LESSON 1

Types of Medicines

**MAIN IDEA** A medicine is a drug that can prevent or cure an illness or ease its symptoms.

If you have a cold or feel as if you are getting a fever, you might go to the drugstore to buy some medicine that can help you feel better. You might also choose to use a medicine to help relieve the aches and pains caused by an injury. A medicine is a drug that prevents or cures an illness or eases its symptoms. Medicines can help your body in many ways. When sickness or injury occurs, medicines can often help a person feel better or recover from the illness.

In earlier times, many medicines were taken from plant leaves. People might eat the leaves or drink tea brewed from them. Today, most medicines are made in laboratories. Many come in the form of pills or liquids and are swallowed. Medicines may also be injected into the bloodstream using needles, inhaled into the lungs, or rubbed into the skin.

Medicines in the United States are carefully controlled by the Food and Drug Administration (FDA). This agency is part of the federal government’s Department of Health and Human Services. The FDA sets standards for medicine safety and effectiveness. The agency tests and approves medicines before they can be sold.

**Medicines can help your body in many ways.**

Various types of medicines are used in various ways. Some medicines protect you from getting certain diseases. Some cure diseases or kill germs. Still some medicines are used to manage chronic, or ongoing, conditions such as asthma. Other medicines help relieve symptoms of illness or treat minor injuries.

**Myth vs. Fact**

**Myth:** Only babies and toddlers need vaccines.

**Fact:** Several important vaccines are required for those between the ages of 10 and 18. Most preteens and teens will need to receive a vaccine or booster shot for diphtheria and tetanus, chicken pox, hepatitis B, measles, mumps, and rubella, and meningococcus.

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**Reading Check**

**DEFINE** What are medicines?
Have you ever had to get a shot during a visit to a doctor or nurse? Sometimes, a doctor may give you a shot to help fight an illness. On other occasions, you may get a shot to help prevent a disease. A vaccine is an example of a type of medicine that is used to keep you from getting a disease. A medical professional may also give people certain medicines to help them recover from a disease or ease the symptoms of an illness. Scientists who focus on finding cures have developed medicines that help a sick person's body fight disease or infection. Others types of medicines can be used to relieve pain, soreness, or swelling.

Preventing Disease
A vaccine (vak-SEEN) is a preparation of dead or weakened pathogens that is introduced into the body to cause an immune response. Vaccines protect against diseases that can spread from person to person. When you are vaccinated, your body can make substances called antibodies that will attack or kill off the germs that cause a disease. Some vaccines provide protection for many years. Others, such as the flu vaccine, protect you for only about a year.

Fighting Germs
Antibiotics (an-tih-by-AH-tiks) are medicines that reduce or kill harmful bacteria in the body. An antibiotic may be prescribed to treat an infection. However, improper use can make bacteria resistant. That means certain antibiotics may no longer stop an infection. An antibiotic cannot help the body fight an illness such as the common cold. Other drugs are used to fight viruses and fungi.
Relieving Pain
Have you ever had sore muscles, a toothache, or a headache? If you took medicine to feel better, it was most likely a pain reliever. Pain relievers block pain signals sent through the nervous system. Many pain relievers are available as over-the-counter (OTC) medicine, or a medicine that you can buy without a doctor’s permission. These include aspirin, ibuprofen, and acetaminophen. Aspirin can also reduce swelling. Some painkillers, such as codeine, treat more serious pain and are available only with a prescription. A prescription (prih-SKRIP-shuhn) medicine is a medicine that can be obtained legally only with a doctor’s written permission. Prescription medicines require a written order because they typically carry more risks.

Managing Disease
Some medicines help people manage chronic diseases or conditions, such as allergies, asthma, diabetes, or mental illnesses such as anxiety and depression. People with diabetes take insulin to help control their blood sugar. People with allergies can take antihistamines to treat swelling and other allergy symptoms.

Often, medicine is taken by swallowing. However, medicine can be given in a number of different ways. The various methods of delivering medicine to the body include:

- **Swallowing, or ingestion.** A pill, tablet, capsule, or liquid moves through the stomach into the bloodstream and then through the body. Most pain relievers are taken this way.
- **Injection, or shot.** Injected medicines begin to work more quickly because they directly enter the bloodstream. These are administered by a needle that pierces the skin.
- **Inhalation.** Medicine can be inhaled, or breathed in, as a mist or fine powder. People with asthma may use an inhaler. Cold or sinus medication can also be inhaled through the nose.
- **Topical application.** Creams and ointments can be rubbed directly onto the skin. Patches containing medicine may also be applied to the skin.

