



# Physical Activity and Fitness



## Chapter Preview

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### *Working with the Photo*

Physical activity is important to your total health.

**How does your mental/emotional health benefit from physical activity?**

# Start-Up Activities



**Before You Read** Do you know how to achieve your fitness goals? Answer the Health eSpotlight questions below and then watch the online video. Keep a record of your answers.



## Health eSpotlight



### Achieving Fitness Goals

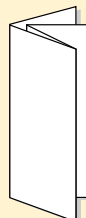
Achieving fitness goals often requires careful planning. Some goals, like participating in a race for charity, require a schedule and time in order to be successful. What fitness goals would you like to achieve? What short- and long-term goals are necessary to achieve your plan?

Go to [glencoe.com](http://glencoe.com) and watch the health video for Chapter 9. Then complete the activity provided with the online video.

## FOLDABLES® Study Organizer

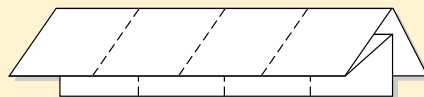
**As You Read** Make this Foldable® to help you organize the information on physical activity, exercise, and physical fitness presented in Lesson 1. Begin with a plain sheet of 11" × 17" paper.

1 Fold the sheet of paper in half along the short axis, then fold in half again. This forms four columns.



3 Unfold and draw lines along the folds.


2 Open the paper and refold it in half along the long axis, then fold in half again. This forms four rows.



4 Label the chart as shown.

Chapter 9	Definition	Examples	Impact on my life
Physical Activity			
Exercise			
Physical Fitness			

In the appropriate section of the chart, write down definitions and examples of physical activity, exercise, and physical fitness, as well as the impact each has on your daily life.

Go Online

Visit [glencoe.com](http://glencoe.com) and complete the Health Inventory for Chapter 9.

## Lesson 1

# The Benefits of Physical Activity

## Guide to Reading

### Building Vocabulary

Write each term below in your notebook and add a definition in pencil. As you read the lesson, be prepared to make corrections to your definitions.

- physical activity (p. 204)
- coordination (p. 205)
- balance (p. 205)
- calories (p. 205)
- physical fitness (p. 206)
- exercise (p. 207)
- aerobic exercise (p. 207)
- anaerobic exercise (p. 208)

### Focusing on the Main Ideas

In this lesson, you will learn to

- **analyze** the benefits of physical activity.
- **develop** habits to improve your physical health.
- **describe** various types of physical activities.
- **explain** the importance of exercise to overall fitness.

### Reading Strategy

**Predicting** Examine the headings, figures, and captions before you read this lesson. Predict what kinds of information you think you will learn.

**FOLDABLES** Study Organizer Use the Foldable® on p. 203 as you read this lesson.

## Quick Write

Write a short paragraph about the kinds of physical activity you do in a typical day.

## Choosing an Active Lifestyle

Connor and Marcus are identical twins. Although they look alike, their interests and health habits are different. When they have a choice between playing basketball or a video game, Connor chooses basketball and Marcus chooses the video game. When there is a choice between taking the stairs or an elevator, Connor takes the stairs. Can you guess which choice Marcus makes?

Which brother are you more like? If you are like Connor, you follow an active lifestyle that includes plenty of physical activity. **Physical activity** is *any form of bodily movement that uses up energy*. Health experts advise teens to get 60 minutes of physical activity on most days. This can be done all at once or divided into 10- or 15-minute bursts of activity.

### Reading Check

**Identify** How much physical activity is recommended for teens?



## Why Is Physical Activity Important?

Like a machine, your body is made up of many moving parts. Staying physically active helps keep those parts in good working order. Physical activity benefits each side of the health triangle:

- **Physical Health:** When you choose to make regular physical activity a part of your life, you have more energy to complete your daily activities. Physical activity helps your heart and lungs work more efficiently and strengthens your bones. It improves **coordination**, *the smooth and effective working together of your muscles and bones*. It also improves your **balance**, *the feeling of stability and control over your body*. Physical activity during the day helps you sleep better and more soundly at night. It also helps you maintain a healthy weight by burning **calories**. These are *units of heat that measure the energy available in foods*. Physical activity helps “use up” calories that could lead to unwanted extra pounds. **Figure 9.1** on the next page shows the calories burned doing various activities for one hour.
- **Mental/Emotional Health:** Physically active people are better able to handle the stress and challenges of everyday life. They also tend to have higher self-esteem. Being physically active will help you think more clearly and concentrate better in school.



### MediaWatch



#### Fitness in a Bottle

Have you seen TV or magazine ads that promise to make you physically fit without any effort on your part? The ad may claim that the product will magically tone muscles or take off pounds. If these products sound too good to be true, they probably are. The best way to achieve fitness is to engage in physical activity.

**Find an ad for a health product that claims to easily improve physical health. Does the ad seem believable? Where can you find more information on the product?**

- ◀ Some forms of physical activity are done in a group. **What are some social benefits of these kinds of activities? How do they benefit your health triangle?**



▼ FIGURE 9.1

## CALORIES BURNED IN ONE HOUR FOR VARIOUS PHYSICAL ACTIVITIES

Activities that burn the most calories are shown in green. Those that burn the least amount are shown in red. **How does burning calories affect your physical health?**

ACTIVITY	If You Weigh 130 Lbs	If You Weigh 155 Lbs
Backpacking	413	493
Basketball (game)	472	563
Basketball (shooting baskets)	266	317
Bicycling (average effort)	472	563
Bowling	177	211
Canoeing (moderate effort)	413	493
Dancing (general)	266	317
Football, touch	472	563
Frisbee playing (general)	177	211
Frisbee playing (ultimate)	207	246
Golf (general)	236	281
Horseback riding (general)	236	281
House cleaning (general)	207	246
Mowing lawn	325	387
Stair climbing	472	563
Swimming (general)	590	704
Water volleyball	177	211
Weight lifting (moderate)	177	211

- **Social Health:** Whether you are on a team or working out with a partner, physical activity can benefit your social health. Physical activity can help you meet new people with similar interests but from different backgrounds. It also improves your ability to work with others as a team, and also demonstrates your willingness to join others of diverse culture, ethnicity, and gender.

### Physical Activity and Fitness

Physical activity is also a key to **physical fitness**, *the ability to handle the physical demands of everyday life without becoming overly tired*. People who are physically fit have enough energy to do the



# Health Skills Activity

## Practicing Healthful Behaviors

### Activity + Eating + Sleeping = Good Physical Health

In a way, physical health can be viewed as a health triangle within a health triangle. The three sides to physical health—physical activity, good eating habits, and adequate rest—are interrelated. Teens who are active during the day tend to get more restful sleep during the night. When you eat the right foods, you give your body the fuel it needs for physical activity. Taking care of your physical health can help you maintain a healthy weight and lower your risk of developing serious health problems.

