

# **Personal Fitness**

**Course No. 1501300**

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# Personal Fitness

Course No. 1501300

revised and edited by

**Pam Jameson**

**Sue Fresen**

graphics by

**Rachel P. McAllister**

Curriculum Improvement Project  
IDEA, Part B, Special Project



**Exceptional Student Education**

<http://www.leon.k12.fl.us/public/pass/>

**Curriculum Improvement Project**

Sue Fresen, Project Manager

**Leon County Exceptional Student Education (ESE)**

Ward Spisso, Director of Exceptional Education and Student Services

Diane Johnson, Director of the Florida Diagnostic and Learning Resources  
System (FDLRS)/Miccosukee Associate Center

**Superintendent of Leon County Schools**

William J. Montford

**School Board of Leon County**

Maggie Lewis, Chair

Joy Bowen

Dee Crumpler

J. Scott Dailey

Fred Varn

# Table of Contents

Acknowledgments .....	ix
<b>Unit 1: Introduction to Personal Fitness (Physical Fitness) .....</b>	<b>1</b>
Unit Focus .....	1
Vocabulary .....	3
Introduction .....	7
Benefits from Achieving Physical Fitness .....	8
Fitness Evaluation of Americans: A Failing Grade .....	9
Health-Related Fitness Components .....	11
Practice .....	15
Skill-Related Fitness Components .....	17
Basic Training Principles: Overload, Progression, and Specificity .....	19
Exercising Safely: Guidelines .....	21
Practice .....	25
Heat-Related Problems: Southeastern United States Weather .....	30
Stress Management: Learning to Cope .....	31
Progressive Relaxation Activities .....	36
Other Positive Tips for Managing Stress .....	38
Summary .....	39
Practice .....	41
<b>Unit 2: Body Composition and Nutrition .....</b>	<b>53</b>
Unit Focus .....	53
Vocabulary .....	55
Introduction .....	59
Overweight, Overfat, Obese, Underfat, or Ideal? .....	59
Body Types: Ectomorph, Endomorph, and Mesomorph .....	61
Waist-to-Hip Ratio .....	63
Importance of Weight Control .....	64
Methods of Measuring Body Composition .....	64
Skinfold Measurements .....	66
Body Mass Index .....	71
Figuring Ideal Body Weight According to Height .....	74
Figuring Ideal Body Weight According to Frame Size .....	75
Figuring Ideal Body Weight According to Body Fat Percentage .....	78
Practice .....	79
Improving Body Composition: Losing Body Fat .....	81
Calorie Usage in Activities .....	82
Figuring Calorie Usage in Activities .....	82
The Eating Right Food Guide Pyramid .....	83
Nutrition Facts and Fallacies .....	85

Eating Disorders: When Food Becomes an Enemy .....	87
Summary .....	88
Practice .....	89
<b>Unit 3: Flexibility</b> .....	97
Unit Focus .....	97
Vocabulary .....	99
Introduction .....	103
Flexibility: Factors You Can and Cannot Control .....	104
The Flexible Body: Healthy, Relaxed, Alert, and Aware .....	105
The Inflexible Body: Pain, Pain, and More Pain .....	106
Practice .....	107
Methods to Improve Your Flexibility: Static, Passive, Dynamic, and Ballistic Stretching .....	108
Improving Flexibility Using Training Principles: Overload, Progression, and Specificity .....	109
Practice .....	111
Guidelines for Safe Stretching: Be Patient and Treat Your Body Well .....	112
Measuring Flexibility: How Well Can You Stretch? .....	114
Health Problems from Lack of Flexibility .....	118
General Stretching Program .....	124
Summary .....	129
Practice .....	130
<b>Unit 4: Muscular Fitness</b> .....	137
Unit Focus .....	137
Vocabulary .....	139
Introduction .....	143
Muscular Fitness: Strong Muscles That Can Keep Working .....	143
Muscle Structure: Fast- and Slow-Twitch Muscle Fibers .....	145
Practice .....	147
Developing Muscular Fitness: Isometric, Isotonic, and Isokinetic Exercise ..	149
Training Principles for Muscular Fitness: Overload, Progression, and Specificity .....	151
F.I.T.T. Formula .....	152
Practice .....	154
Common Fallacies Associated with Weight Training .....	155
Find Your Starting Point: Measuring Muscular Strength and Endurance ....	156
Isometric Exercises: Limited Gains but Convenient .....	166
Isotonic Exercises/Calisthenics: Large Gains and Convenient .....	166
Isotonic Exercises: Free Weights and Weight Machines .....	174
Summary .....	184
Practice .....	186

<b>Unit 5: Cardiovascular Fitness</b>	191
Unit Focus	191
Vocabulary	193
Introduction	197
The Cardiovascular System: The Heart, Blood Vessels, and Blood	198
Why is Cardiovascular Fitness Important?	200
Practice	201
The Best Exercise for Developing a Healthy Heart: Aerobic Exercise	206
Effects of Aerobic Exercise: Strengthening the Heart and Other Muscles	207
Practice	208
Cardiovascular Diseases: The Heart of the Matter	209
Risk Factors for Heart Disease	209
Risk Factors You Cannot Control: Age, Heredity, and Gender	213
Determining Your Cardiac Risk	213
Risk of Heart Attack	214
Practice	215
Your Heart Rate: A Measurement of Your Cardiovascular Fitness	216
Improving Cardiovascular Fitness Using Training Principles: Overload, Progression, and Specificity	220
Target Heart Rate Zone: Determining Exercise Level	222
Calculating Target Heart Rate Zone (THRZ)	224
Monitoring Heart Rate during Exercise	225
Recovery Heart Rate: How Quickly the Heart Returns to Normal	225
Heart Rate Response to Exercise	226
Practice	227
Determining Your Level of Aerobic Fitness	235
One-Mile Run/Walk	235
Three-Minute Step Test	237
Guidelines for Safe Aerobic Exercise: Smart Exercise	239
Selecting Your Cardiovascular Program	241
Aerobic Activities	242
Summary	253
Practice	255
<b>Unit 6: Consumer Health Issues</b>	261
Unit Focus	261
Vocabulary	263
Introduction	265
Practice	267
What Influences Your Buying Decision?	268
Avoiding a Rip Off	270
Fitness Gimmicks and Gadgets: Empty Promises and Devices	271

Practice .....	275
Common Fitness Fallacies: Separating Fact from Fiction .....	276
Fad Diets: A Losing Strategy That Leads to Weight Gain .....	278
Drugs Used for Weight Control: Harmful Side Effects .....	279
Diuretics: Leading to a Dangerous Loss of Water .....	280
The Solution to Weight Loss: Exercise and a Low-Fat, Nutritious Diet .....	280
Performance-Altering Drugs: Facts and Fallacies .....	281
Practice .....	283
Health Clubs: Finding One That Fits Your Needs .....	284
Checking Out a Health Club .....	290
Summary .....	293
Practice .....	294
<b>Unit 7: Personal Fitness Program .....</b>	<b>299</b>
Unit Focus .....	299
Vocabulary .....	301
Introduction .....	305
What Is a Personal Fitness Program? .....	305
Why Is a Personal Fitness Program Important? .....	306
Practice .....	310
Rating Physical Activities .....	312
Choosing Physical Activities .....	313
Practice .....	317
Other Considerations When Designing Your Personal Fitness Program .....	318
Attitude Profile .....	322
Summary .....	326
Physical Fitness/Body Composition Profile .....	327
Designing a Body Composition Program .....	330
Designing a Flexibility Program .....	332
Designing a Muscular Fitness Program .....	334
Designing a Cardiovascular Fitness Program .....	336
My Personal Fitness Program .....	337
Behavioral Contract for Exercise .....	338
My Exercise/Workout Log .....	339
Practice .....	342
<b>Appendices .....</b>	<b>351</b>
Appendix A: Index .....	353
Appendix B: Help Agencies .....	355
Appendix C: References .....	357



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### Content Revisor

Pam Jameson, Adaptive Physical  
Education Resource Teacher  
Leon County Schools  
Water Aerobic Instructor  
Premier Health and Fitness Club  
Tallahassee, FL

### Copy Editor

Deborah Shepard, National  
Board of Professional Teaching  
Standards (NBPTS)  
Certified English Teacher  
Lincoln High School  
Past President, National Board  
Certified Teachers of Leon County  
Region I 2003 Florida Teacher of  
the Year  
Tallahassee, FL

### Review Team

JoCyria Acoff, Physical Education  
Teacher  
Lincoln High School  
Tallahassee, FL

Adam Hagan, Physical Education  
Teacher  
University High School  
Orlando, FL

Marilyn Bello-Ruiz, Project Director  
Parents Educating Parents in the  
Community (PEP)  
Family Network on Disabilities of  
Florida, Inc.  
Clearwater, FL

Dr. Kent Hamilton, Curriculum  
Developer for Art, Music,  
and Physical Education  
Leon County Schools  
Special Education Adjunct  
Professor  
Florida State University  
Tallahassee, FL

Mark Goldman, Professor  
Tallahassee Community College  
Past President, Leon  
Association for Children with  
Learning Disabilities (ACLD)  
Parent Representative, Leon  
County Exceptional Student  
Education (ESE) Advisory  
Committee  
Tallahassee, FL

Lynn Hazel, Physical Education  
Teacher  
South Broward High School  
Hollywood, FL

## **Review Team Continued**

Michelle Michael, Physical Education  
Teacher  
Department Chair  
Southwest Regional Representative  
Physical Education Association  
Dunnellon High School  
Dunnellon, FL

Allison O'Connor, Exceptional Student  
Education (ESE) Teacher  
St. Lucie West Centennial High School  
Port St. Lucie, FL

Milagros Pou, Multicultural  
Specialist  
Parent Educating Network (PEN)  
Parent Training Information  
Center of Florida  
Clearwater, FL

Dr. Don Rapp, Child Development  
Professor (Retired)  
Florida State University  
Author and Publisher  
Rapport Unlimited  
Tallahassee, FL

Marcia Ryan, Dropout Prevention  
Teacher  
Department Co-Chair  
Second Chance School  
Tallahassee, FL

Dawn Townsend, Physical Education  
Teacher  
Bayside High School  
Palm Bay, FL

Bonnie Turk, Athletic Director  
Lincoln Park Academy  
Ft. Pierce, FL

Doug VanEtten, Developmental  
Teacher  
Schwettman Education Center  
New Port Richey, FL

Margaret Wood, Exceptional Student  
Education (ESE) Teacher  
Department Chair  
Leon High School  
Tallahassee, FL

Ronnie Youngblood, Director of  
Interdivisional Support Services  
Leon County Schools  
Tallahassee, FL

## **Production Staff**

Sue Fresen, Project Manager  
Rachel McAllister, Graphic Design Specialist  
Curriculum Improvement Project  
Tallahassee, FL

## **Unit 1: Introduction to Personal Fitness (Physical Fitness)**

This unit describes physical fitness and what is required to obtain a physically fit body. Students will learn the components and benefits of physical fitness.

### **Unit Focus**

- benefits from achieving physical fitness
- need for physical fitness in today's world
- components of physical fitness
- basic training principles of physical fitness
- exercise safety guidelines
- effects of weather on training
- stress management
- personal fitness evaluation



## Fitness Career Opportunity

### Personal Trainer

Personal trainers design well-organized fitness and health programs for individual clients and help them meet their short- and long-term fitness goals. Here are some common reasons why clients hire personal trainers:

- weight management
- cardiovascular/aerobic fitness
- muscular strengthening and development
- body shaping
- psychological health
- self-esteem
- lifestyle
- athletic performance
- exercise adherence and motivation
- nutrition and diet
- physical health
- social needs
- rehabilitation

A qualified trainer usually has an academic degree in physical education or exercise physiology and/or is certified by a national organization. For more information on personal trainers, contact:

American College of Sports Medicine  
(ACSM)  
401 W. Michigan St.  
Indianapolis, MN 46202-3233  
(317) 637-9200  
[www.acsm.org](http://www.acsm.org)

American Council on Exercise  
(ACE)  
4851 Paramount Dr.  
San Diego, CA 92123  
(800) 825-3636  
[www.acefitness.org](http://www.acefitness.org)

Aerobics & Fitness Association of  
America (AFAA)  
15250 Ventura Blvd., Suite 200  
Sherman Oaks, CA 91403-3297  
(800) 365-5326  
[www.aerobics.com](http://www.aerobics.com)

National Strength and Conditioning  
Association (NSCA)  
1955 N. Union Blvd.  
Colorado Springs, CO 80909  
(800) 815-6826  
[www.nasca.com](http://www.nasca.com)



## Vocabulary

*Study the vocabulary words and definitions below.*

- agility** ..... the ability to change direction of the whole body quickly and easily
- balance** ..... a kind of coordination that allows you to maintain control over your body while stationary or moving
- body composition** ..... the percentage of body weight that is fat compared to lean body tissue such as muscle, bone, and other tissues and organs; one of the measurements of your physical fitness
- cardiovascular exercise** ..... steady, sustained rate of exercise at which the heart can supply the oxygen needed by the body; also called *aerobic exercise*
- coordination** ..... the ability to use the senses in harmony with the muscles in the body to produce smooth and accurate movements
- cross-train** ..... to vary activities and exercises from day to day
- F.I.T.T.** ..... the formula used to achieve overload and increase your level of physical fitness:  
Frequency (how often to exercise);  
Intensity (how hard to exercise);  
Type (what kind of exercise); and  
Time (how long to exercise)



<b>flexibility</b> .....	the ability to move joints and muscles through a full range of motion without pain or injury
<b>health-related fitness components</b> .....	the parts of physical fitness the body must improve and develop to achieve well-being: cardiovascular or aerobic fitness, muscular endurance, and strength; flexibility; and body composition
<b>heat cramp</b> .....	a muscle spasm caused by intense heat or lack of adequate fluid intake
<b>heat exhaustion</b> .....	a reaction to heat characterized by weakness and collapse as a result of dehydration
<b>heat stroke</b> .....	the most serious illness due to heat—considered a medical emergency; body stops sweating and exhibits a dangerously high body temperature
<b>muscular endurance</b> .....	the ability to use certain muscles repetitively for a long period of time without tiring
<b>muscular strength</b> .....	the ability of muscles to exert a force one time
<b>overload</b> .....	a training principle that says you must work the body harder than it is normally worked to improve physical fitness; to <i>increase</i> frequency, intensity, type, or time ( <i>F.I.T.T.</i> formula)



<b>physical fitness</b> .....	the ability of the whole body to perform at maximum capability
<b>power</b> .....	the ability to combine maximum strength and speed in a movement
<b>progression</b> .....	a training principle that says you must do a gradual increase in overload necessary for achieving higher fitness levels; to <i>change</i> frequency, intensity, type, and time ( <i>F.I.T.T.</i> formula)
<b>range of motion</b> .....	the distance a joint can move without pain or injury
<b>reaction time</b> .....	the time required to start a movement after being alerted to the need to move
<b>sedentary</b> .....	inactive—sitting or resting a great deal with little exercise
<b>skill-related fitness components</b> .....	movements that help a person in any physical activity, particularly sports and recreation: agility; balance; coordination; power; reaction time; and speed
<b>specificity</b> .....	a training principle that says you must work the specific part of the body you want to improve
<b>speed</b> .....	the ability to move your body quickly from one point to another
<b>stress</b> .....	the body's response to any situation that makes a demand on it







## Unit 1: Introduction to Personal Fitness (Physical Fitness)

### Introduction

Nearly all of us want to look better and feel better. We want to learn to manage our stress and emotions rather than letting them overwhelm us and limit our activities and well-being. In short, we want to function at the highest level we can in our daily living.

One of the most important and necessary ways to achieve these goals is to become physically fit. **Physical fitness** is the ability of the whole body to perform at maximum capability. To perform at a high level, the body's systems must be healthy. The physically fit body can breathe in adequate oxygen and deliver it throughout the body. The physically fit body has muscles that work without easily tiring. Joints and muscles in a physically fit body are flexible rather than tight and stiff. And the physically fit body does not carry too much fat.



*The physically fit body works efficiently.*

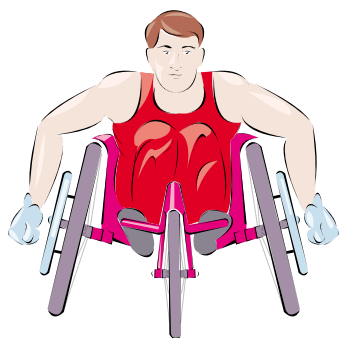
The physically fit body works efficiently, and so it is able to provide something many of us feel we lack: *energy*. Physically fit people have enough energy to complete their daily work. They have enough energy to enjoy leisure time and respond to any emergency situation. When we look at someone with energy, we often see someone who looks healthy and productive—someone who is living a happy and full life. Achieving physical fitness improves every part of our lives.



## Benefits from Achieving Physical Fitness

What are the benefits of achieving physical fitness? Achieving physical fitness

- improves your physical appearance. A fit body has strong, toned muscles.
- improves your overall health and wellness. Your heart will be stronger, and your cholesterol level will drop. Your body weight will be easier to control. Your risk of illness will decrease. Your bones will be stronger, and you may live longer!
- makes you happier. Your self-esteem and confidence rise; you have less mental fatigue, and your relationships improve.
- improves quality of life. Tension is released; you have increased energy and a better attitude.
- reduces **stress**, anxiety, and depression.
- improves quality of sleep.
- improves mental sharpness, which means greater success in your schoolwork or job.
- reduces your risk of cardiovascular disease and other chronic diseases. The lifestyle you lead in your early years is reflected later on. Stay healthy and fit!



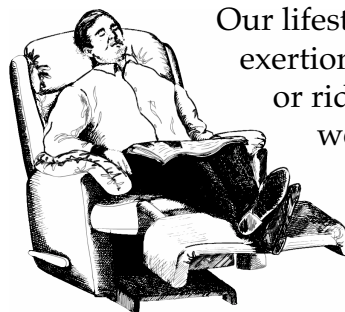
*This book will help you develop a fitness program that is suited to your own fitness level and personal needs.*

This book is designed to help you understand the different components, or parts, of physical fitness. It will help you evaluate your present level of physical fitness. And this book will help you develop a fitness program that is suited to your own fitness level and personal needs.



## Fitness Evaluation of Americans: A Failing Grade

Our ancestors did not have to think much about fitness. Physical activity was built into their lifestyles. They worked in their gardens, plowed fields, and took care of livestock. They hand-washed their clothes and dishes, gathered firewood, and made their own clothes. And they walked to get from one place to another. They even spent their leisure or free time in some kind of physical activity. In some less developed countries, this is still the way of life. For instance, in many countries, cycling is still the means of everyday transportation.



*Most people live a sedentary lifestyle—we spend our time sitting rather than being active.*

Our lifestyles do not always include daily physical exertion and exercise. Rather than walk, we drive cars or ride buses. Rather than farm or do manual labor, we sit at desks and work at our computers.

Rather than hand-wash clothes, we use automatic washing machines. Rather than exercise or physically exert ourselves, we watch television or movies, or we sit and play video games. Most people live a **sedentary** lifestyle—we spend our time sitting rather than being active.

Today, only one in five Americans is physically fit. Four out of five Americans score poorly on fitness tests for muscular strength, **flexibility**, and cardiovascular endurance. Statistics show that 60 percent of today's healthcare costs is due to unhealthy lifestyles. That means that it is less expensive to maintain a healthy body than it is to pay for a sick one. Obesity is on the rise and is at an all-time high in teenagers. Research has shown that a lifetime of healthy living may increase your life expectancy by about 2.5 years.

The typical high school student's lifestyle does not include enough exercise. In addition, three out of four teenagers eat too much fat. Today's teenagers have a significantly higher percentage of body fat compared to teenagers 20 years ago. The blood pressure of teens is higher than the blood pressure of teens in the past. Today's teens are not as healthy overall as were teens in the past.



A person's physical ability to function independently in life, without assistance, is called *functional health*. Functioning independently in life without assistance is one of the purposes of physical fitness. Daily living skills such as walking, driving a car, or even feeding yourself can become problems if fitness levels drop below a normal functional health level. However, a person may have functional health but still have other health concerns, such as symptoms of cardiovascular disease. When considering health and fitness, all factors must be examined.

A *sedentary*, or inactive, lifestyle and a diet high in fat are considered major risk factors for heart disease. Cardiovascular disease is the leading cause of death in the United States. This disease causes over half of all deaths in our country.

Exercise and a healthy lifestyle should begin in your early years and be lifetime habits. Being physically active will greatly reduce your risk of heart disease. The following chart shows the major risk factors for heart disease that you *can* and *cannot* control through healthy behavior.

Major Risk Factors for Heart Disease	
Factors We <i>Can</i> Control	Factors We <i>Cannot</i> Control
<ul style="list-style-type: none"><li>• physical inactivity</li><li>• overweight or obesity</li><li>• high blood pressure</li><li>• high stress</li><li>• high cholesterol</li><li>• diet high in saturated fat, excess sugar, and salt</li><li>• smoking, drugs, and alcohol</li></ul>	<ul style="list-style-type: none"><li>• age (the older you are, the higher your risk)</li><li>• gender (males have a higher risk)</li><li>• heredity (conditions and diseases that might run in your family)</li></ul>

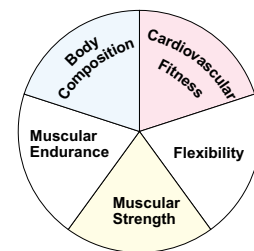


## Health-Related Fitness Components

Improving and developing the body's **health-related fitness components** will help in achieving good health. These health-related components include cardiovascular or aerobic fitness; **muscular strength**; **muscular endurance**; flexibility; and **body composition**. Taken together, these components are a measure of overall health and physical fitness.

### Cardiovascular Exercise: Strengthening the Heart

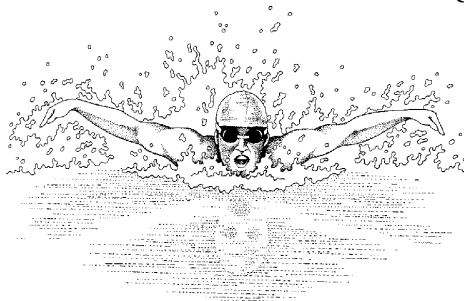
The *cardiovascular system* includes the heart and blood vessels. This system must continuously pump oxygen-rich blood through the blood vessels to all of your muscles, including your most important muscle—your heart. **Cardiovascular exercise**, or *aerobic exercise*, increases the amount of



Health-Related Fitness

oxygen the body needs to meet its

energy output. The more oxygen-rich blood your heart pumps throughout your body, the stronger your cardiovascular system becomes. *Cardiovascular exercises* are continuous activities that use the large muscle groups of the body. An example would be a swimmer performing uninterrupted laps in a pool for 30 minutes.



A swimmer performing uninterrupted laps in a pool for 30 minutes would be doing cardiovascular or aerobic exercise.

Cardiovascular endurance is the most important physical fitness component for health. Your life depends upon the fitness of your heart, blood vessels, and lungs. They must be strong enough to deliver nutrients and oxygen throughout the body.

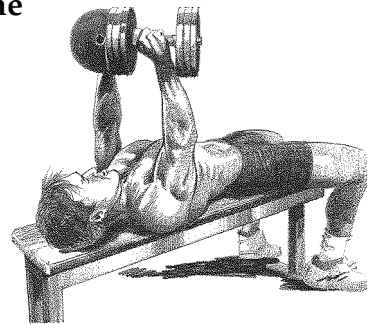
**Activities to Increase Cardiovascular Fitness:** brisk walking, jogging, biking, swimming, aerobic or step classes, jumping rope



### Muscular Strength: Pushing a Weight One Time

The capacity of a muscle to exert the greatest possible force against a resistance is referred to as *muscular strength*. Strength is important for proper posture, for successful sports performance, and in resisting injuries.

For example, a weight lifter using his legs to push the most weight he can one time would be using muscular strength.

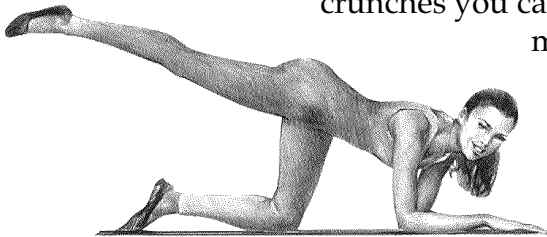


*Weight lifting with challenging resistance is a good activity to increase muscular strength.*

**Activities to Increase Muscular Strength:** weight lifting with challenging resistance, sprinting or other explosive-type movements, strength conditioning classes

### Muscular Endurance: Continuous Use of a Muscle

*Muscular endurance* is the ability to use certain muscles over and over for a long period of time without tiring. The number of push-ups or abdominal crunches you can do is a good measure of your muscular endurance.



*When you have muscular endurance, your body has the energy to resist fatigue.*

When you have muscular endurance, your body has the energy to resist fatigue. Your posture will be improved, and you will have a reduced risk of back pain.

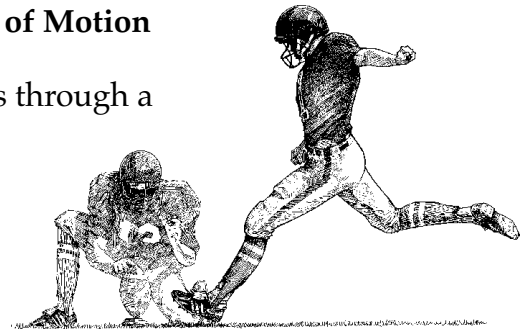
A person washing and waxing a car for two hours requires a certain degree of muscular endurance. A person shoveling snow or raking leaves also must have an adequate amount of muscular endurance.

**Activities to Increase Muscular Endurance:** resistance exercises with high repetitions, muscle toning classes, calisthenics



## Flexibility: Moving through a Range of Motion

The ability to move joints and muscles through a full **range of motion** without pain or injury is defined as *flexibility*. When you have good flexibility, your muscles move freely and efficiently. Flexibility increases your resistance to muscle soreness, reduces your risk of injury, and helps you maintain good form as your body moves and rests.



*A field goal kicker on a football team must have excellent flexibility in his leg muscles.*

A punter or field goal kicker on a football team must have excellent flexibility in his leg muscles to be efficient at kicking the football.

A gymnast performing a back walkover must possess a high degree of flexibility, especially in the back muscles.

**Activities to Increase Flexibility:** progressive stretching exercises, gymnastics, karate, yoga

## Body Composition: Fat Mass vs. Lean Body Mass

Your body is *composed*, or made up, of bones, muscles, fat, blood, and other tissues and organs. Each of these components is part of your body's weight. The weight of your body is divided into *lean body mass* and *fat mass*. Lean body mass is the weight of everything except fat. *Body composition* refers to a comparison of these two. Body composition is usually expressed as a ratio or percentage. The percentage of your body weight that is fat tissue compared to the weight of lean body tissue, such as bones, muscles, and other tissues and organs, is your body composition. A low percentage of body fat is more important for health and fitness than a low body weight. Dieting without exercising is not the best way to achieve a healthy body. Nor is becoming excessively lean with too little body fat.





## Methods of Determining Body Composition

*Body composition* can be measured or estimated in many different ways. A few of the methods include skinfold measurements; hydrostatic or underwater weighing; bioelectrical impedance; dual X-ray absorbiometry (DEXA); and various circumference measurements on the body.

*Skinfold measures* are taken with *skinfold calipers* on a few designated sites of the body. Skinfold calipers are instruments used to measure body fat directly under the skin. Skin and fat are grasped and pulled away from the underlying muscle, and then measured. These measurements are then plugged into a formula for calculating body fat and fat-free percentages. Body composition is commonly assessed this way.

*Hydrostatic or underwater weighing* is a more difficult and inconvenient but more accurate method of testing body composition. A person is weighed when totally under water.

With the *bioelectrical impedance* method, electrodes are attached to the body to measure electrical current as it passes through the body. The faster the flow, the lower the proportion of fat in the body.

*Dual X-ray absorbiometry* (DEXA) uses low-energy X-rays to scan the whole body. Fat, muscle, and bone have different densities which can be seen on the X-ray film. Body composition is then calculated by the computer.





## Practice

Match each definition with the correct term. Write the letter on the line provided.

- |          |   |                                      |
|----------|---|--------------------------------------|
| _____ 1. | the ability of the whole body to perform at maximum capability  | A. body composition                  |
| _____ 2. | inactive—sitting or resting a great deal with little exercise   | B. cardiovascular exercise           |
| _____ 3. | the ability to move joints and muscles through a full range of motion without pain or injury  | C. flexibility                       |
| _____ 4. | the parts of physical fitness the body must improve and develop to achieve well-being: cardiovascular or aerobic fitness, muscular endurance, and strength; flexibility; and body composition | D. health-related fitness components |
| _____ 5. | the ability to use certain muscles repetitively for a long period of time without tiring  | E. muscular endurance                |
| _____ 6. | the percentage of body weight that is fat compared to lean body tissue such as muscle, bone, and other tissues and organs   | F. muscular strength                 |
| _____ 7. | steady, sustained rate of exercise at which the heart can supply the oxygen needed by the body; also called <i>aerobic exercise</i>   | G. physical fitness                  |
| _____ 8. | the ability of muscles to exert a force one time  | H. range of motion                   |
| _____ 9. | the distance a joint can move without pain or injury  | I. sedentary                         |



## Practice

### Fitness Image Activity

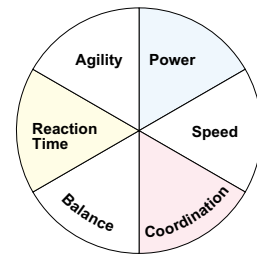
List 10 habits or characteristics you feel a **physically healthy and fit individual** possesses. Be able to give reasons for your answers.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_
8. \_\_\_\_\_
9. \_\_\_\_\_
10. \_\_\_\_\_



## Skill-Related Fitness Components

Developing **skill-related fitness components** improves a person's ability in any physical activity. These components are especially important in playing sports or in recreational activities. They include **agility, balance, coordination, power, reaction time, and speed**. As a person increases skill in these components, performance in sports, games, and recreational activities will improve.



