system.

Antidepressant and Antipsychotic Medicines Medications can also help people suffering from mental illnesses. These medicines can help regulate brain chemistry, or stabilize moods. For example, mood stabilizers are often used in the treatment of mood disorders, depression, and schizophrenia. Proper medication can help people with these diseases live healthy lives. As with other prescribed medications, it is important to talk to your doctor before you stop taking the medication, even if you feel better.

Cancer Treatment Medicines Some cancers can be treated and even cured. Some medicines can be used to treat cancer. These medicines can reduce rapid cell growth and help stop the spread of cancer cells. One drug, chemotherapy, uses chemicals to kill fast-growing cancer cells. Immunotherapy, or biological therapy, uses the body's immune system to fight the cancer cells. Because these medications can also destroy healthy cells, serious side effects may occur as part of the treatment. Other medications can help treat the side effects.



■ **Figure 19.2** Strep throat is a bacterial infection that is treated with antibiotics prescribed by a doctor. *Why is it important to take all of the antibiotics a doctor prescribes, even if you are feeling better?*



READING CHECK

Describe Give two reasons that a person would take a body-regulating medicine.



■ **Figure 19.3** Medications help many people with conditions such as asthma and diabetes live active, normal lives. *How do medicines work to control these diseases?*

Taking Medications

Main Idea Medicines enter the body in a variety of ways.

Medicines can be delivered to the body in many ways. Factors that determine how a medicine is taken include what the medicine is used for, and how it will most quickly and effectively help a person.

- **Oral medicines** are taken by mouth in the form of tablets, capsules, or liquids. These medicines pass from the digestive system into the bloodstream.
- **Topical medicines** are applied to the skin. Transdermal skin patches also deliver a medicine through the skin.
- **Inhaled medicines**, such as asthma medicines, are delivered in a fine mist or powder.
- **Injected medicines** are delivered through a shot, and go directly into the bloodstream.

However you take a medicine, it is always important to follow the directions on the medicine label.

Reactions to Medications

Main Idea The effect of medicine depends on many factors.

Medicines can have a variety of effects. They can cause **side effects**, *reactions to medicine other than the one intended*. Some side effects may be mild, such as drowsiness, but others may be more severe, and can even cause death.

Medicine Interactions

When two or more medicines are taken together, or when a medication is taken with certain foods, the combination may have a different effect than when the medicine is taken alone. Types of medicine interactions include the following:

- **Additive interaction** occurs when *medicines work together in a positive way*. For example, an anti-inflammatory and a muscle relaxant may be prescribed to treat joint pain.
- **Synergistic effect**—*the interaction of two or more medicines that results in a greater effect than when each medicine is taken alone*—occurs when one medicine increases the strength of another.

- **Antagonistic interaction** occurs when *the effect of one medicine is canceled or reduced when taken with another medicine*. For example, someone who receives an organ transplant must take anti-rejection medicines. If the person is diabetic and takes insulin, the anti-rejection medicine may decrease the effectiveness of the insulin.

Tolerance and Withdrawal

When a person takes a medication for a long period of time, the body can become used to the medication. Problems that may occur include:

- **Tolerance** is a condition in which the body becomes used to the effect of a medicine. The body requires increasingly larger doses to produce the same effect. Sometimes a person will experience “reverse tolerance.” In this condition, the body requires less medicine.
- **Withdrawal** occurs when a person stops using a medicine on which he or she has become physiologically dependent. Symptoms of withdrawal can include nervousness, insomnia, severe headaches, vomiting, chills, and cramps which gradually ease in time. Talk to your health care provider if you experience withdrawal.



■ **Figure 19.4** Medicine labels include important information about possible side effects and interactions. *Why is it important to read this information before you take the medicine?*

LESSON 1 ASSESSMENT



Visit glencoe.com and use this code to complete the Interactive Study Guide for this lesson.

After You Read

Reviewing Facts and Vocabulary

1. Define the term *medicine* and the term *drugs*.
2. What types of medicines fight pathogens? What types of medicines prevent disease?
3. Compare a *synergistic effect* with an *antagonistic interaction*.