### On Your Own

Describe your own physical health triangle. If the sides are not balanced, identify which areas need work. Tell what habits you can adopt that will improve your overall physical health. Develop a plan to practice these habits regularly.

things they want to do. They also have a reserve of energy for times when their bodies need it.

People who are physically fit tend to live longer and healthier lives. Later in this chapter, you will learn how to set fitness goals that will help you improve your fitness level.

## The Importance of Exercise

Look again at Figure 9.1. Several of the activities shown, including weight lifting and stair climbing, are exercises. **Exercise** is *planned physical activity done regularly to build or maintain one's fitness*. Exercise is an important ingredient in an overall fitness plan. The reason is simple: while every physical activity works various muscles, exercise targets specific muscles.

Exercises fall into two basic categories—aerobic and anaerobic—though many exercises have elements of both. Each of these categories serves an important role in physical fitness. **Aerobic exercise** is *rhythmic, nonstop, moderate to vigorous activity that requires large amounts of oxygen*. Aerobic exercise works a very important muscle in your body—your heart. It also benefits the lungs. Stair climbing, swimming, running, biking, and many forms of dancing are examples of aerobic exercise.



- Swimming can be a leisure activity, a sport, or an exercise. **Which kind of exercise is swimming?**



John Morgan/Index Stock

**Go Online**

Visit [glencoe.com](http://glencoe.com) and complete the Interactive Study Guide for Lesson 1.

**Anaerobic exercise** is intense physical activity that requires little oxygen but uses short bursts of energy. Lifting weights, gymnastics, and football are examples of anaerobic exercises. In the next lesson you will learn more about the benefits of aerobic and anaerobic exercise.



**Reading Check**

**Define** What is exercise?



## Lesson 1 Review



**After You Read**

**Review this lesson for new terms, major headings, and Reading Checks.**

### What I Learned

1. **Vocabulary** What is *physical activity*?
2. **Explain** What are the physical, mental/emotional, and social health benefits of being physically active?
3. **Identify** What are the two types of exercise? Describe each of them.

### Thinking Critically

4. What is the relationship between physical activity, nutrition, sleep, and weight management?

5. **Analyze** Alex would like to become more physically active but only if he can avoid exercising. What advice would you give Alex?

### Applying Health Skills

6. **Advocacy** Develop a poster campaign that emphasizes the importance of physical activity. Include ideas for different types of physical activity that would appeal to teens. Get permission to post these in school hallways.

# Lesson 2

## Endurance, Strength, and Flexibility

### Guide to Reading

#### ● Building Vocabulary

List each term below in your notebook. As you come across it in your reading, write the definition.

- heart and lung endurance (p. 210)
- muscle strength (p. 211)
- muscle endurance (p. 211)
- flexibility (p. 212)
- body composition (p. 213)
- heredity (p. 214)

#### ● Focusing on the Main Ideas

In this lesson, you will learn to

- **identify** the five elements of physical fitness.
- **describe** exercises that improve different areas of physical fitness.
- **develop** behaviors that will improve your body composition.

#### ● Reading Strategy

##### Organizing Information

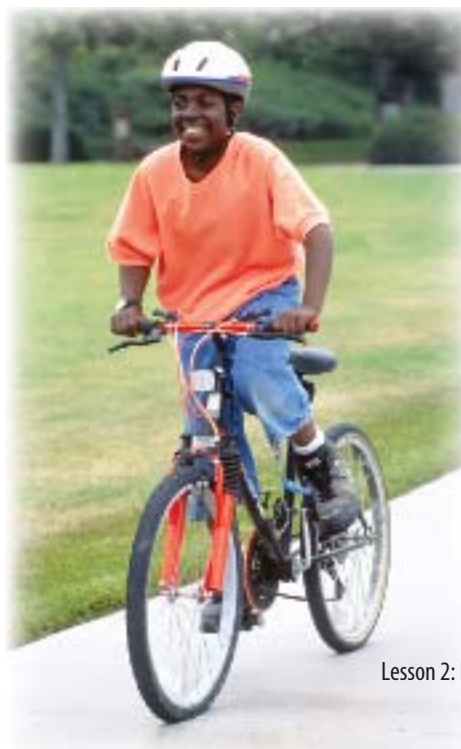
Copy the graphic organizer below onto a sheet of paper. Complete the organizer with information from the lesson.



### Measures of Fitness

Before you start any physical fitness program, you should have your level of physical fitness measured. There are five elements of physical fitness. They are cardiovascular endurance or heart and lung endurance, muscle strength, muscle endurance, flexibility, and body composition. In this lesson, you'll learn how to measure and improve your physical fitness.

- ▶ Types of physical activity that can improve heart and lung endurance include running, walking, and cycling. **Why are activities that involve endurance important to the health of your heart and lungs?**



### Quick Write

Write a paragraph describing why you think flexibility is important. What activities do you think can help improve flexibility?





### Academic Vocabulary

**indicator** (IN di kay tor)  
(noun) a sign. *Having a close group of friends is an indicator of good social health.*

## Heart and Lung Endurance

Blood pressure is a measure of how well your heart pumps blood through your body. It is an **indicator** of heart health. In a way, the same thing can be said about cardiovascular endurance, or **heart and lung endurance**. This endurance is *a measure of how efficiently your heart and lungs work when you exercise and how quickly they return to normal when you stop*. The word *endure* means “to last.” When you have high heart and lung endurance, you can work or play for long periods without running out of “steam.” **Figure 9.2** shows a test that measures heart and lung endurance.

If your score is low, do not be discouraged. Heart and lung endurance can be improved. Try doing nonstop moderate to vigorous exercise for at least 20 minutes, three to five times a week. You will notice an improvement after a few weeks.

Activities that build heart and lung endurance include swimming and cycling. Swimming carries the added advantage of providing a total body workout.

Other related exercises that can improve heart and lung endurance are walking, jogging, and running. If you walk, your goal should be 30 minutes at a brisk pace. If you jog or run, aim for at least 20 minutes. If that is difficult, try alternating walking and jogging and slowly work up to 20 minutes of jogging.



### Reading Check

**Explain** Why is it important to build heart and lung endurance?

**FIGURE 9.2**

## MEASURING HEART AND LUNG ENDURANCE

This test will help you determine if you need to improve your heart and lung endurance. You can take this test when you first start working out and again, when you have been working out for a few weeks. **What does a score of 101 or more mean?**

- 1.** Work with a partner, taking turns. Using a sturdy bench about 8 inches high, step up in 2 seconds and down in 2 seconds for 3 minutes.
- 2.** Fully extend each leg as you step. Step up with your right foot, then your left. Step down with your right foot first. Stepping should be continuous.
- 3.** Step at the rate of 24 steps per minute for 3 minutes.
- 4.** Find your pulse on the side of your neck. Count the number of pulses you feel for 1 minute.
- 5.** To rate your heart and lung endurance, find your recovery heart rate on the chart. This term refers to how quickly your heart rate returns to normal right after exercise is stopped.