**Reading Check**
*Explain* Name three different kinds of medicine, and tell what each does.
PRESCRIPTION AND NON-PREScription MEDICINES

Main Idea: Some medicines require a doctor’s permission, while others are available without a prescription.

As you have learned, prescription medicine can be obtained only with a written order from a doctor. Written permission is required because prescription medicines carry more risks. You do not need a doctor’s permission to buy an over-the-counter medicine. However, both prescription and over-the-counter medicines must be used very carefully.

If you are prescribed medicine, your doctor will write out instructions that explain how much to take, when to take it, and for how long. Prescriptions must be filled by a pharmacist who is trained to prepare and distribute medicines. Your doctor’s instructions will appear on the prescription medicine label.

The FDA requires medicine labels to have specific information. Always read the label closely before taking any medicine, and follow the directions.

You can find over-the-counter (OTC) medicines in groceries and drugstores. They are considered safe to use without a doctor’s permission. However, always be careful when you use OTC medicines. Follow the directions, because even OTC medicines can be harmful if not used correctly. If you have any questions about a medicine, ask a doctor or pharmacist.

Reading Check
Contrast: What is the main difference between prescription and over-the-counter (OTC) medicines?

Reading Check

Your doctor or pharmacist can help you understand a prescription medicine label. What types of information can you find on a prescription medicine label?

LESSON 1

REVIEW

After You Read

1. Vocabulary Define the term antibiotics. Use it in an original sentence.
2. Name What is the type of medicine that prevents a disease from developing?
3. List What are the four main purposes of medicines?

Thinking Critically

4. Analyze A friend of yours on the football team wants an energy burst before a game. He wants to take a handful of vitamins. When you express concern, he says, “They’re over-the-counter vitamins.” Respond to this comment.

Applying Health Skills

5. Apply Lanie’s doctor gave her a six-day prescription of an antibiotic for her sore throat. After only three days, all of her symptoms are gone. Should Lanie continue taking the antibiotic? Explain why or why not.
LESSON 2

How Medicines Affect Your Body

**MAIN IDEA:** Medicines can contribute to good health when used properly.

**How Medicines Enter the Body**

**MAIN IDEA:** A medicine may be swallowed, injected, inhaled, or applied to the skin.

Different medicines are used in different ways. For example, a mild sunburn or an itchy mosquito bite could be treated with a cream or lotion. Another form of over-the-counter medicine could help relieve pain from a headache or a pulled muscle. A person with a serious illness may need prescription pills or injections. Medicines affect your body differently depending on how they are administered.

Swallowing, or ingestion, is the most common way to take medicines. Pills, tablets, capsules, and liquids are taken orally, or by mouth. The medicine moves into the stomach and small intestine. From the digestive system, the medicine passes into the bloodstream and circulates throughout the body. Cold medicines and pain relievers are often delivered this way.

Injection, or a shot, is another way that medicines can enter the body. A needle injects the medicine directly into the bloodstream. Injected medicines begin to work more quickly than other types.

Inhalation is yet another delivery system. Medicine can be inhaled as a mist or fine powder. People with asthma often use inhalers. You can breathe in, or inhale, cold or sinus medication through your nostrils.

Medicines affect your body differently depending on how they are administered.

Medicines are also given topically, or applied to the skin. You can apply creams and ointments this way. Skin patches that release medicine over time are another type of topical medicine.

**Reading Check**

**IDENTIFY** What is the most common way medicines are taken?
Because every person's body is unique, medicines affect people in different ways. Combining medicines may also affect the way they work. Some medicines do not interact well with others and can cause harmful reactions. Some people are allergic to certain medicines and cannot take them at all. Your age, weight, and overall health can determine how a medicine affects you.

Side Effects
Medicines can help you, but if you do not use them properly, they can also hurt you. A side effect is a reaction to a medicine other than the one intended. Sometimes, side effects are simply unpleasant. For example, a medicine might make you feel sick to your stomach, sleepy, dizzy, or cause a headache. A more serious side effect is an allergic reaction, which requires immediate medical attention.

You can avoid most side effects by following the instructions from your doctor and pharmacist. Always inform your doctor of any allergies you have to medicines. Read the label on any kind of medicine you take.