Thinking Critically

4. **Analyze.** Why are vaccines given to children at a young age?
5. **Evaluate.** Explain why people should not stop taking prescribed medications without talking to their doctor.

Applying Health Skills

6. **Accessing Information.** Use reliable online resources to find information on new and experimental drugs. Write a paragraph evaluating one of the drugs, and list the reasons why you think the information is reliable.

Writing Critically

7. **Descriptive.** Write a paragraph describing why it's important to take a medicine as your doctor prescribed.

Real Life Issues

After completing the lesson, review and analyze your response to the Real Life Issues question on page 524.

LESSON 2



GUIDE TO READING

BIG Idea Medicines are safe only if they are used for the intended purpose and according to the directions on the label.

Before You Read

Make a T-Chart. Make a two-column chart like the one below. Label one column "Prescriptions" and the other column "OTCs." As you read, fill in the first column with information about prescription medicines. Fill in the second column with information about over-the-counter (OTC) medicines.

Prescriptions	OTCs

New Vocabulary

- ▶ prescription medicines
- ▶ over-the-counter (OTC) medicines
- ▶ medicine misuse
- ▶ medicine abuse
- ▶ drug overdose

Using Medicines Safely

Real Life Issues

Safety First. Monica is on the swim team and has an earache. She visits her doctor, who prescribes an antibiotic. Monica is supposed to take the medicine for ten days. Her friend Amy, who is also on the swim team, thinks she may have an ear infection, too. Amy doesn't want to go to the doctor, though, so she asks Monica if she can share her medicine.



Writing Write a dialogue in which Monica explains to Amy why she doesn't think she should share her medication.

Standards for Medicines

Main Idea Medicines are regulated to make them safe.

All new medicines in the United States must meet standards set by the Food and Drug Administration (FDA). Before approving a drug for use, the FDA receives information about a medicine's chemical composition, intended use, effects, and possible side effects. Drug manufacturers test new medicines according to FDA guidelines. That includes completing at least three clinical trials for a drug. During a clinical trial, the drug is tested on human volunteers. They are monitored to determine the drug's effectiveness and to identify any harmful side effects.

Sometimes, if a drug hasn't yet completed clinical trials but is thought to be effective, people with life-threatening illnesses are allowed to use the drug. This usage is referred to as *experimental*. Patients are given experimental drugs only after clinical trials show that the drugs are safe and may be effective in treating their illness.

The FDA does not regulate herbal and dietary supplements. These supplements do not go through the same testing procedures or meet the same strict requirements for safety and proven effectiveness. Many people believe that herbal supplements are safe because some are advertised as “natural.” Even supplements made from natural compounds can have harmful side effects or interactions. Never take any supplement without telling your health care provider first.



Prescription Medicines

Prescription medicines are medicines that are dispensed only with the written approval of a licensed physician or nurse-practitioner. A licensed pharmacist dispenses these medicines. Prescription medicines provide only the amount of medicine that is needed to treat your condition. If more medicine is needed, your health care provider must approve a refill. A prescription medicine should be taken *only* by the person whose name appears on the label.

■ **Figure 19.6** Medicines are regulated by the FDA, but herbal supplements are not. *Explain whether herbal supplements are safer than medicines.*

Over-the-Counter (OTC) Medicines

Over-the-counter (OTC) medicines, or medicines you can buy without a doctor's prescription are available without a prescription. The FDA considers these medicines to be safe if they are used as the label directs. However, all medicines can harm you if not used according to the directions.

While all OTC medicines are available without a prescription, the distribution of some OTC medicines is controlled. For example, cold medications that contain pseudoephedrine must be kept behind the pharmacy counter. These medications can be used to make highly addictive, illegal drugs.

Medicine Labels

When the FDA approves a medicine, it is considered safe when used as directed. The FDA requires that all prescription and OTC medicine labels contain information telling consumers how to use the medicine safely and effectively. The requirements for prescription and OTC medicine labels differ. Prescription medicine labels must also include any special instructions for taking the medicine, the prescribing doctor's name, the patient's name, the pharmacy's name and address, the date the prescription was filled, the prescription number, and whether refills are allowed. **Figure 19.7** on page 532 shows the information that must appear on all OTC medicine labels.