Scoring (number of heartbeats)	Rating
70-100	Acceptable heart and lung endurance
101 or more	Low heart and lung endurance



## Muscle Strength and Endurance

The ability of your muscles to exert a force is called strength. **Muscle strength** is a measure of the most weight you can lift or the most force you can exert at one time. **Muscle endurance** is a measure of a muscle's ability to repeatedly exert a force over a prolonged period of time. Both measures are important to overall fitness.

**Figures 9.3** and **9.4** provide two different tests of muscle strength and endurance. Figure 9.3 tests the strength and endurance of the muscles in your mid-section. These muscles make up what fitness experts refer to as your *core*. Core muscles are important to safe lifting as well as balance. Developing a strong, durable core will lessen the risk of injury to your back.

Figure 9.4 on the next page tests strength and endurance of the muscles in your upper body. These muscles, which include those of the arms, shoulders, and chest, provide power. Players in contact sports, such as basketball, baseball and football, all work their upper bodies.

Like heart and lung endurance, muscle strength and endurance can be improved. The tests in Figures 9.3 and 9.4 are great strengthening exercises. Others include step-ups, which you practiced in Figure 9.2, and push-ups. Push-ups strengthen muscles in your arms and chest. **Figure 9.5** on the next page illustrates a technique for doing push-ups.

**FIGURE 9.3**

### MEASURING ABDOMINAL STRENGTH AND ENDURANCE

Abdominal strength helps reduce the risk of injury to your back. **What are some ways to build abdominal strength?**

1. Work with a partner, taking turns. Lie on your back with your knees slightly bent. Your partner should hold your feet.
2. With your arms crossed on your chest, curl your upper body forward. Return to the starting position. Your head should never touch the floor.
3. Continue to do curl-ups at the rate of about 20 per minute, stopping when you can no longer continue, or have completed 60 curl-ups.
4. To rate your abdominal strength and endurance, find your score on the chart. The range shown is acceptable for your age and gender. If you do not score with this range, continue working at this exercise until you do.

Age	Female	Male
12	18–32	18–36
13	18–32	21–40
14	18–32	24–45
15	18–35	24–47



### Personal Trainer



Do you like being physically fit? Do you want to help other people get fit by creating a personal workout for them that is fun, challenging, and motivating? If so, you may want to become a personal trainer. A personal trainer is a certified specialist who helps people achieve physical fitness. The need for personal trainers is high because the fitness industry is growing. If you want to be a personal trainer, you should practice your goal-setting skills and make sure that you get plenty of physical activity every day.

**What kinds of clients does a personal trainer have? Go to Career Corner at [glencoe.com](http://glencoe.com) to find out.**



▼ FIGURE 9.4

## MEASURING UPPER-BODY STRENGTH AND ENDURANCE

You can measure your upper-body strength and endurance by measuring the time you can hang from a bar with your chin above the bar. **What do you think are the benefits of building upper-body strength?**

1. Work with a partner, taking turns. Grasp a horizontal bar with your palms facing toward or away from your body.
2. Raise your body until your chin clears the bar, or you can be lifted into position. Your elbows should be flexed, your chest close to the bar. Your partner should start the stop watch.
3. Hold your position as long as possible. The watch stops when your chin touches or drops below the bar.
4. To rate your upper-body strength and endurance, find your score on the chart. The range of seconds shown is acceptable for your age and gender. If you do not score within this range, continue working at this exercise until you do.



Age	Female	Male
12	7–12	6–13
13–15	8–12	15–20

Another approach to building muscle strength is weight lifting. Also known as *resistance training*, weight lifting can be used to strengthen every muscle group. Just make sure that a fitness instructor or other expert supervises your workout.



### Reading Check

**Compare** What is the difference between muscle strength and muscle endurance?

▼ FIGURE 9.5

## DOING A PUSH-UP

1. Lie facedown on the floor. Bend your arms and place your palms flat on the floor beneath your shoulders.



2. Straighten your arms, pushing your entire body upward. Then lower your body to the floor. Repeat.



## Flexibility

Are you able to bend and touch your toes? If you can, you probably have good flexibility.

**Flexibility** is the ability of your body's joints to move easily through a full range of motion. Flexibility permits bending, turning, and stretching. It helps you reduce your risk of muscle injury. Gymnasts and dancers need a high level of flexibility.

You can improve your flexibility through regular stretching, bending, and twisting exercises. Move slowly and gently, holding each stretch. This will gradually improve the flexibility of your muscle groups.

## Body Composition

The last measure of physical fitness is body composition. **Body composition** is the ratio of body fat to lean body tissue, such as bone, muscle, and fluid. Body composition is different than body weight. Your body weight is simply how much you weigh. Your body composition is how much of that weight is body fat, muscle, and other lean body tissue. Too much body fat can lead to serious health problems.

One method for measuring body composition is the skinfold test, which involves pinching a fold of skin at two or three sites on the right side of the body. Each fold is measured with an instrument called a skinfold caliper. To assure accuracy, a trained person should administer the skinfold test using standardized testing procedures and a high quality caliper. Ask your fitness instructor about the skinfold test. Another way to measure body composition is to calculate your body mass index (BMI). Your BMI assesses your body weight relative to your height. It is an indirect measure of body fat for most people. However, people who are physically fit with larger amounts of muscle may have a high BMI score but little body fat. For these people, a skinfold test or other methods of measuring body fat are better. See page 262 in Chapter 11 for instructions on how to calculate your BMI.

One of the keys to improving body composition is to eat healthy foods and increase your physical activity. Teens with too much body fat generally have a weight problem. Taking in fewer calories and burning more calories through exercise will help shed some of the excess weight. Physical activities and exercise build muscle mass while reducing the percentage of body fat. By decreasing the amount of calories you consume and increasing your physical activity, you are choosing positive health behaviors that can protect your health.

**Reading Check** **Compare** What is the difference between body weight and body composition?

- ▶ Eating nutritious foods and exercising regularly can improve your body composition. **What are some nutritious foods that you like to eat?**





## Fitness and a Healthy Attitude

How a person performs on fitness tests depends on a variety of factors. An important one is **heredity**, *the passing of traits from parents to their children*. Speed, for example, is a trait that is often inherited, or passed down, from parents. People who can run fast have more of one type of muscle fiber than another.

