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Fitness, Health, and Wellness for All

In This Chapter

Student Web Resources

www.fitnessforlife.org/student

Lesson 1.1

Scientific Foundations

Lesson Objectives

After reading this lesson, you should be able to

1. describe the scientific method;
2. define *health and medical science* and *nutrition science*;
3. define *kinesiology* and list the seven types of science it encompasses; and
4. describe and differentiate the warm-up, the workout, and the cool-down.

Lesson Vocabulary

biomechanics, calisthenics, cool-down, dietitian, dynamic warm-up, exercise anatomy, exercise physiology, exercise psychology, exercise sociology, health and medical science, kinesiology, motor learning, motor skill, nutrition science, sport pedagogy, stretching warm-up, warm-up, workout

Science is the study of knowledge based on observation and experimentation. In school, you study various sciences, such as natural science (focused on nature), social science (focused on individual and social behavior), and mathematics (focused on numbers and their operations). Examples of natural science include biology, chemistry, and physics; examples of social science include psychology, sociology, and geography; and examples of mathematics include algebra, geometry, and calculus.

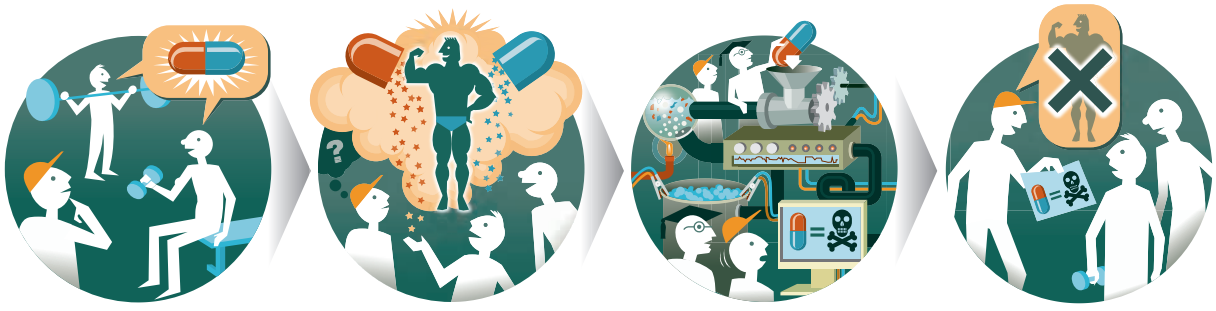
FIT FACT

Many of the names of sciences end with "-ology," which means "the study of."

The Scientific Method

Scientists of all types use the scientific method to discover new knowledge and establish principles that help us make good decisions and solve problems. A simplified form of the scientific method is presented here. The steps—identifying a problem, establishing a hypothesis, collecting information, and interpreting information—are shown in figure 1.1.

The information presented in this book is based on studies that use the scientific method as described in figure 1.1, and each chapter includes a special feature called Science in Action. This feature helps you see how research in **health and medical science, kinesiology** (exercise science), and **nutrition science** can help us make good decisions about fitness, health, and wellness.



Problem
Friends are considering taking a dietary supplement. Should I take one?

Hypothesis
They think a supplement might help them get fit faster.

Collect information
Conduct a search for information about benefits and risks associated with the supplement.

Interpret information
Analysis and conclusion: the risks are greater than the benefits. Don't take the supplement.

FIGURE 1.1 A simplified form of the scientific method.

You've probably used the scientific method yourself when conducting experiments in science classes. You've also read studies that used the scientific method. But you may not have thought about using the scientific method in your personal life. As you work your way through the Fitness for Life program, you'll learn to use the scientific method to help you solve problems and make healthy lifestyle decisions. You'll also use the scientific method to plan programs for building your fitness, health, and wellness.

Health and Medical Science

Medicine is the art and science of healing. Historically, the practice of medicine has been focused on diagnosing and treating disease. In prehistoric times, people often associated illness with demons and evil influences. But as early as 2000 BC, Egyptians performed surgery and began to build a more scientific base for medicine. Modern medical practitioners use evidence-based approaches, and research studies are required before medical procedures and medicines are approved.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Because of advances in health and medical science, life expectancy in the United States has increased dramatically over the last century. In 1900, the life expectancy for Americans was 47 years. Over the next century, it almost doubled, reaching nearly 80 years. Health and medical scientists have developed medicines that treat bacterial infections, and as a result infectious diseases such as typhoid fever and smallpox, which used to be among the leading causes of death, have been conquered. Before 1900, fewer than 100 medicines were available to doctors. Now there are more than 10,000, and in the United States they must be tested before the government's Food and Drug Administration (FDA) approves them. With infectious illness reduced, the main causes of early death in developed countries today are heart disease, cancer, diabetes, and other chronic diseases related to unhealthy lifestyles.

Health science focuses on preventing disease and promoting wellness and high quality of life. Some health scientists study personal health issues in order to help individuals prevent disease and promote wellness. Public health scientists, on the other hand, study patterns of health and illness among populations in order to help prevent epidemics of illness; thus they are sometimes called epidemiologists.

> "Physical fitness is not only one of the most important keys to a healthy body; it is the basis of dynamic and creative intellectual activity."
>
> —John F. Kennedy, U.S. president

Kinesiology (Exercise Science)

The past two centuries have sometimes been called the golden age of medicine because they have seen many of the most significant advances in health and medical science. Toward the end of the 20th century, a relatively new science called kinesiology emerged as more and more evidence accumulated showing the health and wellness benefits

of physical activity and exercise. The U.S. National Research Council now recognizes kinesiology as a major area of science along with other major branches such as those listed at the beginning of this chapter.

Put simply, kinesiology is the study of human movement. There are, of course, many types of human movement. Some involve small muscle movements, such as the movement of your eyes when reading, the movement of your fingers when typing, and the movement of your hands when playing a musical instrument. Kinesiology is the study of all human movement, but it focuses on large-muscle physical activity; in fact, the phrase "physical activity" is a very general term for large muscle movement. There are many types of physical activity, including moderate activities such as walking, vigorous activities such as aerobics, sport and recreational activities, and exercise for muscle fitness and flexibility. These activity types are included in the Physical Activity Pyramid, which is described in more detail throughout this book.