READING CHECK

Describe How would you obtain a prescription medicine?

Figure 19.7

Over-The-Counter Medicine

Active Ingredient:

Ingredient that treats condition, including amount per unit

Inactive Ingredients:

Substances added to the product that do not help treat the condition, such as flavor and color

Uses:

Conditions or symptoms treated by the product

Warnings:

Side effects, interactions, when to talk to a doctor, when not to take the product, keep out of reach of children

Expiration Date:

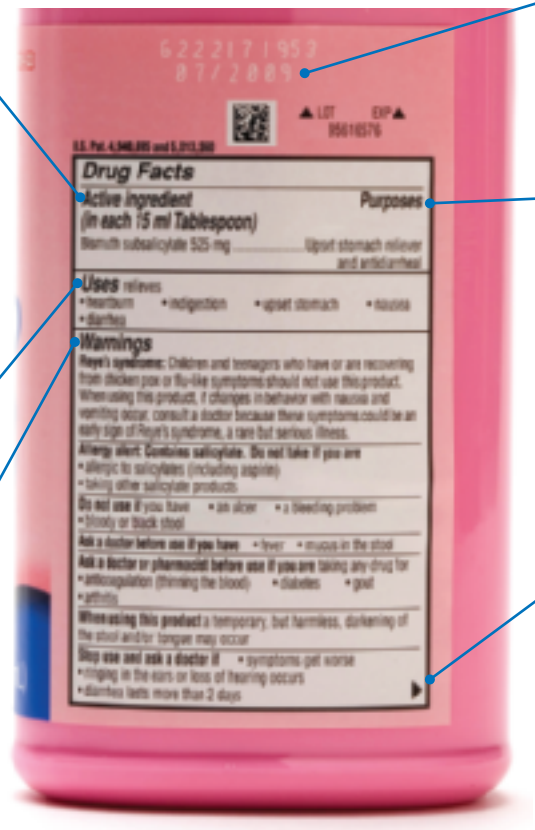
The date you should no longer use the medicine

Purpose:

Product category and what the product is supposed to do, such as antacid

Other Information and Directions:

Some information may be printed on the opposite side of the label. This information may include how to take the medicine, how to store the product, and required information about certain ingredients, such as sodium



Medicine Misuse

Main Idea Taking medicines unnecessarily or without following the label instructions is dangerous.

Medicine misuse can prevent the user from getting the full benefit of the medicine and can have serious health consequences. **Medicine misuse** involves *using a medicine in ways other than the intended use*. Examples of medicine misuse are:

- Failing to follow the instructions on or in the package
- Giving a prescription medicine to a person for whom it was not prescribed, or taking another person's medicine
- Taking too much or too little of a medicine
- Taking a medicine for a longer or shorter period than prescribed or recommended
- Discontinuing use of a medicine without informing your health care provider
- Mixing medicines without the knowledge or approval of your health care provider

**BusinessWeek**

HEALTH NEWS

Drugs Get Smart

Analyze. Go to glencoe.com and watch the video *Drugs Get Smart*. In a group, discuss the benefits connected to personalized drug treatments. Write a paragraph explaining why you think the tailored drugs may or may not be an advancement in the treatment of medicine.

Medicine Abuse

Intentionally taking medications for nonmedical reasons is **medicine abuse**. Most teens—96 percent—use medicines correctly. Some, however, think that medicines requiring a prescription and OTC medicines are safer than illegal drugs. Abusing any medicine is dangerous and illegal. Teens should avoid using drugs to:

- To lose weight or stay awake while studying. A healthy diet and exercise are the safest way to maintain a healthy weight. Getting plenty of sleep and managing your time wisely will help you study effectively.
- To fit in with peers. A dangerous trend is the emergence of “pill parties,” where teens mix whatever OTC and prescription medicines are available. Mixing medicines, drugs, or alcohol is extremely dangerous.
- Avoid taking any medicine that was prescribed to someone else. Medicines are prescribed to treat a specific illness. It’s illegal and unsafe to use a drug not prescribed to you.

One danger of medicine misuse is **drug overdose**—*a strong, sometimes fatal reaction to taking a large amount of a drug*. Misusing medicines can also lead to addiction. Never use a medicine other than how it is prescribed or intended.