Differences like these don't make one person better—or worse—than another. If you want to improve your level of physical fitness, you will need to set goals for yourself. It is perhaps even more important to keep a positive outlook about what you *can* do. Remember that improvement is possible in every area of fitness and that each improvement you make gives a boost to your physical health. Also remember, however, that everyone has limits. You can make only so much progress in a short period of time. In the next lesson, you will learn how to set up a fitness plan.

**Go Online**

Visit [glencoe.com](http://glencoe.com) and complete the Interactive Study Guide for Lesson 2.

**Reading Check**

**Explain** How does attitude affect your fitness level?



## Lesson 2 Review

**After You Read**

*Review this lesson for new terms, major headings, and Reading Checks.*

### What I Learned

1. **Vocabulary** What is *body composition*?
2. **List** Name the five elements of fitness.
3. **Identify** What are some exercises that will improve muscle strength and endurance? What are some that will improve flexibility?
4. **Describe** What are some ways to improve body composition?

### Thinking Critically

5. **Evaluate** Evaluate your current physical fitness level using the methods listed in this chapter or other approved methods. Tell what steps, if any, you need to take to boost your current activity level.

6. **Synthesize** When Don scored low on the test for muscle strength and endurance, he decided that fitness is simply “not for him.” What is wrong with Don’s attitude? What advice could you give him?

### Applying Health Skills

7. **Accessing Information** Research different methods for assessing body composition. Compare and contrast the strengths and weaknesses of each method.

## Lesson 3

## Setting Fitness Goals

## Guide to Reading

**Building Vocabulary**

As you read this lesson, write each new highlighted term and its definition in your notebook.

- cross-training (p. 216)
- F.I.T.T. principle (p. 218)
- resting heart rate (p. 219)
- target heart rate (p. 219)
- warm-up (p. 219)
- cooldown (p. 220)

**Focusing on the Main Ideas**

In this lesson, you will learn to

- **identify** factors to consider when choosing activities and exercises.
- **explain** the parts of the F.I.T.T. principle.
- **develop** warm-up and cooldown techniques for preventing injuries.

**Reading Strategy**

**Sequencing** Describe the sequence that should be followed in a workout, along with a short summary of what occurs at each stage.

## Identifying Your Fitness Goals

You wouldn't start a long road trip without first mapping out a route. In the same way, reaching a fitness goal requires a plan. A first step in developing such a plan is deciding what your goals are. What do you personally hope to accomplish? Maybe you want to compete in a certain sport or event. If so, your goal will probably focus on a specific fitness measure. Your goals should include strategies that will help you improve and maintain all three sides of your health triangle.

## Choosing Activities and Exercises

Once you have identified your goal, you need to select activities and exercises that will help you meet it. **Figure 9.6** on page 216 lists some activities and rates each in terms of its fitness benefits. Your coach or physical education teacher can give you guidance on other activities and exercises. Other factors to consider when selecting activities and exercises include the following:

- **Personal tastes.** Make sure you choose activities that you will enjoy doing. You are more likely to stick with such activities. Another way to keep your interest level high is to vary your routine. *Switching between different activities and exercises on different days* is known as **cross-training**.

**Quick Write**

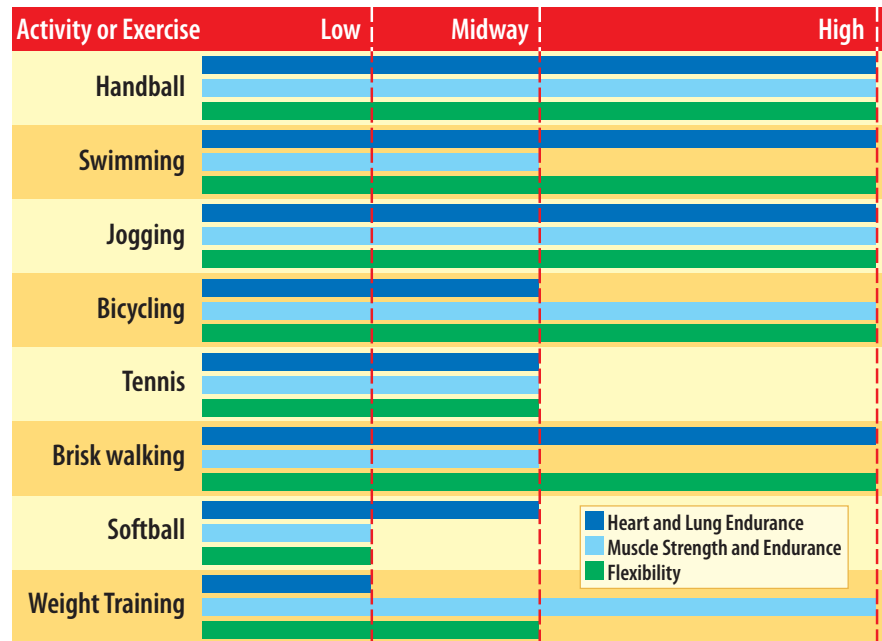
Write a brief description of the type of terrain and weather in your area. Tell what kinds of physical activities would make the most sense in these surroundings.



▼ FIGURE 9.6

## SELECTED ACTIVITIES AND THEIR FITNESS BENEFITS

The ratings in this chart show the benefits of activities done for 30 minutes or more. **Which activities have a high rating for heart and lung endurance?**



Working on improving many areas should be a goal of every fitness plan. Your plan, for example, should include at least 20 to 30 minutes of aerobic exercise 3 to 5 times a week.

- **Requirements.** Some activities will require special equipment, such as rackets, balls, gloves, and so on. Many require protective gear, such as helmets or knee pads. Before you start an activity, find out what kind of equipment you will need. Also decide if you will need lessons or special instruction before you start.



### Reading Check

**Identify** What kinds of questions do you need to ask yourself when choosing activities?

- Keeping a fitness log or journal is a good way to identify your fitness goals as well as track your progress. **What are some fitness goals that you might set for yourself? How would you go about working on these goals?**





## Creating a Schedule

Think about the time of day when you will do a particular activity or exercise. Be practical and realistic. If you have a 7:30 A.M. ride to school, it will probably be difficult to fit in an activity before you leave. Another aspect of scheduling has to do with season and climate. Do you live in a region that gets snow? If so, and if one of your exercises is running, you will need an indoor track or a treadmill during the winter months. Most communities have centers that are open to the public, and which offer pools and other exercise facilities.

Be sure to put your plan in writing. A written plan will help you stay on track and stick with your goal. Start by listing all physical activities that are currently part of your routine. For example, most teens have gym class on certain school days. If you are a member of a sports team, include practice sessions and game days. Be sure to count any outside activities that involve physical movement, such as dance lessons. **Figure 9.7** shows one teen's weekly fitness plan.