*Skill-Related Fitness Components*

Issac Newton's three laws of motion are listed below. When developing the *skill-related fitness components*, understanding these laws will help to achieve the most benefits. The laws state the relationship between force and motion. This knowledge of physics helps coaches and athletes master their games.

### Newton's Three Laws of Motion



The *first law of motion* states that every object tends to remain at rest or move in a straight line until an outside force acts on it.



The *second law of motion* states that the acceleration of an object is set by the size of the force acting on it.



The *third law of motion* states that for every action, there is an equal and opposite reaction.

### Agility: Changing Direction

*Agility* involves the ability of the whole body to change direction quickly and easily. See Newton's laws of motion above. A change of the direction of your body depends upon the force applied.

A basketball player guarding an opponent, moving side to side in a quick and easy manner, would be demonstrating agility.

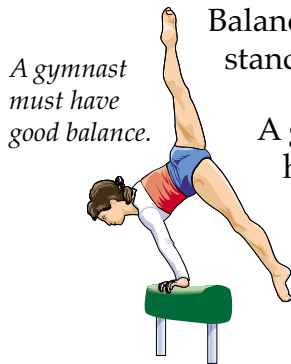


*A basketball player would be demonstrating agility.*

**Activities to Increase Agility:** tennis, wrestling, basketball, soccer, dancing, or cheerleading



## Balance: Maintaining Control of the Body



*A gymnast must have good balance.*

Balance allows you to control your body while you are standing or moving.

A gymnast doing a routine on the balance beam must have good balance in order to perform stunts without falling. For an inline skater to be successful at skating, he or she must develop balance first.

**Activities to Increase Balance:** inline skating, surfing, diving, gymnastics, dancing, yoga

## Coordination: Matching the Senses and the Muscles

*Coordination* is the ability to use the senses in harmony with the muscles in the body to produce smooth and accurate movements.

In order to be successful at jumping rope, you must be able to use your vision along with your legs and feet.



*Racket sports increase coordination.*

**Activities to Increase Coordination:** racket sports, dancing and cheerleading, kicking games, jumping rope

## Power: Combining Strength and Speed

The ability to combine maximum strength and speed in a movement is called *power*. Remember that power equals force. See Newton's laws of motion on the previous page. The amount of acceleration of an object depends on the strength of the applied force.

A baseball player must exert a tremendous amount of force, or power, when throwing the ball from the outfield to home plate.

**Activities to Increase Power:** leaping and jumping activities, throwing, speed races, kickboxing



## Reaction Time: Responding to Signals

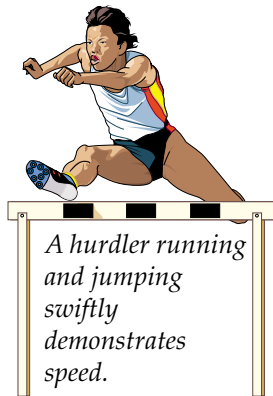
*Reaction time* is the time required to start a movement after being alerted to the need to move.

For instance, when sparring in karate, quick reaction time is necessary to avoid being punched or kicked by your opponent.



*Quick reaction time is necessary in karate.*

**Activities to Increase Reaction Time:**  
volleyball, fencing, karate, track, tennis



*A hurdler running and jumping swiftly demonstrates speed.*

## Speed: Moving Quickly

The ability to move your body rapidly from one point to another is known as *speed*.

A softball player running swiftly from first to second base to beat the throw demonstrates speed.

**Activities to Increase Speed:** track, softball or baseball, football, basketball, various other sports

## Basic Training Principles: Overload, Progression, and Specificity

To develop your physical fitness, you should participate in a regular program of exercise. An effective exercise program should include three basic training principles. They are **overload**, **progression**, and **specificity**.

All health-related fitness components can be improved by using these three basic fitness training principles.

### Overload: Increasing the Demand on the Body

The only way to progress in your fitness program is to *overload*. When you overload, you *increase the demand on* the body slightly beyond its normal level. You work your body harder than it normally works.



There are four general ways to overload the body during exercise: Frequency, Intensity, Type or Time (**F.I.T.T.**). *F.I.T.T.* is a formula describing how often, how hard, what type, and how long you need to exercise.

**F (Frequency):** To improve your fitness level, include more workouts than you usually do per week. If you participate in aerobic activity two times per week, add another day of aerobics and perhaps a day of weight training to your current routine.

**I (Intensity):** To become more fit, you need to increase the difficulty of your workouts. By lifting heavier weights than before, you will increase the intensity of your workout.

**T (Type):** To increase fitness, you need to increase the type of movement in the exercise from normal to advanced techniques. Instead of walking on a flat course, you run on a hilly course.

**T (Time):** Increasing the time you participate in an activity is another way to overload your fitness. Instead of increasing your effort on the treadmill, you might try exercising a longer period of time.

Each of the overload factors should be a part of our exercise program for muscular strength and endurance, cardiovascular fitness, and flexibility.

### **Progression: Increasing the Amount of Work Performed**

To progress in your exercise, the *amount of work* performed by the body needs to gradually *increase* using the *F.I.T.T.* formula. You do a gradual increase in overload necessary to achieve higher levels of fitness. You gradually increase the following:

- the number of times you do an exercise
- how hard you do an exercise
- length of time you perform that exercise
- type of movement in the exercise



*To develop your physical fitness, participate in a regular program of exercise that is right for you.*



The body is quick to adapt to the workload placed upon it. *Progression* is important in order for you to continually improve your level of fitness. However, try to avoid overloading the body with too much increase too soon.

### **Specificity: Training to Reach Certain Goals**

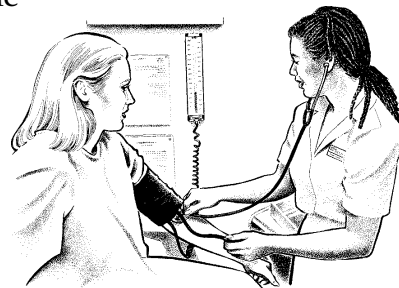
*Specificity* in training means you must work the specific part of the body you want to improve. You train your body in a specific way to reach a specific fitness goal. For example, if you want to increase your strength, you would increase weight resistance. If your goal is flexibility, you would perform stretching exercises. However, if your goal is overall fitness, it is best to **cross-train**. *Cross-training* is participating in different activities instead of the same ones to achieve fitness. An example of cross-training would be as follows.

- Day 1 - running or jogging
- Day 2 - swimming
- Day 3 - weight training

### **Exercising Safely: Guidelines**

Exercise should be enjoyable, not painful. The old adage, “no pain, no gain,” now reads “train, don’t strain.” Exercise can be done safely by following a few basic guidelines and prevention measures.

**Get a medical checkup.** A physical examination is recommended before beginning an exercise program. A doctor can check for any conditions that would make it unsafe for you to exercise.



*A physical examination is recommended before beginning an exercise program.*

### **Dress appropriately for exercise.**

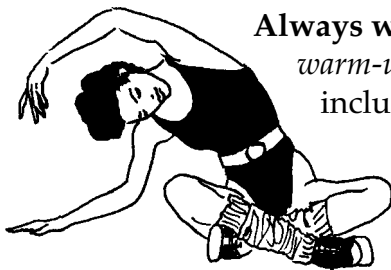
Clothing should be comfortable and loose-fitting. Wear lightweight fabrics that help absorb sweat and allow the sweat to evaporate. Clothing that is loose and light in color helps to promote heat loss as you sweat. Light-colored clothing reflects the sun’s rays. Dark clothing absorbs the sun’s



rays. Avoid wearing dark clothing on hot, sunny days. For safety considerations, wear light-colored and reflective clothing at dusk, night, and dawn. Wear quality footwear with good support, cushioning, and comfort. Wear safety equipment when necessary: bike helmets, pads, gloves, etc.

**Listen to your body.** If you feel pain while exercising, slow down or stop immediately. If you have been ill, exercise at a slower pace when you start back.

**Exercise at the correct level.** For exercise to be beneficial for you, it is important that you exercise with the correct frequency, intensity, type, and time. Start slowly and gradually increase the F.I.T.T. formula as you become more accustomed to exercise.



*Always warm up and stretch.*

**Always warm up and stretch.** A five- to 10-minute *warm-up* and gentle stretch period should be included before you jump into your activity. Hold stretches. Never bounce into a stretch. A warm-up helps prevent muscle strains, slowly increases the heart rate, and prepares your body for more intense exercise.

**Always cool down, stretch, and relax.** A five- to 10-minute *cool-down* should follow your workout. The cool-down helps to bring the heart rate back to normal, increases flexibility, and relaxes the body. A gradual decrease in heart rate helps prevent blood from pooling in the muscles that were used. To gradually decrease your heart rate, move about slowly and continuously. You may walk or do some other light activity for about three to five minutes. It's important to then stretch for another three to five minutes. Stretching helps loosen tightened muscles and helps prevent muscle soreness. You may repeat some of the same stretching exercises you did during your warm-up.





## Pre-Exercise Health History Form

name: \_\_\_\_\_ date: \_\_\_\_\_

address: \_\_\_\_\_ phone: \_\_\_\_\_

\_\_\_\_\_ birth date: \_\_\_\_\_

family physician: \_\_\_\_\_ phone: \_\_\_\_\_

### Health History (Check all that apply.)

- \_\_\_\_\_ diabetes
- \_\_\_\_\_ rheumatic fever
- \_\_\_\_\_ heart murmur
- \_\_\_\_\_ any heart trouble
- \_\_\_\_\_ high blood pressure
- \_\_\_\_\_ lung disease
- \_\_\_\_\_ breathing problem
- \_\_\_\_\_ anemia
- \_\_\_\_\_ overweight problem
- \_\_\_\_\_ eating disorder
- \_\_\_\_\_ injuries (to back, knees, ankles, etc.)
- \_\_\_\_\_ surgery
- \_\_\_\_\_ allergies
- \_\_\_\_\_ seizure disorders

### Family History (Check if grandparents, parents, or siblings have ever had any of the following illnesses.)

- \_\_\_\_\_ high blood pressure
- \_\_\_\_\_ high cholesterol levels
- \_\_\_\_\_ diabetes
- \_\_\_\_\_ congenital heart disease
- \_\_\_\_\_ heart surgery
- \_\_\_\_\_ stroke
- \_\_\_\_\_ cancer
- \_\_\_\_\_ heart attack

Explain all checked: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

*turn over to complete form*



yes	no	
_____	_____	Do you use any tobacco products? If yes, how much? _____ _____
_____	_____	Do you drink alcohol? If yes, how much? _____ _____
_____	_____	Is your body weight and percent body fat within healthy standards? _____
_____	_____	Are you taking any prescribed medications? If yes, list. _____ _____
_____	_____	Have you had a physical examination recently? When? _____
_____	_____	Do you have any injuries or conditions that would give you problems when you exercise? If so, explain. _____
_____	_____	Do you have a method for handling stress? Explain. _____ _____
_____	_____	Do you get sufficient sleep and rest? _____
_____	_____	Do you have a healthy diet? Describe. _____ _____
_____	_____	Do you have an eating disorder? _____
_____	_____	Do you exercise regularly? Describe your activities. _____ _____
<hr/> <hr/> <i>I acknowledge, to the best of my ability, that I am in good health and have no known medical problems that would restrict my ability to participate in this exercise program.</i>		
signature _____		date _____
parent/guardian signature _____		date _____



## Practice

Use the list below to write the correct term for each definition on the line provided.

<b>agility</b>	<b>F.I.T.T.</b>	<b>reaction time</b>
<b>balance</b>	<b>overload</b>	<b>skill-related fitness components</b>
<b>coordination</b>	<b>power</b>	<b>specificity</b>
<b>cross-train</b>	<b>progression</b>	<b>speed</b>

- \_\_\_\_\_ 1. movements that help a person in any physical activity, particularly sports and recreation: agility; balance; coordination; power; reaction time; and speed
- \_\_\_\_\_ 2. the ability to change direction of the whole body quickly and easily
- \_\_\_\_\_ 3. a kind of coordination that allows you to maintain control over your body while stationary or moving
- \_\_\_\_\_ 4. the ability to combine maximum strength and speed in a movement
- \_\_\_\_\_ 5. the ability to use the senses in harmony with the muscles in the body to produce smooth and accurate movements
- \_\_\_\_\_ 6. the time required to start a movement after being alerted to the need to move
- \_\_\_\_\_ 7. the ability to move your body quickly from one point to another
- \_\_\_\_\_ 8. a training principle that says you must work the body harder than it is normally worked to improve physical fitness; to *increase* frequency, intensity, type, or time (*F.I.T.T.* formula)



- \_\_\_\_\_ 9. a training principle that says you must do a gradual increase in overload necessary for achieving higher fitness levels; to *change* frequency, intensity, type, and time (*F.I.T.T.* formula)
- \_\_\_\_\_ 10. a training principle that says you must work the specific part of the body you want to improve
- \_\_\_\_\_ 11. the formula used to achieve overload and increase your level of physical fitness
- \_\_\_\_\_ 12. to vary activities and exercises from day to day



## Practice

Write **HR** if the terms are **health-related fitness components or activities** or deal with ways to achieve well-being. Write **SR** if the items are **skill-related fitness components or activities** or deal with ways to improve ability in any physical activity.

- \_\_\_\_\_ 1. step aerobics class
- \_\_\_\_\_ 2. balance
- \_\_\_\_\_ 3. football
- \_\_\_\_\_ 4. coordination
- \_\_\_\_\_ 5. brisk walking
- \_\_\_\_\_ 6. muscular strength
- \_\_\_\_\_ 7. power
- \_\_\_\_\_ 8. reaction time
- \_\_\_\_\_ 9. weight lifting
- \_\_\_\_\_ 10. muscular endurance
- \_\_\_\_\_ 11. body composition
- \_\_\_\_\_ 12. agility
- \_\_\_\_\_ 13. flexibility
- \_\_\_\_\_ 14. gymnastics
- \_\_\_\_\_ 15. cardiovascular endurance



## Practice

*Circle the letter of the correct answer.*

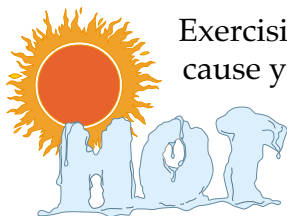
1. The most important part of physical fitness is \_\_\_\_\_.
  - a. strength
  - b. muscular endurance
  - c. flexibility
  - d. cardiovascular fitness
2. A regular exercise program \_\_\_\_\_.
  - a. helps you to look and feel better
  - b. improves your self-esteem and confidence
  - c. reduces your risk of heart disease
  - d. all of the above
3. \_\_\_\_\_ is a major risk factor for heart disease that you *cannot* control.
  - a. Obesity
  - b. Heredity
  - c. Smoking
  - d. Physical inactivity
4. \_\_\_\_\_ is *not* a health-related part of fitness.
  - a. Body composition
  - b. Cardiovascular
  - c. Muscular strength
  - d. Coordination
5. \_\_\_\_\_ is *not* a skill-related part of fitness.
  - a. Balance
  - b. Power
  - c. Reaction time
  - d. Flexibility



6. \_\_\_\_\_ is *not* one of the ways in which you can apply the overload principle.
- a. Intensity
  - b. Progression
  - c. Frequency
  - d. Duration of time
7. \_\_\_\_\_ is *not* one of the principles of training.
- a. Overload
  - b. Individuality
  - c. Progression
  - d. Specificity
8. Increasing the amount of work performed by the body beyond its normal level is an example of \_\_\_\_\_ .
- a. specificity
  - b. progression
  - c. overload
  - d. duration
9. A cool-down in your exercise routine should be included to \_\_\_\_\_ .
- a. allow the heart rate to gradually return to normal
  - b. prevent soreness and increase flexibility
  - c. help relax the body
  - d. all of the above
10. A warm-up \_\_\_\_\_ .
- a. helps avoid muscle strains
  - b. gradually increases the heart rate
  - c. is *not* needed once you are in good physical shape
  - d. both *a* and *b*



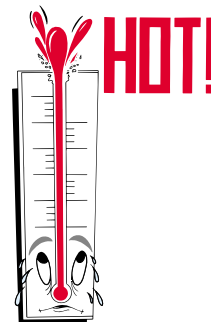
## Heat-Related Problems: Southeastern United States Weather



Exercising in a warm environment with high humidity can cause your body temperature to soar. This can increase the risk of a heat-related problem or a heat illness. Taking precautions to reduce the risk of a heat illness is very important.

### Heat Illness Prevention Tips

- Don't rely on thirst as an indicator of fluid loss.
- Drink one-half to one cup of water every 15 minutes during physical activity.
- Drink water before, during, and after physical exertion to keep your body properly hydrated. Maintaining hydration means having adequate fluids for your body to function properly.
- Avoid drinks with caffeine or alcohol, which cause the body to excrete fluids rapidly.
- Decrease frequency, intensity, type, and time (F.I.T.T. formula) when exercising in extreme heat and humid climates.
- Avoid working out in rubberized suits or other heavy clothing that cause heavy perspiration. Choose clothing that is light-colored, loose fitting, and absorbs moisture. These prevent evaporation of sweat and cause further dehydration, or extreme loss of body fluids.
- Gradually get used to exercising in the heat for approximately seven to 10 days.
- Exercise early in the day or later in the day when the heat is less intense.
- Try exercising indoors at a recreation center or a fitness club.
- Always wear sunscreen, a hat, and sunglasses for protection from the sun.







## Heat Cramps, Heat Exhaustion, and Heat Stroke

A first aid measure for **heat cramps** and **heat exhaustion** is to move the affected person out of the sun to a shady, well-ventilated place. Have the person stretch. Massage the cramp and apply ice to the affected muscles. Let the person rest. Encourage the person to drink fluids to rehydrate. Remove extra clothing and refer the person to a physician, if necessary.

Symptoms of Heat-Related Illnesses		
Heat Cramps	Heat Exhaustion	Heat Stroke
<ul style="list-style-type: none"><li>• muscle cramping</li><li>• thirst</li><li>• chills</li><li>• rapid pulse</li><li>• nausea</li></ul>	<ul style="list-style-type: none"><li>• cold, clammy skin</li><li>• weak, faint, dizzy</li><li>• profuse sweating</li><li>• rapid pulse</li><li>• headache</li><li>• pale skin</li><li>• extreme fatigue</li></ul>	<ul style="list-style-type: none"><li>• lack of sweat</li><li>• high body temperature</li><li>• dry, hot skin</li><li>• confusion</li><li>• sudden collapse</li><li>• possible unconsciousness</li></ul>

**Heat stroke** is an extreme medical emergency and is life threatening. Call immediately for emergency medical help. In the meantime, cool the victim with cold water, ice bags, and a fan. Remove all extra clothing.

## Stress Management: Learning to Cope

*Stress* is the response of the body to any situation that makes a demand on it. Stress is natural. We experience different types and degrees of stress nearly all of the time. However, too much stress of any kind can affect our physical and mental well-being. The key to successful stress management is to learn healthful ways to cope.



*Negative stress, called distress, can be caused by an upsetting event such as failing a test.*

### Types of Stress: Eustress and Distress

Positive stress, called *eustress*, can be caused by something such as winning an award. Eustress can serve to motivate us and to keep us from becoming bored. Eustress can help us to do our best and to become more creative. Eustress can even provide us with energy to accomplish a task or to achieve daily goals.



Negative stress, called *distress*, can be caused by an upsetting event such as failing a test. The body responds to both positive and negative stress in the same manner.

Too much of any stress can lead to health problems. Minor symptoms of stress include tension headaches, tight neck and shoulder muscles, sleeplessness, constipation, irritability, and fatigue. Prolonged stress can lead to illnesses, dizziness, severe headaches, and diarrhea. Serious stress can even lead to major health problems such as high blood pressure, chronic depression, ulcers, heart disease, and diabetes.

### Types of Stressors: The Source of Stress

A *stressor* is the source or cause of the stress. Anything can cause stress depending upon how an individual responds to various situations. The cause of stress can be psychological, environmental, social, or physiological.

- psychological—anger, love, anxiety, fear
- environmental—excessive heat, cold, noise, overcrowding
- social—relationships, family problems, loneliness
- physiological—illness, caffeine, sugar, alcohol, drugs

### Sources of Teen Stress

Many situations can create stress among high school students. For example, pressure to make good grades, rules from parents, various life changes, and challenges associated with performance are common sources of teen stress. Other common stressors include the following:

- school issues (moving to a new school, tests, grades, giving reports, being made fun of in class)
- social relationships (peer pressures, friendships, dating, acceptance in a group)



*Relationships can be a cause of stress.*



- self-image (personal worth, acceptance of own strengths and limitations)
- meeting expectations (satisfying teachers, supervisors, parents, other authoritative figures)
- family relationships (rules, disciplinary measures, quarrels, divorce, siblings).

### **The Body's Reaction to Stress: The Three Stages**

The body responds to stress by going through these three stages: 1) alarm, 2) resistance, and 3) exhaustion.

**Alarm Stage.** The body recognizes the stress and releases hormones such as adrenaline as it prepares for “fight or flight.” The individual will either stay and face the situation or escape the situation.

**Resistance.** In this stage, your body repairs any damage caused from the stress. For example, an argument with a friend can trigger symptoms such as an increase in heart and breathing rates, tensed muscles, increased irritability, and fatigue. If the stress is eliminated or managed, those symptoms usually disappear. If, however, the problem persists and a solution is not found, symptoms may continue.

**Exhaustion.** Long-term stress that is not properly handled can eventually cause physical and mental exhaustion. Exhaustion occurs when a person completely wears out and feels entirely drained of energy.

Long-term stress can cause migraine headaches, ulcers, chronic illnesses, high blood pressure, heart problems, backaches, digestive disorders, severe depression, and insomnia.



## Coping with Stress: Strategies

While it is impossible to live completely free of eustress or distress, learning to cope with stress can help reduce negative effects. Nutrition, exercise, rest and relaxation, personal attitudes, and relationships all contribute to our ability to manage the stresses of life.

People cope with stress in many ways. Positive coping strategies can actually help decrease stress. Negative coping strategies can worsen or increase stress. Unfortunately, many people often choose methods of coping that are not healthy.

### Negative Coping Strategies

Here are some common behaviors that can work *against* reducing stress:

- using drugs or alcohol
- procrastination (putting things off)
- irritable, hostile, temperamental, or aggressive behavior
- denying or ignoring your true feelings
- blaming others
- inflexible attitudes
- self-destructive talk.



*Using drugs or alcohol work against reducing stress.*

### Positive Coping Strategies

Using positive coping strategies can lessen stress and help your mind and body function normally. Here are a few of the healthiest ways to cope with stress.

**Exercise regularly.** Physical activity helps to relieve stress and tension in a number of ways. It relaxes the muscles and increases blood flow. It improves digestion. Physical activity even increases your self-esteem. Endorphins, or pain-relieving substances, are released during exercise. They produce a *natural high* and help the body cope with daily stress. A good workout clears the mind and energizes the body.



**Emphasize good nutrition.** It is important to eat a variety of foods to assure that you are getting proper nutrients. Eating a balanced diet helps your energy level and makes you feel better. A healthy diet should be low in fat. Sugar, caffeine, and nicotine can make you jittery and nervous, and put negative stress on the heart.

**Practice relaxation techniques.** Relaxation methods such as meditation, progressive muscular relaxation, and massage therapy can help in reducing stress. A massage helps in reducing muscle tension, relieving stress, and promoting relaxation. Meditation techniques such as deep breathing can help calm your body and help improve your energy and concentration.

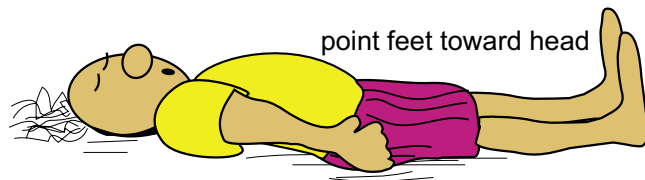
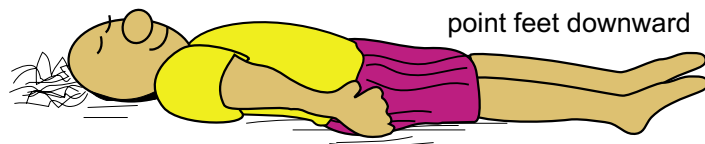


## Progressive Relaxation Activities

Find a **quiet place** where you will not be distracted for at least **20 to 30 minutes**. Lie flat on your back on a firm surface with your eyes closed. Take off your shoes and get comfortable. Let your arms fall loosely by your sides.



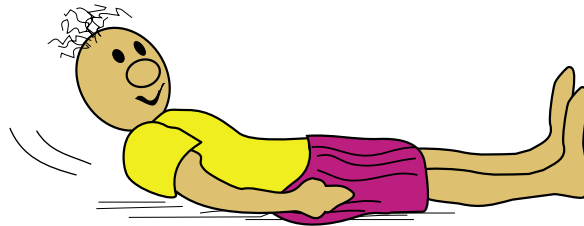
1. Be aware of what parts of your body are tense. Contract each group of muscles, then relax. Make sure to breathe slowly and deeply. Do each muscle group two or three times until tension is released. Then, move to the next area.
2. Curl your toes away from your head and point your feet downward. Relax. Flex your feet, pulling your toes towards your head. Relax.



3. Fully extend the legs, tightening the muscles on top of your thighs. Relax.
4. Press your heels down into the floor, creating tension in the back of your thighs. Relax.
5. Squeeze buttocks together tightly. Relax.



6. Press your lower back to the floor and at the same time pull your abdominal muscles inward. Relax.
7. Press elbows into the floor, creating tension in the upper back. Relax.
8. Roll shoulders inward, tensing neck and upper back. Relax.
9. Shrug shoulders as if trying to touch them to your ears. Relax.
10. Spread fingers as far apart as possible, then clench them into a tight fist. Relax.
11. Make a tight fist and rotate the wrist. Slowly open the hand.
12. Bend your head forward, touching your chin to your chest. Relax.



13. Raise the eyebrows, wrinkling the forehead. Relax. Close your eyes tightly and wrinkle your nose. Slowly, relax your face.
14. Open your mouth widely. Relax.

As you continue to lie in a relaxed state, focus on areas of your body that are still feeling tense. Repeat the exercises for those particular muscle groups.



## Other Positive Tips for Managing Stress

- Get sufficient rest and sleep.
- Set realistic goals and expectations for yourself.
- Set priorities and get organized. If an unpleasant task faces you, do it early and get it over with. Procrastination is stressful.
- Learn to recognize and act on early symptoms of stress.
- Share your problems with a friend, family member, or counselor.
- Be aware and recognize the parts of your life that you can control and let the others go. Know your limits and learn to accept what is.
- Be your best friend. Encourage, pamper, and take care of yourself.
- Respect your body.
- Make decisions and avoid letting problems drift.
- Slow down and take pleasure in every moment. Take on tasks one at a time, focusing on what is in front of you.
- Communicate positively and clearly with others.
- Balance your life, work, and leisure. Avoid too much of anything.
- Eat a well-balanced diet and do *not* skip meals. Food fuels our bodies. Without proper food intake, your body will not respond correctly.

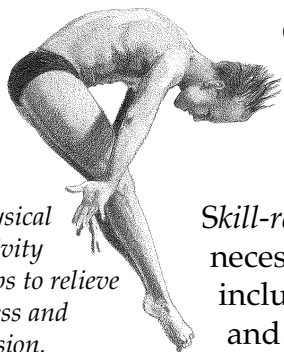






## Summary

*Physical fitness* helps you look and feel better, and it helps you function at a high level in your daily living. There are numerous physical and mental benefits from being physically fit. However, Americans today are generally unfit and overweight, increasing their risk for many diseases.



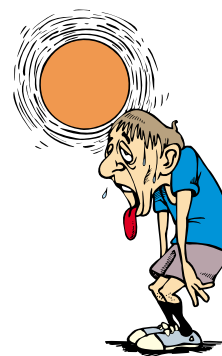
*Physical activity helps to relieve stress and tension.*

Cardiovascular fitness, *muscular endurance* and strength, *flexibility*, and *body composition* are all *health-related fitness components*. Cardiovascular fitness is the most essential component for life!

*Skill-related fitness components* of physical fitness are necessary in sports and recreational activities. They include *agility, balance, coordination, power, reaction time, and speed*.

To improve your fitness, you must periodically alter your exercise routine. The training principles used to reach fitness goals are *overload, progression, and specificity*. To overload, or improve your physical fitness level, you must apply the *F.I.T.T.* formula and increase the amount of activity or exercise. F.I.T.T. stands for *Frequency* (how often to exercise), *Intensity* (how hard to exercise), *Type* (what kind of exercise), and *Time* (how long to exercise). The progression principle refers to doing a series of overloads by controlling the rate at which you change the F.I.T.T. formula. Specificity is the overloading of specific muscles.

Heat-related illnesses can occur when a person becomes extremely overheated and dehydrated, or loses a great amount of bodily fluids. *Heat cramps, heat exhaustion, and heat stroke* are serious heat-related illnesses that can occur when the body becomes too dehydrated. If life-threatening heat stroke occurs, emergency medical help should be called immediately.