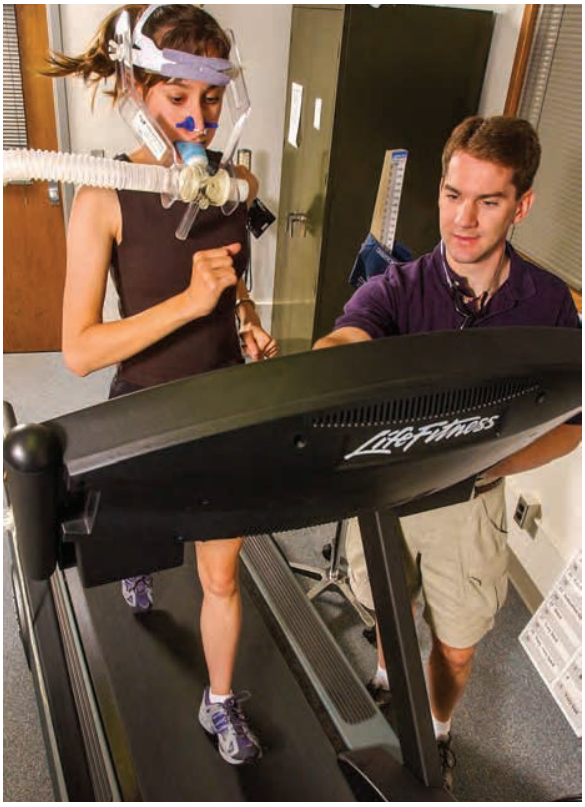
FIT FACT

One national health goal established by the U.S. Department of Health and Human Services (USDHHS) is to eliminate disparities in fitness, health, and wellness. People who study kinesiology look for ways of helping *all* people be active, fit, healthy, and well—regardless of race, ethnicity, social or economic class, disability, age, sex, or gender identity.

The general category of kinesiology includes seven sciences. The most prominent are featured in this chapter and in special features that appear throughout this book. They include **exercise physiology, exercise anatomy, biomechanics, exercise psychology, exercise sociology, motor learning,** and **sport pedagogy**. These sciences provide the foundation for our current understanding of the health benefits of physical activity and exercise. Exercise professionals, including physical education teachers, study all of the sciences in kinesiology as part of their training. You don't need to know as much about kinesiology as your teachers, but an understanding of the sciences of kinesiology will help you to understand the information in this book.

Exercise Physiology

Physiology is a branch of biology focused on the study of body systems. More specifically, exercise physiology is a branch of kinesiology that explores how physical activity affects body systems. For example, exercise physiologists study the cardiovascular, respiratory, skeletal, muscular, and other body systems to see how they are affected by exercise. Understanding the basic principles of exercise physiology is essential for planning physical activity programs for promoting lifelong fitness, health, and wellness.



Exercise physiology is the branch of kinesiology that explores how physical activity affects body systems.

Exercise Anatomy

Human anatomy is a branch of biology focused on studying the structure of the human organism. Scientists who study human anatomy focus on the tissues that make up the body (muscle, bone, tendon, ligament, skin, organ). Scientists who study exercise anatomy are especially interested in understanding how we use our muscles—and how our

muscles work together with our bones, ligaments, and tendons—to produce movement. Understanding exercise anatomy can help you choose good exercises for building your personal fitness program.

Biomechanics

The human body is much like a machine. It uses a complex system of levers (bones) that are moved by the force produced when you contract your muscles. Biomechanics is the branch of kinesiology that seeks to understand the human machine in motion through the principles of physics. Knowing the basic principles of biomechanics can help you move efficiently and avoid injury.

Exercise Psychology

Psychology is commonly referred to as the science of mind and behavior. More specifically, exercise psychology focuses on the study of human behavior in all types of physical activity, including sport and exercise for fitness. Exercise psychology, including sport psychology, can help motivate people to be active, set realistic goals, and perform better in sports.

Exercise Sociology

Sociology is the study of society and social relationships. Within this broad field, exercise sociology focuses on social relationships and interactions in physical activity, including sports. Exercise sociology has helped people understand teamwork and cooperation; social responsibility; and cultural and ethnic differences in physical activity. Understanding key principles of exercise and sport sociology will help you experience positive social interactions in your physical activity.

Exercise sociology is the branch of kinesiology that focuses on social relationships and interactions in physical activity, including sports.

Motor Learning

When you see the word *motor*, you may think of an automobile engine, but the term *motor learning* in this book refers to skill learning. When you perform a movement skill (also called a **motor skill**), your brain sends a signal through a nerve that tells the relevant muscles to contract. Nerves and muscle fibers that work together to produce movement are

Biomechanics is the branch of kinesiology that seeks to understand the human body in motion through the principles of physics.

Motor learning is the branch of kinesiology that involves the study of nerves and muscles to see how they work together to perform motor skills.

called a motor unit. Performing a motor skill, such as throwing a ball, requires action by many motor units (nerves and muscles). People who study motor learning have developed rules and principles that help us learn motor skills and control movements. In this book, you'll learn the best ways to develop and practice the skills used in all of the activities presented in the Physical Activity Pyramid.

Physical Education and Sport Pedagogy

Pedagogy is the art and science of teaching. People who study pedagogy as a science focus on discovering the best ways to teach. Sport pedagogy is the study of teaching and learning in many different physical activity settings, including school physical education, on sports teams, and in fitness clubs. The word *sport* is used broadly to include more than just traditional American sports. In other regions of the world, *sport* is used similarly to the term *physical activity*. So sports, or sporting activities, include activities such as riding a bike, taking a hike, performing muscle fitness exercises, and performing traditional sports such as basketball, volleyball, or tennis. People who study pedagogy as a science focus on developing a better understanding of the most appropriate approaches to teaching and the many factors that influence learning. They apply learning principles to help students meet important educational objectives. Examples include applying motor learning principles to help students improve their skills, applying management principles to increase physical activity during classes, and using motivational principles to encourage full participation and optimal learning.