The label on any kind of medicine explains when and how to use it as well as how much to use. Some medicines should not be taken together. In addition, some activities can be dangerous if you take certain medicines. For example, labels on medicines that cause sleepiness warn against operating machinery or driving. Ask your doctor or pharmacist if you do not understand a medicine label.

Drug Interactions
Taking two or more medicines at once can be dangerous. They may cause unexpected drug interactions. For example, one drug may become more effective or less effective, or the combination may produce different, more dangerous side effects that neither drug would have caused when taken by itself. Taking medicines with certain foods can also cause interaction problems. Always let your doctor and pharmacist know what other medicines you are taking before starting a new medicine.

You can buy over-the-counter (OTC) medicines without a prescription. Why is it important to carefully read the label on any medicine?
**Tolerance**
When someone uses a particular medicine for a long period of time, the person’s body may develop a tolerance. Tolerance is the body’s need for larger and larger amounts of a drug to produce the same effect. The concept of tolerance can apply to medicine as well as alcohol and other drugs. In some cases, tolerance may cause a medicine to lose its effectiveness over time.

The more an antibiotic is used, the less effective it becomes.

A person may go through withdrawal when he or she stops using the medicine. These symptoms will gradually ease over time. If you experience withdrawal after using a medicine, talk to your doctor. You may need to be prescribed a different medication. Symptoms of medicine withdrawal can include:
- Nervousness.
- Insomnia.
- Severe headaches.
- Vomiting.
- Chills.
- Cramps.

**Antibiotic Resistance**
The more an antibiotic is used, the less effective it becomes. This is especially true when an antibiotic is overused. Why? Antibiotics kill harmful illness-causing bacteria in the body. With frequent exposure, however, bacteria often build up a resistance to antibiotics. Bacteria adapt to, or overcome, the medicine. Bacteria can also develop a resistance when antibiotics are not taken as prescribed. For example, if the prescription label says to take the medicine for 14 days, and you stop after 7 days, the bacteria may still be in your body and could make you sick again. Medicines should always be used wisely, and they should be used only as directed.

**Reading Check**
**IDENTIFY** Name two risks of using medicines.

- The MRSA bacteria can infect a simple scrape and move to the lungs. Most antibiotics will not cure it. Why might these bacteria be so resistant to antibiotics?

**LESSON 2**

**REVIEW**

**After You Read**
1. **VOCABULARY** Define the term side effect. Use it in an original sentence.
2. **DESCRIBE** What factors determine a medicine’s effect on the body?
3. **LIST** Name two ways medicines are taken into the body.

**Thinking Critically**
4. **ANALYZE** Why might a doctor prescribe different medicines for two people with the same illness?
5. **HYPOTHESIZE** Milla’s doctor has prescribed a medicine to treat a case of poison ivy. She also regularly takes medicine because she has trouble concentrating. Should Milla tell her doctor what medicine she is already taking? Why or why not?

**Applying Health Skills**
6. **ACCESSING INFORMATION**
Go online to research a popular drug that you have seen advertisements for. What condition does the drug treat? What are its side effects?
LESSON 3

Using Medicines Correctly

**BIG IDEA** Using medicines improperly can cause harmful side effects.

**IMPROPER USE OF MEDICINES**

**MAIN IDEA** Misusing medicines can be as harmful as using illegal drugs.

Medicines are types of drugs. Medicines are intended to be helpful, not harmful. They can prevent and cure diseases, fight germs, and relieve pain. If they are not used properly, however, medicines can be as harmful as illegal drugs. They can cause addiction, injury, and even death. If you use medicines improperly as a teen, it can result in serious health problems not only now but also later in life.

Both prescription medicines and over-the-counter medicines carry labels warning of possible side effects. Using too much medicine or using it too often can cause serious damage to body systems. For example, using too much of a medicine could cause liver or kidney failure. Certain medicines can also be very dangerous to unborn babies, newborns, or young children. A woman who is pregnant or plans to become pregnant should talk to a doctor before she takes any medicine.

**Medicine Misuse**

Medicines have many benefits when they are used correctly. Research studies show that most teens—96 percent—do use medicines correctly. Taking medicine in a way that is not intended is known as medicine misuse.

If not used properly, medicines can be as harmful as illegal drugs.

Taking more medicine than a doctor instructs is one example of misusing medicines. Another example is failure to follow the directions on the label. Medicine misuse can be dangerous. It may only prevent you from getting the full benefits of a medicine. At worst, however, medicine misuse can seriously harm your health. This is why medicines need to be taken with great care.