*Stress* is the response of the body to any demands made upon it. Stress is a natural part of life. Our bodies respond the same to both good (eustress) and bad (distress) stress. Learning to recognize our individual sources of stress and using positive coping strategies will reduce our overall stress.



Safety measures should be taken upon starting an exercise program. Among these are a medical checkup, appropriate attire, exercising at your own fitness level, and warming up and cooling down.

Additional precautions must be taken when exercising in high heat and humidity. To prevent heat-related illnesses, it is important to drink plenty of water, avoid wearing rubberized suits, avoid alcohol and caffeine, and get used to the climate gradually.



## Practice

Write **yes** or **no/not sure** in front of each of the following **stress management statements**.

- \_\_\_\_\_ 1. I enjoy school.
- \_\_\_\_\_ 2. I trust and value my own judgment.
- \_\_\_\_\_ 3. When I make mistakes, I usually admit them and learn from them.
- \_\_\_\_\_ 4. I value my own opinion but can appreciate the views of others.
- \_\_\_\_\_ 5. I can recognize and accept my feelings of being angry, sad, happy, and scared.
- \_\_\_\_\_ 6. I usually know how to deal with my feelings.
- \_\_\_\_\_ 7. I would know where to get help and would do so if I couldn't deal with my feelings.
- \_\_\_\_\_ 8. I can say *no* without feeling guilty.
- \_\_\_\_\_ 9. I set realistic objectives for myself.
- \_\_\_\_\_ 10. I can establish and maintain friendships.
- \_\_\_\_\_ 11. I accept responsibility for my actions.
- \_\_\_\_\_ 12. I can set limits for myself and maintain them.
- \_\_\_\_\_ 13. I feel enthusiastic most of the time.
- \_\_\_\_\_ 14. I am able to give and receive love.
- \_\_\_\_\_ 15. I know how to relax my body and mind without the use of drugs.
- \_\_\_\_\_ 16. I feel good about my body and my physical appearance.

Total of *no/not sure* responses: \_\_\_\_\_

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. There are no margins, text, or other markings on the paper.



## Practice

### Lifestyle Appraisal—How Healthy Are You?

Take this **Lifestyle Appraisal** to help assess your current level of wellness and to **identify behaviors that can affect your health**. Write **True** if the statement is correct. Write **False** if the statement is not correct.

#### Family and Friends

- \_\_\_\_\_ 1. I can share my feelings with my family.
- \_\_\_\_\_ 2. I have someone in my life who will listen to me when I need to talk or have a problem.
- \_\_\_\_\_ 3. I prefer doing things with a group rather by myself.
- \_\_\_\_\_ 4. I give and receive affection well.

#### Physical Activity

- \_\_\_\_\_ 1. I am physically active for at least 30 to 60 minutes three or more times per week.
- \_\_\_\_\_ 2. My fitness level is higher than most individuals my age.
- \_\_\_\_\_ 3. I exercise for reasons other than just losing or maintaining my weight.
- \_\_\_\_\_ 4. I usually do not get short of breath participating in moderate-intensity exercise.
- \_\_\_\_\_ 5. I include stretching exercises, aerobic exercise, and weight training in my exercise program.

#### Body Composition

- \_\_\_\_\_ 1. My body fat percentage and weight is in the normal, healthy range.
- \_\_\_\_\_ 2. I avoid dieting, especially yo-yo dieting and binge eating.
- \_\_\_\_\_ 3. I am happy with the way my body looks.



### **Nutrition**

- \_\_\_\_\_ 1. I regularly eat a healthy, well-balanced diet.
- \_\_\_\_\_ 2. I keep my daily total fat intake to 30 percent or less.
- \_\_\_\_\_ 3. I rarely eat excess sugar, salt, high-fat fast foods, or junk foods.
- \_\_\_\_\_ 4. I avoid fasting, skipping meals, or bingeing.
- \_\_\_\_\_ 5. I eat breakfast regularly.
- \_\_\_\_\_ 6. I avoid eating my largest meal in the evening or eating late at night.
- \_\_\_\_\_ 7. I drink plenty of water.

### **Alcohol**

- \_\_\_\_\_ 1. Drinking has never caused me to do things that I later regret.
- \_\_\_\_\_ 2. Drinking has never created problems for me.
- \_\_\_\_\_ 3. I do not drink to cope with stress or depression.

### **Tobacco or Drug Use**

- \_\_\_\_\_ 1. I do not smoke cigarettes or use any other type of tobacco.
- \_\_\_\_\_ 2. I do not use any illegal drugs.
- \_\_\_\_\_ 3. I drink no more than two caffeinated beverages per day.
- \_\_\_\_\_ 4. I am not addicted to any over-the-counter or prescription drugs.



### **Automobile Safety**

- \_\_\_\_\_ 1. I always use seat belts when I drive.
- \_\_\_\_\_ 2. I always use seat belts when I am a passenger.
- \_\_\_\_\_ 3. I have not had a speeding ticket or other moving violation in the last year.
- \_\_\_\_\_ 4. I do not drive after drinking or ride with a driver who has been drinking.

### **Personal**

- \_\_\_\_\_ 1. I am aware that anyone who engages in sexual activity should protect himself or herself against sexually transmitted diseases (STDs) and unwanted pregnancies.
- \_\_\_\_\_ 2. I am aware of the dangers of sexually transmitted diseases such as herpes, genital warts, acquired immunodeficiency syndrome (AIDS).
- \_\_\_\_\_ 3. I check my body at least monthly for unusual lumps, bumps, dark spots, or sores.
- \_\_\_\_\_ 4. I use sun protection when in the sun for long periods of time.

### **Sleep and Relaxation**

- \_\_\_\_\_ 1. I find it easy to unwind and relax.
- \_\_\_\_\_ 2. I have specific methods for relaxing.
- \_\_\_\_\_ 3. I get at least six to eight hours of sleep each night.
- \_\_\_\_\_ 4. I sleep soundly, rarely waking up during the night.
- \_\_\_\_\_ 5. I usually feel rested and energized in the morning.



### **Stress Management**

- \_\_\_\_\_ 1. I practice positive coping strategies to manage stressful situations.
- \_\_\_\_\_ 2. I seldom feel rushed, tense, or anxious.
- \_\_\_\_\_ 3. I usually complete most of the tasks I set out to accomplish.
- \_\_\_\_\_ 4. I rarely get ill and have to take time off from work or school.

### **Cardiac Risk**

- \_\_\_\_\_ 1. My blood pressure is within the normal range.
- \_\_\_\_\_ 2. My total cholesterol is within the healthy range.
- \_\_\_\_\_ 3. I have no more than two immediate relatives over age 60 with cardiovascular disease or who have died from heart disease.

### **Personality**

- \_\_\_\_\_ 1. I am usually happy and have a positive outlook.
- \_\_\_\_\_ 2. I can usually relax and enjoy leisure time without worrying about other things.
- \_\_\_\_\_ 3. I am rarely demanding, controlling, or hostile.





**Scoring:** Total the number of *true* responses. \_\_\_\_\_

- 40-50:**        **Great Lifestyle.** Congratulations! Your score indicates a higher than average healthy lifestyle. By continuing to choose healthy habits throughout your life, you can enjoy a quality life with the greatest chance for a healthy body and mind.
- 25-39:**        **Good Lifestyle.** This score indicates an average healthy lifestyle, but there is room for improvement. Review your false responses and gradually modify your lifestyle to help them become true statements.
- 24 or below:**   **Need to Improve Lifestyle.** This score indicates that you are taking unnecessary risks with your health. This makes you more prone to developing a health or medical problem, or to be involved in an accident. These high-risk habits can be prevented by identifying your lifestyle patterns and making a plan to improve them.



## Practice

Write **True** if the statement is correct. Write **False** if the statement is not correct.

- \_\_\_\_\_ 1. A high percentage of Americans are out of shape and overweight.
- \_\_\_\_\_ 2. Today's teenagers are more physically active and fit than ever before.
- \_\_\_\_\_ 3. Cardiovascular disease is the leading cause of death in the United States.
- \_\_\_\_\_ 4. You have to be an athlete or be sports-oriented to be physically fit.
- \_\_\_\_\_ 5. Leading an inactive lifestyle is considered a major risk factor for heart disease.
- \_\_\_\_\_ 6. Muscular endurance is the ability of a muscle to exert maximum force against a resistance.
- \_\_\_\_\_ 7. Thirst is a good indicator of fluid loss.
- \_\_\_\_\_ 8. Your body weight is a much better indicator of overall health and fitness than your body fat percentage is.
- \_\_\_\_\_ 9. Maximum strength and speed combined in movements such as leaping and jumping are defined as power.
- \_\_\_\_\_ 10. Wearing a rubberized suit while exercising reduces the body's ability to release heat, which can be very dangerous.
- \_\_\_\_\_ 11. Losing great amounts of sweat during exercise is nothing to be concerned about.
- \_\_\_\_\_ 12. Increasing your aerobic workout from 20 minutes to 45 minutes is an example of overloading.



- \_\_\_\_\_ 13. The body responds in a different manner to positive stress (eustress) than it does to negative stress (distress).
- \_\_\_\_\_ 14. Exercise does little to relieve tension and stress.
- \_\_\_\_\_ 15. Stress can be caused by environmental factors, various foods, or social relationships.



## Practice

Use the list below to complete the following statements.

distress  
endorphins  
eustress  
heart disease

heat exhaustion  
heat stroke  
negative coping strategy

positive coping strategies  
self-image  
stress

1. The response of the body to any situation that makes a demand on it is called \_\_\_\_\_ .
2. When stress is positive, it is called \_\_\_\_\_. When stress is negative, it is called \_\_\_\_\_ .
3. Serious stress can cause major health problems such as high blood pressure, ulcers, and \_\_\_\_\_ .
4. Some of the main sources of teen stress are school issues, social relationships, and \_\_\_\_\_ .
5. Regular exercise, meditation, and relaxation are \_\_\_\_\_ .
6. Using drugs or alcohol to cope with stress or escape your problems is a \_\_\_\_\_ .
7. Exercise produces pain-relieving substances called \_\_\_\_\_ .



8. \_\_\_\_\_ is a reaction to heat characterized by weakness and collapse as a result of dehydration
9. A \_\_\_\_\_ is an extreme medical emergency and is life threatening. Call immediately for emergency medical help.

**exercise  
flexibility  
fluid**

**heat cramp  
heart**

**sedentary  
warm-up**

10. A \_\_\_\_\_ is a muscle spasm caused by intense heat or lack of adequate fluid intake.
11. The ability to move joints and muscles through a full range of motion without pain or injury is called \_\_\_\_\_ .
12. Don't rely on thirst as an indicator of \_\_\_\_\_ loss.
13. \_\_\_\_\_ should be enjoyable, not painful. The old adage of "no pain, no gain" now reads "train, don't strain."
14. A \_\_\_\_\_ helps in preventing muscle strains, increases the heart rate slowly, and prepares your body for more intense exercise.
15. A \_\_\_\_\_ , or inactive, lifestyle and a diet high in fat are considered major risk factors for heart disease.
16. Your most important muscle is your \_\_\_\_\_ .



## Practice

Use the list below to write the correct term for each definition on the line provided.

<b>body composition</b>	<b>overload</b>
<b>cardiovascular exercise</b>	<b>physical fitness</b>
<b>health-related fitness components</b>	<b>skill-related fitness components</b>
<b>muscular endurance</b>	

- \_\_\_\_\_ 1. a training principle that says you must work the body harder than it is normally worked to improve physical fitness; to *increase* frequency, intensity, type, or time (F.I.T.T. formula)
- \_\_\_\_\_ 2. the parts of physical fitness the body must improve and develop to achieve well-being: cardiovascular or aerobic fitness, muscular endurance, and strength; flexibility; and body composition
- \_\_\_\_\_ 3. steady, sustained rate of exercise at which the heart can supply the oxygen needed by the body; also called *aerobic exercise*
- \_\_\_\_\_ 4. movements that help a person in any physical activity, particularly sports and recreation: agility; balance; coordination; power; reaction time; and speed
- \_\_\_\_\_ 5. the ability of the whole body to perform at maximum capability
- \_\_\_\_\_ 6. the ability to use certain muscles repetitively for a long period of time without tiring
- \_\_\_\_\_ 7. the percentage of body weight that is fat compared to lean body tissue such as muscle, bone, and other tissues and organs

## Unit 2: Body Composition and Nutrition

This unit describes body composition and the factors that influence it. Students will learn how to measure and test their own body composition. They will also gain an understanding of how nutrition and exercise are the key components of determining your body composition.

### Unit Focus

- the relationship between body weight and body composition
- determining your ideal body weight
- why it is important to know your body type
- methods of measuring body composition
- eating right and the food pyramid
- nutrition facts and fallacies
- eating disorders



## **Fitness Career Opportunity**

### **Sports Nutritionist**

Sports nutritionists advise athletes and others on how to eat for optimal fitness and peak performance. They often work in universities, for sports teams, at health clubs, or in corporate or wellness centers.

Clients seek out sports nutritionists for a variety of reasons. The following are some of the more common reasons:

- to gain or lose weight
- to optimize athletic performance
- to increase energy and endurance
- to improve overall eating habits.

In seeking out a sports nutritionist, it is advisable to look for a registered dietician (R.D.) who belongs to the American Dietetic Association (ADA).

For a free state-by-state listing of registered dietitians, contact:

ADA National Center for Nutrition and Dietetic Hotline  
(800-366-1655)  
or  
American Dietetic Association  
216 W. Jackson Blvd.  
Chicago, IL 60606-6995  
(312) 899-0040 or (800) 877-1600  
<http://www.eatright.org/nfs/>

For information concerning sports nutrition, contact:

International Center for Sports Nutrition  
Omaha, Nebraska  
(402) 559-5505





## Vocabulary

*Study the vocabulary words and definitions below.*

- anorexia nervosa** ..... an eating disorder in which a person refuses to eat and suffers severe weight loss; also called *starvation sickness*
- body composition** ..... the percentage of body weight that is fat compared to lean body tissue such as muscle, bone, and other tissues and organs; one of the measurements of your physical fitness
- bulimia** ..... an eating disorder in which a person overeats and then vomits, or uses diuretics or laxatives to get rid of the food before it is digested
- calorie** ..... a unit of heat that measures the energy available in food; about 3500 extra calories equal one pound of fat
- carbohydrate** ..... a nutrient in food that is the main source of energy for the body
- diuretics** ..... drugs used to increase the amount of fluids lost through urine
- ectomorph** ..... a body type characterized by a slender, lean frame with long bones and muscles



- electrolyte** ..... a mineral whose electrical charge helps control the body's fluid balance  
*Example:* Sodium ( $\text{Na}^{++}$ ), calcium ( $\text{Ca}^{++}$ ), and potassium ( $\text{K}^{+}$ ) are examples of electrolytes.
- endomorph** ..... a body type characterized by a soft roundness, heavy legs, narrow shoulders, and a large chest
- fallacy** ..... a mistaken idea
- fat** ..... flabby and untuned tissue; a nutrient in food that provides energy and can be stored in the body
- ideal body weight** ..... how much you would weigh if your body fat percentage were in the healthy range
- lean body mass** ..... the makeup of your body that is muscle, bone, tissue, and organs, but not fat
- mesomorph** ..... a body type characterized by a well-proportioned muscular, athletic physique
- nutrients** ..... substances found in food that the body must have to function properly; provide energy and materials for growth and repair of body tissues
- obese** ..... having an excessive amount of body fat



- overfat** ..... having more than a recommended percentage of body fat
- overweight** ..... weighing about 10 percent more than the weight considered desirable for a particular height or age
- protein** ..... a nutrient in food that helps the body build and repair body tissue and provides energy
- skinfold calipers** ..... an instrument used to measure the body fat directly under the skin
- somatotype** ..... your personal body type in terms of your body composition related to heredity
- underfat** ..... having less than a recommended percentage of body fat

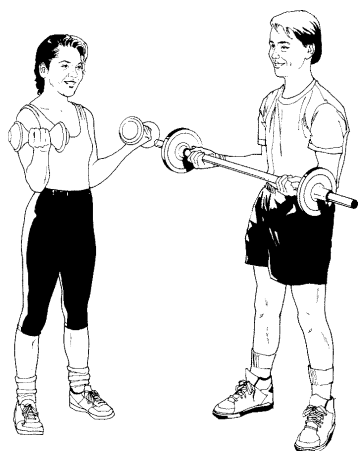




## Unit 2: Body Composition and Nutrition

### Introduction

Many people place far too much emphasis on their body weight. Weight alone is not a good measure of health. A comparison of the amount of **fat** on your body to the amount of **lean body mass** is a much more accurate measure of your health. *Lean body mass* consists of your muscles, bones, and other tissues and organs. *Fat* appears on the body as flabby and untuned tissue. The proportion of fat in the body to lean body mass is known as **body composition**. Your body composition is expressed as the percentage of body weight that is fat compared to its percentage of lean body tissue.



*Your body composition is expressed as the body's percentage of fat and its percentage of lean body tissue.*

The body composition of a fit male teenager should be between nine percent and 15 percent body fat. The body composition of a fit female teenager should be between 14 percent and 21 percent. Everyone should work towards these healthy ranges. Most Americans need to lower the amount of fat on their bodies and raise the amount of lean body mass, or muscle. Developing a body composition low in fat is one of the most important goals for achieving good health.

You cannot tell whether you carry too much body fat simply by weighing yourself. A weight scale combines both your lean body mass and your body fat into one measure.

### Overweight, Overfat, Obese, Underfat, or Ideal?

A person who is **overweight** weighs approximately 10 percent more than is desirable for a particular height or age. An **overfat** person has *more* body fat than is recommended. An **underfat** person has *less* body fat than is recommended.



*Body builders have a high percentage of muscle and low body fat.*

However, a person who weighs more than the suggested amount on a height-weight chart is not necessarily *overfat*.

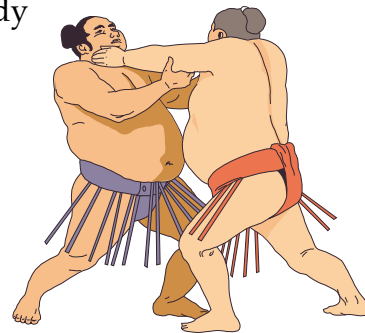
These charts are figured for people who have an average percentage of body fat. But some people such as body builders and other muscular athletes will have a very low percentage of body fat. Most of their body is made of muscle. Muscle tissue is heavier and weighs more than an equal amount of fat tissue. Consequently, these very fit athletes will weigh more than the height-weight charts suggest.

On the other hand, a person who appears slim and lean may actually have too much body fat. He or she may have a low body weight because fat tissue

weighs less than muscle tissue. This body composition is often seen in people who diet to avoid being overweight but do not exercise or achieve physical fitness. The amount of body fat we carry is not always obvious. We cannot tell by our looks or even by the pounds we register on a scale.

An **obese** person has an excessive amount of body fat. A Sumo wrestler would be considered *obese*.

It is important to know your body type and focus on healthy and reasonable goals for your body type. **Remember:** Working toward a certain body weight should not be our goal. Weighing the ideal amount for our height will not make our bodies healthy, fit, or low in body fat. A far more important goal is to eat a nutritious diet and get regular exercise. Together, these practices will lead to a healthy body composition.



*A Sumo wrestler would be considered obese.*



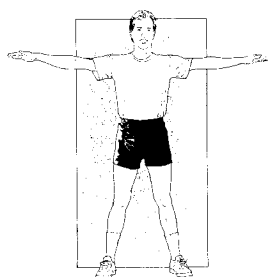
## Ideal Body Weight: What Should I Weigh?

Your **ideal body weight** is how much you should weigh if your body fat percentage were in the proper range. There are simple formulas that are helpful in determining about what you should weigh. You will most likely look and feel the best—and be the healthiest—at your ideal body weight.

Acceptable Ranges for Percent Body Fat*		
Age	Male	Female
13	10-25%	17-32%
14	10-25%	17-32%
15	10-25%	17-32%
16	10-25%	17-32%
17	10-25%	17-32%
17+	10-25%	17-32%

\* calculated from triceps and skinfold measurements

## Body Types: Ectomorph, Endomorph, and Mesomorph



When it comes to body types, we are not all created equal! Everyone comes in a different size and shape. Our genetics, gender, and even lifestyle make each of us unique. However, some of us can be described as having one of three standard body types: **ectomorph**, **endomorph**, or **mesomorph**. Most of us are a combination of two body types. Your **somatotype** is your body type in terms of your body composition related to heredity.

### Ectomorph: Slender and Lean

This body type is familiar in long-distance runners. An *ectomorph* is usually slender and lean with long bones and muscles. Ectomorphs usually have a low body weight and a low percentage of body fat.

### Mesomorph: Trim and Athletic

The *mesomorph* has a well-proportioned build. A mesomorph has medium to large bones and solid muscular development. Their body fat is usually within the desirable ranges. Many athletes are considered to be mesomorphs.



## Endomorph: Round and Soft

The *endomorph's* body is soft and round. The endomorph has thick, heavy legs, narrow shoulders, and a large chest. They carry a high percentage of body fat at and below the waist, creating a bottom-heavy look.

## The Typical Body Type: A Combination of Two Body Types

Most of us can be classified as a combination of two of the basic body types. For example, an individual who is naturally muscular and well proportioned but has extra body fat would be a meso-endomorph. This body type is typical of heavy power lifters and Sumo wrestlers.

The only combination that cannot occur is the endo-ectomorph.

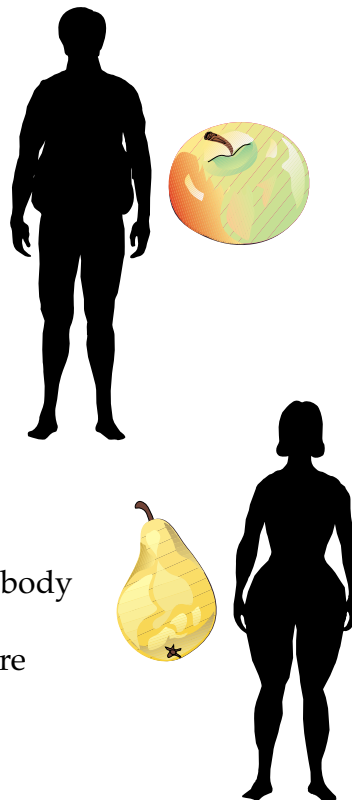
Heredity determines to a large extent what basic body type you will tend to be. However, exercise patterns and eating habits largely influence your body type as well.

## Apple or a Pear?

When people gain excess weight, they often develop one of two body shapes. These shapes are referred to as the *apple* and the *pear*.

**Apple.** The apple-shaped person carries most of his extra weight in the chest and abdomen. Apples tend to be males and usually have pot bellies. Research has shown that the apple-shaped person is at greater risk for heart disease, diabetes, and certain cancers.

**Pear.** The pear-shaped person tends to store body fat below the waist. They carry extra fat in the thighs, hips, and buttocks. A pear shape is more common in females.







## Waist-to-Hip Ratio

Check your own body shape using the waist-to-hip ratio below.

1. Measure your waist at its smallest point.

waist measurement: \_\_\_\_\_ inches

2. Measure your hips where they are the largest.

hip measurement: \_\_\_\_\_ inches

3. Divide the waist measurement by the hip measurement to determine your waist-to-hip ratio.

waist  $\div$  hip measurement = waist-to-hip ratio

*Example:* waist = 28 inches; hips = 40 inches

$28 \div 40 = 0.70$  waist-to-hip ratio

\_\_\_\_\_  $\div$  \_\_\_\_\_ = \_\_\_\_\_ waist-to-hip ratio \_\_\_\_\_

According to the American Heart Association (AHA), a waist-to-hip ratio of greater than 0.80 for women and 0.95 for men may increase the risk for heart disease, high blood pressure, stroke, diabetes, respiratory problems, and certain cancers. In many cases, these problems can be improved with proper weight control.



## Importance of Weight Control

One in every three Americans is either overfat or obese. It is a simple fact that carrying extra fat on your body increases your energy needs. Carrying extra fat also raises your risk for developing health-related problems.

Maintaining a proper body composition helps a person feel and look good. It also helps a person to be at his mental and physical best.

The following are some health problems associated with carrying too much body fat.

- A diet high in fat can lead to arteriosclerosis (hardened arteries).
- Arteriosclerosis reduces the blood supply to vital organs.
- Arteriosclerosis raises blood pressure.
- Arteriosclerosis can cause a heart attack.

Regular exercise and a healthy diet are the keys to maintaining a healthy body composition.

### Arteriosclerosis and High Blood Pressure can lead to...

stroke	infections
damaged kidneys	problems during pregnancy
heart attack	certain cancers
breathing difficulties	shortened life
problems during surgery	decreased quality of life
diabetes	

## Methods of Measuring Body Composition

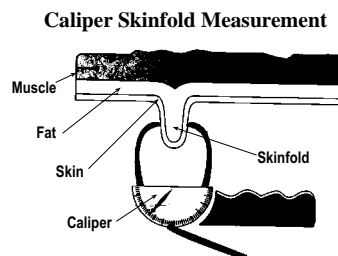
Body fat percentages can be estimated using different methods. The quickest and simplest methods use skinfold and body measurements. More complex methods include underwater weighing, electrical impedance, and ultrasound.

All methods used to determine body fat are approximations. However, taking body fat and body measurements is more accurate than weighing yourself on a scale.



### Skinfold Measurements: Pinching Fat

Taking a *skinfold measurement* is a common, convenient method used to measure body fat. The skinfold technique pinches fat from various places on the body with instruments called **skinfold calipers**. The skinfold caliper measures the fat that lies directly under the skin. It is believed that half of the fat in our body lies right under the skin. The remaining half is deep within your body's organs. Skinfold measurements are usually taken at the back of the arm, at the waist or hip, chest, and thigh area. (See *Skinfold Measurements* activity on the following pages.)



### Hydrostatic or Underwater Weighing: Measuring a Submerged Body

*Hydrostatic* or underwater weighing is considered to be the most accurate method of measuring body composition. Muscle is denser than fat. The difference between regular weight and underwater weight reflects the difference between fat and lean tissue. Thus, percentage of body fat can be calculated. This method requires special equipment and professional analysis. A large water tank or swimming pool and a weighing scale are required. The person is first weighed on dry land. Then the person is weighed under water.

### Bioelectrical Impedance: Passing Electrical Currents through the Body

In the *bioelectrical impedance* method, the speed of an electric current is measured as it passes through the body. Muscle has a lot of water, while fat has very little water. The faster the flow, the lower the proportion of fat in the body.

### Dual X-Ray Absorbiometry (DEXA)

In *dual X-ray absorbiometry* (DEXA), low-energy X-rays scan the whole body. Fat, muscle, and bone have different densities and can be seen on the X-ray film. The computer calculates the percentage of each.

### Body Mass Index (BMI): Estimating Body Fat

Body mass index (BMI) is a commonly used method to estimate body fat. It compares your height and weight and predicts your body fat. (See *Body Mass Index* activity on pages 71-73.)



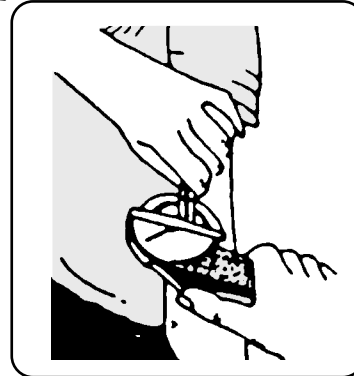
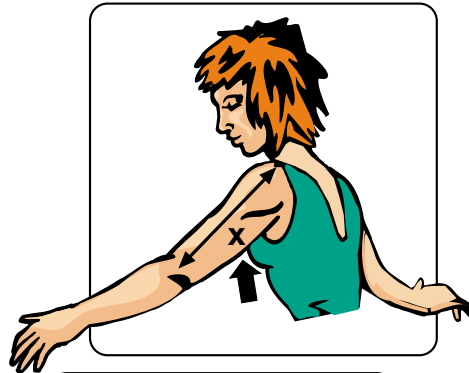
## Skinfold Measurements

To determine your percent of body fat, first find a partner. Decide who will be measured first.

Measure two skinfolds on the body: the triceps, or the back of the arm, and the calf in the lower leg. Use the right side of the body for all measurements.

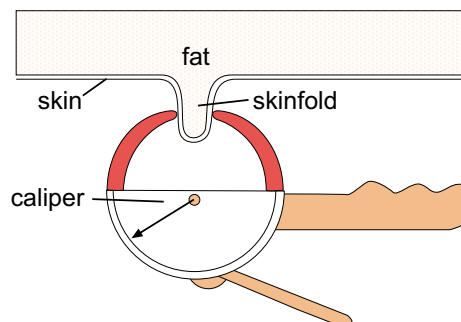
### Procedure for Triceps Skinfold Measurement

1. Find the middle point between the shoulder and elbow on the back of the right arm. Mark it with an "X" using a marking pencil.
2. Lift the skin away from the muscle, grasping it right above the marked area. Pinch the skinfold with your finger and thumb. (It is not necessary to pinch hard.)
3. Using the skinfold caliper, measure the thickness of the skinfold. Repeat the measurement two more times, and record the average of the three to the nearest millimeter (mm).