FITNESS TECHNOLOGY: World Wide Web

WWW 3

The World Wide Web has given many people immediate access to all kinds of health and fitness information. As you'll learn elsewhere in this book, some of the information available on the web is good. However, much of it is inaccurate, especially health information. In each chapter of this book, you'll find a web address that leads you to sound information about fitness, health, and wellness. Look for special web symbols included throughout the book; just type in the address from the first page of the chapter, and you'll find good, reliable information. These web pages will also give you links to other good sources of fitness and health information.

Using Technology

Access the web address provided at the beginning of each chapter in this book. You will find additional information related to topics in each lesson. Explore the topics to learn more. Explore some of the websites provided to find good fitness and health information.

SCIENCE IN ACTION: Guidelines for Warming Up and Cooling Down

WWW 4

The time you spend doing physical activity each day is your physical activity session. The activity session has three phases: warm-up, workout, and cool-down. The **warm-up** is the activity you perform before your workout in order to get ready for it. The **workout** is the main part of your activity session. It can involve exercise to build fitness, participation in a competitive event, or activity done just for fun. The **cool-down** is the activity you perform after your workout to help you recover. You can use the information presented here about warming up and cooling down to prepare yourself for the various workouts described in this book.

The general warm-up helps your heart and other body systems get ready for more vigorous physical activity.

The Warm-Up

Experts have studied the warm-up for nearly 100 years. For many years, exercise physiologists thought that a **stretching warm-up** was the preferred method of getting ready for a workout. For this reason, the most common type of warm-up includes static stretching (slowly stretching a muscle beyond its normal length and holding the stretch for several seconds). The American College of Sports Medicine (ACSM) notes that a warm-up improves range of motion and may reduce the risk of injury. But some recent research has raised questions about whether the traditional stretching warm-up really prevents injury. Additionally, questions have been raised about the effects of a stretching warm-up on certain types of performance. The best evidence now suggests that your warm-up can vary depending on the workout you plan to perform. Here are some warm-up guidelines:

You don't need to perform a warm-up prior to a workout of low to moderate intensity (such as walking or slow jogging). Low to moderate physical activity is used as a general warm-up as recommended by ACSM, so a workout consisting of low- to moderate-intensity exercise doesn't require a special warm-up.

ACSM recommends 5 to 10 minutes of general warm-up involving low- to moderate-intensity physical activity prior to a vigorous workout or competition. The goal is to increase your body and muscle temperature. This general warm-up helps your heart and other body systems get ready for more vigorous exercise. The general warm-up can include walking, jogging, and **calisthenics**, such as those included in a **dynamic warm-up** (see the Taking Action feature near the end of the chapter).

The National Strength and Conditioning Association (NSCA) recommends a series of dynamic exercises prior to a workout or competition that requires strength, speed, and power. Examples of dynamic exercises include jogging, skipping, hopping, jumping, and calisthenics using your arms, legs, shoulders, and hips (see this chapter's Taking Action feature). You can also perform sport-related movements that use your body parts similarly to how you'll use them

in sport competition. Examples include jumping and shooting drills for basketball and swinging a club or bat with gradually increasing intensity. Dynamic warm-up exercises are good for increasing your body temperature and for getting your muscles ready for more vigorous exercise. They can serve as all or part of the general warm-up recommended by ACSM.

A stretching warm-up may be performed prior to a workout or competition, including activities that require strength, speed, and power, if the stretch is not held too long. The NSCA recommends dynamic movement exercises as the preferred warm-up before activities requiring strength, speed, and power. For this reason, some may choose not to perform a stretching warm-up before these activities. However, for those who enjoy a stretching warm-up, stretching exercises can be included as long as each stretch is not held for more than 60 seconds, even prior to a strength, speed, and power workout. Recent research indicates that as long as the stretches don't exceed 60 seconds, they don't inhibit performance. Research also indicates that abruptly stopping a stretching warm-up after regularly performing one increases risk of injury. If you choose a stretching warm-up you should use a variety of stretching exercises to address all of your major muscle groups and joints (see this chapter's Taking Action feature). Stretches should be held for 15 to 30 seconds. Stretching is more effective when your muscles are warm, so you should stretch only after performing a general warm-up.

Stretching exercises used to build flexibility, rather than for warming up, are best performed as a separate part of your workout. The stretching warm-up and the stretching workout are not the same thing. A stretching warm-up is used to prepare you for physical activity. The stretching workout includes exercises to build flexibility, a health-related component of physical fitness. ACSM recommends that stretching for flexibility be done after the general warm-up as part of the workout or as a separate workout session after the cool-down. The flexibility workout is typically much more comprehensive than a warm-up. You will have the opportunity to study flexibility and the flexibility workout later in this book.

The Cool-Down

After a workout, your body needs to recover from the demands of physical activity; to aid this process, ACSM recommends a cool-down of 5 to 10 minutes after a vigorous workout. The cool-down usually consists of slow to moderate activity, such as walking or slow jogging, that allows your heart and muscles to gradually recover. The cool-down helps prevent dizziness and fainting. Hard exercise increases the flow of blood to your muscles; for example, running causes more blood to be pumped to your arms and legs than to your head. If you suddenly stop running, the blood can pool in your legs. This leaves your heart with less blood to pump to your brain, which may cause you to feel dizzy or faint. But if you continue moving after a hard run, your muscles will squeeze the veins of your legs. This helps return the blood to your heart, which can then pump more blood to your brain, making you less likely to feel dizzy or faint. The following list provides some more cool-down guidelines.