### Reading Check

**Recall** What type of information should go into a fitness plan?

**FIGURE 9.7**

## SAMPLE WEEKLY FITNESS PLAN

A written plan will help you stick with your goals. **Which activities has this teen added to his or her existing schedule? How many hours per day on average is this teen active?**

Calendar		Edit		Settings		
Monthly	Weekly	Daily				
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
<b>1</b> Ride bike (1 hr)	<b>2</b> Gym class (30 min)	<b>3</b> Basketball after school (40 min)	<b>4</b> Gym class (30 min)	<b>5</b> Ride bike after school (40 min)	<b>6</b> Gym class (30 min)	<b>7</b> Soccer game (50 min)
<b>8</b>	<b>9</b> Soccer practice (1 hr)	<b>10</b> Karate class (1 hr)	<b>11</b> Soccer practice (1 hr)	<b>12</b> Karate class (1 hr)	<b>13</b> Walk home briskly from soccer practice (20 min)	<b>14</b> Karate class (1 hr)
<b>15</b>	<b>16</b> Walk home briskly from soccer practice (20 min)	<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>	<b>21</b>
<b>22</b>	<b>23</b>	<b>24</b>	<b>25</b>	<b>26</b>	<b>27</b>	<b>28</b>





# Health Skills Activity

## Accessing Information

### Measuring Your Heart Rate

There are several reliable methods for determining your heart rate, or pulse. One of the easiest is to place two fingers at the base of your neck. Do not use your thumb, which has a pulse of its own. Feel for a throbbing sensation. This sensation is your heart pumping blood through an artery in your neck. Using a clock with a second hand, count the number of throbs in ten seconds. Multiply this number by six to get your heart rate.



### On Your Own

Take your current resting heart rate using this method. Investigate other reliable methods for taking this measurement. Share your findings.

## Building Fitness Levels

Whatever activity you choose to do, remember to start small. If you have never swum laps, you are probably not ready to compete on the school swimming team. Take each activity one day at a time and build up gradually. As you progress, adjust each activity using the **F.I.T.T. principle**, a method for safely increasing aspects of your workout without injuring yourself. The letters in the name stand for **F**requency, **I**ntensity, **T**ime, and **T**ype.

*Frequency* is how often you work different muscle groups. Gradually increase the number of times per week you work a muscle group. You might start by working out two or three times per week. Eventually, you can work out every day.

*Intensity* refers to how hard you work different muscle groups. If you are lifting weights, you increase intensity by adding more weight. If you are running laps, you increase intensity by increasing your speed.

*Time*, or *duration*, is a measure of how long you spend per session. Teens should get a total of 60 minutes of activity on most days. If you are just beginning an activity or exercise, you will need to start by doing less than that. You can eventually build up your endurance to a point where you can do the full hour.



## Connect To... Math



### Target Heart Rate

The best way to become used to calculating your target heart rate is to practice. Try it right now. If you are 13 years old, for example, your target heart rate will be within this range:

$$(220 - 13) \times 0.6 = 124 \text{ low end}$$

$$(220 - 13) \times 0.8 = 166 \text{ high end}$$

Compute the range for a 14-year-old.

*Type* refers to the type of activity you choose to do. A complete workout package should feature both aerobic and anaerobic exercises. For some fitness goals, you will want to do more of one type of exercise than another.

It is important that any changes to your workouts be made gradually. Adjust only one F.I.T.T. element at a time. Trying to do too much, too soon, can result in injury.

## Monitoring Your Heart Rate

You can monitor the intensity of your workout by checking your heart rate right before, during, and then after your workout. **Resting heart rate** is the number of times your heart beats per minute when you are relaxing. Take this measurement at the very beginning of a workout session, before you start any exercise. **Target heart rate** is the range of numbers between which your heart and lungs receive the most benefit from a workout. Finding your target heart rate is simple. You start by subtracting your age from 220. Then you multiply the resulting number by 0.6 and again by 0.8. The range of numbers between the two products represents your target heart rate. After you complete your workout, take your recovery heart rate. This measures how quickly your heart returns to normal right after you finish working out. The Health Skills Activity on page 218 gives you instructions on how to measure your heart rate.

**Reading Check** Define What is target heart rate?

## Warming Up and Cooling Down

Every exercise or activity session should begin with a warm-up and end with a cooldown. A **warm-up** is a period of low to moderate exercise to prepare your body for more vigorous activity. Warming up helps prevent injuries to muscles, joints, and connective tissue. Warm-ups should last around ten minutes and should include light aerobic exercise to get your blood flowing. Walking or jogging in place is an excellent choice. Warming up can also include practicing skills related to the activity you will be doing. Complete your warm-up with simple stretches such as those shown in **Figure 9.8**, on the next page. Stretch only the muscles that have been warmed up. Stretching cold muscles could lead to injury.

**What Teens THINK**

**How can you make physical activity part of your daily routine?**

You can make physical activity a part of your daily routine by getting involved in sports. You can just go outside and run for five minutes or longer. You can also go to a gym and work out and get stronger.

Deric G.  
Snow Hill, NC

**Go Online**

**Topic: Stretching for Fitness**

Visit [glencoe.com](http://glencoe.com) for Student Web Activities to learn about why stretching is so important, and how you can make stretching part of your overall health plan.

**Activity:** Using the information provided at the link above, create a personal stretching routine that you can use before and after strenuous exercise.



A **cooldown** is a period of low to moderate exercise to prepare your body to end a workout session. Cooling down helps return blood circulation and body temperature to normal. A cooldown should last around ten minutes and include gentle stretching exercises. You might repeat the same stretches you did during your warm-up.

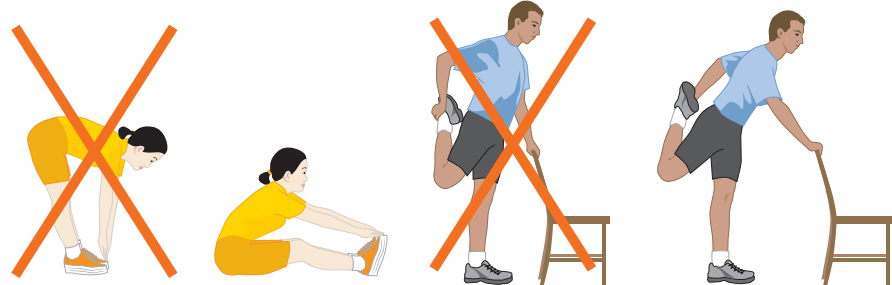
▼ **FIGURE 9.8**

## BASIC STRETCHES

Learning good stretching techniques can help prevent injury. **Try the two techniques illustrated and tell where you feel the “pull.”**

**Go Online**

Visit [glencoe.com](http://glencoe.com) and complete the Interactive Study Guide for Lesson 3.