**Reading Check**

**RECALL** How can medicine misuse affect a person's health?

LESSON 3 Using Medicines Correctly 79
Medicine Abuse

Medicine abuse is intentionally using medicines in ways that are unhealthful and illegal. Medicine abuse is a form of drug abuse. Some teens believe that prescription and OTC medicines are safer than illegal drugs. However, medicines are safe only if used properly. People may abuse medicines for several reasons:

- **To lose weight** A healthy diet and exercise are the safest way to maintain a healthy weight.
- **To stay awake** Getting plenty of sleep and learning strategies to manage your time wisely will help you study effectively.

- **To get “high”** A dangerous trend is the practice of having “pill parties,” in which partygoers mix whatever OTC and prescription medicines may be available. Using medicine that is not prescribed for you is both illegal and dangerous and could even cause death.

Using a medicine prescribed to someone else is also medicine abuse. Medicines are prescribed for a specific person to treat a specific illness. Using someone else’s medicine, even if you think you have the same illness, is both illegal and unsafe.

A danger of both medicine abuse and medicine misuse is the risk of overdose. An overdose is when someone takes too much medicine at once. Misusing medicines can also lead to addiction. The best way to make sure you are using a medicine safely is to follow the instructions on the label.

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**Health SKILLS ACTIVITY**

**Practicing Healthful Behaviors**

**Handling Medicine Safely in Your Home**

**What do you know about medicine safety in the home?** Follow these guidelines to store, use, and dispose of medicine safely.

**Before taking two or more medicines at the same time, get your doctor’s approval. Combining medicines can cause harmful side effects.**

**Do not use medicines that have passed their expiration date.**

**To safely dispose of outdated or unused liquid or pills, flush them down the toilet.**

- Know what medicines are in your home and what they are used to treat.
- Store medicines in a cool, dry place.
- Keep medicines safely sealed in childproof containers, and keep them out of the reach of children.
- Never share prescription medicines. They could cause serious harm to someone else.
- Do not use OTC medicines for more than ten days at a time without first checking with your doctor.

Create a “Medicine Safety Checklist” that you can use at home. Review the completed checklist with your family. Post the list in an appropriate spot in your home.
Medicines can be helpful, but they can also cause serious harm. This is why they should be taken with great care. To avoid misuse, follow these guidelines:

- Follow the instructions on the label.
- Take the correct dosage for the recommended length of time. If you experience side effects from a prescription drug, contact your doctor before you stop using the medicine.
- Do not take medicines after their expiration date.
- Do not give prescription medicines to someone else. Do not use a medicine prescribed for an earlier illness without asking your doctor.

Never give prescription medicines to someone else.

- Contact your doctor if you do not understand the label instructions, if you experience any unusual or unpleasant side effects, or if you accidentally take too much medicine.
- Store all medicines safely—in a cool, dry place, in their original containers, and out of reach of children.

Reading Check
GIVE EXAMPLES What are three ways to use medicines safely?
Hands-On HEALTH ACTIVITY

Making Smart Choices about Medicines

WHAT YOU WILL NEED
* Three index cards per student
* One pencil or pen per student
* Internet or library access

WHAT YOU WILL DO
1. In teams of three, use each of your index cards to write one medicine you might find at a pharmacy. Each group should compile a total of nine different medications.

2. Research the health benefits and risks associated with each of the medicines you have listed. On the back of each card, list two benefits and two risks for each medication.

3. When you are finished, place all the completed cards face down in the middle of the table. Your teacher will then name a category, such as how the medicine enters the body, whether it is a prescription or OTC medicine, or which one carries the most risk.

4. For each round, your team will turn the cards over and sort them into the proper category. The winner is the team that completes the most rounds successfully.

A medicine can be either helpful or harmful to the body, depending on whether it is used properly and how it affects your body. Some medicines can protect you from certain diseases or are used to manage specific conditions. Others cure diseases, kill germs, relieve symptoms, or treat minor injuries. This activity will help you better understand the health risks and benefits of using different medications.