READING CHECK

List What are some ways that teens might abuse medicines?



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Explore glencoe.com and use this code to complete the Student Web Activity describing how dietary supplements are regulated.

LESSON 2 ASSESSMENT



After You Read

Reviewing Facts and Vocabulary

1. How do *prescription medicines* differ from *OTC medicines*?
2. List four pieces of information that must be on an OTC medicine label. Describe the purpose of each piece of information.
3. What is *medicine misuse*? How does it differ from *medicine abuse*?

Thinking Critically

4. **Analyze.** Why does the FDA regulate medicines and the information on medicine labels?
5. **Evaluate.** What are three ways you can avoid medicine abuse?



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Visit glencoe.com and use this code to complete the Interactive Study Guide for this lesson.

Applying Health Skills

6. **Advocacy.** Create a bookmark that gives information on the importance of correct medicine use.

Writing Critically

7. **Expository.** Create a script for a commercial or PSA that explains how people can use their health care providers, pharmacists, and medicine labels to ensure that they are using their medicines properly.

Real Life Issues

After completing the lesson, review and analyze your response to the Real Life Issues question on page 530.

Hands-On HEALTH

Activity Stay Informed

Medicines can treat many health problems. If they're taken improperly, however, the same medicines can cause health problems. Working in teams of four or five, compete to determine which team can better define medicine terms. Then, create an informative pamphlet or poster on how to use medicines wisely.

What You'll Need

- textbook for each student
- six index cards per student
- pens or pencils
- small paper bag, one per team
- markers, paints, and poster board

What You'll Do

Step 1

Form teams of four or five. Write each vocabulary term on an index card and the definition of each term on a different index card.

Step 2

Place all the cards into a bag.

Step 3

At your teacher's signal, exchange bags with another team and match each term with the correct definition.

Apply and Conclude

Create a poster or pamphlet listing medicine facts. Persuade others to make positive health choices regarding the use of medicines.

Checklist: Advocacy

- ✓ Clear, health-enhancing message
- ✓ Support for the position with relevant information
- ✓ Awareness of the audience
- ✓ Encouragement of others to make healthful choices





For chapter review podcasts and audio summaries, use this code at glencoe.com.

LESSON 1**The Role of Medicines****Key Concepts**

- ▶ Medicines can help manage chronic conditions, including allergies, diabetes, asthma, and depression, and can treat cancer.
- ▶ Medicines can be taken orally or topically. They can be inhaled or taken by injection.
- ▶ When taking medicines, some people may experience side effects or allergies.
- ▶ When medicines interact, they may have a different effect than intended.

Vocabulary

- ▶ medicines (p. 524)
- ▶ drugs (p. 524)
- ▶ vaccine (p. 525)
- ▶ side effects (p. 528)
- ▶ additive interaction (p. 528)
- ▶ synergistic effect (p. 528)
- ▶ antagonistic interaction (p. 529)

LESSON 2**Using Medicines Safely****Key Concepts**

- ▶ The FDA regulates medicines and their distribution to make sure that medicines are safe and effective.
- ▶ Written approval in the form of a prescription is needed for some medicines, but OTC medicines can be bought without a prescription.
- ▶ Medicines can be dangerous if they are not used as directed.

Vocabulary

- ▶ prescription medicines (p. 531)
- ▶ over-the-counter (OTC) medicines (p. 531)
- ▶ medicine misuse (p. 532)
- ▶ medicine abuse (p. 533)
- ▶ drug overdose (p. 533)



Health eSpotlight



With the information you have learned from the chapter, go back and view the videos and discuss as a class.

LESSON 1

Vocabulary Review

Correct the sentences below by replacing the italicized term with the correct vocabulary term.

1. A(n) *drug* is the interaction of two or more medications that results in a greater effect than when each medicine is taken alone.
2. People may experience *synergistic effects* while taking a medicine, which are effects that are not intended.
3. *Antagonistic interactions* are used to treat or prevent disease, and are dangerous when mixed with alcohol.
4. A(n) *side effect* occurs when medicines work together in a positive way.
5. A(n) *additive interaction* is a substance other than food that changes the structure or function of the body or mind.