## Lesson 3 Review

### After You Read

Review this lesson for new terms, major headings, and Reading Checks.

### What I Learned

1. **Vocabulary** What is the *F.I.T.T. principle*?
2. **Recall** Name two factors that need to be considered when choosing activities or exercises.
3. **Explain** Why are warm-ups and cooldowns important parts of any fitness routine?

### Thinking Critically

4. **Synthesize** Rich has made more progress than he expected in the first three weeks of weight lifting. He now plans to increase his load and the length of his sessions. Do you think Rich has made a good decision? What positive health behavior should Rich do to prevent health problems?

5. **Evaluate** Anne has planned out a schedule that includes four hours of activity and exercise each day. Previously she has been sedentary. What do you think are her chances of success with her fitness program?

### Applying Health Skills

6. **Goal Setting** Establish a personal physical activity goal. Use the goal-setting steps on page 29 and 30 to develop a plan to achieve your goal. Create a schedule to help you evaluate your progress.

## Lesson 4

## Sports Conditioning and Avoiding Injury

## Guide to Reading

## ● Building Vocabulary

As you read this lesson, write each new highlighted term and its definition in your notebook.

- conditioning (p. 222)
- P.R.I.C.E. formula (p. 224)
- dehydration (p. 225)
- heat exhaustion (p. 225)

## ● Focusing on the Main Ideas

In this lesson, you will learn to

- **describe** the benefits of conditioning.
- **develop** nutrition habits for athletes.
- **identify** ways of minimizing injury risks during sports or activities.
- **show** how to treat sports-related injuries.

## ● Reading Strategy

**Identifying Problems and Solutions** As you read the lesson, identify injuries described and ways of dealing with each.

## Quick Write

Describe an injury you had while playing a physical game or sport. Tell how this injury was treated.

## Sports Conditioning

Standing behind the center, Evan barked signals. Everyone in the stands sat silently, breathlessly watching. There was one second left on the clock. Time for one last play. North High was down by four points. The game—and season—were on the line.

“Hut! Hut! Hut!” Evan called. He took the snap from the center and moved back in the pocket. Out of the corner of his eye he saw a large linebacker barreling toward him from the right. Evan scrambled left and threw the ball as he skillfully dodged the tackler. Time seemed to stand still as the ball floated downfield. It fell gracefully into the hands of Evan’s teammate. “Touchdown!” the official shouted. The North High fans went wild. “Evan!” they cheered. “Evan! Evan! Evan!”

- ▶ Proper conditioning will strengthen your muscles so you can play your best when you compete. **What type of conditioning exercises do you think the tennis player in this picture practices?**





Michael Newman/PhotoEdit

Playing a sport can seem glamorous, especially when you are a star quarterback. It is also a fun way to make physical activity part of your life. Playing a sport involves much more than showing up for games, however. Athletes devote many hours off the field to physical **conditioning**, *a regular activity and exercise that prepares a person for a sport*. Some conditioning takes place right before a game. Baseball players, for example, practice batting and fielding. Basketball play-

▲ Drinking water before and during a game is a good sports nutrition habit. **What is another?**

ers do passing drills and take practice shots from different spots on the court. Conditioning may also include weight training and other exercises. Additionally, maintaining a healthy diet and getting enough rest are important aspects of conditioning.



### Reading Check

**Identify** Besides practice and exercise, what are two conditioning practices every athlete should follow?



## Sports Nutrition

Everyone needs proper nutrition. The term *nutrition* refers to the nutrients found in food and how they nourish the body. For athletes, good nutrition includes following specific guidelines on and off the field.

One common guideline is to eat carbohydrates before a game or event. Whole grains, fruits, and vegetables are good energy sources. Avoid foods high in simple sugars, such as candy bars. These will provide a burst of energy, but one that lasts only briefly.

Before and during a game, you should drink plenty of water. Your body loses water through perspiration, even outdoors in winter. Drinking water is important for any strenuous workout because it keeps you from getting dehydrated. If you start to feel dizzy, take a break for a few minutes. Sit in the shade and drink more water. Good athletes always take care of their bodies.



### Reading Check

**Give Examples** Name specific foods that athletes might eat before a game for added energy.



## Minimizing Risk

Whether your fitness program includes sports or some other activity, safety should be your first concern. You have already



### DEVELOPING

## Good Character

### Being a Team Player

When you play a team sport, you owe it to your team to be your best. Being your best means showing up, and on time, for practice. It means following team rules on and off the playing field. It means being supportive of your teammates, accepting their differences and limitations, and working cooperatively.

**In what ways is being a good team player important even if you do not play a sport?**



learned some guidelines for minimizing the risk of an activity-related injury. These guidelines include progressing gradually, warming up, and cooling down. Other guidelines include using the right equipment and knowing your limits.

## Proper Gear

In sports, proper gear starts with equipment used in your game. For some team sports, you wear cleats. These are shoes with spikes on the bottom that grip the ground and provide traction. Whatever shoes you wear should be suitable to your activity or game. Shoes should also fit properly, feel comfortable, and provide adequate support.

For games played in bright sunlight, a good pair of sunglasses is more than a fashion statement. It is a necessity. Choose shatterproof glasses with lenses that offer UV protection. UV protection will shield your eyes from the same harsh rays that cause sunburns on unprotected skin.

Other protective gear includes athletic supporters, knee pads, elbow pads, and helmets. Specific needs and equipment will depend on your activity or sport. You want to be sure to choose the appropriate gear in order to reduce your risk of injury.

For non-sports activities, wear clothing that is loose-fitting or stretchable. This type of clothing will give you freedom of movement and help you stay cool in warm weather. In cool weather, dress in layers to trap warm air against your body.

- ▼ You should remember to use appropriate athletic gear. **What are some features to consider when buying shoes for a sport or physical activity?**



## Know Your Limits

As Mike stood in his outfield position, his shoulder hurt from where a ball had struck it earlier. The game was important, however, so Mike decided to play through the pain. When Mike learned later that he had separated his shoulder, he felt bad in more than one way. He would be on the bench for the rest of the baseball season.

Do not make the same mistake Mike did. Learn to listen to your body whether you play a sport or exercise. If someone tells you “No pain, no gain,” do not believe them. Pain is your body’s way of telling you to slow down or stop, if you have been injured. If you experience pain, you should take the appropriate health care measure to protect yourself from further injury.





## Treating Injuries

Sometimes even when you are cautious, injuries can occur, especially when you are playing *contact sports*. This term is used for any sport where physical contact between players is normal. Football, hockey, and boxing are examples of contact sports.