\_\_\_\_\_ + \_\_\_\_\_ + \_\_\_\_\_ = \_\_\_\_\_ ÷ 3 = \_\_\_\_\_ mm

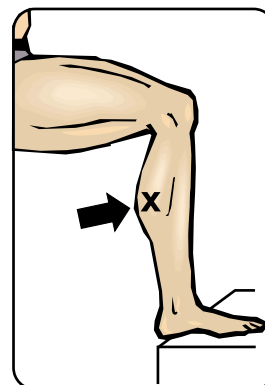
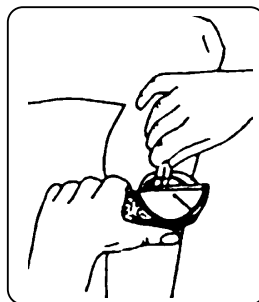
My triceps skinfold measurement is \_\_\_\_\_ mm.





### Procedure for Calf Skinfold Measurement

1. Place your right foot on a step or elevated surface to a bent-knee position of about 90 degrees. Mark an "X" on the inside of the lower leg at the largest part of the calf muscle.
2. Pinch the skinfold just above the marked point, lifting the skin away from the muscle. Measure the thickness of the skinfold with the calipers.
3. Take three total measurements, and record the average of the three to the nearest millimeter.



\_\_\_\_\_ + \_\_\_\_\_ + \_\_\_\_\_ = \_\_\_\_\_ ÷ 3 = \_\_\_\_\_ mm

My calf skinfold measurement is \_\_\_\_\_ mm.

### Final Measurement Procedure

Add your triceps measurement and calf measurement together. Use the sum to determine an approximation of your body fat percentage. Refer to the *Body Composition Conversion Tables* on the following pages and the *Acceptable Ranges for Percent Body Fat* chart on page 61.

My final measurement is: triceps + calf = \_\_\_\_\_ mm.

My body fat percentage is estimated at \_\_\_\_\_ %.

Analyze your results.

My body fat percentage is (check one):

\_\_\_\_\_ lower than the desired range.

\_\_\_\_\_ in the proper range.

\_\_\_\_\_ higher than the desired range.

**Note:** A 3% to 5% body fat measurement error is associated with the skinfold method.



To maintain or improve my body composition I can do the following things:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_



## Body Composition Conversion Table for Females\*

Total (millimeters)	Percent Fat	Total (millimeters)	Percent Fat	Total (millimeters)	Percent Fat	Total (millimeters)	Percent Fat	Total (millimeters)	Percent Fat
1.0	5.7	16.0	14.9	31.0	24.0	46.0	33.2	61.0	42.3
1.5	6.0	16.5	15.2	31.5	24.3	46.5	33.5	61.5	42.6
2.0	6.3	17.0	15.5	32.0	24.6	47.0	33.8	62.0	42.9
2.5	6.6	17.5	15.8	32.5	24.9	47.5	34.1	62.5	43.2
3.0	6.9	18.0	16.0	33.0	25.2	48.0	34.4	63.0	43.5
3.5	7.2	18.5	16.4	33.5	25.5	48.5	34.7	63.5	43.8
4.0	7.5	19.0	16.7	34.0	25.8	49.0	35.0	64.0	44.1
4.5	7.8	19.5	17.1	34.5	26.1	49.5	35.3	64.5	44.4
5.0	8.2	20.0	17.3	35.0	26.5	50.0	35.6	65.0	44.8
5.5	8.5	20.5	17.6	35.5	26.8	50.5	35.9	65.5	45.1
6.0	8.8	21.0	17.9	36.0	27.1	51.0	36.5	66.0	45.4
6.5	9.1	21.5	18.2	36.5	27.4	51.5	36.5	66.5	45.7
7.0	9.4	22.0	18.5	37.0	27.7	52.0	36.8	67.0	46.0
7.5	9.7	22.5	18.8	37.5	28.0	52.5	37.0	67.5	46.3
8.0	10.0	23.0	19.1	38.0	28.3	53.0	37.4	68.1	46.6
8.5	10.3	23.5	19.4	38.5	28.6	53.5	37.7	68.5	46.9
9.0	10.6	24.0	19.7	39.0	28.9	54.0	38.0	69.0	47.2
9.5	10.9	24.5	20.0	39.5	29.2	54.5	38.3	69.5	47.5
10.0	11.2	25.0	20.4	40.0	29.5	55.0	38.7	70.0	47.8
10.5	11.5	25.5	20.7	40.5	29.8	55.5	39.0	70.5	48.1
11.0	11.8	26.0	21.0	41.0	30.1	56.0	39.3	71.0	48.4
11.5	12.1	26.5	21.3	41.5	30.4	56.5	39.6	71.5	48.7
12.0	12.4	27.0	21.6	42.0	30.7	57.0	39.9	72.0	49.0
12.5	12.7	27.5	21.9	42.5	31.0	57.5	40.2	72.5	49.6
13.0	13.0	28.0	22.2	43.0	31.3	58.0	40.5	73.0	49.6
13.5	13.3	28.5	22.5	43.5	31.6	58.5	40.8	73.5	49.9
14.0	13.6	29.0	22.8	44.0	31.9	59.0	41.1	74.0	50.2
14.5	13.9	29.5	23.1	44.5	32.2	59.5	41.1	74.5	50.5
15.0	14.3	30.3	23.4	45.0	32.6	60.0	41.7	75.0	50.9
15.5	14.6	30.5	23.7	45.5	32.9	60.5	42.0	75.5	51.2

\*Use this table to determine percent body fat for all girls ages 5 to 18.



**Body Composition Conversion Table for Males\***

Total (millimeters)	Percent Fat	Total (millimeters)	Percent Fat	Total (millimeters)	Percent Fat	Total (millimeters)	Percent Fat	Total (millimeters)	Percent Fat
1.0	1.7	16.0	12.8	31.0	23.8	46.0	34.8	61.0	45.8
1.5	2.0	16.5	13.1	31.5	24.2	46.5	35.2	61.5	46.2
2.0	2.5	17.0	13.5	32.0	24.5	47.0	35.5	62.0	46.6
2.5	2.8	17.5	13.9	32.5	24.9	47.5	35.9	62.5	46.9
3.0	3.2	18.0	14.2	33.0	25.3	48.0	36.3	63.0	47.3
3.5	3.6	18.5	14.2	33.5	25.6	48.0	36.3	63.0	47.3
4.0	3.9	19.0	15.0	34.0	26.0	49.0	37.0	64.0	48.0
4.5	4.3	19.5	15.3	34.5	26.4	49.5	37.4	64.5	48.4
5.0	4.7	20.0	15.7	35.0	26.7	50.0	37.8	65.0	48.8
5.5	5.0	20.5	16.1	35.5	27.1	50.5	38.1	65.5	49.1
6.0	5.4	21.0	16.4	36.0	27.5	51.0	38.5	66.0	49.5
6.5	5.8	21.5	16.8	36.5	27.8	51.5	38.9	66.5	49.9
7.0	6.1	22.0	17.2	37.0	28.2	52.0	39.2	67.0	50.2
7.5	6.5	22.5	17.5	37.5	28.6	52.5	39.6	67.5	50.6
8.0	6.9	23.0	17.9	38.0	28.9	53.0	40.0	68.0	51.0
8.5	7.2	23.5	18.3	38.5	29.3	53.5	40.6	68.5	51.3
9.0	7.6	24.0	18.6	39.0	29.7	54.0	40.7	69.0	51.7
9.5	8.0	24.5	19.0	39.5	30.0	54.5	41.1	69.5	52.1
10.0	8.4	25.0	19.4	40.0	30.4	55.0	41.4	70.0	52.5
10.5	8.7	25.5	19.7	40.5	30.8	55.5	41.8	70.5	52.8
11.0	9.1	26.0	20.1	41.0	31.1	56.0	42.2	71.0	53.2
11.5	9.5	26.5	20.5	41.5	31.5	56.5	42.5	71.5	53.6
12.0	9.8	27.0	20.8	42.0	31.9	57.0	42.9	72.0	53.9
12.5	10.2	27.5	21.2	42.5	32.2	57.5	43.3	72.5	54.3
13.0	10.6	28.0	21.6	43.0	32.6	58.0	43.6	73.0	54.7
13.5	10.9	28.5	21.9	43.5	33.0	58.5	44.0	73.5	55.0
14.0	11.3	29.0	22.3	44.0	33.3	59.0	44.3	74.0	55.4
14.5	11.7	29.5	22.7	44.5	33.7	59.5	44.7	74.5	55.8
15.0	12.0	30.0	23.1	45.0	34.0	60.0	45.1	75.0	56.1
15.5	12.4	30.5	23.4	45.5	34.4	60.5	45.5	75.5	56.5

\*Use this table to determine percent body fat for all boys ages 5 to 18.





## Body Mass Index

The *Body Mass Index* (BMI) is a quick and easy way to determine a healthy weight without referring to the standard charts.

On the *BMI* chart on the page 73, find your height in inches down the left side of the chart. Then go across the line of your height until you get to your weight in pounds. Now go up to the top of the chart to find your BMI.

The desirable ranges for females and males are listed below.

Acceptable Ranges of Body Mass Index (BMI)		
Age	Male	Female
	Percent of Fat	Percent of Fat
13	16.6 - 23	17.5 - 24.5
14	17.5 - 24.5	17.5 - 25
15	18.1 - 25	17.5 - 25
16	18.5 - 26.5	17.5 - 25
17	18.8 - 27	17.5 - 26
17+	19.0 - 27.8	18.0 - 27.3

The federal government has established the following BMI scale.

Percent of Fat	
lower than 18.5	underweight
18.5 - 24.9	normal
25 - 29.9	overweight
30 and higher	obese

If you possess a lot of muscle mass, your BMI may tend appropriately to be a bit higher. A high BMI is associated with a greater risk for cardiovascular disease and diabetes.



**Results:**

My body mass index is \_\_\_\_\_ .

To determine an approximation of your proper weight, place the ruler at your height and at the desirable body mass index (BMI) range. Your target weight will appear where the ruler crosses the left column.

My proper weight according to this formula should be  
approximately \_\_\_\_\_ pounds.

Do you believe this is an accurate measure of your proper body  
weight? \_\_\_\_\_

Why or why not? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



	Normal												Overweight						Obese						Extreme Obesity			
BMI	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42				
Height (inches)	Body Weight (pounds)																											
58	91	96	100	105	110	115	119	124	129	134	138	143	148	153	158	162	167	172	177	181	186	191	196	201				
59	94	99	104	109	114	119	124	128	133	138	143	148	153	158	163	168	173	178	183	188	193	198	203	208				
60	97	102	107	112	118	123	128	133	138	143	148	153	158	163	168	174	179	184	189	194	199	204	209	215				
61	100	106	111	116	122	127	132	137	143	148	153	158	164	169	174	180	185	190	195	201	206	211	217	222				
62	104	115	120	126	131	136	142	147	153	158	164	169	175	180	186	191	196	202	207	213	218	224	229	235				
63	117	113	118	124	130	135	141	146	152	158	163	169	175	180	186	191	197	203	208	214	220	225	231	237				
64	110	122	128	134	140	145	151	157	163	169	174	180	186	192	197	204	209	215	221	227	232	238	244	250				
65	114	120	126	132	138	144	150	156	162	168	174	180	186	192	198	204	210	216	222	228	234	240	246	252				
66	118	130	136	142	148	155	161	167	173	179	186	192	198	204	210	216	223	229	235	241	247	253	260	266				
67	121	127	134	140	146	153	159	166	172	178	185	191	198	204	211	217	223	230	236	242	249	255	261	268				
68	125	131	138	144	151	158	164	171	177	184	190	197	203	210	216	223	230	236	243	249	256	262	269	276				
69	128	135	142	149	155	162	169	176	182	189	196	203	209	216	223	230	236	243	250	257	263	270	277	284				
70	132	139	146	153	160	167	174	181	188	195	202	209	216	222	229	236	243	250	257	264	271	278	285	292				
71	136	143	150	157	165	172	179	186	193	200	208	215	222	229	236	243	250	257	265	272	279	286	293	301				
72	140	147	154	162	169	177	184	191	199	206	213	221	228	235	242	250	258	265	272	279	287	294	302	309				
73	144	151	159	166	174	182	189	197	204	212	219	227	235	242	250	257	265	272	280	288	295	302	310	318				
74	148	155	163	171	179	186	194	202	210	218	225	233	241	249	256	264	272	280	287	295	303	311	319	326				
75	152	160	168	176	184	192	200	208	216	224	232	240	248	256	264	272	279	287	295	303	311	319	327	335				
76	156	164	172	180	189	197	205	213	221	230	238	246	254	263	271	279	287	295	304	312	320	328	336	344				



## Figuring Ideal Body Weight According to Height

One common method used to determine appropriate body weight is based upon your height. This gives you a very basic approximation of how much you should weigh.

### Formula

**Females:** 100 pounds (lbs.) for five feet and add an additional five pounds for each inch of height over five feet.

*Example:* A female who is five feet and five inches would estimate her ideal body weight as 125 pounds.

$$100 \text{ lbs.} + (5 \times 5 \text{ lbs.}) = 125 \text{ lbs.}$$

**Males:** 106 pounds for five feet and add an additional five pounds for each inch of height over five feet.

*Example:* A male who is five feet and nine inches would estimate his ideal body weight as 151 pounds.

$$106 \text{ lbs.} + (9 \times 5 \text{ lbs.}) = 151 \text{ lbs.}$$

*Figure your ideal body weight using the formula above.*

1. I currently weigh \_\_\_\_\_ pounds.
2. I am \_\_\_\_\_ feet and \_\_\_\_\_ inches tall.
3. According to this formula I should weigh \_\_\_\_\_ pounds.
4. Analyze your results. How does this formula compare to your current body weight? \_\_\_\_\_  
Does this formula seem to be appropriate for you? \_\_\_\_\_  
Why or why not? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



## Figuring Ideal Body Weight According to Frame Size

This is another simple way to estimate your ideal body weight based upon your frame size. Follow these easy steps.

1. With a partner, measure the width of your elbow using the skinfold calipers. Elbow width is measured by bending the elbow 90 degrees, and then measuring the distance between the two knobby protrusions on each side of the elbow.
2. Refer to the *Frame Size Chart* on the following page to determine whether you have a small, medium, or large frame.
3. Once you have determined your frame size, refer to the *Height/Weight Chart* on page 77 for determining the suggested optimal weight range.

Record your scores.

1. According to the *Frame Size Chart*, I have a \_\_\_\_\_ frame.
2. According to the *Height/Weight Chart* for determining a suggested optimal weight range, I should weigh between \_\_\_\_\_ .
3. Analyze your results.

Do you feel this calculation is accurate for you?\_\_\_\_\_ Explain your answer. \_\_\_\_\_

What do you think your main body type is (ectomorph, endomorph, or mesomorph)? \_\_\_\_\_

Could you be a combination of two types? Explain. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



Frame Size Chart			
Female			
Height	Small Frame	Medium Frame	Large Frame
5' 0" & below	less than 54 mm	54–67 mm	more than 67 mm
5' 1" to 5' 8"	less than 56 mm	56–70 mm	more than 70 mm
5' 9" & above	less than 58 mm	58–72 mm	more than 72 mm
Male			
Height	Small Frame	Medium Frame	Large Frame
5' 0" & below	less than 63 mm	63–76 mm	more than 76 mm
5' 5" to 6' 1"	less than 67 mm	67–81 mm	more than 81 mm
6' 2" & above	less than 70 mm	70–86 mm	more than 86 mm



Height/Weight Chart			
Female			
Height	Small Frame	Medium Frame	Large Frame
4' 9"	88– 90	92–103	100–115
4' 10"	90– 97	94–106	102–118
4' 11"	92–100	97–109	105–121
5' 0"	95–103	100–112	108–124
5' 1"	98–106	103–115	111–127
5' 2"	101–109	106–118	114–130
5' 3"	104–112	109–122	117–134
5' 4"	107–115	112–126	121–138
5' 5"	110–119	116–131	125–142
5' 6"	114–123	120–135	129–146
5' 7"	118–127	124–139	133–150
5' 8"	122–131	128–143	137–154
5' 9"	126–136	132–147	141–159
5' 10"	130–140	136–151	145–164
5' 11"	134–144	140–155	149–169
6' 0"	138–148	144–159	153–173
Male			
Height	Small Frame	Medium Frame	Large Frame
5' 1"	107–115	113–124	121–136
5' 2"	110–118	116–128	124–139
5' 3"	113–121	119–131	127–143
5' 4"	116–124	122–134	130–147
5' 5"	119–128	125–138	133–151
5' 6"	123–132	129–142	137–156
5' 7"	127–136	133–147	142–161
5' 8"	131–140	137–151	146–165
5' 9"	135–145	141–155	150–169
5' 10"	139–149	145–160	154–174
5' 11"	143–153	149–165	159–179
6' 0"	147–157	153–170	163–184
6' 1"	151–162	157–175	168–189
6' 2"	155–166	162–180	173–194
6' 3"	159–170	167–185	177–199
6' 4"	163–174	172–190	184–203



## Figuring Ideal Body Weight According to Body Fat Percentage

To determine ideal body weight in pounds (lbs.) using this formula, you must know your body fat percentage (%). Use the percentage of body fat found on the skinfold measurement test.

Follow these steps to determine a desirable body-weight range for you.

*Example:* A female weighing 105 lbs. with 20% body fat has a desired body weight range between 98 and 106 lbs.

1. Find the lean body percentage.

$$100\% - \text{Fat Percentage} = \text{Lean Body Percentage}$$

$$100\% - 20\% = 80\% \text{ (Lean Body Percentage)}$$

2. Find the lean body weight in pounds.

$$\text{Body Weight} \times \text{Lean Body Percentage} = \text{Lean Body Weight}$$

$$105 \times 80\% = 84 \text{ lbs. (Lean Body Weight)}$$

3. Use the table below to find the desired lean percentage.

$$100\% - \text{Desired Percent Fat} = \text{Desired Lean Percent}$$

**Female:**

$$\text{Upper limit: } 100 - 21 = 79\%$$

$$\text{Lower limit: } 100 - 14 = 86\%$$

**Male:**

$$\text{Upper limit: } 100 - 15 = 85\%$$

$$\text{Lower limit: } 100 - 9 = 91\%$$

4. Find the desired body weight range in pounds.

$$\text{Lean Body Weight} \div \text{Desired Lean Percentage} = \text{Desired Body Weight Range}$$

$$84 \div 79\% = 106 \text{ lbs. (Upper Limit)}$$

$$84 \div 86\% = 98 \text{ lbs. (Lower Limit)}$$

$$98 \text{ lbs.} - 106 \text{ lbs.} = \text{Desired Body Weight Range}$$

*Use the formula above to figure your ideal body weight.*





## Practice

*Match each definition with the correct term. Write the letter on the line provided.*

- |  |                     |
|--|---------------------|
| _____ 1. having an excessive amount of body fat                              | A. body composition |
| _____ 2. well-proportioned, muscular, athletic body                          | B. ectomorph        |
| _____ 3. percentage of body weight that is fat compared to lean body tissue  | C. endomorph        |
| _____ 4. weighing about 10 percent more than the weight considered desirable | D. mesomorph        |
| _____ 5. slender, lean frame with long bones and muscles                     | E. obese            |
| _____ 6. soft roundness with heavy legs, narrow shoulders, and a large chest | F. overweight       |



## Practice

Use the list below to write the correct term for each definition on the line provided.

**fat**  
**ideal body weight**  
**lean body mass**  
**overfat**

**skinfold calipers**  
**somatotype**  
**underfat**

- \_\_\_\_\_ 1. an instrument used to measure the body fat directly under the skin
- \_\_\_\_\_ 2. your personal body type in terms of your body composition related to heredity
- \_\_\_\_\_ 3. the makeup of your body that is muscle, bone, tissue, and organs, but not fat
- \_\_\_\_\_ 4. flabby and untuned tissue; a nutrient in many foods that provides energy and can be stored in the body
- \_\_\_\_\_ 5. how much you would weigh if your body fat percentage were in the healthy range
- \_\_\_\_\_ 6. having less than a recommended percentage of body fat
- \_\_\_\_\_ 7. having more than a recommended percentage of body fat



## Improving Body Composition: Losing Body Fat

The best approach to losing body fat combines regular exercise with a sensible nutritional plan.

To lose a pound of fat, you must lose or burn about 3500 **calories** more than you take in. You could lose a pound of fat by eating 3500 fewer calories than you normally do. Or you could burn 3500 calories through exercise. The average teenager's daily diet is about 3500 calories. But simply going an entire day without food is a dangerous and inefficient way to lose fat. Similarly, the average person cannot safely burn 3500 calories after a day or even two days of exercise. The healthiest approach to losing body fat and *keeping it off* combines moderate exercise and a *slight* reduction of daily calories. This approach leads to a healthy and gradual loss of fat.

### Dieting without Exercising

Dieting without exercising in order to reduce body weight can produce a loss of pounds on the scale. However, when exercise is not included in a weight-loss program, the body loses fat *and* valuable muscle tissue. Drastically reducing calories in the daily diet makes the body think it is starving. When the body is starved, it reacts by breaking down its own muscle tissues. In addition, the body will try to save energy by burning *fewer* calories!

### Exercising without Dieting

For a weight-loss program to be successful, exercise is vital. Exercise preserves the lean muscle tissue. Preserving and increasing the amount of lean tissue helps you keep off the excess weight. Lean tissue consumes more calories than an equal amount of fat tissue. Lean tissue is, therefore, very valuable in losing and maintaining weight.

Exercise is the most important way to make long-term changes in your body composition. Your body will be leaner, stronger, and more toned. Try to strive for daily exercise, expending at least 300 calories per workout. (See activity *Calorie Usage in Activities* on the following page.)

To trim down, decrease your food intake and maintain a daily exercise program. If exercise is the only thing that is added or increased, weight loss will be a slow process. A change in nutritional habits needs to go hand-in-hand with workouts to achieve results.



## Calorie Usage in Activities

Exercise is a great way to expend extra calories while controlling body fat and proper body weight. Try to expend around 300 calories at each workout. Here is a chart to help you in estimating the number of calories burned in various activities. Use the column that comes closest to your body weight to approximate calories expended.



Burning Calories			
Activity	Calories Burned Per Hour At Approximate Weight		
	75 lbs	100 lbs	150 lbs
Aerobic class	300	336	360
Bicycling, 6 mph	135	160	240
Bicycling, 12 mph	225	270	410
In-Line Skating	162	216	324
Jogging, 5.5 mph	365	440	660
Jogging, 7 mph	510	610	920
Jumping Rope	415	500	750
Running in place	360	430	650
Running, 10 mph	710	850	1280
Swimming, 25 yds/min	155	185	275
Swimming, 50 yds/min	270	325	500
Tennis (singles)	220	265	400
Walking slowly, 2 mph	125	160	240
Walking moderately, 3 mph	175	210	320
Walking briskly, 4.5 mph	245	295	440
Weight lifting	225	300	450

## Figuring Calorie Usage in Activities

*Example:* Activity—**Brisk walking (150 lb. person)**

Number of calories per hour (**440**) x number of hours (**2**) = **880** calories

Activity: \_\_\_\_\_

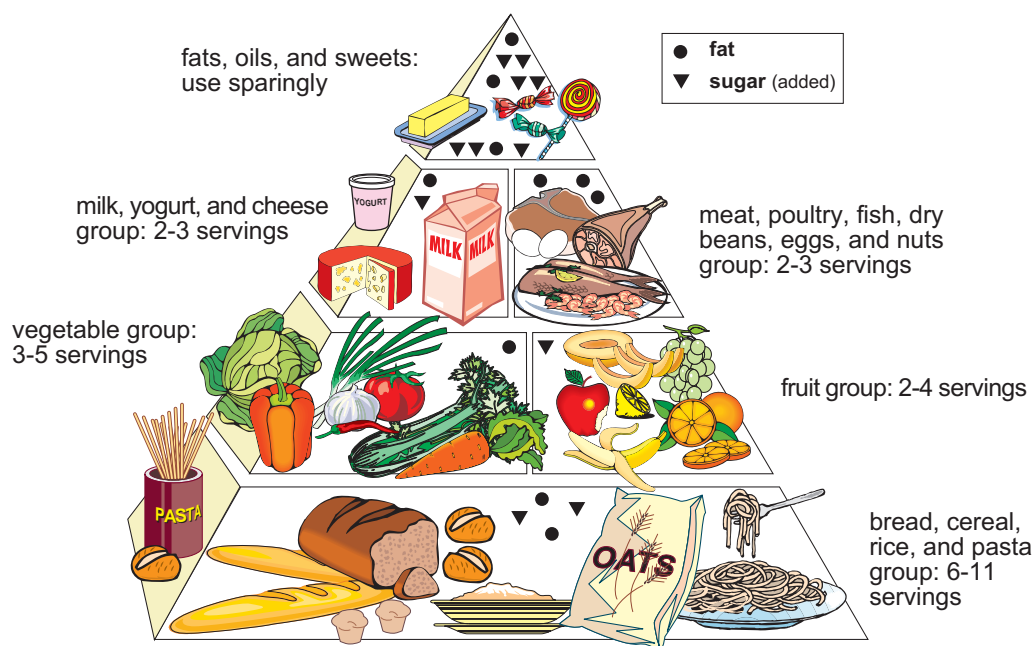
Number of calories per hour \_\_\_\_\_ x number of hours \_\_\_\_\_ = \_\_\_\_\_  
calories



## The Eating Right Food Guide Pyramid

The United States Department of Agriculture (USDA) and the United States Department of Health and Human Services have developed guidelines for helping Americans choose better eating habits. The Food Guide Pyramid was developed as a general guide of what to eat each day. The Food Guide Pyramid calls for eating a variety of foods to get the **nutrients** you need and the right amount of calories to maintain a healthy weight.

These easy-to-follow guidelines suggest that most of our calories should come from **carbohydrates** (50-60 percent) such as bread, cereal, rice, and pasta. The rest of our calories should come from fruits and vegetables, dairy products, and lean meat, fish, poultry, beans, or nuts. We should eat *fats*, oils, and sweets sparingly. Keep in mind that within each food group there are still naturally occurring fats and oils that should be figured into your total intake.



The Food Guide Pyramid



The Food Guide Pyramid recommends the following daily guidelines.

- Six to 11 servings of whole grains—bread, cereal, rice, or pasta (a serving is equal to one slice of bread;  $\frac{1}{2}$  of a bagel or English muffin; one ounce ready-to-eat cereal;  $\frac{1}{2}$  cup of cooked cereal, rice, or pasta)
- Two to four servings of fruit (a serving is equal to one medium apple, orange, or banana;  $\frac{1}{2}$  cup of canned fruit;  $\frac{3}{4}$  cup of juice)
- Three to five servings of vegetables (a serving is equal to one cup of raw, leafy greens;  $\frac{1}{2}$  cup of other vegetables, cooked or chopped raw;  $\frac{3}{4}$  cup of vegetable juice)
- Two to three servings of milk, yogurt, and cheese (a serving is equal to one cup of milk or yogurt;  $1\frac{1}{2}$  ounces of natural cheese; two ounces of processed cheese)
- Two to three servings of meat, beans, eggs, or nuts (a serving equals two to three ounces of cooked lean meat, poultry, or fish;  $\frac{1}{2}$  cup cooked dried beans, one egg, or two tablespoons of peanut butter counts as one ounce of lean meat)



## Tips ...

### For Healthy Eating and Weight Control

Eat a variety of nutrient-rich foods.

Eat plenty of whole grains, fruits, and vegetables.

Eat moderate portions and be aware of what a serving size consists of.

Choose foods that are low in fat.

Use salt and sugar in moderation.

Make changes in your diet gradually.

Eat smaller, more frequent meals, and spread them evenly throughout the day.

Eat the majority of your food early in the day with your evening meal the smallest.

Eat slowly to give your stomach a chance to feel full.

Avoid second helpings.

Broil, bake, boil, steam, or barbecue rather than fry or saute.

Snack on healthy, low-fat foods such as popcorn, pretzels, low-fat crackers, and fruit.

Drink a glass or two of water before a meal to help diminish your appetite.

Learn to read food labels.

Eat from smaller plates to make food portions appear larger.

Keep a food diary to help you evaluate your diet.

Enlist encouragement from a close friend or family member.

Find an exercise partner you can count on.

Eat only in a specified place in the house.

Avoid fad diets that don't include the proper nutrients your body needs.

Avoid losing more than two pounds of weight per week.



## Nutrition Facts and Fallacies

It is often hard to know what to believe about diet and exercise. A **fallacy** is a mistaken idea, often believed by many people. Here are several of the most commonly believed fallacies followed by the real facts.

- Fallacy:** I can just go on a popular or fad diet to lose weight.
- Fact:** Dieting alone may help you to lose weight temporarily, but the weight is usually gained back. Fad diets are diets that promise fast weight loss. Only a lifetime commitment to eating low-fat healthy foods and getting regular exercise guarantees success.
- Fallacy:** Certain foods, diet pills, or **diuretics** can help burn fat calories, promoting weight loss.
- Fact:** No foods burn fat. *Diuretics* are drugs that increase the amount of fluid lost through urine. Diet pills or diuretics may help you lose water weight. However, pounds lost from water weight are not body fat and will return quickly.
- Fallacy:** Sugar is a good source of quick energy.
- Fact:** Sugary foods may give you an immediate energy boost, but it is short-lived. The rapid rise in blood sugar is followed by feelings of hunger, irritability, and sleepiness.
- Fallacy:** During exercise you should drink water only when you feel thirsty.
- Fact:** Your body can become dehydrated before you feel thirsty. Serious health problems, up to and including death, can result if your fluid intake is inadequate. It is important to drink water before, during, and after exercise. Sports drinks (such as *Gatorade* and *Powerade*) are best used *after* exercise to replace important **electrolytes** lost during exercise.