Understanding Key Concepts

After reading the question or statement, select the correct answer.

6. A vaccine for polio will do which of the following?
 - a. Causes the body to make antibodies to fight polio
 - b. Causes people to develop the polio disease
 - c. Protects the body against the measles virus
 - d. Protects people against polio for a short time

7. What type of medicine might your doctor prescribe if you have an ear infection caused by bacteria?
 - a. Antifungal
 - b. Antitoxin
 - c. Antiviral
 - d. Antibiotic
8. What type of medicine might your doctor prescribe if you have the flu?
 - a. Antitoxin
 - b. Antibiotic
 - c. Antiviral
 - d. Antifungal
9. Why would you take an antihistamine?
 - a. To cure an allergy
 - b. To relieve allergy symptoms
 - c. To slow an allergic reaction
 - d. To build immunity
10. If a person takes two medicines at the same time and one is less effective than when taken alone, what is this called?
 - a. Additive interaction
 - b. Antagonistic interaction
 - c. Side effect
 - d. Synergistic effect



11. What type of medication is aspirin?
 - a. Analgesic
 - b. Antiviral
 - c. Antihistamine
 - d. Antibiotic

Thinking Critically

After reading the question or statement, write a short answer using complete sentences.

12. **Analyze.** How do bacteria become resistant to certain types of antibiotics?

13. **Evaluate.** Why do narcotic pain relievers require a doctor's prescription?
14. **Describe.** How can medication help people with mental illness?
15. **Compare.** Why might taking a medicine orally rather than taking a medicine topically help a person?
16. **Explain.** What can result if a person takes a medication for a long period of time?
17. **Evaluate.** Anne does not like the side effects of the prescription medicine she is taking. Why should she talk to her doctor before she stops taking the medicine?
18. **Describe.** How does a vaccine work? Can a vaccine help cure disease? If so, how?
19. **Explain.** What is the difference between a synergistic effect and an antagonistic effect when taking medicines?

LESSON 2

Vocabulary Review

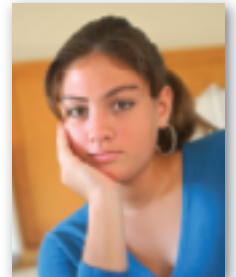
Use the vocabulary terms listed on page 535 to complete the following statements.

20. Medicines that you can buy without a doctor's prescription are called _____.
21. If you take a large amount of a medicine, you could have a life-threatening reaction known as a(n) _____.
22. Intentionally taking medicines for nonmedical reasons is known as _____.
23. Medicines that are available only with the recommendation of a doctor, and are dispensed only by a licensed pharmacist are called _____.
24. Failing to follow the instructions on or included with a medicine package is an example of _____.

Understanding Key Concepts

After reading the question or statement, select the correct answer.

25. Which does *not* describe a prescription medication?
 - a. Only a specified amount is distributed.
 - b. Written approval is required.
 - c. It should be taken only by the person it is prescribed to.
 - d. It can be purchased without a doctor's recommendation.
26. Which must have proven safety and effectiveness before being sold?
 - a. Prescription medicines
 - b. Herb-based diet pills
 - c. Protein shake drink mix
 - d. Vitamins
27. Which of the following information is *not* on an OTC medicine label?
 - a. The directions for taking the medicine
 - b. The expiration date
 - c. The inactive ingredients in the medicine
 - d. The name of the pharmacy
28. Which of the following is a way a person could misuse a medicine?
 - a. Taking only half of the prescription with your doctor's approval
 - b. Saving half of an antibiotic prescription in case you get sick later
 - c. Following the instructions on the medicine label
 - d. Taking two medicines at the same time, as directed by a doctor
29. Why might teens abuse medicines?
 - a. They take medicine only as prescribed by a doctor.
 - b. They do not like the side effects of a certain medicine.
 - c. They believe the medicine may help them study longer.
 - d. They think the medicine is hard to obtain.