- Do not lie down or sit down immediately after vigorous activity.
- Gradually reduce the intensity of activity during the cool-down (for example, if you were running, slow to a jog, then a walk, and then consider gentle stretching).
- Walk or do other moderate total body movements.
- You may choose to do some of the stretching exercises presented in the chapter titled Flexibility after your general cool-down while your muscles are still warm.

Student Activity

How does the information in this feature change the way you would warm up before, and cool down after, a workout?

Nutrition Science

Nutrition science is the study of how plants and animals use food to grow and sustain life. This book, of course, focuses on human nutrition. Nutrition scientists study nutrients (carbohydrate, protein, fat, vitamin, and mineral) to better understand which ones contribute to healthy growth and development. One type of nutrition science—food science—is the study of the chemical makeup of food. Another type—food technology—focuses on food processing, packaging, preservation, and safety. **Dietitians** are experts who help people apply principles of nutrition in daily life.

For healthy growth and development, apply the principles of nutrition in daily life.

Lesson Review

1. What is the scientific method and what are its four steps?
2. What are the *health and medical* and *nutrition sciences*, and how do they relate to fitness, health, and wellness?
3. What is *kinesiology*, and what are the seven types of science it encompasses?
4. What are the warm-up and the cool-down, and how are they best performed?

SELF-ASSESSMENT: Physical Fitness Challenges

Each chapter of this book includes a feature titled Self-Assessment. In most chapters, the self-assessment is designed to help you determine your personal fitness level. You'll record and analyze your assessment results. In this self-assessment, you'll try 11 challenges. They're called challenges rather than tests because *they are not meant to be tests of fitness; nor are they meant to be exercises that you do to get fit*. Instead, trying these challenges is a fun way to better understand the differences between the various parts of physical fitness. Please do not draw conclusions about your fitness based on your performance in these challenges. As you work your way through this book, you'll learn many self-assessments to help you determine your true fitness level.

The cardiorespiratory endurance and flexibility challenges will help you warm up before performing the other challenges. You may also want to consider additional warm-up exercises recommended by your teacher.

PART 1: Health-Related Physical Fitness Challenges

Running in Place (cardiorespiratory endurance)

1. Determine your resting heart rate for one minute. To do this, use your fingers to feel your pulse at your wrist or neck, then count your pulse (heartbeats) for one minute.
2. Run 120 steps in place for one minute. Count one step every time a foot hits the floor.
3. Rest for 30 seconds, then count your pulse (heart rate) for one minute. People with good cardiorespiratory endurance recover quickly after exercise. Is your heart rate after this exercise within 15 beats per minute of your resting heart rate before running in place?

This challenge focuses on cardiorespiratory endurance.

Two-Hand Ankle Grip (flexibility)

1. Squat with your heels together. Lean the upper body forward and reach with your hands between your legs and behind your ankles.
2. Clasp your hands in front of your ankles.
3. Interlock your hands for the full length of your fingers. Keep your feet still.
4. Hold the position for five seconds.

This challenge focuses on flexibility.

Single-Leg Raise (muscular endurance)

1. Bend forward at your waist so that your upper body rests on a table and your feet are on the floor.
2. Raise one leg so that it is extended straight out behind you. Complete several such raises with each leg. Performing multiple repetitions (8 or more) requires muscular endurance. Stop if you reach 25 with each leg.

This challenge focuses on muscular endurance.

Arm Skinfold (body fat level)

1. Let your right arm hang relaxed at your side. Have a partner gently pinch the skin and the fat under the skin on the back of your arm halfway between your elbow and shoulder. Together the skin and fat under the skin is called a skinfold.
2. Several skinfolds in different body locations can be used to determine the total amount of fat in the body. At this point there is no need to measure the skinfold. The skinfold on the arm is used only to illustrate the concept of body composition.

This challenge focuses on body composition.

90-Degree Push-Up (strength)

1. Lie facedown on a mat or carpet with your hands under your shoulders, your fingers spread, and your legs straight. Your legs should be slightly apart and your toes should be tucked under.
2. Push up until your arms are straight. Keep your legs and back straight—your body should form a straight line.
3. Lower your body by bending your elbows until your upper arms are parallel to the floor (elbows at a 90-degree angle), then push up until your arms are fully extended. Do one push-up every three seconds. You may want to have a partner say "up-down" every three seconds to help you. Performing up to 5 push-ups requires muscular strength.

This challenge focuses on strength.

Knees-to-Feet (power)

1. Kneel so that your shins and knees are on a mat. Hold your arms back. Point your toes straight backward.
2. Without curling your toes under you or rocking your body backward, swing your arms upward and spring to your feet.
3. Hold your position for three seconds after you land.

This challenge focuses on power.

PART 2: Skill-Related Physical Fitness Challenges

Line Jump (agility)

1. Balance on your right foot on a line on the floor.
2. Leap onto your left foot so that it lands to the right of the line.
3. Leap across the line onto your right foot; land to the left of the line.
4. Leap onto your left foot, landing on the line.

This challenge focuses on agility.

Double Heel Click (speed)

1. Jump into the air and click your heels together twice before you land.
2. Your feet should be at least three inches (eight centimeters) apart when you land.

This challenge focuses on speed.

Backward Hop (balance)

1. With your eyes closed, hop backward on one foot five times.
2. After the last hop, hold your balance for three seconds.

This challenge focuses on balance.

Double-Ball Bounce (coordination)

1. Hold a volleyball in each hand. Beginning at the same time with each hand, bounce both balls at the same time, at least knee high.
2. Bounce both balls three times in a row without losing control of them.

This challenge focuses on coordination.

Coin Catch (reaction time)

1. Point your right elbow outward in front of you. Your right hand, palm up, should be beside your right ear. If you're left-handed, do this activity with your left hand.
2. Place a coin as close to the end of your elbow as possible.
3. Quickly lower your elbow and grab the coin in the air with the hand of the same arm.

This challenge focuses on reaction time.