**Fallacy:** Adding more **protein** to my diet will help me build muscle.

**Fact:** A normal diet supplies plenty of protein for muscle growth. Regular exercise training of specific muscle groups and a balanced diet increases muscle mass and strength. An excessive amount of protein is stressful to the kidneys. Like excess fat or carbohydrates in the diet, too much protein will be stored as fat.

**Fallacy:** *Fasting*, or skipping meals, will help me to lose weight.

**Fact:** Abstaining from food, or fasting, will not help you to lose fat weight. When you skip meals, your body is forced into a starvation mode. It will use up important calorie-burning muscle tissue to survive. Your body will slow down and begin to store fat even more efficiently than before.

**Fallacy:** Vitamins will give me more energy.

**Fact:** Vitamins do not supply energy. They only help the body to use energy. Energy is supplied by food in the form of calories. Vitamin supplements may be helpful for individuals with special needs. However, for an average, healthy person, a well-balanced diet supplies sufficient nutrients.

**Fallacy:** Muscle cramps indicate a lack of salt intake.

**Fact:** Muscle cramping is often caused by severe water loss from sweating or over-exercising. Salt tablets can worsen this condition. They draw more water out of the muscle and into the stomach.

**Fallacy:** Overfat people eat more than lean ones.

**Fact:** Not necessarily. Overfat people often eat *less* than lean individuals. Their bodies, however, have adjusted to a low-calorie intake. When they do overeat, they easily gain weight.





- Fallacy:** You only burn a high rate of calories while you exercise.
- Fact:** Exercise helps make your body a better fat-burning machine. Regular exercise helps you continue burning a high rate of calories even after you stop exercising.
- Fallacy:** Exercise increases your appetite.
- Fact:** Exercise actually blunts your appetite temporarily. More exercise means your body needs more nutrients. Exercise helps you to regulate calorie intake to appropriate levels.
- Fallacy:** Bread, rice, pasta, and other *carbohydrates* are fattening.
- Fact:** Whole grain carbohydrates such as bread, pasta, rice, and cereal have less than half the calories of fat. They are the best source of energy during physical activity. It is what is added to carbohydrates, such as butter and sour cream, that makes some foods fatty.

## Eating Disorders: When Food Becomes an Enemy

Over a million Americans suffer from eating disorders. Poor eating habits and obsessive dieting can lead to serious health problems.

One type of eating disorder, known as *starvation sickness*, is called **anorexia nervosa**. It is characterized by a refusal to eat followed by severe weight loss. Individuals with this disorder believe they are overweight even though they appear very thin. Many may also develop an obsession to over exercise.

Another eating disorder is **bulimia**. The bulimic individual often eats large amounts of high-calorie foods. After overeating, the individual vomits or uses laxatives to get rid of the food before it is digested.

People with these disorders think they are overweight, even when they may actually be very thin. These eating disorders can cause chronic health problems and even death. People with these problems should seek the help of a professional.



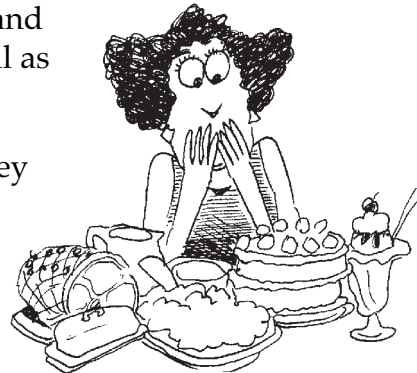
## Summary

Many people place far too much emphasis on their body weight. Weight alone is not a sufficient measure of health. Knowing how much of your body is *lean body mass* and how much is *fat* is a much more important indicator of health. The proportion of *lean body mass* to fat in the body is known as *body composition*. Seeing the relationship between body weight, body shape, and disease has helped us understand the importance of body composition in achieving good health. Carrying an excessive amount of body fat, or being *overfat* or *obese*, puts us at high risk for many diseases.

To improve body composition, you should combine diet and regular exercise. It takes a reduction of 3500 *calories* to lose a pound of fat. To ensure that the fat is lost and not muscle, it is important to exercise as well as take in fewer calories.

A low-fat diet and regular exercise are the key ingredients in achieving good health and a lean, fit body.

Over a million Americans suffer from *anorexia nervosa* or *bulimia*. These eating disorders can cause health problems. Victims of these disorders need professional help.



*Poor eating habits can lead to serious health problems.*



## Practice

Match each definition with the correct term. Write the letter on the line provided.

- |  |                     |
|--|---------------------|
| _____ 1. a mistaken idea   | A. anorexia nervosa |
| _____ 2. an eating disorder in which the individual overeats and then vomits or uses diuretics or laxatives to get rid of the food before it is digested | B. bulimia          |
| _____ 3. a nutrient in food that is the main source of energy for the body   | C. calorie          |
| _____ 4. a mineral whose electrical charge helps control the body's fluid balance  | D. carbohydrate     |
| _____ 5. drugs used to increase the amount of fluids lost through urine  | E. diuretics        |
| _____ 6. a nutrient in food that helps the body build and repair body tissue and provides energy   | F. electrolyte      |
| _____ 7. an eating disorder in which a person refuses to eat and suffers severe weight loss; also called <i>starvation sickness</i>                      | G. fallacy          |
| _____ 8. a unit of heat that measures the energy available in food   | H. nutrients        |
| _____ 9. substances found in food that the body must have to function properly; provide energy and materials for growth and repair of body tissues       | I. protein          |



## Practice

Write **True** if the statement is correct. Write **False** if the statement is not correct.

- \_\_\_\_\_ 1. How much you weigh is the most important factor to consider in health and fitness.
- \_\_\_\_\_ 2. A common and convenient way for measuring body fat is underwater weighing.
- \_\_\_\_\_ 3. Muscle is heavier and weighs more than an equal amount of body fat.
- \_\_\_\_\_ 4. You can be overweight according to a height-weight chart but have the proper amount of body fat.
- \_\_\_\_\_ 5. Bread, rice, pasta, and other carbohydrates tend to be higher in fat content than other foods.
- \_\_\_\_\_ 6. It takes about 3500 calories to gain or lose a pound of fat.
- \_\_\_\_\_ 7. Bulimia is an eating disorder in which a person starves herself and refuses to eat.
- \_\_\_\_\_ 8. The best method for losing body fat is a combination of a proper diet and regular exercise.
- \_\_\_\_\_ 9. The food pyramid includes dietary guidelines to help us develop healthier eating habits.
- \_\_\_\_\_ 10. Dieting alone is a great way to lose weight and keep off the excess body fat.
- \_\_\_\_\_ 11. Exercise is mainly for people who need to lose weight.
- \_\_\_\_\_ 12. Diuretics are a safe way to help you lose weight and body fat.
- \_\_\_\_\_ 13. People are usually overweight because they eat much more than lean people.



- \_\_\_\_\_ 14. Skipping meals forces your body to use important muscle tissue to survive.
- \_\_\_\_\_ 15. Women naturally have a higher percentage of body fat than men.



## Practice

Circle the letter of the correct answer.

1. \_\_\_\_\_ is the best method for losing body fat and weight.
  - a. Dieting alone
  - b. Exercise alone
  - c. A combination of diet and exercise
  - d. None of the above
2. Having an *excessive* amount of body fat is called \_\_\_\_\_.
  - a. overweight
  - b. obese
  - c. ideal weight
  - d. body composition
3. An instrument used to measure the amount of body fat is a \_\_\_\_\_.
  - a. calorie
  - b. fallacy
  - c. skinfold caliper
  - d. fat grabber
4. \_\_\_\_\_ is the makeup of your body mass that is muscle, bone, tissue, and organs, not fat.
  - a. Lean body mass
  - b. Obese body mass
  - c. Body composition
  - d. Body fatness
5. Weighing 10 percent more than the standard charts consider desirable for your age and height is called \_\_\_\_\_.
  - a. overweight
  - b. overfat
  - c. obese
  - d. lean



6. A health-related component of physical fitness that compares the amount of fat on your body to lean body tissue is called \_\_\_\_\_ .
- a. ideal body weight
  - b. lean body mass
  - c. body fatness
  - d. body composition
7. Bulimia is an eating disorder characterized by \_\_\_\_\_ .
- a. eating excessively
  - b. abusing laxatives
  - c. inducing vomiting
  - d. all of the above
8. When your body fat percentage is in the appropriate range, your weight is called \_\_\_\_\_ .
- a. perfect weight
  - b. ideal body weight
  - c. maximum weight
  - d. ideal poundage
9. A fallacy is \_\_\_\_\_ .
- a. the truth
  - b. a mistaken idea
  - c. the best way
  - d. factual
10. Drugs that increase the amount of fluids lost through urine are called \_\_\_\_\_ .
- a. calories
  - b. laxatives
  - c. steroids
  - d. diuretics
11. Although \_\_\_\_\_ tend to weigh more than is suggested on a height-weight chart, they are *not* generally overfat.
- a. Sumo wrestlers
  - b. weight lifters
  - c. people who diet but do not exercise
  - d. none of the above



12. A(n) \_\_\_\_\_ body tends to store body fat below the waist in the thighs, hips, and buttocks.
- pear-shaped
  - apple-shaped
  - banana-shaped
  - grapefruit-shaped
13. A(n) \_\_\_\_\_ body is believed to increase one's risk for heart disease, diabetes, and certain cancers.
- pear-shaped
  - hourglass-shaped
  - box-shaped
  - apple-shaped
14. This is a fact: \_\_\_\_\_ .
- To lose weight I need to go on a fad diet
  - Sugar can help me with quick energy
  - I should drink water before, during, and after exercise
  - Adding protein to my diet will help me develop bigger muscles
15. This is a fallacy: \_\_\_\_\_ .
- Vitamins will give me more energy
  - Muscle cramps usually occur from severe water loss through sweating
  - Skipping meals or fasting will force my body into a starvation mode
  - Rice, bread, and pasta are good sources of energy during physical activity
16. A starvation diet will \_\_\_\_\_ .
- slow down my body and it will begin to store fat
  - give me more energy
  - be the healthiest way to diet
  - help me develop muscles more quickly





17. The food pyramid recommends \_\_\_\_\_ .
- a. six to 11 servings of carbohydrates and two to four servings of fruit
  - b. three to five servings of vegetables and two to three servings of dairy
  - c. two to three servings of meat
  - d. all of the above
18. People who carry their extra weight in the chest and abdomen are at a greater risk for \_\_\_\_\_ .
- a. migraine headaches
  - b. eating disorders
  - c. heart disease, diabetes, and certain cancers
  - d. lean body mass



## Practice

Use the list below to write the correct term for each definition on the line provided.

<b>anorexia nervosa</b>	<b>fat</b>
<b>body composition</b>	<b>ideal body weight</b>
<b>bulimia</b>	<b>lean body mass</b>
<b>diuretics</b>	<b>obese</b>

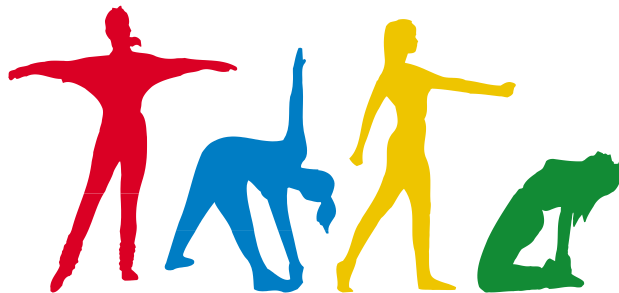
- \_\_\_\_\_ 1. having an excessive amount of body fat
- \_\_\_\_\_ 2. the percentage of body weight that is fat compared to lean body tissue such as muscle, bone, and other tissues and organs; one of the measurements of your physical fitness
- \_\_\_\_\_ 3. flabby and untoned tissue; a nutrient in food that provides energy and can be stored in the body
- \_\_\_\_\_ 4. how much you would weigh if your body fat percentage were in the healthy range
- \_\_\_\_\_ 5. drugs used to increase the amount of fluids lost through urine
- \_\_\_\_\_ 6. the makeup of your body that is muscle, bone, tissue, and organs, but not fat
- \_\_\_\_\_ 7. an eating disorder in which a person refuses to eat and suffers severe weight loss
- \_\_\_\_\_ 8. an eating disorder in which a person overeats and then vomits, or uses diuretics or laxatives to get rid of the food before it is digested

## Unit 3: Flexibility

This unit describes flexibility and its relationship to functional health. Students will learn the benefits of a flexible body.

### Unit Focus

- what flexibility is
- factors that influence flexibility
- benefits of flexibility and how it effects our functional health
- types of stretches
- improving flexibility using training principles: overload, progression, and specificity
- guidelines for safe stretching
- measuring flexibility
- suggested stretching program



## **Fitness Career Opportunity**

### **Certified Athletic Trainers and Physical Therapists**

Certified athletic trainers teach people how to do the right exercises and techniques during physical training. The right exercises and techniques help people avoid injury and get the most out of their workouts. Certified athletic trainers also help injured people recover. Many athletic teams and sports medicine clinics use certified athletic trainers to develop exercise programs. Many athletic trainers are also physical therapists.

Physical therapists help injured people recover and disabled people overcome their physical limitations. Sports physical therapists usually work at sports-medicine clinics. Physical therapy is one of the fastest-growing health-care professions.

For more information on athletic trainers and physical therapists, contact:

National Athletic Trainer's Association  
(NATA)  
2952 Stemmons Street  
Dallas, Texas 75247-6916  
1-800-879-6282  
[www.nata.org](http://www.nata.org)

American Physical Therapy Association  
(APTA)  
111 Fairfax Street  
Alexandria, Virginia 22314-1488  
1-800-999-2782  
[www.apta.org](http://www.apta.org)



## Vocabulary

*Study the vocabulary words and definitions below.*

- ballistic stretching** ..... a type of muscle lengthening that uses bobbing or bouncing to force a muscle past its stretching point
- cool-down** ..... the tapering-off period after exercise that allows the body to gradually return to a resting state
- dynamic stretching** ..... a type of muscle lengthening that involves slow, controlled movements past a muscle's stretching point
- F.I.T.T.** ..... the formula used to achieve overload and increase your level of physical fitness:  
Frequency (how often to exercise);  
Intensity (how hard to exercise);  
Type (what kind of exercise); and  
Time (how long to exercise)
- flexibility** ..... the ability to move joints and muscles through a full *range of motion* without pain or injury
- flexion** ..... the bending movement around a joint  
*Example:* bending the arm at the elbow to bring food to your mouth
- joint** ..... the place where two or more bones connect  
*Examples:* the knee, elbow, and hip
- ligaments** ..... strong tissue that attaches one bone to another bone



- muscle** ..... groups of tissue that surround bones and produce physical movements
- overload** ..... a training principle that says you must work the body harder than it is normally worked to improve physical fitness; to *increase* frequency, intensity, type, or time (*F.I.T.T.* formula)  
*Example:* to improve flexibility you must stretch a muscle beyond its normal length to reach its stretching point
- passive stretching** ..... a type of muscle lengthening in which you rely on a partner for assistance in the stretch
- progression** ..... a training principle that says you must do a gradual increase in overload necessary for achieving higher fitness levels; to *change* frequency, intensity, type, and time (*F.I.T.T.* formula)  
*Example:* to improve flexibility you must increase the amount of stretching that you do
- range of motion** ..... the distance a joint can move without pain or injury
- specificity** ..... a training principle that says you must work the specific part of the body you want to improve  
*Example:* to increase flexibility in your hamstrings you must do hamstring stretches
- static stretching** ..... a type of muscle lengthening that involves slowly moving to a point of muscle tension and then holding that position



**stretching** ..... exercising to lengthen your muscles and improve flexibility

**stretching point** ..... the point at which your muscle is being lengthened and at which you begin to feel a slight discomfort

**tendon** ..... strong tissues that attach muscle to bone

**warm-up** ..... exercises that increase the body's temperature and prepare it for more vigorous activity







## Unit 3: Flexibility

### Introduction

Have you ever been inactive for a few weeks or even a few days and then found your body tight and painful to move? Have you ever worked your body hard and then awakened the next morning feeling stiff? Perhaps you had difficulty straightening or bending your back. Perhaps leaning over to tie your shoes or brushing your hair felt painful. Your body had become tight because your **muscles** and **joints** had become less flexible than normal.



Flexibility is the ability to move your muscles and joints through a full **range of motion** without pain or injury. When you lose flexibility, your body can no longer move or bend the way it once could. Your body may no longer be able to run or walk smoothly. Your body may even lose its ability to sit straight in a chair. The aging process decreases our levels of flexibility. Flexibility is a health-related fitness component that is important for good health and physical fitness.

How flexible you are depends on how far your muscles will stretch and the distance your joints will move without pain or injury. *Muscles* are the tissue surrounding bones. Muscles lengthen and shorten to move joints. *Joints* are the places where two or more bones connect.

Different joints and muscles in the body move in different ways. Bone structure determines the direction the joints move. Your knees, for example, are hinge joints, and move back and forth like a gate opening and closing. Your neck rotates or turns from side to side. Your hips and shoulders are ball-and-socket joints that can move up and down or around in a circle. The distance that any joint can move without causing pain or injury is called its *range of motion*.



By regularly **stretching** your muscles, you can maintain and even increase your flexibility. Stretching for flexibility is an important part of a balanced physical fitness program. Flexibility keeps your joints and muscles in good working order and helps to prevent injuries.

## Flexibility: Factors You Can and Cannot Control

Your flexibility is determined by the bone structure of your joints and by the soft tissues that surround your joints. The range of motion of your knees, which only move back and forth, is limited by the way the bones fit together. It is difficult to improve the range of motion of knees.

The range of motion of joints that move in many different directions, such as your ankle and hip, are determined both by the way the bones fit together and by the soft tissues that surround them. Soft tissues include muscles, **ligaments**, and **tendons**. Care must be taken to avoid injury to your muscles, ligaments, and tendons. Ligaments are strong tissues that attach bone to bone. They can be stretched, but if they are stretched too far, they will tear. Tendons are strong tissues that attach muscle to bone. They cannot be easily stretched. By stretching the muscles around joints such as your hips and ankles and shoulders, you can improve their range of motion.



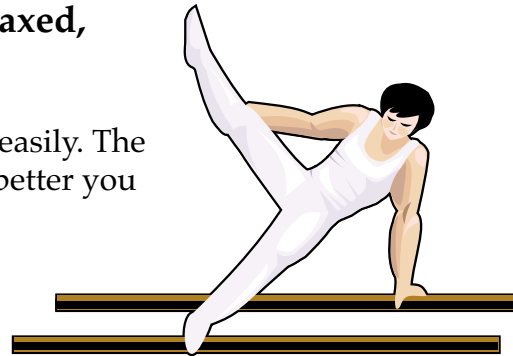
Your flexibility will be increased or decreased by other factors. Note which of these factors you can control and which you cannot.

- Physically active people usually have greater flexibility than those who do not exercise.
- Females are generally more flexible than males.
- As you age, your flexibility naturally declines. However, with regular stretching, this loss of flexibility can be slowed down.
- Overweight people tend to be less flexible than those of average weight.
- Other factors that influence flexibility are genetics, body temperature, and injuries.



## The Flexible Body: Healthy, Relaxed, Alert, and Aware

A flexible body moves gracefully and easily. The more easily your body can move, the better you will feel about yourself. So flexibility is good for the body and the mind! To maintain or increase your flexibility, you must stretch regularly.



Regular stretching ...

- helps make your daily activities easier and your physical movements more comfortable.
- helps prevent injuries by increasing the range of motion around joints.
- improves performance in physical activities. Athletic skills become smoother and more coordinated as you become more flexible.
- lowers your risk for back pain. Back problems are often the result of poor flexibility in the lower back, hips, and legs.
- minimizes muscle soreness. Stretching after exercise can help to decrease muscle soreness.
- increases relaxation, reduces emotional stress, and reduces muscle tension.
- improves your awareness of your body and body image.
- feels good!



## The Inflexible Body: Pain, Pain, and More Pain

When you lose your flexibility, your muscles become short and tight. Everyday activities can feel burdensome because your body is not loose and does not easily bend. It is difficult to move from place to place when you feel stiff. The following are a few of the more common problems tight muscles can cause:

- extreme muscle soreness
- joint or muscle stiffness
- muscle pulls or tears
- lower back pain
- neck, shoulder, or back ache
- bad posture
- athletic injuries
- muscle tension and stress
- difficulty moving your body in normal, daily activities
- muscle imbalance.





## Practice

*Match each definition with the correct term. Write the letter on the line provided.*

- |          |   |                    |
|----------|---|--------------------|
| _____ 1. | the place where two or more bones connect   | A. flexibility     |
| _____ 2. | strong tissue that attaches one bone to another bone  | B. joint           |
| _____ 3. | exercising to lengthen your muscles and improve flexibility   | C. ligament        |
| _____ 4. | the distance a joint can move without pain or injury  | D. muscle          |
| _____ 5. | the ability to move joints and muscles through a full <i>range of motion</i> without pain or injury | E. range of motion |
| _____ 6. | strong tissues that attach muscle to bone   | F. stretching      |
| _____ 7. | groups of tissue that surround bones and produce physical movements                                 | G. tendon          |



## Methods to Improve Your Flexibility: Static, Passive, Dynamic, and Ballistic Stretching

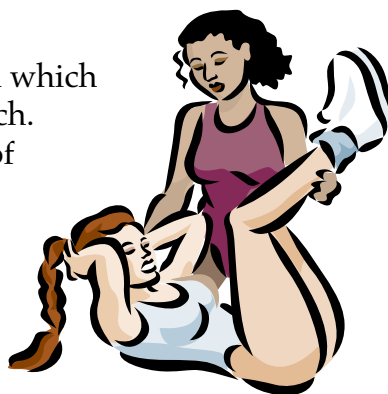
The only way to improve your flexibility is to do regular and proper stretching. Consistently lengthening the muscles through stretching increases your flexibility. There are several methods of stretching used to increase flexibility: **static stretching**, **passive stretching**, **dynamic stretching**, and **ballistic stretching**.

### Static Stretching: Holding a Position

*Static stretching* involves slowly moving to a **stretching point** and holding that position for 15-30 seconds. The stretching point is the point at which your muscle is being lengthened. It is a safe point that is slightly uncomfortable but *not* painful. Static stretching is the *safest* method of stretching to increase flexibility. There are many benefits to static stretching. It requires little energy to perform, it relieves muscle tension and soreness, and it promotes relaxation.

### Passive Stretching: Using a Partner

*Passive stretching* is a type of static stretching in which you rely on a partner for assistance in the stretch. Partner stretching can be an effective method of stretching for tight, sore, or weak muscles. Caution should be taken to prevent the partner from pushing too hard and causing an injury. This type of stretching is *not* recommended.



### Dynamic Stretching: Moving Slowly past the Stretching Point

*Dynamic stretching* is a type of stretching that involves slow, controlled movements past the stretching point. Dynamic stretching can be helpful for specific sports and activities. It is *not* recommended for the average individual.



### Ballistic Stretching: Bouncing into a Stretch

*Ballistic stretching* is a type of stretching that uses the body's weight to bob, bounce, or jerk past a muscle's stretching point. While some advanced athletes may find this method beneficial, it is considered risky and dangerous for most people. When performing ballistic stretching, it is easy to overstretch, which can cause extreme muscle soreness, muscle pulls, or tears. For health-related personal fitness, ballistic stretching is *not* necessary, nor is it recommended.

### Improving Flexibility Using Training Principles: Overload, Progression, and Specificity



You can improve your flexibility by using some of the same training principles that are used by professional and collegiate athletes and dancers. The principles of **overload**, **progression**, and **specificity** will help you continually improve your flexibility and work specific joints in your body that are inflexible.

### The Principle of Overload—F.I.T.T.: Frequency, Intensity, Type, and Time

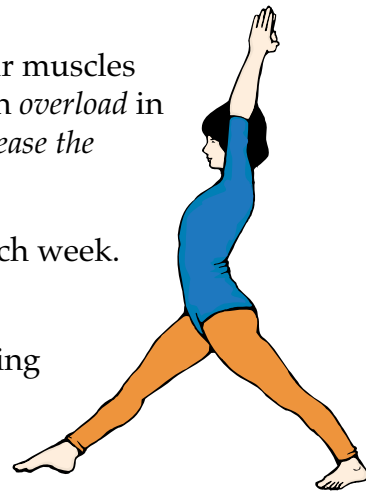
To increase your flexibility, you must stretch your muscles farther than they normally stretch. To accomplish *overload* in flexibility training, use the **F.I.T.T.** formula to *increase the demand* on your body beyond its normal level.

(F) Frequency—stretch at least three times each week. Stretching daily is best.

(I) Intensity—stretch the muscle to its stretching point, then hold the stretch in a static stretch for 15 seconds.

(T) Type—change the type of stretching exercise from normal to advanced movements.

(T) Time—increase the length of each stretching session, the amount of time a position is held, or the number of times an exercise is executed.





## The Principle of Progression: Continually Improving Flexibility

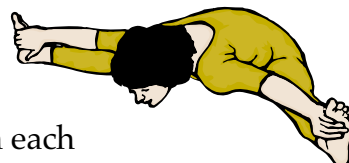
To continually improve or *progress* in your flexibility, the *amount of work* performed by the body needs to gradually increase by doing a series of overloads applying the *F.I.T.T. formula*.

(F) Frequency—increase the number of stretching sessions for each week (stretching daily is best).

(I) Intensity—increase the distance you stretch each muscle as your body becomes more flexible.

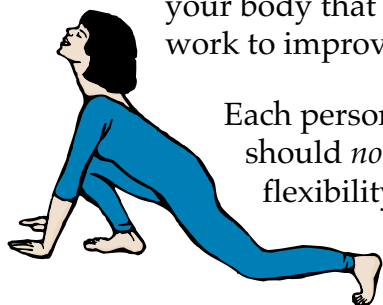
(T) Type—increase the type of stretching exercise from static to passive stretching.

(T) Time—increase how long the position is held and how many times you perform each stretch.



## The Principle of Specificity: Measure and Work Each Joint Separately

You may be flexible in one joint or area of the body and inflexible or tight in another part of the body. Work particularly hard on stretching areas of your body that have poor flexibility. Of course, you should work to improve the flexibility of all your muscles and joints.



Each person has a different degree of flexibility. You should *not* compare your own flexibility with the flexibility of others. Instead, keep track of how well your flexibility increases in each area of your body.





## Practice

Use the list below to write the correct term for each definition on the line provided.

ballistic stretching	passive stretching	static stretching
dynamic stretching	progression	stretching point
overload	specificity	

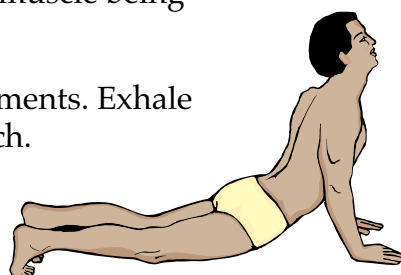
- \_\_\_\_\_ 1. a training principle that says you must do a gradual increase in overload necessary for achieving higher fitness levels; to *change* frequency, intensity, type, and time (F.I.T.T. formula)
- \_\_\_\_\_ 2. a training principle that says you must work the body harder than it is normally worked to improve physical fitness; to *increase* frequency, intensity, or time (F.I.T.T. formula)
- \_\_\_\_\_ 3. a training principle that says you must work the specific part of the body you want to improve
- \_\_\_\_\_ 4. a type of muscle lengthening in which you rely on a partner for assistance in the stretch
- \_\_\_\_\_ 5. a type of muscle lengthening that involves slow, controlled movements past a muscle's stretching point
- \_\_\_\_\_ 6. a type of muscle lengthening that uses bobbing or bouncing to force a muscle past its stretching point
- \_\_\_\_\_ 7. the point at which your muscle is being lengthened and at which you begin to feel a slight discomfort
- \_\_\_\_\_ 8. a type of muscle lengthening that involves slowly moving to a point of muscle tension and then holding that position



## Guidelines for Safe Stretching: Be Patient and Treat Your Body Well

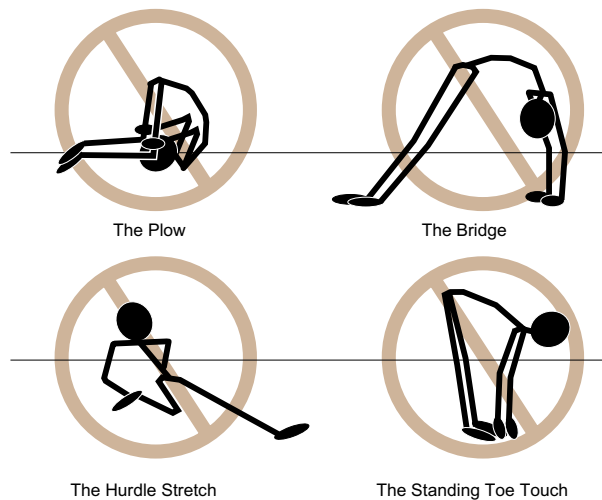
Anyone can begin a flexibility program. But if you over-stretch or go beyond your body's limits, you will end up injuring your muscles and joints. Take satisfaction in your long-term commitment to fitness and don't try to remake your body in a day. Follow the guidelines for safe stretching below.