WRAPPING IT UP
Create a "How to Use Medicines Wisely" checklist that explains the steps to use when making a decision about using a medicine. Keep in mind the purpose of the medication, the way a medication affects your body, the health benefits and risks of a medication, and how the medication is used.
LESSON 1  Types of Medicines

BIG IDEA Using medicines wisely is a sign of good personal and consumer health.
* A medicine is a drug that can prevent or cure an illness or ease its symptoms.
* Different medicines are used in various ways and serve different purposes in the body.
* Medicines in the United States are carefully controlled by the Food and Drug Administration (FDA), which sets standards for medicine safety and effectiveness.
* Some medicines require written permission from a doctor (prescription medicines).
* Other medicines are available without a prescription (over-the-counter [OTC] medicines).

LESSON 2  How Medicines Affect Your Body

BIG IDEA Medicines can contribute to good health when used properly.
* Different types of medicines can be used or taken in different ways.
* A medicine may be swallowed, injected, inhaled, or applied to the skin.
* Medicines affect different people in different ways and can be harmful if not used properly.

LESSON 3  Using Medicines Correctly

BIG IDEA Using medicines improperly can cause harmful side effects.
* Misusing or abusing medicines can be as harmful as using illegal drugs.
* Taking medicine in a way that is not intended is medicine misuse.
* Medicine abuse is intentionally using medicines in ways that are unhealthful and illegal.
* Medicines are helpful only when they are used properly.
* Using medicines properly involves reading and following label instructions and taking the correct dosage for the recommended length of time.
* Always store medicines safely—in a cool, dry, secure place that is out of the reach of children.
On a sheet of paper, write the numbers 1–8. After each number, write the term from the list that best completes each statement.

**LESSON 1** Types of Medicines

1. A(n) _______ is a medicine that can be sold only with a written order from a doctor.

2. A medicine that prevents a disease from developing is called a(n) _______.

3. A(n) _______ is a type of medicine that is used to treat a bacterial infection.

4. A drug that prevents or cures a disease or illness or eases its symptoms is called _________.

5. You can buy a(n) _______ without a written order from a doctor.

**LESSON 2** How Medicines Affect Your Body

6. Drowsiness and nausea are examples of _______ that you could have from taking medicine.

7. Frequent exposure to antibiotics can cause bacteria to adapt to, or build up a _________ to, these drugs.

8. If you use a particular medicine for a long period of time, your body may develop a ________ for it.

On a sheet of paper, write the numbers 9–14. Write True or False for each statement below. If the statement is false, change the underlined word or phrase to make it true.

**LESSON 3** Using Medicines Correctly

9. Taking more of a medicine than a doctor instructs is an example of medicine misuse.

10. An important part of storing medicines safely is to keep them out of the reach of adults.

11. One way to make sure you are using a medicine safely is to ignore the instructions on the label.

12. Only prescription medicines carry labels warning of possible side effects.

13. A danger of both medicine abuse and medicine misuse is the risk of drug overdose.

14. It is always okay to share prescription medicines.
Using complete sentences, answer the following questions on a sheet of paper.

Thinking Critically

15. PREDICT How could medicine misuse or abuse affect each side of your health triangle?

16. INTERPRET You have gotten sick, so your doctor has prescribed you some medicine. After taking the medicine, however, you break out in a rash. What should you do?

17. ANALYZE What can you do to help make sure you use a prescription medicine properly?

Write About It

18. OPINION Write a blog post about the benefits and dangers of medicines. Explain ways that medicines can contribute to good health if used properly and ways they can be harmful if they are misused or abused.

19. DESCRIPTIVE WRITING Imagine that you have a medicine cabinet at home that is full of many different types of medicine. Explain how you would go about organizing the medicine cabinet to help make it safer for your family.

STANDARDIZED TEST PRACTICE

Writing

Read the prompts below. On a separate sheet of paper, write an essay that addresses each prompt. Use information from the chapter to support your writing. Refer to the tips in the right column.

1. Carl experiences back pain and visits his doctor, who prescribes a prescription painkiller. His friend Matt pulls a muscle playing basketball. Matt asks Carl if he can share his medicine. Explain why Carl should not share his prescription medicine with his friend Matt.

2. Imagine that you are a pharmacist working in a drugstore. A customer is confused by the label on the over-the-counter medicine. Write a dialogue in which you explain the different parts of a medicine label to ensure that they are using the medication properly.

Whenever you begin writing, first determine your task, audience, and purpose. Ask yourself the following questions: What is my topic? What are the guidelines of my essay? Is my purpose to explain a topic or persuade my audience? Who will be reading my writing? Understanding your task, audience, and purpose will help you accomplish your writing goal.