Lesson 1.2

Lifelong Fitness, Health, and Wellness

Lesson Objectives

After reading this lesson, you should be able to

1. define *physical fitness*, *health*, and *wellness* and describe how they are interrelated;
2. describe the five components of health and wellness;
3. describe the six parts of health-related physical fitness and the five parts of skill-related physical fitness; and
4. define *self-assessment* and explain how it is important to good fitness, health, and wellness.

Lesson Vocabulary

agility, balance, body composition, body fat level, cardiorespiratory endurance, coordination, flexibility, functional fitness, health, health-related physical fitness, hypokinetic condition, muscular endurance, physical fitness, power, public health scientist, reaction time, skill-related physical fitness, speed, strength, wellness

If you could have one wish come true, what would it be? Some people would wish for material things, such as money, a new car, or a new house. But after thinking about it, most people indicate that they would wish for good fitness, health, and wellness for themselves and their family. If you possess health, fitness, and wellness, you can enjoy life to its fullest. Without them, no amount of money will allow you to do all of the things you would like to do. More than 90 percent of all people, including teens, agree that good health is important because it helps you feel good, look good, and enjoy life with the people you care about most.

As you read this book, you'll learn more about healthy lifestyle choices that can help you be fit, healthy, and well. You'll learn how to prepare a healthy personal lifestyle plan and how to use self-management skills to stick with your plan. The goal of this book is to help you become an informed consumer who makes effective decisions about your lifelong fitness, health, and wellness.

> "The first wealth is health."
>
> —Ralph Waldo Emerson, poet

Before you can start developing a plan, you need some basic information. In this lesson, you'll learn definitions for some key words used throughout this course. You'll better understand the meaning of the words *fitness*, *health*, and *wellness*, and you'll learn about their components.

What Is Health? What Is Wellness?

Early definitions of **health** focused on illness. The first medical doctors concentrated on helping sick people overcome their health problems; in other words, their main job was treating people who were ill.

But in 1947, the World Health Organization (WHO), which now includes representatives from 194 countries, issued a statement indicating that health meant more than freedom from disease or illness. This recognition led people to develop a more comprehensive definition of health, which now includes **wellness**. According to the WHO statement, the sheer fact of not being sick doesn't mean you are well. Wellness is the positive component of health that includes having a good quality of life and a good sense of well-being exhibited by a positive outlook on life.

Figure 1.2 shows that a healthy person both is not ill (the blue circle) and has a strong wellness component (the green circle). Illness is the negative component of health that we want to treat or prevent, whereas wellness is the positive component of health that we want to promote.

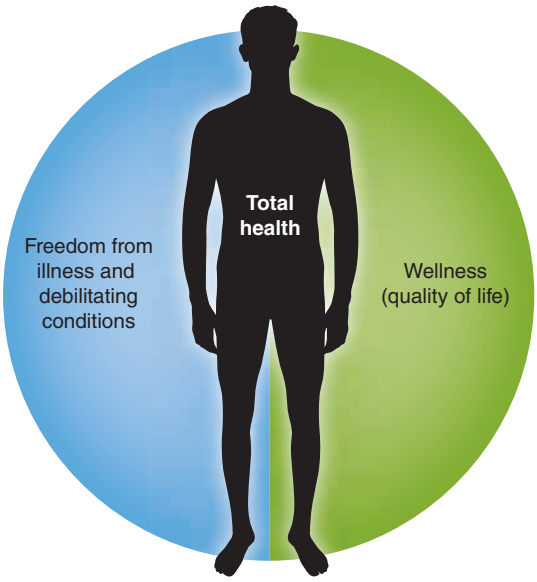


FIGURE 1.2 Being healthy means having wellness in addition to not being ill.

Health and wellness have many components, and a chain is often used to show how the components are linked (figure 1.3). For a chain to be strong, each link must be strong. Likewise, to have good health and wellness, you must have all of the health and wellness components, not just one or two. The goal is to promote the positive while avoiding the negative in each component, as shown in figure 1.3. If you're happy, informed, involved, fit, and fulfilled, then you have incorporated the positive aspects of the health components into your life. You possess wellness, and your risk of illness is reduced. The bottom line is this: Health is freedom from disease and debilitating conditions as well as optimal wellness in all five components (physical, emotional-mental, social, intellectual, and spiritual).

Personal Health and Community Health

One major goal of this book is to help each reader achieve good personal health, including wellness. Another important goal is to promote community health, which refers to the health of a group rather than an individual—from small groups such as families and networks of friends, to larger groups such as towns and cities, and on to very large groups such as states and countries. Just as each person sets health goals, communities do so as well. Your school is a community, and many schools have a coordinated school health program (CSHP). A CSHP program has many components including physical education, health education, wellness programs, and other programs designed to improve the personal health of students and the health of the school community.

One example of a large-scale program designed to promote health in a large community is the Healthy People 2020 project, in which the U.S. Department of Health and Human Services has set national health goals to be accomplished by

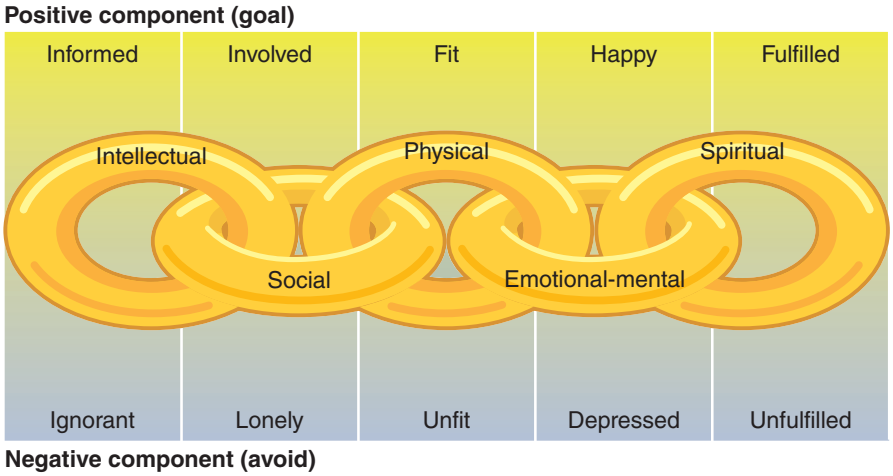


FIGURE 1.3 The total health and wellness chain.
Based on Corbin et al. 2011.

the year 2020. The project is part of an ongoing program. Every 10 years, experts from more than 400 groups nationwide work together to develop health goals for the nation. **Public health scientists** and other experts from every state and many federal and private agencies develop the goals. Many of the Healthy People 2020 objectives are described on the unit opening pages of this book.