- Always begin an exercise session with a **warm-up**. It is important to warm up the body before stretching. Increasing the body's temperature helps to increase circulation needed for the muscles and joints to work properly. A typical warm-up might include some easy jogging or brisk walking before running.
- Perform gentle stretches before workout.
- Perform longer and deeper stretches during the **cool-down**, or the end of your workout.
- Perform static stretches only. Move slowly and smoothly into each stretch, holding each position for 15 seconds.
- Perform each stretch one to three times each.
- Release each stretch as carefully as you moved into it.
- Stretch to a point of tension, not pain.
- Stretch within your own limits. Listen to your body—its limits may be different each day.
- Avoid fast stretching and bouncing while stretching.
- Avoid locking your knees or other joints when stretching.
- Relax into the stretch and focus on the muscle being lengthened.
- Breathe naturally throughout all movements. Exhale when moving more deeply into a stretch.
- Use proper form and body alignment for all stretches.





- Vary your stretching routine by learning new ways to stretch muscles.
- Focus on the tight muscles in your body, but include stretches for the entire body.
- Stretch daily. Frequency and consistency are the keys to improving flexibility.
- Avoid harmful stretching positions. The plow, hurdle stretch, bridge, and standing toe touch are just a few of the more common positions that can create stress on the back or knee joint.



- Always end each exercise session with a cool-down. Perform stretching exercises for flexibility in the warm-up and cool-down portion of every workout session. Gradually stretching the muscles helps prevent muscle soreness.

## Measuring Flexibility: How Well Can You Stretch?

Before starting an exercise program, you should measure your flexibility. You will then be able to measure your progress and see the increase in your flexibility over time.

There is no single test that can measure your overall flexibility. Each joint is specific and must be measured individually. However, measuring areas of the body such as the shoulder, hip, and lower back will give you an indication of the flexibility you have in your major joints.



## Level of Flexibility in Major Joints

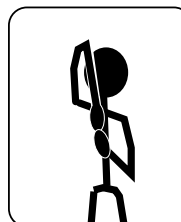
To evaluate your level of flexibility, you will need one or two partners for some of the following tests. Stretch before beginning these evaluations.

### 1. Upper Body and Shoulder Flexibility Evaluation

#### Shoulder Reach

**Purpose:** To evaluate flexibility of upper body and shoulders.

**Procedure:** Raise your left arm. Reach down your back as far as possible. At the same time, place your right arm behind your back and attempt to reach up to the fingers of your left hand. Have your partner observe if your fingers touch. This measures the flexibility of your right shoulder. Record your result and rating below. Reverse the arm positions to measure the flexibility of your left shoulder. Record your result and rating below.



Shoulder Reach Ratings		
Upper Body Flexibility	Fitness Zone	
	Healthy	Low
Right Shoulder Flexibility—right hand behind head		
Left Shoulder Flexibility—left hand behind head		
Healthy.....fingertips can touch Low .....fingertips are <i>not</i> touching		
<b>Number of Inches between Fingertips</b> inches for right shoulder: _____ inches for left shoulder: _____		



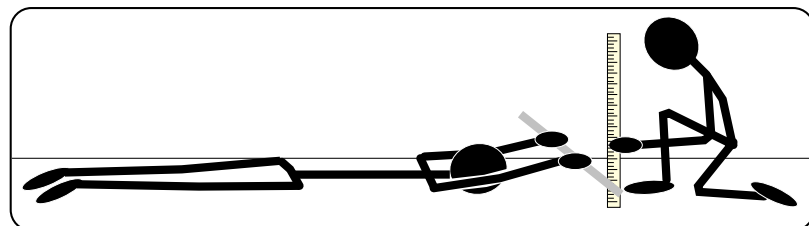
### Variation:

#### Arm Lift

**Purpose:** To evaluate flexibility of the front of the muscles in your shoulders.

**Materials:** dowel stick or light-weight rod, yardstick

**Procedure:** Lie face down on the floor. Place your arms out in front of you. With your arms spread a shoulder-width apart, hold a stick or other light-weight rod in your hands. Your palms should be face down. Your arms and wrist should be straight. Keep your chin on the floor, and raise your arms and rod as high as possible. Hold that position for three seconds. Have your partner use a yardstick to measure how many inches the rod is above the floor. Repeat twice. Record your best result and rating below.



Arm Lift Ratings		
Upper Body Flexibility	Fitness Zone	
	Healthy	Low
Right/Left Shoulder Flexibility		
Healthy.....11-14 inches off the floor		
Low .....less than 11 inches off the floor		
number of inches off floor: _____		

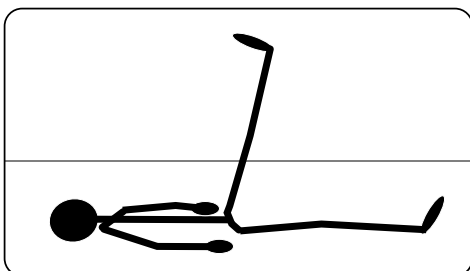


## 2. Hamstring Flexibility and Hip Flexion Evaluation

### Hamstring L-Stretch

**Purpose:** To evaluate the flexibility of hamstring muscles and the amount of **flexion** or bending movement in the hip flexors.

**Procedure:** **Hamstring L-Stretch—Hamstrings Flexibility**—Lie flat on your back. Keep one leg extended straight out on the floor. Slowly lift your other leg straight up until you feel a slight tension in the back of the thigh. Do not force the leg up. Normal hamstring length will allow the leg to reach an angle of 80 to 85 degrees. Record your result and rating below. After one leg is measured, test and measure the other leg. Record your result and rating below.

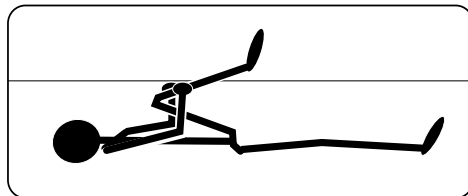


Hamstring L-Stretch Ratings		
Hamstring Flexibility	Fitness Zone	
	Healthy	Low
Right Hamstring Flexibility—right leg		
Left Hamstring Flexibility—left leg		
Healthy .....leg reaches an angle of at least 80 degrees Low .....leg reaches an angle less than 80 degrees		
Write <b>yes</b> or <b>no</b> for each leg. Reached an angle of at least 80 degrees— right leg: _____ left leg: _____		



**Procedure: Knee Hug—Hip Flexion**—Lie flat on your back, and extend both of your legs straight out on the floor. Keep your right leg in place, and pull your left knee to your chest, holding it firmly with both of your hands. Normal hip

flexion is displayed if your right leg stays flat. Record your result and rating below. After one leg is measured, test and measure your other leg. Record your result and rating below.



Knee Hug Ratings		
Hip Flexion	Fitness Zone	
	Healthy	Low
Right Knee Flexion—right leg		
Left Knee Flexion—left leg		
Healthy.....able to keep opposite leg flat on the floor Low .....unable to keep opposite leg flat on the floor		
Write <b>yes</b> or <b>no</b> for each leg. Able to keep opposite leg flat on the floor— right leg: _____ left leg: _____		



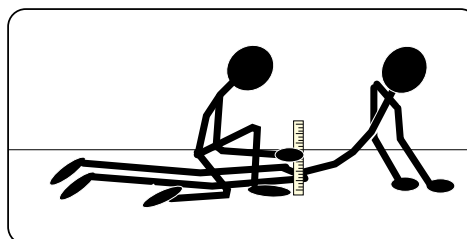
### 3. Back Extension Evaluation

#### Extended-Arm Trunk Lift

**Purpose:** To evaluate upper back and trunk flexibility.

**Materials:** 12-inch ruler

**Procedure:** Lie face down and put your hands in position for a push-up. Lift your upper body upward with your arms while keeping your lower back relaxed and your hip bones in contact with the floor. Stop immediately if you feel any discomfort. Have your partner use a 12-inch ruler to measure how far your hips come up from the floor. Record your result and rating below.



Extended-Arm Trunk Lift Ratings		
Back Extension Flexibility	Fitness Zone	
	Healthy	Low
Upper Back and Trunk Flexibility		
Healthy.....hips remain in contact with the floor while arms are fully extended Low .....hips come up from the floor		
Write <b>yes</b> or <b>no</b> . Hips remained in contact with the floor: _____		





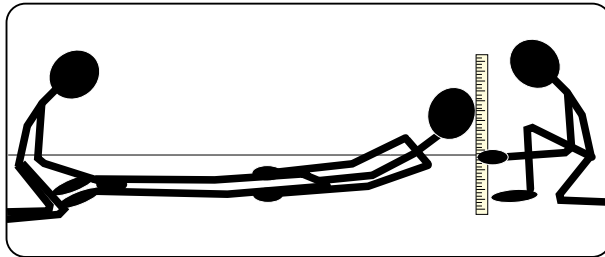
## Variation:

### Trunk Lift

**Purpose:** To evaluate upper back and trunk strength and flexibility.

**Materials:** yardstick

**Procedure:** Lie face down on the floor. Point your toes, and place your hands under your thighs. Have your partner hold your legs. Lift your chin slowly up as high as possible. Hold this position for about three seconds. Have another partner use a yardstick to measure how many inches your chin is above the floor. Repeat this activity twice. Record your best result and rating below.



Trunk Lift Ratings		
Back Extension Flexibility	Fitness Zone	
	Healthy	Low
Upper Back and Trunk Strength and Flexibility		
Healthy.....chin is 9-12 inches off the floor		
Low .....chin is less than 9 inches off the floor		
Write <b>yes</b> or <b>no</b> .		
Chin is 9-12 inches off the floor: _____		



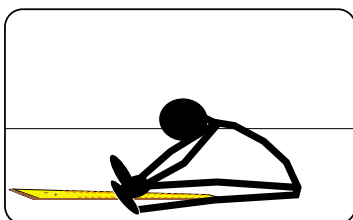
#### 4. Trunk Flexion Evaluation

##### V-Sit Reach

**Purpose:** To evaluate lower back and hamstrings flexibility.

**Materials:** yardstick, tape

**Procedure:** Place a yardstick on floor with the zero mark closest to you. Tape the yardstick down with a long piece of tape at the 15-inch mark. Sit on the floor



with your shoes off and your legs extended straight out in front. Straddle the yardstick between your legs with the zero mark towards your body and the 15-inch mark towards your heels. Place your feet eight to 12 inches apart. Line up your heels with the 15-inch mark on the yardstick. Allow your

head to drop toward or between your arms. Place one hand over the other palms down. Slowly stretch as far forward as possible. Your fingers should remain on the yardstick while your knees remain straight. Stop immediately if you feel any discomfort. Hold the position for a few seconds without bouncing. Repeat two more times. Record your farthest reach to the nearest inch and rating below.

V-Sit Reach Ratings			
Trunk Flexion—Lower Back and Hamstring Flexibility			
Age	Males	Females	Fitness Zone*
	Number of Inches Good—Better	Number of Inches Good—Better	
13	9 - 13	11 - 15	healthy
14	10 - 13	12 - 15	healthy
15	11 - 14	13 - 17	healthy
16	11 - 15	13 - 16	healthy
17+	12 - 16	13 - 16	healthy
*Scores below age-appropriate numbers are considered low.			
best score in inches: _____			
V-sit reach fitness zone: _____			



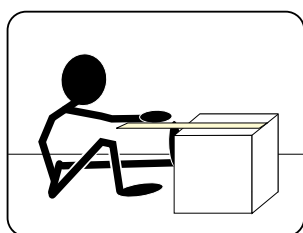
## Variation:

### Back Saver Sit and Reach

**Purpose:** To evaluate lower back and hamstring flexibility.

**Materials:** 12-inch high box, yardstick, tape

**Procedure:** Tape a yardstick to the top of the box so that the yardstick extends nine inches toward you. Point the zero mark of the yardstick toward you. With your shoes off, sit down on the floor with the back of the box against a wall. Extend one of your legs so that your foot is flat against the end of the box. Bend your other knee, with the sole (bottom) of your foot flat on the floor two to three inches to the side of the straight knee. Extend your arms in front of you over the yardstick. Place one of your hands on top of the other with your palms down. Reach forward as far as you can. Do this four times, holding the position of the fourth reach for at least one second while your partner measures how far you reached. Record your result and rating below. After one side is measured, switch the positions of your legs, and measure your other side. Record your result and rating below.



Back-Saver Sit and Reach Ratings				
Trunk Flexion—Lower Back and Hamstring Flexibility				
Age	Males	Females	Fitness Zone*	
	Number of Inches	Number of Inches	Right Leg	Left Leg
13	8	10	healthy	healthy
14	8	10	healthy	healthy
15+	8	12	healthy	healthy
*Scores below age-appropriate numbers are considered low.				
score in inches for right leg: _____				
score in inches for left leg: _____				
right leg back-saver sit and reach fitness zone: _____				
left leg back-saver sit and reach fitness zone: _____				



## Flexibility Results

Record your ratings and improvement goals on the following chart. Then answer the questions about your results.

Flexibility Fitness Results				
Date	Test	Fitness Zone		Improvement Goals
		Healthy	Low	
	<b>1. Upper Body</b>			
	Shoulder Reach			
	right shoulder			
	left shoulder			
	or			
	Arm Lift			
	right/left shoulder			
	<b>2. Hamstring and Hip</b>			
	Hamstring L-Stretch			
	right leg			
	left leg			
	Knee Hug Hip Flexors			
	right leg			
	left leg			
	<b>3. Back</b>			
	Extended-Arm Trunk Lift <i>or</i> Trunk Lift			
	<b>4. Trunk</b>			
	V-Sit Reach <i>or</i> Back Saver Sit and Reach			
	right leg			
	left leg			



## Health Problems from Lack of Flexibility

Lack of flexibility can do more than keep you from doing splits. Poor flexibility can cause pain, bad posture, and joint damage. Poor flexibility of the ...

... *shoulder* can cause neck, shoulder, and back aches or pain, or bad posture.

... *hip* can cause hip and lower back pain, or bad posture.

... *back* can cause lower back pain, or bad posture.

... *trunk* can cause lower back and knee problems.

*Answer the following based on your **Flexibility Fitness Results** on the previous page.*

1. What areas are you most in need of improvement in flexibility? \_\_\_\_

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2. Which of your flexibility tests were in the healthy fitness zone? \_\_\_\_

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3. Write a plan of action to accomplish your flexibility goals. \_\_\_\_\_

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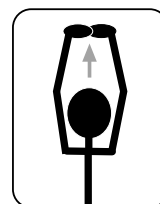


## General Stretching Program

### The Stretches

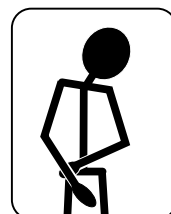
Follow closely the instructions for each stretch. Remember not to compare your level of flexibility with that of your classmates. Doing so will only cause you to stretch farther than you should and may cause you to overstretch your muscles. Extend your muscles only to their stretching point—or the point at which you feel a *slight* discomfort.

**Overhead Shoulder Stretch.** Clasp your hands together and reach above your head as high as possible. Hold for 15 seconds. Release and repeat two more times.



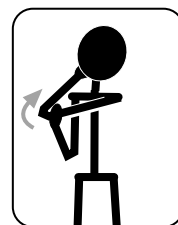
**Chest and Shoulder Pull.** Clasp your hands together behind your back and slowly lift your arms upward. Keep your body upright and your knees slightly bent. Hold for 15 seconds. Release and repeat two more times.

**Side Neck Stretch.** With your hands behind your back, pull your left arm to your right side while tilting your head to the right until you feel tension in the left side of your neck. Hold for 15 seconds. Reverse to other side.



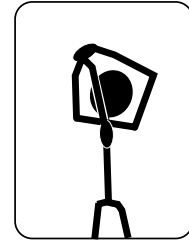
**Posterior Neck Stretch.** Bow your head forward. Interlock your hands on the back of your head. Gently pull your head down with your chin resting on your chest. Hold for 15 seconds. Release and repeat two more times.

**Deltoid Stretch (shoulder).** Bring your right arm straight across to the left side of your body. Grasp your right elbow with your left hand at chest level, and pull your elbow and arm back until you feel a slight stretch in your right shoulder. Hold for 15 seconds. Repeat on the other side.

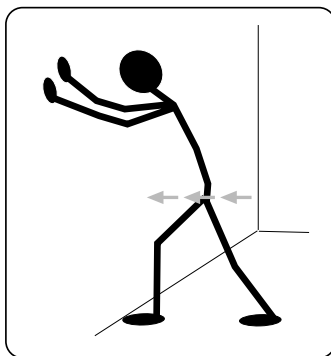




**Triceps Stretch (back of upper arm).** Raise both of your arms above your head. Drop your left hand behind your head, keeping your palm flat on your back. With your right hand, grab your left elbow and press it towards the center of your back until you feel a slight tension on the back of your left arm. Hold for 15 seconds. Repeat on the other arm.

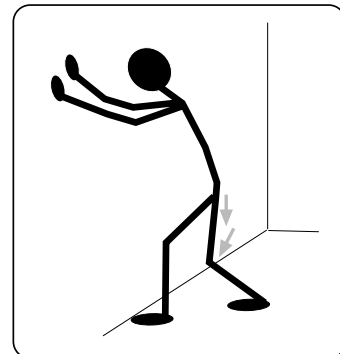


**Calf Stretch (two parts):**

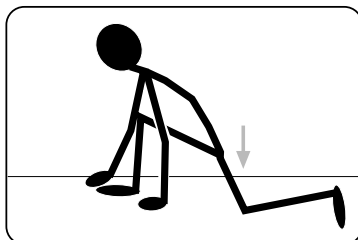


a) Stand facing a wall. Place both of your hands on the wall. Bring your right foot to the base of the wall and step back with your left leg. Keep your left leg straight and your left foot pointing directly forward with your left heel on the floor. Press your hips forward toward the wall until you feel a slight stretch in the back of your lower left leg behind the knee. Hold for 15 seconds.

b) Next, slowly bend your left knee and slide your hips back as if preparing to sit down. You should feel the tension shift to an area just above your left heel. Hold for 15 seconds. Switch legs and repeat both parts of the calf stretch.



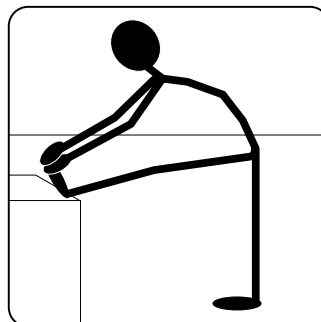
**Runner's Stretch (hip flexors).** Lunge forward with your right leg. Place your hands on the floor, one on each side of your right leg. Keep your right knee directly over the ankle. Do *not* allow your knee to go past your toes. You should feel a slight tension in the front of your upper left leg. Hold for 15 seconds. Repeat on the other leg.



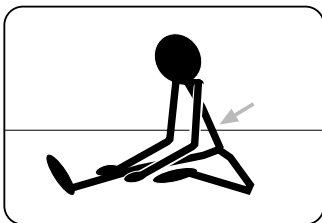


### Hamstring Stretch (back of upper leg):

**a) Standing Hamstring.** Place your left leg on a chair with your toes pointing straight up. Bend forward at the hips, keeping your back straight. Lead with your chest as you fold down towards your thigh. Lean until you feel a slight tension on the under-side of your upper left leg. Hold for 15 seconds. Release slowly. Repeat on the other leg. This can also be done from a chair or a wheelchair. Remember to always keep a slightly bent knee.

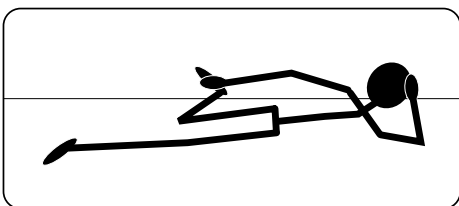
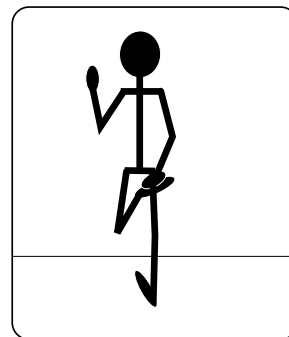


**b) Seated Hamstring.** Sit on the floor with your right leg extended and your left leg bent with the sole of your left foot touching the inside of your right knee. Place your hands on the floor on each side of your right leg. Keeping your back straight, slowly bend forward from your hips, bringing your chest towards your right knee. Hold for 15 seconds. Release slowly. Repeat on the other leg.



### Quad Stretches (front of upper leg):

**a) Standing Quad.** Stand near a wall and place your left hand at shoulder level on the wall. Grasp your left foot with your right hand. Keeping knee, hip, and ankle in alignment, pull your left heel towards your buttocks until you feel a slight tension in the front of your left thigh. Hold for 15 seconds. Repeat on the other leg. This can also be done lying on your stomach.



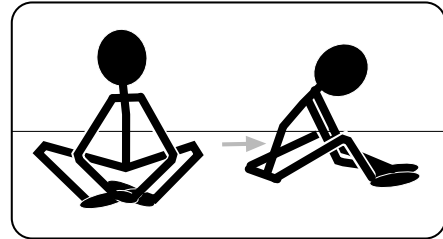
**b) Side-Lying Quad.** Lie on your left side with legs extended and on top of one another. Support your head with your left hand. Reach



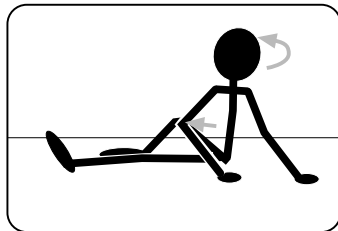


with your right hand and grab your right foot, pulling the heel towards your buttocks. Hold for 15 seconds. Repeat on the other leg.

**Groin Stretch (inner thigh).** Sit on the floor with both of your legs bent at the knee and the soles of your feet touching together. Grab your feet with your hands, and pull your feet as close as possible to your body. Slowly lean forward, keeping your back straight and bending from the hips. Bend forward until you feel a slight tension in the inner-thigh area. Hold the position for 15 seconds without pressing or bouncing into the stretch. Release slowly. Repeat.



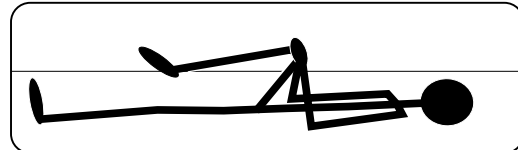
**Seated Spine Stretch.** Sit on the floor and extend both of your legs out in front of your body. Bend your left leg and cross it over your right leg, placing your left foot on the floor on the outside of your right knee.



Turn your upper body to the left using your right elbow to press against the outside of your left thigh. Press against the thigh until you feel a slight tension. Hold for 15 seconds. Reverse your legs and repeat.

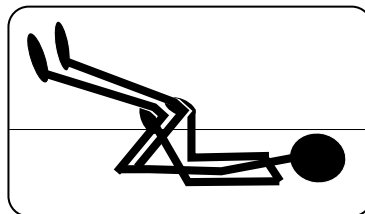
### Lying Tuck Knee Stretches (lower back relaxer):

**a) Single-Knee Tuck.** Lie on your back with both of your legs extended straight out on the floor. Pull your left knee to your chest, holding your leg just below the knee with both hands. Hold for 15 seconds. Repeat using the other leg.



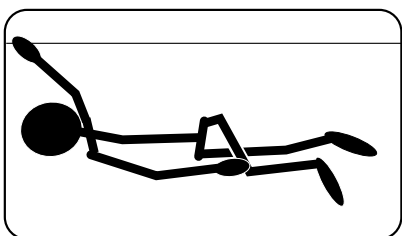


**b) Double-Knee Tuck.** Lie on your back and tuck both of your knees to your chest. Place your hands behind your knees, and hug them into your chest. Hold for 15 seconds. Relax and repeat two more times.

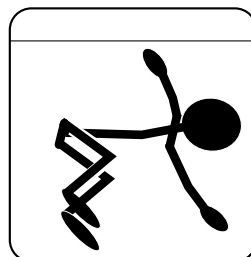


### Lying Spine Stretches (lower back stretch):

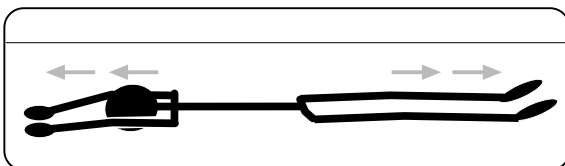
**a) Single Knee.** Lie on your back with your arms extended straight out to your sides and your legs extended out on the floor. Tuck your left knee into your chest and bring it over to the right side of your body. Grab your left upper leg with your right hand and bring it as far as possible to your right side. Relax, and repeat on the other side.



**b) Double Knee.** Lie on your back with your knees tucked to your chest, and your arms extended straight out to your sides. Slowly roll your lower body to your left side, keeping your arms flat on the floor. Relax into the stretch. Slowly roll body to right side.



**c) Lying Total Stretch (whole body stretch).** Lie on your back. Extend your arms straight above your head and extend your legs on the floor with your toes pointed. Reach and stretch your arms as far as possible above your head, and stretch your toes and



feet as far as possible away from your body. Relax and repeat two more times.



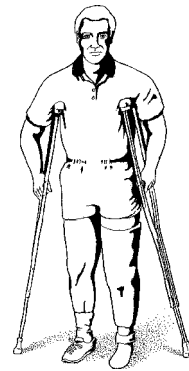
## Summary

*Flexibility* is the ability to move muscles and joints through a full *range of motion* without causing pain or injury. Flexibility is important for good health and contributes to overall physical fitness. Proper and regular *stretching* can reduce injuries, lessen the chance of back pain, decrease *muscle* soreness, and help in daily physical activities. Stretching also helps relieve stress and enhances relaxation.

*Static, dynamic, passive, and ballistic* stretches are all methods of stretching. Static stretching, or moving to a point of tension and holding that position, is the safest way to improve flexibility. Ballistic stretching involves bouncing while stretching. It is considered high risk for injury and is not recommended.

To continually improve your flexibility, you must apply the F.I.T.T. training principles: increase the (F) frequency, the (I) intensity, the (T) type, and the (T) time you spend stretching.

Following some basic guidelines will help you improve your flexibility. Perform all stretches one to three times each, holding each stretch for 15-30 seconds. Push only to the *stretching point*, or the point of slight discomfort. Do not stretch your muscles to the point of pain, or you may overstretch your muscles. Try to stretch every day. Relax and enjoy the good feeling stretching creates!



*Proper and regular stretching can reduce injuries.*



## Practice

Write **True** if the statement is correct. Write **False** if the statement is not correct.

- \_\_\_\_\_ 1. Developing good flexibility can help prevent injury.
- \_\_\_\_\_ 2. Back problems are often the result of poor flexibility in the lower back, hips, and legs.
- \_\_\_\_\_ 3. The hurdle stretch is a safe and effective way to stretch the hamstrings, or back of the upper leg muscles.
- \_\_\_\_\_ 4. Competing with other students when stretching is a safe method for improving flexibility.
- \_\_\_\_\_ 5. The best way to increase flexibility is to use the body's momentum to force the muscle beyond its stretching point.
- \_\_\_\_\_ 6. Muscle soreness can be minimized and reduced with gentle stretching.
- \_\_\_\_\_ 7. Flexibility is limited by the bony structure as well as the muscles, ligaments, and tendons around the joint.
- \_\_\_\_\_ 8. Physically active individuals are generally more flexible than those people who do not exercise.
- \_\_\_\_\_ 9. Stretching exercises should be performed before the body is warmed up.
- \_\_\_\_\_ 10. The training principle of specificity states that flexibility can only be gained in those muscle or joints that are stretched.
- \_\_\_\_\_ 11. Ballistic stretching is a risky method of stretching that can overstretch muscles.
- \_\_\_\_\_ 12. The amount of movement a joint will allow without causing stress on that joint is called *range of motion*.



- \_\_\_\_\_ 13. Females are not usually more flexible than males.
- \_\_\_\_\_ 14. The sit and reach test is a way of evaluating overall flexibility of the body.
- \_\_\_\_\_ 15. Ideally, stretching should be performed every day.



## Practice

*Circle the letter of the correct answer.*

1. The ability to move muscles and joints through a full range of motion without injury or pain is called \_\_\_\_\_.
  - a. stretching
  - b. meditation
  - c. flexibility
  - d. overload
2. \_\_\_\_\_ is the safest way to improve flexibility.
  - a. Passive stretching
  - b. Dynamic stretching
  - c. Ballistic stretching
  - d. Static stretching
3. The benefits of stretching and a flexibility program do *not* include \_\_\_\_\_.
  - a. reduced injuries
  - b. relaxation
  - c. reduced risk of back pain
  - d. increased muscle soreness
4. Ballistic stretching is a type of stretching that \_\_\_\_\_.
  - a. uses a partner for assistance
  - b. involves bobbing and bouncing while stretching
  - c. involves slow and controlled movements
  - d. involves holding a stretch to the stretching point
5. Safe stretching does *not* include \_\_\_\_\_.
  - a. holding each stretch for 15 seconds
  - b. moving rapidly into the stretched position
  - c. a warm-up before stretching
  - d. performing each stretch one to three times



6. A lack of flexibility may cause \_\_\_\_\_.
  - a. lower back pain
  - b. muscle tension and stiffness
  - c. athletic injuries
  - d. all of the above
7. Tissues that connect muscle to bone are called \_\_\_\_\_.
  - a. tendons
  - b. arteries
  - c. muscle fibers
  - d. ligaments
8. A type of stretching in which you rely on a partner for assistance is referred to as \_\_\_\_\_.
  - a. passive stretching
  - b. dynamic stretching
  - c. static stretching
  - d. ballistic stretching
9. The place where two or more bones connect is called a \_\_\_\_\_.
  - a. muscle
  - b. joint
  - c. tendon
  - d. ligament
10. Joints are moved by the lengthening and shortening of surrounding \_\_\_\_\_.
  - a. muscle
  - b. ligament
  - c. tendon
  - d. bone
11. To increase flexibility, the muscle must be overloaded by \_\_\_\_\_.
  - a. bouncing beyond the stretching point
  - b. forcing the stretch to pain
  - c. slowly stretching further than normal
  - d. holding the stretch for five minutes



12. Regular stretching exercises will help to \_\_\_\_\_.
  - a. make daily activities easier
  - b. improve performance in physical activities
  - c. minimize muscle soreness
  - d. all of the above
13. Stretching that involves slow, controlled movements past the stretching point is called \_\_\_\_\_.
  - a. passive stretching
  - b. ballistic stretching
  - c. static stretching
  - d. dynamic stretching
14. Always begin an exercise session with a warm-up and end it with a(n) \_\_\_\_\_.
  - a. ballistic stretch
  - b. heavy meal
  - c. additional warm-up
  - d. cool-down
15. The tissues that connect bone to bone are called \_\_\_\_\_.
  - a. tendons
  - b. ligaments
  - c. muscles
  - d. joints





## Practice

Use the list below to complete the following statements.