Even if you are not injured through contact, you might experience muscle soreness. For strains, sprains, and muscle soreness, the **P.R.I.C.E. formula** will provide some relief. The letters stand for *Protect, Rest, Ice, Compress, and Elevate*. Apply the following **formula** as soon as possible after the game, event, or activity:

### Academic Vocabulary

**formula** (FAWR myuh luh) (*noun*) a way of doing something. *The formula for good health includes eating healthful foods, getting enough physical activity, and getting a good night's sleep.*

- **Protect** the injured part from further injury by keeping it still. Try not to move it too much. Moving it may make the pain worse.
- **Rest** the injured part.
- **Ice** the part using an ice pack.
- **Compress**, or put pressure on, the part using an elastic bandage. This will keep the injury from swelling. It will also help keep that part of your body motionless. Just be careful not to wrap the bandage too tightly. This could cut off the flow of blood.
- **Elevate** the injured part above the level of the heart.



### Reading Check

**Explain** What do the letters in the P.R.I.C.E. formula stand for?



## Weather-Related Injuries

Some sports and activities, such as ice hockey, skiing, and ice skating, are done in cold weather. Other activities tend to be played

- ▶ Treat an injury such as muscle soreness as soon as possible after it occurs. **Which steps in the P.R.I.C.E. formula is this teen demonstrating?**



in hot weather. Temperatures at both extremes pose a health risk to the body. You should follow practices that will reduce your risk of injury.

When the temperature rises in the summer, so does your body's. You perspire more, which is your body's way of cooling you down. If you are not careful to replace this lost water, you risk **dehydration**. This *condition caused by excessive water loss* can lead to other, more serious health problems. One of these is **heat exhaustion**—*an overheating of the body that can result from dehydration*. People with heat exhaustion often feel dizzy and have a headache. Their skin feels clammy when touched. Anyone who shows the symptoms of heat exhaustion needs to be taken to a cool, shady spot. The person should receive plenty of fluids. If the symptoms do not go away, call for help immediately.

Cold weather can bring its own share of problems, including frostbite and hypothermia. Chapter 20 will discuss weather-related risks in further detail.

 **Reading Check** **Define** What is *dehydration*?

**Go Online**

Visit [glencoe.com](http://glencoe.com) and complete the Interactive Study Guide for Lesson 4.

## Lesson 4 Review

 **After You Read**

**Review this lesson for new terms, major headings, and Reading Checks.**

### What I Learned

1. **Vocabulary** What is *conditioning*? What are some specific practices that are part of conditioning for most sports?
2. **Identify** Name two ways to minimize the risk of injury during sports or activities.
3. **Recall** What type of treatment is used for an exercise-related or sport-related injury such as muscle soreness?

### Thinking Critically

4. **Analyze** Brandon has tried on several pairs of cleats. The only pair he thinks look good on him are a size too small. He plans to buy the shoes anyway. How could you help Brandon make a healthful decision if you were the salesperson?

5. **Apply** Keely has one more lap to run around the track to finish her routine for the day. She is feeling light-headed and dizzy. What steps would you take to help Keely if you were there at the track?

### Applying Health Skills

6. **Communication Skills** Working with a small group, develop a public service announcement for teens. Your announcement should communicate ways to avoid injury and minimize other risks while being physically active. It should also encourage teens to work cooperatively with peers of different cultures, gender, ethnicities, and skill levels.



# Building Health Skills

Accessing Information

**Practicing Healthful Behaviors**

Stress Management

Analyzing Influences

Communication Skills

Refusal Skills

Conflict Resolution

Decision Making

Goal Setting

Advocacy

## Why Is It Important to Practice Healthful Behaviors?

When you practice healthful behaviors, you take specific actions to stay healthy and avoid risky behaviors. This will help you prevent injury, illness, disease, and other health problems.

### When working out or playing a sport:

- Avoid extreme temperatures.
- Drink water before, during, and after exercise.
- Wear appropriate clothing and protective gear.

## Playing It Safe

Follow the **Model, Practice, and Apply** steps to help you master this important health skill.

### 1 Model

*Read how Rebecca shows her sister, Connie, how to practice healthful behaviors when preparing to go jogging.*

"All set," Connie said. She and Rebecca had decided that they would jog together.

"Wait," Rebecca said. "I just heard that the temperature right now is in the low 90s."

"So?" Connie said. "No pain, no gain!"

"Exercising in the heat can cause heat exhaustion," Rebecca said. "I think we need to wait until it cools down and drink plenty of water."

The girls waited until the late afternoon when the temperature had dropped. Connie went to Rebecca's room. "Now can we go?" she asked.

"Not like that," Rebecca replied. "The clothes you're wearing are dark." "Now that it's starting to get dark out, we need to wear light-colored clothing. That will help drivers see us." She handed her sister a reflective armband. "This will also make us easier to see."



## 2 Practice

*Anya is going for a bike ride. Read the passage below and answer the questions that follow.*

Anya decided to go for a bike ride on a trail that was a few miles outside of town. The countryside surrounding the trail was scenic and peaceful. Anya was looking forward to the bike ride. As Anya was getting ready, she remembered that temperatures sometimes drop quickly during this time of the year. Anya wants to be prepared for the change in weather.

1. What advice would you give Anya about her clothing?
2. What other safety tips would you give Anya before she goes on the bike ride?



## 3 Apply

*Apply what you have learned about practicing healthful behaviors when completing the activity below.*

Working with a partner, develop a pamphlet that would be useful to teens exercising in your community. What weather-related factors or other safety risks exist in your community? How can these dangers be avoided? With your teacher's permission, display your pamphlet in the classroom or school library.

### Self-Check

- Did we describe specific safety risks or weather-related factors in our community?
- Did we explain how these dangers can be avoided?

Looking for an inexpensive activity that will make you feel good?

# RUN FOR IT!

Experts agree. Running relaxes you—and doing something physical helps your self-esteem. Follow these basic steps, and you'll be running a 5K (or 3.1 mile) race in no time.

## 1 GET IN GEAR

Head to your local sporting-goods store and ask the salesperson for a pair of running shoes with good support and cushioning. Mention that you're just starting out, so he or she can recommend the right type of shoe for your needs. When the weather turns cooler, be sure to have warm running gear for the rest of your body.

## 2 MAKE A GOAL

Check out the Road Runners Club of America's local race schedules. Register for a 5K race for teens that is a few weeks or months away. Then get motivated by imagining yourself crossing the finish line.

## 3 FUEL UP

Drink at least eight ounces of water up to five minutes before your run, and then again during and after your run. (Avoid caffeinated beverages, which dehydrate you.) You should have a carbohydrate snack about two to three hours before you run. Carbohydrates give you the energy you need to keep going. Perfect pre-run foods include oatmeal or bananas.

## 4 GET MOVING

After you've warmed up your muscles by stretching, start with a slow-paced jog. If you feel tired, it's okay to walk for a bit and pick up the pace again when you're ready. Once you've finished, you should stretch.