What Is Physical Fitness?

Physical fitness refers to the ability of your body systems to work together efficiently to allow you to be healthy and perform activities of daily living. Being efficient means doing daily activities with the least effort possible. A fit person is able to perform schoolwork, meet home responsibilities, and still have enough energy to enjoy sport and other leisure activities. A fit person can respond effectively to normal life situations, such as raking leaves at home, stocking shelves at a part-time job, and marching in the band at school. A fit person can also respond to emergency situations—for example, by running to get help or aiding a friend in distress.

FIT FACT

Studies indicate that fitness scores in the United States have declined in recent years for recruits in physically demanding lines of work, such as policing, fire fighting, and the military.

The Parts of Physical Fitness

Physical fitness is made up of 11 parts—6 of them health related and 5 skill related. All of the parts are important to good performance in physical activity, including sports. But the 6 are referred to as contributing to **health-related physical fitness** because scientists in kinesiology have shown that they can reduce your risk of chronic disease and promote good health and wellness. These parts of fitness are **body composition**, **cardiorespiratory endurance**, **flexibility**, **muscular endurance**, **power**, and **strength**. They also help you function effectively in daily activities.

As the name implies, **skill-related physical fitness** components help you perform well in sports and other activities that require motor skills. For example, **speed** helps you in sports such as track and field. These 5 parts of physical fitness are also linked to health but less so than the health-related components. For example, among older adults, **balance**, **agility**, and **coordination** are very important for preventing falls (a major health concern), and **reaction time** relates to risk for automobile accidents. Each part of physical fitness is described in more detail in the two following features: The Six Parts of Health-Related Fitness and The Five Parts of Skill-Related Fitness.

FIT FACT

Cardiorespiratory endurance is also referred to as cardiovascular fitness and aerobic fitness. The Institute of Medicine, an independent U.S. nonprofit organization, reviewed names for this fitness component and chose cardiorespiratory endurance, especially for use with youth. They chose the name because this type of fitness requires the cardiovascular and respiratory systems to work well together (cardiorespiratory) to allow your entire body to function for a long time without fatigue (endurance).

Health-Related Physical Fitness

Think about a runner. She can probably run a long distance without tiring; thus she has good fitness in at least one area of health-related physical fitness. But does she have good fitness in all six parts? Running is an excellent form of physical activity, but being a runner doesn't guarantee fitness in all parts of health-related physical fitness. Like the runner, you may be more fit in some parts of fitness than in others. The feature named The Six Parts of Health-Related Fitness describes each part and shows an example. As you read about each part, ask yourself how fit you think you are in that area.

The Six Parts of Health-Related Fitness

Cardiorespiratory endurance is the ability to exercise your entire body for a long time without stopping. It requires a strong heart, healthy lungs, and clear blood vessels to supply your large muscles with oxygen. Examples of activities that require good cardiorespiratory endurance are distance running, swimming, and cross-country skiing.

Strength is the amount of force your muscles can produce. It is often measured by how much weight you can lift or how much resistance you can overcome. Examples of activities that require good strength are lifting a heavy weight and pushing a heavy box.

Muscular endurance is the ability to use your muscles many times without tiring—for example, doing many push-ups or curl-ups (crunches) or climbing a rock wall.

How do you think you rate in each of the six health-related parts of fitness? To be healthy, you should be fit for each of the six parts. Totally fit people are less likely to develop a **hypokinetic condition**—a health problem caused partly by lack of physical activity—such as heart disease, high blood pressure, diabetes, osteoporosis, colon cancer, or a high **body fat level**. You'll learn more about hypokinetic conditions in other chapters of this book. People who are physically fit also enjoy better wellness. They feel better, look better, and have more energy. You don't have to be a great athlete in order to enjoy good health and wellness and be physically fit. Regular physical activity can improve anyone's health-related physical fitness.

Skill-Related Physical Fitness

Just as the runner in our example may not achieve a high rating in all parts of health-related physical fitness, she also may not rate the same in all parts of skill-related physical fitness. Though most sports

Flexibility is the ability to use your joints fully through a wide range of motion without injury. You are flexible when your muscles are long enough and your joints are free enough to allow adequate movement. Examples of people with good flexibility include dancers and gymnasts.

Body composition refers to the different types of tissues that make up your body, including fat, muscle, bone, and organ. Your level of body fat is often used to assess the component of body composition related to health. Body composition measures commonly used in schools include body mass index (based on height and weight), skinfold measures (which estimate body fatness), and body measurements such as waist and hip circumferences.

Power is the ability to use strength quickly; thus it involves both strength and speed. It is sometimes referred to as explosive strength. People with good power can, for example, jump far or high, put the shot, and speed-swim.

require several parts of skill-related fitness, different sports can require different parts. For example, a skater might have good agility but lack good reaction time. Some people have more natural ability in some areas than in others. No matter how you score on the skill-related parts of physical fitness, you can enjoy some type of physical activity.