<b>bouncing</b>	<b>knee</b>	<b>plow</b>
<b>breathe</b>	<b>overload</b>	<b>range of motion</b>
<b>daily</b>	<b>physical therapists</b>	<b>warm-up</b>

1. The distance that any joint can move without causing pain or injury is called its \_\_\_\_\_ .
2. A training principle that says you must work the body beyond its normal level to increase fitness is called \_\_\_\_\_ .
3. \_\_\_\_\_ help injured people recover and disabled people overcome their physical limitations
4. The \_\_\_\_\_ , hurdle stretch, bridge, and standing toe touch are some of the more common positions that can create stress on the back or \_\_\_\_\_ joint.
5. Avoid fast stretching and \_\_\_\_\_ while stretching.
6. \_\_\_\_\_ naturally throughout all movements.  
Exhale when moving more deeply into a stretch.
7. Stretching \_\_\_\_\_ is best.
8. Exercises that increase the body's temperature and prepare it for more vigorous activity are called \_\_\_\_\_ exercises.



## Unit 4: Muscular Fitness

This unit describes the importance of muscular fitness and its benefits to overall health. Students will learn the two components of muscular fitness: muscular strength and muscular endurance. They will also learn how to improve their overall health by improving their muscular fitness.

### Unit Focus

- components of muscular fitness
- benefits of muscular strength and endurance
- muscular structure—three types of muscle fibers
- types of muscular exercise—isometric, isotonic, and isokinetic
- training principles for muscular fitness
- common fallacies associated with weight training
- measuring muscular fitness
- exercise to improve muscular fitness



## **Fitness Career Opportunity**

### **Physical Education Teacher**

Physical education teachers teach and assess physical fitness, athletic skills, and sportsmanship, and promote wellness and healthy lifestyles. Physical education teachers work in elementary schools, middle schools, high schools, or colleges. They are responsible for such things as designing physical fitness and athletic activities, maintaining equipment, and managing budgets.

In the growing field of adaptive physical education, teachers work with children who have been identified with a disability (e.g., mental handicaps, physical handicaps, learning disabilities, or emotional handicaps).

### **Coach**

Many physical education teachers are also coaches. Coaches head sports teams in schools, colleges, or professional or youth leagues. They teach and evaluate sports skills, develop game strategies, develop physical conditioning drills and exercises, recruit players, and often oversee team administration.

For more information on physical education teaching and coaching, contact:

National Association for Sport &  
Physical Education (NASPE)  
Reston, Virginia 22091  
(703) 476-3410  
[www.aahperd.org/naspe/template/cfm](http://www.aahperd.org/naspe/template/cfm)

American Alliance for Health,  
Physical Education,  
Recreation, and Dance  
(AAHPERD)  
1900 Association Dr.  
Reston, Virginia 22091-1598  
(800) 213-7193  
[www.aahperd.org](http://www.aahperd.org)

National High School  
Athletic Coaches  
Association  
P.O. Box 4342  
Hamden, CT 06514  
(800) 262-2495  
[www.hscoaches.org](http://www.hscoaches.org)



## Vocabulary

*Study the vocabulary words and definitions below.*

**calisthenics** ..... exercises that use the weight of one's body as resistance

**fast-twitch muscle fiber** ..... strands in the muscle that contract quickly and are useful for short, intense bursts of action; also called *white muscle fiber*

**fatigue** ..... tiredness or exhaustion; to tire out

**free weights** ..... objects of various weights used for developing or increasing muscular fitness  
*Examples:* barbells and dumbbells

**isokinetic exercises** ..... exercises done on specially designed exercise machines that work the muscle with maximum resistance throughout the muscle's entire range of motion

**isometric exercises** ..... exercises that work a muscle against an immovable object

**isotonic exercises** ..... exercises that cause a muscle to lengthen and shorten through a full range of motion while lifting and lowering a weight or resistance

**muscle fiber** ..... the basic unit of the muscular system; a strand of fiber



<b>muscle tone</b> .....	firm and defined muscle quality resulting from muscular strength and endurance exercises
<b>muscular endurance</b> .....	the ability to use certain muscles repetitively for a long period of time without tiring
<b>muscular fitness</b> .....	the two health-related components of physical fitness: muscular strength and muscular endurance
<b>muscular strength</b> .....	the ability of muscles to exert a force one time
<b>power</b> .....	the ability to combine maximum strength and speed in a movement
<b>repetitions</b> .....	the number of times a complete exercise is performed; also called <i>reps</i>
<b>resistance training</b> .....	exercises in which a muscle or group of muscles repeatedly push or pull against an opposing force; also called <i>weight training</i>
<b>set</b> .....	a group of repetitions performed without resting
<b>skeletal muscles</b> .....	muscles that attach to the skeletal bones by tendons



**slow-twitch muscle fiber** ..... strands in the muscle that contract slowly and have the ability to work for long periods of time; also called *red muscle fiber*

**weight training** ..... exercises performed against resistance to develop and improve muscular strength and endurance; also called *resistance training*



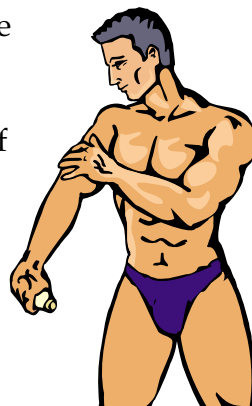




## Unit 4: Muscular Fitness

### Introduction

Have you ever looked with envy at someone on the beach whose body was muscular and well-defined? Those fit muscles not only looked good, but they were healthy, too! **Muscular fitness** not only improves your appearance but helps keep you lean, strengthens your bones, decreases your risk of injury, gives you more energy, and improves your control over your body. **Resistance training**, or **weight training**, is the best method to improve the tone, shape, and strength of your muscles and body.

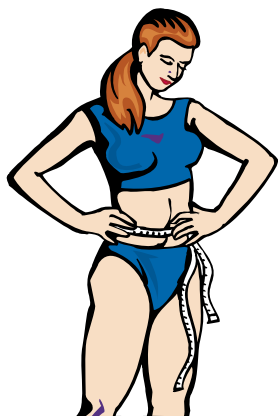


*Muscular fitness will tone and firm muscles, improving appearance.*

### Muscular Fitness: Strong Muscles That Can Keep Working

*Muscular fitness* includes two health-related components of physical fitness: **muscular strength** and **muscular endurance**. Muscular strength is the ability of a muscle or group of

muscles to exert a maximal force in a single effort. Lift a heavy weight one time and you are using muscular strength. Muscular endurance is the ability of a muscle or group of muscles to repeat a movement over time without tiring. Carry a medium load for a long time and you are using muscular endurance.



*Muscular fitness helps keep you lean and strengthens your bones.*

Every movement we make uses our muscular system. Well-conditioned muscles are essential for efficiently carrying out your daily activities. Without muscular strength and endurance, even carrying a load of library books home or unloading a trunk full of groceries can be exhausting.



## Fit Muscles: The Benefits of Muscular Strength and Endurance

Muscular strength and endurance are important components of overall health. Muscular strength and endurance not only improve your physical health, but they can also improve your psychological health. When you work on your body, you work on your mind! Muscular fitness will do the following:

- increase muscle tissue, creating more strength
- tone and firm muscles, improving physical appearance
- burn a higher rate of calories than unfit muscles, even when the body is not exercising
- help decrease fat and improve body composition
- help in correcting muscular strength imbalances
- improve posture
- improve physical ability and athletic performance
- help improve coordination, giving you a better sense of control over your body
- help build self-confidence
- reduce risk of injuries by protecting joints
- help prevent and reduce lower back pain
- help strengthen bones
- reduce risk of heart disease, diabetes, and some forms of cancer
- slow the aging process
- help women build muscular strength and **muscle tone** without gaining bulky muscles
- reduces stress.





## Unfit Muscles: The Body at Risk

A lack of adequate muscular strength and endurance can lead to many health-related problems. A lack of muscular fitness can cause the following:

- poor muscle tone and body composition
- a body that gains weight easily
- poor posture due to weakened muscles
- bone loss
- muscle and joint injuries
- lower back and other joint pain
- diabetes, heart disease, and certain cancers
- reduced control over body
- low energy level and quicker **fatigue** rate.

## Muscle Structure: Fast- and Slow-Twitch Muscle Fibers

Movement by the body is produced by **skeletal muscles**. *Skeletal muscles* are attached to the bones by tendons. When we strengthen and exercise our skeletal muscles, we improve our muscular fitness.



*A sprinter needs muscles with a large number of fast-twitch fibers.*

Skeletal muscles are composed of three types of **muscle fibers**: **fast-twitch muscle fibers**, *intermediate twitch muscle fibers*, and **slow-twitch muscle fibers**. They also contain connective tissue, nerves, and blood vessels.

*Fast-twitch* or *white muscle fibers* contract, or tighten, quickly and are useful for short, intense bursts of action.

However, fast-twitch muscle fibers tire quickly, so they can only be used efficiently for a brief time. A sprinter who needs to explode off the starting line and dash for 50 meters needs muscles with a large number of fast-twitch fibers. To generate an



explosive strength movement requires **power**. Power is the use of maximum strength at a rapid rate. Only a large number fast-twitch fibers can produce power. Someone trying to build muscular strength needs to train and increase the number of fast-twitch muscle fibers.



*Long-distance runners require a large number of slow-twitch fibers.*

*Intermediate twitch* muscle fibers are a combination of fast- and slow-twitch muscle fibers. They are not as fast as the fast-twitch muscles but they have more endurance. However, they do not have as much endurance as the slow-twitch muscle fibers.

*Slow-twitch* or *red muscle fibers* contract slowly and have the ability to work for long periods of time without tiring. These fibers are best suited for aerobic or endurance activities. A long-distance runner requires a large number of slow-twitch fibers. A person trying to increase muscular endurance needs to train and increase the number of slow-twitch fibers.

Everyone is born with a different number of slow-twitch and fast-twitch muscle fibers. An individual born with many fast-twitch muscle fibers will have an advantage in a speed or power sport or activity. And a person born with many slow-twitch muscle fibers will have an advantage in an aerobic or endurance sport or activity. However, everyone can improve the fitness, size, and performance of each kind of muscle fiber through proper exercise training.



## Practice

Use the list below to write the correct term for each definition on the line provided.

<b>fast-twitch muscle fiber</b>	<b>muscular strength</b>
<b>fatigue</b>	<b>power</b>
<b>muscle fiber</b>	<b>resistance training</b>
<b>muscle tone</b>	<b>skeletal muscles</b>
<b>muscular endurance</b>	<b>slow-twitch muscle fiber</b>
<b>muscular fitness</b>	<b>weight training</b>

- \_\_\_\_\_ 1. the two health-related components of physical fitness: muscular strength and muscular endurance
- \_\_\_\_\_ 2. exercises in which a muscle or group of muscles repeatedly push or pull against an opposing force; also called *weight training*
- \_\_\_\_\_ 3. exercises performed against resistance to develop and improve muscular strength and endurance; also called *resistance training*
- \_\_\_\_\_ 4. the ability of muscles to exert a force one time
- \_\_\_\_\_ 5. the ability to use certain muscles repetitively for a long period of time without tiring
- \_\_\_\_\_ 6. muscles that attach to the skeletal bones by tendons
- \_\_\_\_\_ 7. the basic unit of the muscular system
- \_\_\_\_\_ 8. strands in the muscle that contract quickly and are useful for short, intense bursts of action; also called *white fiber*



- \_\_\_\_\_ 9. strands in the muscle that contract slowly and have the ability to work for long periods of time; also called *red fiber*
- \_\_\_\_\_ 10. the ability to combine maximum strength and speed in a movement
- \_\_\_\_\_ 11. tiredness or exhaustion; to tire out
- \_\_\_\_\_ 12. firm and defined muscle quality resulting from muscular strength and endurance exercises



## Developing Muscular Fitness: Isometric, Isotonic, and Isokinetic Exercise

To train each kind of muscle fiber and the overall fitness of muscles, there are three different methods of exercising: **isometric**, **isotonic**, and **isokinetic**. Each of these methods works the muscle against resistance to improve fitness.

### Isometric Exercise: Pressing against an Immovable Object

*Isometric exercises* are exercises in which the muscle contracts when pressed against an immovable object. For example, squeezing a tennis ball in your hand as hard as you can for six to ten seconds is an isometric contraction.



*Isometric exercises take very little space and equipment to perform.*

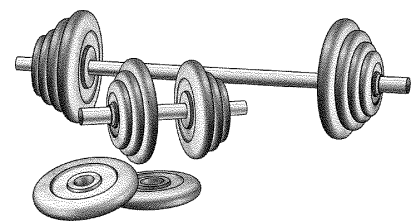
Isometric exercises develop strength only at the position the exercise is performed, not throughout the full range of motion. They do not change the length of the muscle. Isometric exercises are not effective in developing overall strength.

The advantage of isometric exercises is that they take very little space and equipment to perform, and can be done while sitting at a desk or driving in a car. However, they can cause an increase in blood pressure and may not be recommended for persons with circulatory problems.

### Isotonic Exercise: Using Calisthenics, Free Weights, and Weight Machines

*Isotonic exercises* are exercises that cause a muscle to lengthen and shorten through a full range of motion while lifting and lowering a weight or resistance. This resistance may be in the form of weight training equipment such as **free weights** or weight training machines. Free weights are objects of various weight used for developing and increasing muscular strength and endurance. Free weights consist of weighted bars, called *barbells* and *dumbbells*, or *light handheld weights*.

Isotonics also include **calisthenics**, or exercises that use the weight of your own body for resistance. Push-ups or abdominal curl-ups are examples of calisthenics.



*Free Weights*



## Guidelines for Muscular Fitness Exercises

<b>1. Begin with a warm-up.</b>	A warm-up consists of exercises that increase the body's temperature and prepare it for more vigorous activity. A proper warm-up will make you less prone to a muscle or joint injury. A typical warm-up might include light jogging to heat up the body, then some gentle stretching to lengthen the muscles.
<b>2. Use proper gear.</b>	Wear rubber-soled shoes or other non-skid shoes when working out. Wearing gloves can be helpful in protecting your hands and preventing weights from slipping. Always secure barbell plates properly to prevent slipping. Learn proper ways of handling free weights and weight machines.
<b>3. Use proper form.</b>	To get better results out of the exercises and reduce chance of injury, learn and use proper exercise technique and posture for all exercises. Never sacrifice form in an attempt to perform more reps or use more weight. Avoid locking joints when performing any exercise.
<b>4. Avoid horse play.</b>	When working with weights do <i>not</i> play around. Do not attempt to lift weights that are too heavy or perform exercises that are too advanced for your fitness level.
<b>5. Begin slowly.</b>	If you are new to any type of muscular fitness program, begin with very light weights. This will give your body a chance to learn and perform the exercises correctly.
<b>6. Use a spotter.</b>	Do not lift free weights without a partner. A spotter is essential for safety and can aid you in making improvements. Be sure to tell your spotter how many reps you intend to complete and tell the spotter when you need assistance.
<b>7. Exercise major muscle groups.</b>	For total muscle conditioning and balanced fitness, it is essential to exercise the whole body. Avoid exercising only the parts you enjoy the most.
<b>8. Exercise large muscles first.</b>	Since the large muscles require the most energy, workout sessions should be organized with the largest muscle groups first, followed by the smaller groups.
<b>9. Work your full range of motion.</b>	Choose a weight that allows you to perform the exercise through a full range of motion. Range of motion is the distance a joint can move without pain or injury. Working the full range of motion helps to target weak and injury prone areas and avoid tightening of the muscle.
<b>10. Use controlled movements.</b>	Exercise movements should be slow and controlled. When training with weights, take 2 counts to lift the weight, and 4 counts to lower the weight. Swinging or bouncing the weights in attempt to lift them places stress on the joints and muscles. This increases the risk of injury.
<b>11. Remember to breathe.</b>	Avoid holding your breath during any exercise. Holding your breath could cause you to get dizzy. Try to exhale when you are applying the greatest force to the movement, and inhale during the easy part.
<b>12. Rest.</b>	A brief pause of 1 to 2 minutes between sets allows the muscles to recover a bit before beginning the next set. This is a good time to stretch the muscle that has just been worked. Also, workouts with weights that focus on strength should be scheduled every other day. This helps to allow for adequate rebuilding of muscles.
<b>13. End with a cool-down.</b>	Always take adequate time to cool down after working out. This cool-down may include stretching all the major muscle groups, plus any others used in the activities.
<b>14. Train, don't strain.</b>	It is normal to expect some muscle soreness from muscle strength or endurance training. But, it is not necessary to push to pain to improve. A gradual level of progression as your body adapts to exercise is much safer. Always let your muscles adjust to the new weight or exercise before moving on.





Each isotonic exercise demands more muscle force in some positions and less muscle force in others. For example, the muscle effort used to lift a barbell is greater when the arm is perpendicular to the ground than when the arm is parallel to the ground. The change in muscle effort throughout the exercise movement is the only disadvantage to isotonic exercises. Isotonic exercises are the most common and popular form of developing muscular fitness.



### Isokinetic Exercise: Using Specially Designed Weight Machines

*Isokinetic exercises* are exercises done on specially designed weight machines that work muscles through their entire range of motion using variable resistance and speed. By altering the resistance and speed, these machines are able to keep the resistance you are working against at a constant level. The advantage of this method is that maximum resistance is provided at strong points and less resistance is provided at the weak points of the movement.

Isokinetic equipment is becoming more commonly seen in gyms or health clubs. Isokinetics are a superior way of increasing muscular strength and endurance.

### Training Principles for Muscular Fitness: Overload, Progression, and Specificity

The equipment and type of exercise you use will determine the training principles you need. *Isometric exercises* are not always safe, and *isokinetic exercises* require expensive equipment. Therefore, *isotonic exercises* are most commonly used. The following points apply to isotonic exercise training.



In order to improve your muscular fitness, you must consistently *overload* or work your muscles harder than usual. After your muscles have been overloaded, they must be rested. It is during these rest periods that your muscles build and muscular development takes place. You can achieve overload to increase muscular strength and endurance by applying the *F.I.T.T. formula*.



## F.I.T.T. Formula

### (F) Frequency

- Perform muscular fitness exercises three or four times a week.
- Space workouts 48 hours apart to allow the muscles to recover and rebuild if training for muscular strength.
- Increase the length of your exercise sessions to increase muscular fitness.

### (I) Intensity

- Use light resistance and high **repetitions** or *reps* if you desire muscle tone and general strength. *Repetitions* are the number of complete times an exercise is performed.
- Reach fatigue between 12 and 15 repetitions during light resistance.
- Use greater resistance and perform fewer repetitions if your goal is muscular growth and increased strength.
- Reach fatigue between six and 10 repetitions during heavy resistance.
- To improve muscular strength, lift 60-90 percent of what you can lift one time.
- To improve muscular endurance, lift 30-50 percent of what you can lift one time.
- Increase weight and repetitions slowly

### (T) Type

- Determine your normal level for an exercise.
- Exercise at a level above normal to cause the body to function more efficiently.
- Change types of exercises you are performing by moving from above normal to advanced exercises and techniques.

### (T) Time

- Perform one to three **sets** of each exercise for a general fitness program. A *set* is a group of repetitions performed without resting.
- Include at least eight to 10 exercises for the entire body.



- Take a one- to two-minute rest between sets or exercises.
- Try reducing the resting time between sets to increase muscular fitness as your body gets used to a certain workout. Your workout may take from 20 minutes to an hour or more, depending upon your goals.

Even though muscular strength and muscular endurance are separate components of health-related fitness, they are closely related to one another. The primary difference between the two is in the amount of weight lifted and the number of times the movement is performed.

<b>Muscular STRENGTH</b>	→	High Weight/Low Reps
<b>Muscular ENDURANCE</b>	→	Low Weight/High Reps

### **Progression: Increasing Muscular Fitness**

If you are just beginning a muscular fitness program, experts recommend that you develop muscular endurance before muscular strength. To build muscular endurance, train with lighter weights and perform a higher number of repetitions. This will lessen the chance of injury, reduce muscle soreness, and give your body adequate time to learn proper exercise technique.

To progress in a muscular fitness program, increase the resistance and/or the number of repetitions. Once you can perform a pre-established number of repetitions, add a small increase in weight. When you increase the weight you are lifting, decrease the number of repetitions. Then, as your muscles develop, increase the number of repetitions with the heavier weight.

### **Specificity: Targeting Specific Parts of the Body**

Although doing any resistance exercises with proper technique will benefit your muscular fitness, you should design a training program with specific goals in mind. To develop muscular strength or endurance in a particular part of your body, you must work those particular muscles. For example, to increase leg strength, you need to do specific leg exercises. To firm and tighten the stomach area, you must do abdominal strengthening exercises. Moderate resistance training is recommended by the American College of Sports Medicine. One set of 8-10 repetitions of 8-10 exercises at least 2 times a week is also suggested.



## Practice

Match each definition with the correct term. Write the letter on the line provided.

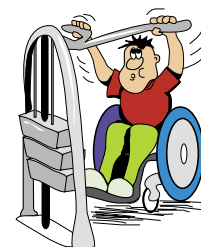
- |          |  |                        |
|----------|--|------------------------|
| _____ 1. | exercises that work a muscle against an immovable object   | A. calisthenics        |
| _____ 2. | exercises that cause a muscle to lengthen and shorten through a full range of motion while lifting and lowering a weight or resistance             | B. free weights        |
| _____ 3. | exercises done on specially designed exercise machines that work the muscle with maximum resistance throughout the muscle's entire range of motion | C. isokinetic exercise |
| _____ 4. | objects of various weights used for developing or increasing muscular fitness, such as <i> barbells </i> and <i> dumbbells </i>                    | D. isometric exercise  |
| _____ 5. | exercises that use the weight of one's body as resistance  | E. isotonic exercise   |
| _____ 6. | the number of times a complete exercise is performed   | F. repetitions         |
| _____ 7. | a group of repetitions performed without resting   | G. set                 |



## Common Fallacies Associated with Weight Training

**Fallacy:** Weight training is only for athletes.

**Fact:** Resistance training has important health benefits for everyone! People from all walks of life can benefit from increasing their muscular strength and endurance. Stronger muscles prevent lower back and joint pain, reduce the risk of many chronic diseases, delay the aging process, and can improve your physical abilities and appearance.



**Fallacy:** Steroids are a safe way of developing muscle mass.

**Fact:** *Steroids* are not only illegal but have many dangerous side effects. The health risks are not worth the muscle mass that can be developed using steroids. The safest way to develop stronger, larger muscles is to follow a regular, strength training program.

**Fallacy:** As a female, I worry I will develop big, bulky muscles if I lift weights.

**Fact:** Certain hormones—such as testosterone, a male hormone—are necessary for big muscles, and females generally don't have them in sufficient quantity. Females improve in muscle tone when they weight train but do not gain as much in muscle size as males.



**Fallacy:** Weight training is not a safe activity for growing and developing adolescents.

**Fact:** A safe weight training program can be very beneficial to adolescents. It can help growing adolescents maximize bone development.



**Fallacy:** Muscle soreness is an indication I have worked out too hard or perhaps injured myself.

**Fact:** Muscle soreness is a normal response to a new physical activity or an increased workload. It is experienced by nearly everyone who trains for muscular fitness. It is common to experience a deeper soreness when your body is new to an exercise or workload. Once your body has adapted to exercise, severe muscle soreness should not occur. However, if you are goal-oriented and push yourself hard in every workout, expect muscle soreness. No matter what your fitness level, when you perform a new activity, you can expect some muscle soreness. Gentle stretching before and after training, as well as light exercises, are ideal for speeding your recovery from muscle soreness.



**Fallacy:** Once I develop the strength I desire, I can stop lifting weights.

**Fact:** The adage *use it or lose it* applies to every component of physical fitness. The body maintains or improves with use and deteriorates with disuse. You must follow a regular exercise program to maintain your fitness level.



## Find Your Starting Point: Measuring Muscular Strength and Endurance

Before starting a muscular fitness program you should measure your muscular strength and endurance. You will then be able to measure your progress over time.



*Everyone can benefit from increasing their muscular strength and endurance.*

Muscular strength and endurance can be measured in many ways. One simple method is to determine if a person can push, pull, and carry her own body weight effectively.



To complete the following muscular fitness evaluations, find a partner. Before performing any of the tests, warm up your body with some light exercising and stretches.

## 1. Grip-Strength Evaluation

**Purpose:** To measure the strength of your hand grip. Grip strength is a strong indicator of overall body strength.

**Materials:** dynamometer (the instrument used to measure grip strength)

**Procedure:** Set the dynamometer setting to zero. Squeeze the dynamometer as hard as you can. You are allowed to move the dynamometer as you apply your maximum force. However, do not swing it or allow it to rest against your body. Test both your right and left hand three times each. Record your best score for each hand.

The dial on the dynamometer will reflect your score in kilograms. Convert to pounds by multiplying the kilograms by 2.2. Record your score and rating below.

Grip-Strength Ratings		
Males	Females	Fitness Zone
Dynamometer Score Converted to Pounds Good—Better	Dynamometer Score Converted to Pounds Good—Better	
55 and above	35 and above	Healthy-Superior
50 - 54	30 - 34	Healthy-Excellent
44 - 49	26 - 29	Healthy-Good
39 - 43	21 - 25	Healthy-Average
34 - 38	17 - 20	Low-Fair
0 - 33	0 - 16	Low-Poor
best score for right-hand grip strength: _____ best score for left-hand grip strength: _____ right-hand grip-strength fitness zone: _____ left-hand grip-strength fitness zone: _____		

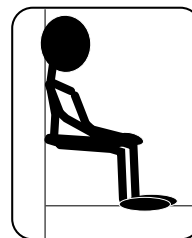


## 2. Wall-Sit Evaluation

**Purpose:** To measure the muscular strength and endurance of the large muscles of the legs and buttocks.

**Materials:** stopwatch and wall

**Procedure:** Stand with your back flat against a wall. Place your feet shoulders' width apart. Stand one to one and one-half feet from the wall. Lean back against the wall so that your back is straight and your shoulder blades touch the wall. Slide down the wall until your knees form a 90-degree angle. Your feet should be flat on the floor and pointing directly forward. Your arms should hang at your sides. Try to hold this position for 15 seconds.



Begin timing as soon as you assume the position described above. End timing the second you raise or lower from the proper position.

Record your time in seconds and rating below.

Wall-Sit Ratings	
	Fitness Zone
Held correct position for 15 seconds or more	healthy
Held correct position for less than 15 seconds	low
score in seconds: _____	
wall-sit fitness zone: _____	





### 3. Curl-Up Evaluation

**Purpose:** To measure the level of muscular strength and endurance of the abdominal muscles.

**Materials:** cushioned mat, measuring strip 30 inches long and 4½ inches wide

**Procedure:** Lie on your back with knees bent at a 140 degree angle, feet flat on floor, legs slightly apart, arms straight and parallel to your trunk, and palms resting on the mat.

Once in the correct position on the mat, have your partner place the measuring strip under your knees. Rest your fingertips on the edge of the measuring strip. Have your partner secure it in place.

To begin, have your partner kneel behind your head with their hands cupped under your head. Start to *curl* up until your fingers reach the other side of the measuring strip. Keep your heels touching the mat. Return to down position by uncurling until your head touches your partner's hands.

Perform as many curl-ups as you can. Do not do more than 75. Pace yourself at a rate of 20 curl-ups per minute, or about one every three seconds. Both you and your partner need to count the curl-ups. Count only the curl-ups that you perform properly. Check your count against your partner's count. Record your score and rating below.

Curl-Up Ratings			
Age	Males Number of Curl-Ups Good—Better	Females Number of Curl-Ups Good—Better	Fitness Zone*
13	21-40	18-32	healthy
14	24-45	18-32	healthy
15+	24-47	18-35	healthy
*Scores below age-appropriate numbers are considered low.			
number of curl-ups: _____			
curl-up fitness zone: _____			



## 4. Push-Up Evaluation

### Standard Push-Ups

**Purpose:** To measure the muscular strength and endurance of the upper body, especially the chest.

**Materials:** cushioned mat

**Procedure:** Lie face down on the mat. Place your hands directly under your shoulders with your fingers pointing forward. Extend your legs straight, parallel, and slightly apart. Tuck your toes to support the weight of your body. When your partner says “begin,” push yourself up with your arms until your body weight rests on your hands and toes. Keep your arms straight and a shoulder-width apart. Keep your legs and back straight.



Lower your body with your arms until your elbows bend at a 90-degree angle, your upper arms are parallel, and you are about one inch from the floor. Then return to the starting straight-arm position and repeat. Keep your body in a straight line from head to toe.