Assessment

30. Which is *not* a risk of abusing medicines?
- Addiction
 - Death from heart failure
 - Paranoia
 - Taking too little medicine
31. Which of the following organizations tests and approves all prescription medicines before they are sold to the public?
- the Centers for Disease Control and Prevention
 - the U.S. Department of Agriculture
 - the Food and Drug Administration
 - the Consumer Product Safety Commission

Thinking Critically

After reading the question or statement, write a short answer using complete sentences.

32. **Explain.** Why should you talk to your doctor before taking herbal supplements?
33. **Analyze.** Why does the FDA limit the distribution of certain OTC medicines?
34. **Explain.** Why should you always read the label before taking a medicine?
35. **Evaluate.** How do the FDA guidelines for approving medicines protect the health of the public?
36. **Discuss.** How can taking medicines not prescribed to you, or mixing medicines, harm your health?



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Technology

PROJECT-BASED ASSESSMENT

Explaining Vaccines

Background

Your body's immune system has the ability to recognize and destroy bacteria and viruses. It remembers features of these pathogens to fight them. By exposing your immune system to parts of a pathogen, or a pathogen that has been altered so it cannot hurt you, a vaccine allows your body to prepare for that pathogen if you become infected.

Task

Create an online cartoon that explains to young children how vaccines work.

Audience

Students in grades 1 through 3

Purpose

Explain why vaccines work, and how important they are in maintaining your health.

Procedure

- Review the text and write notes describing some basic facts about vaccines.
- Conduct an online search to learn how the body's immune system works. Find answers to these questions: How do vaccines prepare the body to fight pathogens? How do vaccines and antitoxins fight disease?
- Search for online cartoons that are geared to children in grades 1 through 3 to see the different styles and formats that you might use.
- Create and organize your cartoon. Use words and pictures that clearly show how vaccines work.
- Present your cartoon to your class or, if possible, to students in grades 1 through 3.

Math Practice

Interpret Graphs. The table below shows the percentages of nonmedical use of psychotherapeutics among 12- to 17-year-olds. Use the table to answer Questions 1–3.

	Past Year		Past Month	
	1999	2000	1999	2000
Any Psychotherapeutic*	7.1%	7.1%	2.9%	3.0%
Pain Relievers	5.5%	5.4%	2.1%	2.3%
Tranquilizers	1.6%	1.6%	0.5%	0.5%
Sedatives	0.5%	0.5%	0.2%	0.2%
Stimulants**	2.1%	2.4%	0.7%	0.8%

* Denotes the non-medical use of any prescription-type pain reliever, tranquilizer, stimulant, or sedative; does not include over-the-counter drugs.
** Includes methamphetamine

Source: U.S. Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, NHSDA

- Of the 12,000 students surveyed in 1999, how many of them have never used any psychotherapeutic drugs in the past year?
 - 10,000
 - 11,148
 - 852
 - 967
- After reviewing the chart above, determine the mean, median, and mode of the 2000 data.
- On one line graph, show the trend, both annually and monthly, of prescription drug abuse in 1999.

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Reading/Writing Practice

Understand and Apply. Read the passage below, and then answer the questions.

Aspirin was first introduced by a German company in 1899. Centuries earlier, people used similar chemicals to ease pain and reduce fever. The ancient Greeks used a bitter powder extracted from the bark of willow trees to treat pain. In the 1700s, physicians treated patients with another willow-derived substance that was later discovered to be the chemical salicin.

By the mid-1800s, European pharmacists used an acid form of salicin to treat arthritis. However, patients who took salicylic acid would often suffer from a painful side effect, a severe upset stomach. With the introduction of the milder aspirin, many patients experienced pain relief with fewer stomach problems.

- What was the author's purpose in writing this piece?
 - To list the dosages of aspirin
 - To describe the types of pain relievers
 - To explain how aspirin works
 - To tell how aspirin products are used
- Which sentence best represents the main idea of the second paragraph?
 - Arthritis causes pain and swelling.
 - Salicylic acid relieves pain, but can irritate the digestive tract.
 - European pharmacists tend to prescribe painkillers other than aspirin.
 - Older aspirin-like products caused stomach irritation.
- Write a pamphlet that outlines the importance of following a doctor's instructions when taking medicines.

National Education Standards

Math: Number and Operations
Language Arts: NCTE 3, NCTE 4