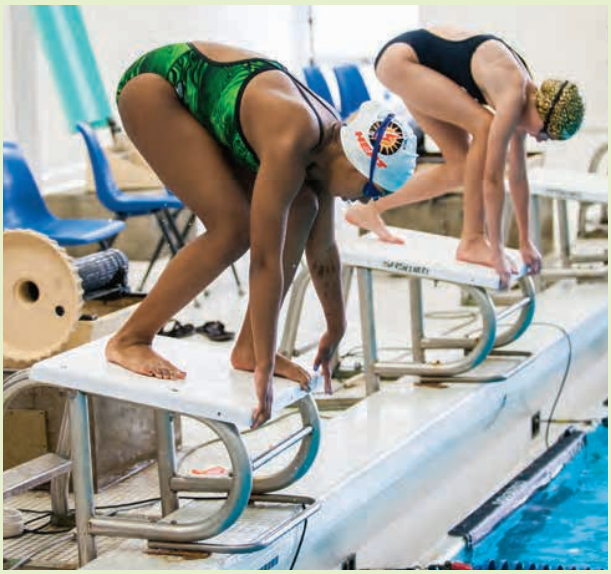
Remember, too, that good health doesn't come from being good in skill-related physical fitness. It comes from doing activities designed to improve your health-related physical fitness, and it can be enjoyed both by great athletes and by people who consider themselves poor athletes.

As noted earlier, health-related fitness offers a double benefit. It not only helps you stay healthy but also helps you perform well in sport and other activities. For example, cardiorespiratory endurance helps you resist heart disease and helps you perform well in sports such as swimming and cross-country running. Similarly, strength helps you perform well in sports such as football and wrestling, muscular endurance is important in soccer and tennis,

Balance is the ability to keep an upright posture while standing still or moving. People with good balance are likely to be good, for example, at gymnastics and ice skating.

Coordination is the ability to use your senses together with your body parts or to use two or more body parts together. People with good eye–hand or eye–foot coordination are good at juggling and at hitting and kicking games, such as soccer, baseball, volleyball, tennis, and golf.

Speed is the ability to perform a movement or cover a distance in a short time. For example, people with good leg speed can run fast, and people with good arm speed can throw fast or hit a ball that is thrown fast.



Reaction time is the amount of time it takes you to move once you recognize the need to act. People with good reaction time can make fast starts in track and swimming and can dodge fast attacks in fencing and karate.

Agility is the ability to change the position of your body quickly and control your body's movements. People with good agility are likely to be good, for example, at wrestling, diving, soccer, and ice skating.

FIT FACT

Power, formerly classified as a skill-related part of fitness, is now classified as a health-related part of fitness. A report by the independent Institute of Medicine provides evidence of the link between physical power and health. The report indicates that power is associated with wellness, higher quality of life, reduced risk of chronic disease and early death, and better bone health. Power, and activities that improve power, have also been found to be important for healthy bones in children and teens.

flexibility helps in sports such as gymnastics and diving, power helps in track activities such as the discus throw and the long jump, and having a healthy amount of body fat makes your body more efficient in many activities.

Functional Fitness

Functional fitness refers to the ability to function effectively when performing normal daily tasks. You have functional fitness if you can do your schoolwork, get to and from school, participate in leisure activities without fatigue, respond to emergency situations, and perform other daily tasks safely and without fatigue (for example, driving a car or doing housework and yardwork). From this point of view, health-related fitness not only helps you stay healthy but also helps you function; for example, it helps you avoid fatigue when working or playing. Similarly, skill-related fitness not only helps you perform well in sports but also can help you function in life, such as when you need to stop quickly while driving a car. As you work your way through this book, you'll learn how each part of health- and skill-related fitness contributes to your functional fitness.

Fitness, Health, and Wellness Are Interrelated

Fitness, health, and wellness are all states of being, and you can maximize all three by living a healthy lifestyle. The interrelationship of fitness, health, and wellness is shown in figure 1.4 by the overlapping circles. For example, if you're active on a regular basis, your fitness improves. That reduces your risk of disease, which improves your health. Your wellness and quality of life are also improved because you feel better and can better enjoy the activities of daily life.

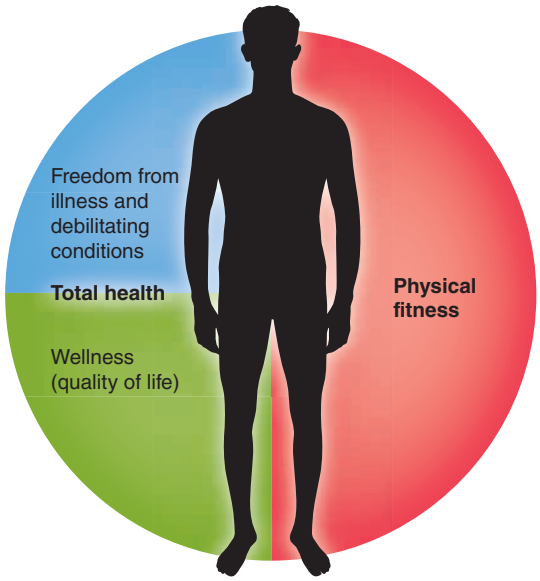


FIGURE 1.4 Interrelationship of fitness, health, and wellness.

Lesson Review

1. What is meant by the terms *physical fitness*, *health*, and *wellness*, and how they are interrelated?
2. What are the five components of health and wellness, and how are they defined?
3. What are the six parts of health-related physical fitness and the five parts of skill-related physical fitness, and how are they defined?
4. What is self-assessment, and how it is important to good fitness, health, and wellness?

TAKING CHARGE: Learning to Self-Assess

Self-management skills help you adopt a healthy lifestyle both now and throughout life. Self-assessment is a type of self-management skill that enables you to test yourself to see what you can do. You can perform many kinds of self-assessment. For example, you can assess your physical fitness, eating patterns, stress level, health risks, knowledge, and ability to perform in a sport. This book includes many self-assessments focused on physical fitness, as well as some that address health, wellness, and healthy lifestyle choices. The following example focuses on health-related physical fitness.

Julia and Troy were friends who wanted to know more about their health-related physical fitness. They had taken fitness tests in school but had learned little about why they were doing the tests or how to test themselves. They wanted to learn how to assess their own fitness.

Julia remembered some of the tests she had taken in elementary school, such as running a 50-yard (about 46-meter) dash and performing something called a "shuttle run." Troy had not taken a fitness test in physical education, but he had been tested for his baseball team to see how far he could throw a ball and how fast he could run to first base.