## 5 TAKE IT UP A NOTCH

Run three to five times a week for eight weeks before a race. Go a little farther each week while gradually picking up your pace. By your third week, you should be up to about 20 minutes (or roughly two miles at an easy 10-minute-per-mile pace). At that rate, you'll be hitting that 5K finish line in about 31 minutes. Then, get ready for your victory lap!





Visit [glencoe.com](http://glencoe.com) to download quizzes and eFlashcards for Chapter 9.

**FOLDABLES® Study Organizer**

**Foldables® and Other Study Aids** Take out the Foldable® that you created for Lesson 1 and any graphic organizers that you created for Lessons 1–4. Find a partner and quiz each other using these study aids.

**Lesson 1 The Benefits of Physical Activity**

**Main Idea** Physical activity benefits your physical, mental/emotional, and social health.

- Teens should get 60 minutes of physical activity on most days. This can be done all at once or divided into 10- or 15-minute bursts of activity.
- People who are physically active have enough energy to do the things they want to do. They also have a reserve of energy for times when their bodies need it.
- Aerobic exercise works your heart and lungs. It requires large amounts of oxygen.
- Anaerobic exercise requires little oxygen and short bursts of energy.

**Lesson 2 Endurance, Strength, and Flexibility**

**Main Idea** The five elements of physical fitness are cardiovascular or heart and lung endurance, muscle strength, muscle endurance, flexibility, and body composition.

- Different exercises improve different areas of physical fitness.
- Heredity is the passing of traits from parents to their children.
- If you want to improve your level of physical fitness, you will need to set goals for yourself and keep a positive outlook.

- Everyone has limits. You can make only so much progress in a short period of time.

**Lesson 3 Setting Fitness Goals**

**Main Idea** Whatever activity you choose, remember to start small. Take each activity one day at a time and build up gradually.

- Factors to consider when selecting activities include personal tastes and requirements.
- A written, weekly fitness plan will help you stick to your goals.
- The parts of the F.I.T.T. principle are **F**requency, **I**ntensity, **T**ime, and **T**ype.
- Warming up is important because it prevents injuries to muscles, joints, and connective tissue. Cooling down is important because it helps return blood circulation and body temperature to normal.

**Lesson 4 Sports Conditioning and Avoiding Injury**

**Main Idea** Proper conditioning will strengthen your muscles so you can play your best and protect yourself from injury.

- Sports are a fun way to make physical activity part of your life.
- Maintaining a healthy diet and getting enough rest are important aspects of conditioning.
- You can minimize risk by knowing your limits and wearing the proper gear.
- The main treatment for sports-related injuries is the P.R.I.C.E. formula—short for **P**rotect, **R**est, **I**ce, **C**ompress, and **E**levate.



## After You Read

## Health eSpotlight



Now that you have read the chapter, look back at your answer to the Health eSpotlight questions on the chapter opener. Are the short-term goals you created realistic? What other ways can teens keep track of their progress towards a long-term fitness goal?

## Reviewing Vocabulary and Main Ideas

On a sheet of paper, write the numbers 1–6. After each number, write the term from the list that best completes each sentence.

- balance
- coordination
- flexibility
- heart and lung endurance
- physical activity
- muscle strength

### Lesson 1 The Benefits of Physical Activity

1. Any form of bodily movement that uses up energy is known as \_\_\_\_\_.
2. \_\_\_\_\_ is the smooth and effective working together of your muscles and bones.
3. \_\_\_\_\_ is the feeling of stability and control over your body.

### Lesson 2 Endurance, Strength, and Flexibility

4. \_\_\_\_\_ is a measure of how efficiently your heart and lungs work

when you exercise and how quickly they return to normal when you stop.

5. The ability of your body's joints to move easily through a full range of motion is known as \_\_\_\_\_.
6. \_\_\_\_\_ is a measure of the most weight you can lift or the most force you can exert at one time.



On a sheet of paper, write the numbers 7–12. 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 Setting Fitness Goals

7. Switching between different activities and exercises on different days is known as cross-training.
8. Your resting heart rate is the range of numbers between which your heart and lungs receive the most benefit from a workout.
9. Warm-ups should consist of low to vigorous activity to prepare you for your workout.

### Lesson 4 Sports Conditioning and Avoiding Injury

10. Regular activity and exercise that prepare a person for a sport are known as nutrition.
11. Before a game or event, you should eat foods high in protein.
12. The P.R.I.C.E. formula can provide relief from muscle stiffness or soreness.



## Applying Technology

### Physical Fitness Presentation

In pairs, you will use PowerPoint® to create a physical fitness presentation for younger students.

- Choose an aspect of physical fitness from this chapter to focus on. Take notes on what information you want to use.
- Open a new PowerPoint® project with 20 slides. Each slide should have no more than four sentences of information. Turn your notes into complete sentences, making sure to use words that younger children will understand.
- Add colorful images and illustrations.
- Save your project. Find an elementary school teacher who will let you show your presentation to his or her class.

## Thinking Critically

Using complete sentences, answer the following questions on a sheet of paper.

- 13. Synthesize** Janice understands that physical fitness is important. She says that she plans to start becoming physically active as an adult. How would you encourage Janice to become physically active now as a teen?

## Write About It

- 14. Persuasive Writing** Write an article for your school paper on the importance of becoming and staying physically active.

## Standardized Test Practice

### Reading

Read the passage and then answer the questions.

Many teens dream of competing in the Olympic Games. The Olympic spirit of universality, excellence, peace, and friendship is represented in many symbols that date back to early modern Games.

The Olympic motto is one symbol of the Olympic spirit. The Olympic motto is *Citius—Altius—Fortius*, which is Latin for “faster, higher, stronger.” The intended meaning is that each athlete should focus on improving his or her own ability, rather than on coming in first.

Another Olympic symbol is the five rings. Each ring is a different color and together they represent the five major continents. (The Americas are treated as one continent.) The rings are interlaced to represent the universality of the Olympics, bringing together athletes from around the world.

The flame is another Olympic symbol, linking the ancient Games to the modern Games. The Olympic flame is lit in Greece and carried by a relay of runners to the site of the Games. There, it is used to light the cauldron that burns until the Closing Ceremony.

### TEST-TAKING TIP

Read the passage carefully once to find out what information it contains. After you read each question, look back at the passage to find the answer.

1. The five rings represent
  - A. the number of athletes in the first modern Games.
  - B. the Olympic motto.
  - C. the five major continents in the world.
  - D. the five major countries in the world.
2. Which statement best represents the main idea of the passage?
  - A. Many teens want to compete in the Olympics.
  - B. Athletes from all over the world compete in the Olympics.
  - C. There are many Olympic symbols.
  - D. Symbols are used to represent the spirit of the Olympics.