Julia and Troy thought about doing a self-assessment that included all of the tests Julia had been given in school and all of the tests Troy had done for his baseball team. But they weren't sure how to do the tests in the correct way, and they weren't sure that these were the best tests. What they really wanted to learn was how to do a self-assessment for health-related physical fitness.

For Discussion

Discuss a plan of self-assessment that Julia and Troy could follow to determine their health-related physical fitness. Did the tests Julia performed in elementary school assess health-related physical fitness? Did the tests Troy performed for his baseball team measure health-related physical fitness? What do you think the tests they performed really measured?

The guidelines in the following Self-Management feature will help you as you answer the discussion questions above and will be useful as you try the various self-assessments included in this book.

SELF-MANAGEMENT: Skills for Learning to Self-Assess

Before you go on a trip, you use a map to make plans. The map helps you decide where you want to go. Assessing your own fitness is much like using a map. You can assess your current fitness and physical activity in order to help you learn where you need to improve and make your plans for doing so. You can also use the assessment information to develop strategies and tactics to commit to your plan. Use the following guidelines as you learn to do personal fitness and activity self-assessments.

- **Try a wide variety of tests.** Fitness and physical activity include many parts, and performing a variety of self-assessments enables you to get a total picture of your fitness and activity needs. You will learn various self-assessment techniques in this class.
- **Choose self-assessments that work best for you.** You'll try all the self-assessments you learn in this book, but ultimately you won't need to use them all. You should choose at least one assessment for each type of health-related physical fitness and one assessment to determine your current activity level. After you've tried many self-assessments, you'll be prepared to select the ones that work best for you.

Learning to assess your own fitness is an important life skill.

- **Practice.** When you first drive a car, it's not easy, but your skill improves with practice. Similarly, the first time you do self-assessments, you'll make mistakes, but the more you practice, the better you'll get. So, once you decide which assessments to use on a regular basis, practice using them!
- **Use self-assessments for personal improvement.** Once you've learned to use self-assessments, repeat them from time to time to monitor your progress. Avoid making assessments too often, but check yourself periodically to see how you're doing. It takes several weeks to see improvement in health-related physical fitness after starting a new activity program. Avoid daily or even weekly self-assessments in favor of self-assessing after several weeks when improvement is more likely.
- **Use health standards rather than comparing yourself with others.** Sometimes people are discouraged when they get test results, often because they had unrealistic expectations. Rather than comparing yourself with others, evaluate yourself in relation to health standards and to your own previous performances. This type of comparison helps you stay realistic. *The standards used in this book are based on the level of fitness needed for good health and wellness—not on comparisons of one person with another.*
- **Information from self-assessments is personal.** Self-assessments are done to gain information that will help you build an accurate personal profile and plan for healthy active living. In many assessments you will work with a partner. Partners must agree to keep test results private. Information may be submitted to an instructor, parent, or guardian—again with the expectation that information is kept private. Information should not be shared with others without the permission of the person being tested. Think of doing a self-assessment like hiring a personal trainer. A personal trainer would have you do a series of tests to determine your strengths and weaknesses and then work with you to come up with a plan to meet your goals. The personal trainer would keep your information totally confidential.

TAKING ACTION: The Warm-Up

As noted in the Science in Action feature in lesson 1, your warm-up should vary depending on the workout you plan to perform. Because *Fitness for Life* includes many types of activity, the type of warm-up you perform will vary from day to day. Before engaging in low- to moderate-intensity activity, no warm-up is typically necessary, though you may choose to do one if you wish. The activities in the warm-up you use prior to vigorous activity will vary depending on the nature of your workout activity. For vigorous activities that involve strength, speed, and power, you may choose a dynamic warm-up. If you prefer a stretching warm-up prior to vigorous activities, the stretches should last 15 to 30 seconds. Be sure not to stretch longer than 60 seconds, because that can result in reduced performance in some activities. You will **take action** here by trying both a stretching warm-up and a dynamic warm-up. After you've tried them, you can work with your teacher and use the guidelines in the Science in Action feature to create warm-up activities for each type of workout you're planning to do.

Those who choose a stretching warm-up before vigorous exercise should hold stretches for 15 to 30 seconds.

For vigorous activities that do involve strength, speed, and power, you can use a dynamic warm-up.

CHAPTER REVIEW

Reviewing Concepts and Vocabulary

As directed by your teacher, answer items 1 through 5 by correctly completing each sentence with a word or phrase.

1. The study of human movement is called _____.
2. The _____ is a series of steps that can help you make good decisions and solve problems.
3. The science that uses principles of physics to understand the human machine is called _____.
4. A hypokinetic condition is a health problem caused by _____.
5. The part of fitness that refers to the types of body tissue is called _____.

For items 6 through 10, as directed by your teacher, match each term in column 1 with the appropriate phrase in column 2.

6. muscular endurance	a. movement of the body using larger muscles
7. agility	b. positive component of health
8. pedagogy	c. ability to change body position quickly
9. physical activity	d. art and science of teaching
10. wellness	e. ability to use muscles continuously without tiring

For items 11 through 15, as directed by your teacher, respond to each statement or question.

11. What is physical fitness?
12. How do health-related physical fitness and skill-related physical fitness differ?
13. Explain how the understanding of health has changed over time.
14. What are some important factors to consider when choosing a warm-up before your workout?
15. What are some guidelines for using self-assessments?

Thinking Critically

Write a paragraph to answer the following question.

You are asked to make an important decision about your fitness, health, or wellness. How would you use the scientific method to make that decision?

Project

Interview several healthy older adults about their fitness, health, and wellness. Ask questions such as these: How would you rate your health? How would you rate your wellness? How would you rate your health-related physical fitness? (Ask the person to use ratings such as good fitness, marginal fitness, and poor fitness.) How do you think teens rate their fitness, health, and wellness compared to people your age? Present the information to a group such as your class or family members.