Perform push-ups continuously until you can no longer do any more. This is not a timed test, but rather a test of how many push-ups you can do without resting.

Count the number of correct push-ups performed continuously. Record your score and rating below.

Push-Up Ratings			
Age	Males Number of Push-Ups Good—Better	Females Number of Push-Ups Good—Better	Fitness Zone*
13	12-25	7-15	healthy
14	14-30	7-15	healthy
15	16-35	7-15	healthy
16+	18-35	7-15	healthy
*Scores below age-appropriate numbers are considered low. number of push-ups: _____ push-up fitness zone: _____			



### Variation:

Some males and females may not have the strength in their arms and chest to do standard push-ups. They should begin by doing as many knee push-ups as they can. In time, they will become strong enough to do standard push-ups. Both males and females should work towards doing as many standard push-ups as they can.

### Knee Push-Ups

**Materials:** cushioned mat and stopwatch

**Procedure:** Lie face down on the mat. Place your hands directly under your shoulders with fingers pointing forward. Extend your legs, feet, and toes straight, parallel, and slightly apart.

When your partner says “begin,” push your upper body up from the floor. Keep your arms straight and a shoulder-width apart. Keep your back straight and your knees on the floor, supporting yourself on your hands and knees. Slowly bend your elbows to 90-degree angle as you lower your upper body to the floor, keeping your trunk straight. Then return to the starting position and repeat.

*Wheelchair adaptation*—use arms to raise and lower your body from a chair or wheelchair. (Make sure wheelchair is in locked position.)

Perform as many correct push-ups as possible in 30 seconds. You may rest if you need to.

Count the number of correct knee push-ups performed in 30 seconds. Record your score below.

#### Knee Push-Up Scores

number of knee push-ups in 30 seconds: \_\_\_\_\_



## 5. Pull-Ups Evaluation

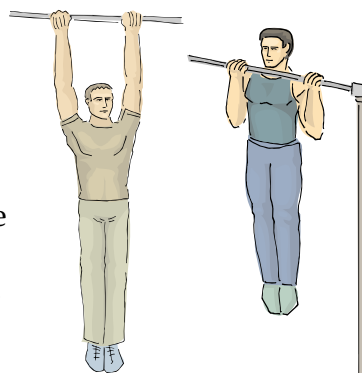
### Standard Pull-Ups

**Purpose:** To measure the muscular strength and endurance of the arm, shoulder, and back muscles.

**Materials:** horizontal bar that allows the body to hang without touching the ground

**Procedure:** Grasp the bar with your palms facing either toward or away from your body. Either grip is acceptable. Do not let your body swing.

Pull your body up until you raise your chin above the bar. Then lower your body until your arms are fully extended. Do not kick your legs or rest.



*Wheelchair adaptation*—use a lower bar that can be reached from your wheelchair. Raise and lower your body from the wheelchair. (Make sure wheelchair is in locked position.)

Perform as many correct pull-ups as you can. Record your number of correct pull-ups completed and rating below.

Standard Pull-Up Ratings			
Age	Males Number of Pull-Ups Good—Better	Females Number of Pull-Ups Good—Better	Fitness Zone*
13	1-4	1-2	healthy
14	2-5	1-2	healthy
15	3-7	1-2	healthy
16+	5-8	1-2	healthy
<p>*Scores below age-appropriate numbers are considered low.</p> <p>number of pull-ups: _____</p> <p>pull-up fitness zone: _____</p>			



### Variation:

#### Flexed-Arm Hang

**Materials:** stopwatch and horizontal bar that allows the body to hang without touching the ground

**Procedure:** Grasp the bar with your hands shoulder-width apart, your palms facing away from your body (overhand grip).

Pull your body up until your chin clears the bar. (You may be lifted up to this position if you cannot pull yourself up.) Begin time on stopwatch at this point. The objective is to maintain a flexed-arm position with the chin above the bar as long as possible. Your legs should hang straight.

*Wheelchair adaptation*—use a bar that is low enough to be reached from your wheelchair. Raise your body from the wheelchair. (Make sure wheelchair is in locked position.)

When your chin touches or falls below the bar, stop timing. Record your time and rating.

Flexed-Arm Hang Ratings			
Age	Males Number of Seconds Good—Better	Females Number of Seconds Good—Better	Fitness Zone*
13	12-17	8-12	healthy
14+	15-20	8-12	healthy
*Scores below age-appropriate numbers are considered low.			
number of seconds: _____			
pull-up fitness zone: _____			



## Muscular Fitness Ratings and Improvement Goals

Record your ratings and improvement goals on the following chart. Then answer the questions about your results.

Muscular Fitness Results				
Date	Test	Fitness Zone		Improvement Goals
		Healthy	Low	
	1. Overall Body Grip-Strength			
	2. Lower Body Wall-Sit			
	3. Abdominals Curl-ups			
	4. Upper Body Standard Push-Ups or Knee Push-Ups			
	5. Upper Body Standard Pull-Ups or Flexed-Arm Hang			

Answer the following based on your **Muscular Fitness Results** above.

1. What areas in muscular strength and endurance most need improvement? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
2. Which of your muscular fitness tests fell into the healthy fitness zone? \_\_\_\_\_  
\_\_\_\_\_



3. Write a plan of action to accomplish your muscular fitness goals.

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## Isometric Exercises: Limited Gains but Convenient

Isometric exercises can be useful for individuals trying to recover from an injury, people with certain physical disabilities, and for those confined to a small space. Remember, though, that the strength gains from isometric exercises are minimal.

Isometric Exercises		
<b>Praying Hands</b>	<b>strengthens arms, shoulders, and upper back</b>	Place palms of hands together at chest level. Either stand or sit. Press palms together for 6-10 seconds, then release.
<b>Doorway Push</b>	<b>strengthens shoulders and arms</b>	Stand in doorway with arms extended down by sides, palms facing in. Raise arms from sides to doorway and push against door frame. Hold for 6-10 seconds and release.
<b>Wall-Sit</b>	<b>strengthens major muscles of legs</b>	Slide down the wall until knees form a 90° angle. Feet should be flat on the floor and point directly forward. Relax extended arms by your sides. Hold position for 6-10 seconds and release.
<b>Wall Posture</b>	<b>strengthens abdominals, back, and buttocks</b>	Place back to the wall with feet about 3" in front of you, knees slightly bent. Relax arms by your side. Contract your abdominal muscles and push your back, shoulders, and buttocks against the wall. Hold 6-10 seconds and release.
<b>Pelvic Tilt</b>	<b>strengthens abdominals, back, and buttocks</b>	Lie on back with legs extended and arms next to body, palms down. Contract the abdominal muscles, and at the same time press the lower back against the floor. Hold 6-10 seconds and release.
<b>Static Push-up</b>	<b>strengthens arms, chest, and upper back</b>	Assume a face-down position on a mat with your hands directly under your shoulders, legs extended, and toes tucked to support body. Lower the body until the arms and the elbows are flexed, or bent to a 90° angle or less. Hold this position 6-10 seconds and release.

## Isotonic Exercises/Calisthenics: Large Gains and Convenient

Many exercises for muscular fitness require little or no equipment besides the weight of your own body! Body conditioning exercises which use your own weight as resistance are called *calisthenics*. Calisthenics only permit you to increase the repetitions you do but not the (body) weight you use as resistance. Therefore, these exercises mainly develop muscular endurance, not muscular strength.

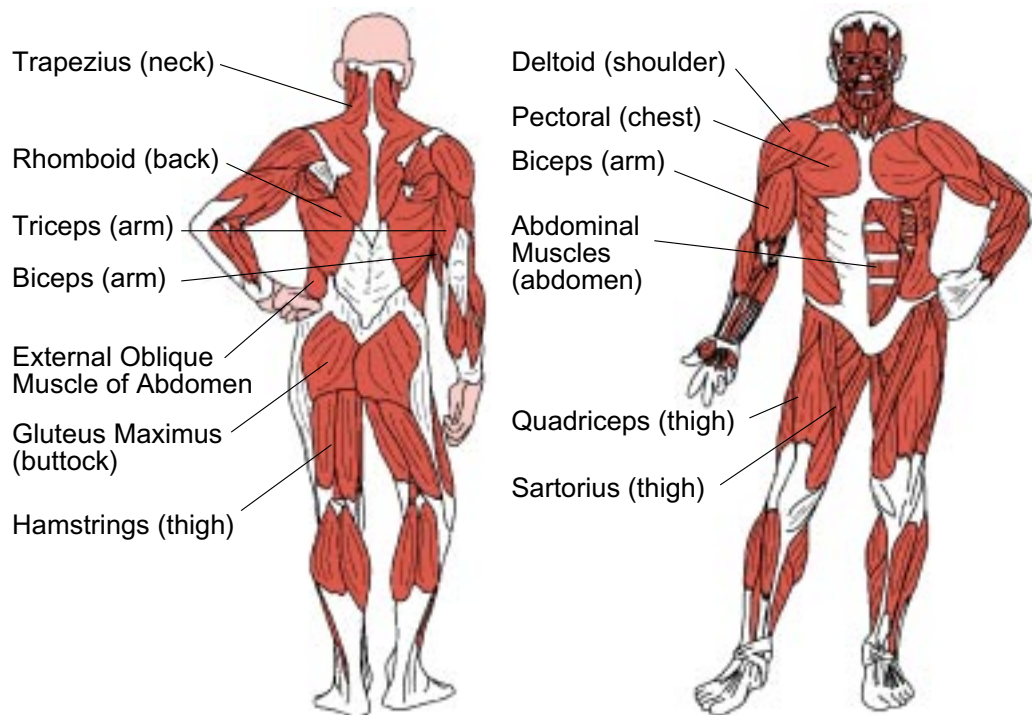




However, by adding free weights such as dumbbells, barbells, or strapped-on weights in many of these exercises, you can develop muscular strength as well as muscular endurance.

Calisthenics are very popular and a great way to exercise in your own home! They help to develop firm, toned muscles.

### The Muscular System



The exercises on the following page are common exercises used to increase the muscular fitness of major muscle groups of the body. Try to complete one set of each exercise, performing as many repetitions as you can. As your muscular fitness improves, you can either add one or two more sets, or add free weights to the exercises. Stretch the muscle groups that are being exercised between every set.

Remember the laws of motion when working out (see Unit 1, page 17). For every action, there is an equal and opposite reaction. This will help remind you to apply force equally through the entire exercise. If you are using a weight machine, you should use the same amount of force to raise and lower the weight. This will give your muscles a full range of motion. Do not raise the weight with great speed and allow it to drop or fall back down.



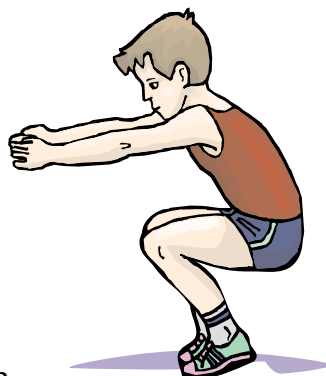
## Exercises for the Thighs, Buttocks, and Legs

### 1. Half Squats

**Purpose:** Develops muscular strength and endurance in the thighs and buttocks.

**Action:** Start with your feet shoulder-width apart, your hands on hips or straight out in front of your body.

Slowly squat until your thighs are parallel to the floor and then return to a full-standing position. Do not squat into deep-knee bend, or squat, as this position places too much stress on the knees.



**To Increase Intensity:** Hold dumbbells by your sides or a barbell on your shoulders.

### 2. Lunges

**Purpose:** Develops muscular strength and endurance in the thighs and buttocks.

**Action:** Stand with your feet together, your toes facing forward, and your arms at your sides.

Step forward, lunging with one foot so the knee of your lunging leg is over your heel, and the lower part of your leg is perpendicular to the floor. Push off with your front leg to return to starting position.

Alternate lunges, leading first with your right leg and then with your left leg.



**To Increase Intensity:** Hold a barbell on your shoulders or dumbbells by your sides.



### 3. Side Leg Raises

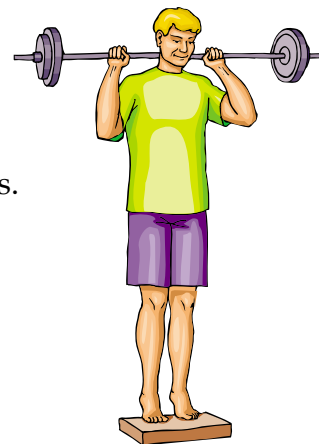
- Purpose:** Develops muscular strength and endurance in the outer thigh and buttock region.
- Action:** Lie on your left side and support your head with your left hand. Rest your right hand on the floor in front of your chest for balance. Extend your legs without locking knees. Lift your right leg slowly up while keeping your bottom leg flat on the floor. Lower your leg slowly back to the starting position. Perform this exercise very slowly in a controlled manner. Do as many repetitions as you can before switching to the other leg.

**To Increase Intensity:** Strap weights onto your ankles.

### 4. Heel Raises

- Purpose:** Develops muscular strength and endurance in the calves, the muscles in the lower leg.
- Action:** Place your feet shoulder-width apart, and rest your hands on hips. Stand tall with good upright posture. Raise up on your toes as far as possible, and then lower back down until your heels touch the floor. Do as many repetitions as you can in a slow, controlled manner. Stretch your calf muscles, then repeat.

**To Increase Intensity:** Hold dumbbells by your sides or a barbell behind your head on the shoulders. Also, place your toes on an elevated surface approximately six inches high.





## Exercises for the Upper Body

### 1. Push-Ups

**Purpose:** Develops muscular strength and endurance mainly in the chest.

**Action:** Lie on your stomach with your body straight and your weight on your toes and hands. Place your hands shoulder-width apart.

Keeping your back straight, lower your whole body until your chest is about a fist's distance off the floor. Push yourself back up again. Exhale on the exertion of the movement. Perform push-ups in a slow, rhythmic fashion. It is important not to let your back sag or arch.



### Modified Push-Ups

- **Wall push-aways** (easiest): Stand facing wall about 20 inches away. Place your hands shoulder-width apart on the wall. Slowly lower your chest to the wall as you bend your arms at the elbows. Return to the starting position.
- **Bent-knee push-ups:** With your knees on the floor and your back straight, perform push-ups in the same manner as standard push-ups.
- **Push-ups with feet elevated** (most advanced; box or raised surface needed): Place your feet on an elevated surface and your hands on the floor. Lower your body down and then extend your arms back up. Try to avoid arching your back.



## 2. Pull-Ups

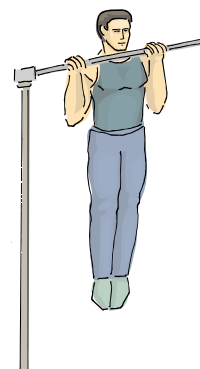
**Purpose:** Develops muscular strength and endurance mostly in the back and arms.

**Materials:** horizontal bar raised high enough so that when grasped, the feet are off the floor

**Action:** Grasp the bar with palms forward, using an overhand grip, your hands shoulder-width apart, and your arms fully raised.

Pull your body up so that your chin is slightly above the bar. Lower your body back to an arms-extended position.

Complete as many reps as possible. Use a spotter to give you a slight help so you complete more reps after you fatigue.



*Wheelchair adaptation*—use a bar that is low enough to be reached from your wheelchair. Raise your body from the wheelchair. (Make sure wheelchair is in locked position.)

**Variation:** Pull-ups can also be done with a wider grip and pulling body up with bar behind the head and neck.

### Modified Pull-Ups

**Action:** Lie flat on the floor under a horizontal bar that can be grasped at arm's length.

Grab the bar with your palms either facing out or in. With your body straight, lift your chin up to the bar as you keep your heels on the floor. Then lower your body to an arms-extended position. Complete as many reps as you can.



### 3. Back Arch

**Purpose:** Develops muscular strength and endurance in the lower back.

**Materials:** none

**Action:** Lie on your stomach with your fingers laced and placed behind your head. Slowly lift your head and chest off the floor as you keep your legs in contact with the floor. Keep your head in neutral alignment. Return to the starting position and repeat.

### 4. Chair Dips

**Purpose:** Develops muscular strength and endurance mainly in the triceps, or back of the arm.

**Materials:** sturdy chair

**Action:** Place a chair against the wall. Place your hands with your knuckles forward on the front edge of the chair. Extend your legs forward so you are balanced on your heels. Lower your buttocks down towards the floor as far as possible. Then raise your body back up by fully extending your arms. Exhale as you push your body up. Do as many reps as you can.

**Modification:** If chair dips are too difficult, substitute the modified chair dips described below.

### Modified Chair Dips

**Action:** Sit on the floor with your hands flat on the floor next to your hips and your fingers pointing outward. Keeping your arms straight, raise your hips off the floor until your body is straight and at a 45-degree angle from the floor. Your heels and hands should be the only body parts touching the floor. Lower your buttocks towards the floor as you keep your arms straight. Complete as many reps as you can.



## 5. Curl-Ups

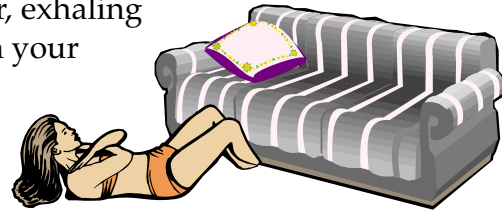
**Purpose:** Develops muscular strength and endurance in the abdominal muscles.

**Materials:** a couch or other secure object

**Action:** Sit with your legs bent at the knees and your feet flat on the floor with your heels about 12 inches from your buttocks. Cross your arms in front of your chest with your hands grasping the opposite shoulders.

Slowly lower your upper body and trunk back until your shoulder blades touch the floor.

Lift your body off floor, exhaling as you come up. Touch your elbows to your thighs. Continue moving back and forth with slow, controlled movements.



**Modification:** Place feet under a couch or other secure object.

### Variation: Crunches

**Action:** Lie on your back with your knees bent, your feet flat on the floor, and your arms folded across your chest.

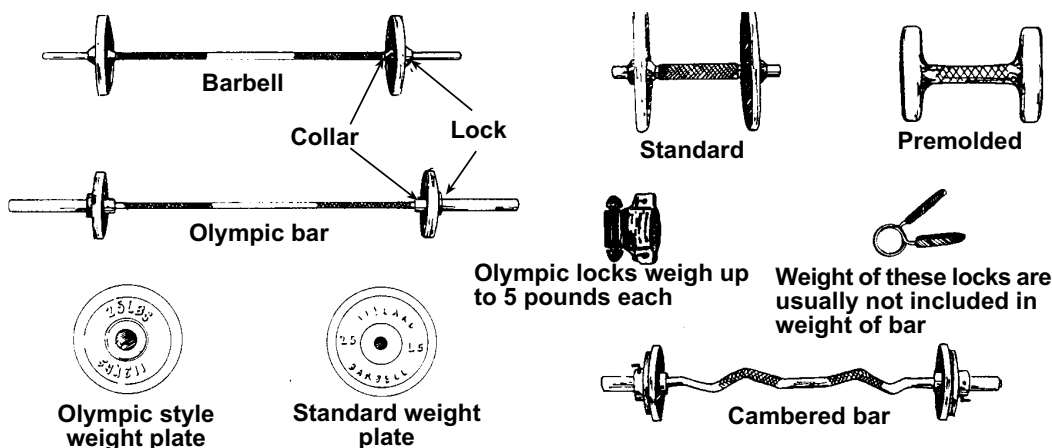
Curl your shoulders and upper back off the floor together as a unit. Slowly lower your body to floor. Exhale each time you come up. You can also add a twist to the crunches by alternately curling your shoulders and upper back toward your opposite knees.



## Isotonic Exercises: Free Weights and Weight Machines

When you train with free weights and weight machines, you need to protect yourself from injury by selecting the appropriate weight to lift. Take a conservative approach when starting out: Lift less rather than more.

### Free Weights



Remember the training principles for gaining muscular strength and endurance. If specific strength gains are your goal, you need to find a weight that will cause fatigue at between six and 10 repetitions. If you want general strength and firm, toned muscles but not a size increase, find a weight that will cause fatigue at between 12 to 15 repetitions.

Become familiar with free-weight equipment. The most common free-weight equipment used when lifting are dumbbells, barbells, locks, and weight plates. When you train with weight machines, you need to find a certified instructor to show you how to use the equipment safely and properly. You should also train with a partner. A partner can serve as a spotter and keep you from being pinned under a weight. There are many settings on the weight equipment that need to be adjusted for your individual body size. Most machines can be adjusted to vary the seat, arm, leg, and weight settings.

How you breathe during a lift is very important. Always breathe out when raising or pushing a weight. Always breathe in when lowering or releasing a weight. *Never* hold your breath when lifting or pushing a weight. Holding your breath can cause dizziness or fainting. Holding your breath can also cause a dramatic increase in your blood pressure and may damage some blood vessels.





Here are a few of the more common exercises for training on free weights and weight machines. Free weight exercises require a spotter.

## Exercises for the Thighs, Buttocks, and Legs

### 1. Half Squats (using free weights)

**Purpose:** Develops muscular strength and endurance in the thigh and buttocks muscles.

**Action:** Rest a barbell across your shoulders behind your neck. Keeping your back as straight as possible, bend your knees and lower your body into a half-squat position. Do not let your knees flex beyond your toes. Slowly, stand up straight again.



### 2. Lunges (using free weights)

**Purpose:** Develops muscular strength and endurance in the thigh and buttocks muscles.

**Action:** Hold a dumbbell in each hand, and keep your arms down at your sides. Lunge forward with your right foot, bending at the knee. To avoid strain, keep your knee in line with your ankle. Push off with your front leg to return to the starting position. Alternate lunges moving forward and back off your right leg and then off your left leg. Lunges can also be performed with a barbell on the shoulders.

### 3. Leg Press (using weight machine)

**Purpose:** Develops muscular strength and endurance in the thigh and buttocks muscles.

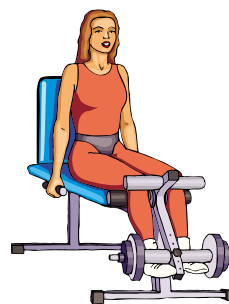
**Action:** Sit with your torso upright and your back against the back of the seat. Your legs should be flexed 90 degrees or less. Holding onto the handrails, push the footpad to the extended knee position without locking your knees. Exhale during the outward press. Slowly, return to the starting position.



#### 4. Knee Extension (using weight machine)

**Purpose:** To develop muscular strength and endurance in the muscles in the front of the thighs—the quadriceps.

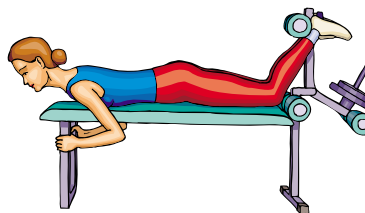
**Action:** Sit on the seat and place your ankles under the roller pad. Keep your torso erect and your lower back flat against the seat. Slowly extend your lower legs through a complete range of motion. Exhale while extending your legs. Pause briefly in the extended position, and then slowly lower the weight without letting the weight plate hit the stack. Repeat until the set is completed.



#### 5. Knee Flexion (using weight machine)

**Purpose:** Develops muscular strength and endurance in the hamstrings, or the back of the thigh.

**Action:** Lie on your stomach and grip the handles or edge of the bench. Place your kneecaps at the edge of the bench with your ankles under the pads. Flex your legs at the knee as you bring your heels as far as possible towards your buttocks. Exhale during the upward movement. Pause briefly in the fully flexed position. Then lower the weight slowly, but don't allow your hips to rise off the bench. Repeat until set is completed.



#### 6. Heel Raises (using free weights)

**Purpose:** Develops muscular strength and endurance in the calf muscles.

**Action:** Place a barbell on your shoulders or hold dumbbells down at your sides. Place the balls of your feet on the edge of an elevated and stable surface about six inches high. Place your feet about hip-width apart. Keep your torso erect and your legs straight. Slowly come up onto your toes, raising your heels as high as possible. Exhale as you lift up. Slowly lower your heels to a full stretch without pain. Do not bend your torso or flex your knees.

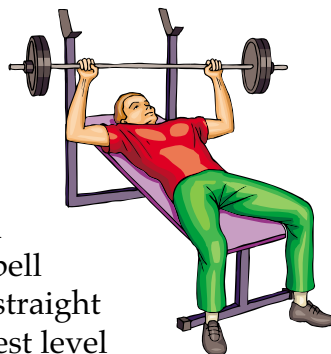


## Exercises for the Upper Body

### 1. Bench Press (using free weights)

**Purpose:** Develops muscular strength and endurance in the chest muscles.

**Action:** For this exercise you will need a spotter. Lie on your back on the bench with your feet flat on the floor. Grasp the barbell with an overhand grip, hands slightly wider than shoulder-width apart. A spotter should help you lift the barbell off the standards. Press the barbell straight

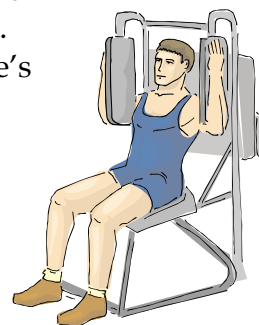


up above your mid-chest level until your arms are fully extended but not locked at the elbow. Exhale during the upward movement. Do not bounce the bar off your chest, and make sure your hips remain on the bench at all times. Slowly lower the bar to your chest, and continue until you complete the set. Support the barbell until the spotter can help you rack it.

### 2. Pec Deck (using weight machine)

**Purpose:** Develops muscular strength and endurance in the chest muscles.

**Action:** Sit on the seat with your back, head, and shoulders in contact with the back pad. Align your shoulders with the machine's axis of rotation. Squeeze the pads or rollers together with your forearms not your hands. Exhale as your elbows come together, pulling the arm pads in front of your chest. Continue reps until you complete the set.

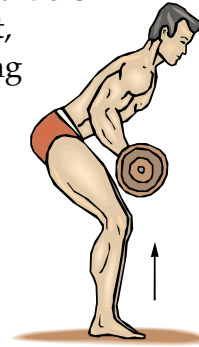




### 3. Bent-Over Rowing (using free weights)

**Purpose:** Develops muscular strength and endurance in the large muscles of the back.

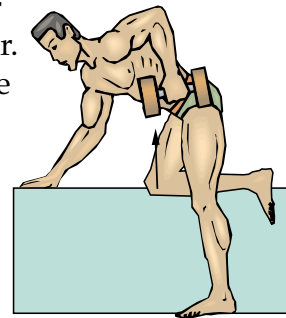
**Action:** Bend over to pick up the barbell with an overhand grip and your knees flexed. Keep your shoulders higher than your hips, your lower back flat, your arms straight, and your head up facing forward. Slowly pull the bar straight up until it touches your mid-chest. Exhale as you lift the barbell and keep your torso rigid. Slowly lower the barbell straight down. Extend your arms fully without allowing the weight to touch the floor. Continue reps until you complete the set.



### 4. One-Arm Dumbbell Rowing (using free weights)

**Purpose:** Develops muscular strength and endurance in the large muscles of the back.

**Action:** Using a bench for support, bend at your waist with your back parallel to the floor. Grasp a dumbbell in one hand and place your other hand and knee on a bench for back support. Exhale as you pull the dumbbell to your chest. Pause briefly then slowly lower the weight until your arm is extended. Continue reps until you complete the set.





## 5. Lat Pulldowns (using weight machine)

**Purpose:** Develops muscular strength and endurance in the large muscle groups of the back.

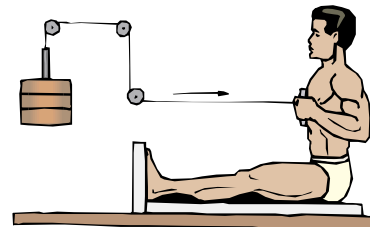
**Action:** Grasp the long bar with an overhand grip slightly wider than shoulder-width. You may either sit on the bench, kneel on one knee, or kneel on both knees. Keeping your torso erect, pull the bar smoothly straight down. Keep your elbows out and away from your body. Exhale as you pull the bar down to the base of your neck. Slowly extend your arms back upward. Continue reps until you complete the set.

**Variation:** You can also pull the bar to the front of your body under your chin at chest level.

## 6. Seated Rows (using weight machine)

**Purpose:** Develops muscular strength and endurance in the large upper back muscles.

**Action:** Assume a seated position either on the floor or bench with your knees slightly flexed. Keeping your torso erect, grasp the handles with palms facing inward. Exhale while pulling the handles smoothly into your chest. Pull with your arms and back, keeping your back upright. Avoid letting your torso pull the weight. Return to the arms-extended position. Continue reps until you complete the set.

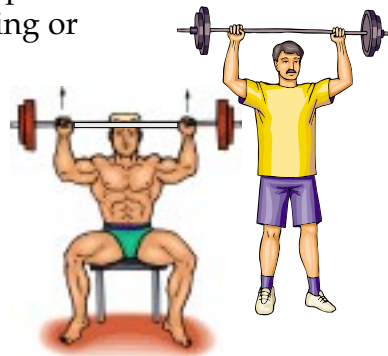




## 7. Military Press (using free weights)

**Purpose:** Develops muscular strength and endurance in the muscles of the shoulder.

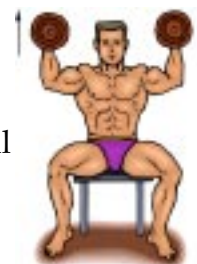
**Action:** For this exercise you will need a spotter. This exercise can be done either standing or seated. Grasp the barbell with an overhand grip about shoulder-width apart. Exhale while pressing the bar upward and overhead until your arms are fully extended. Slowly lower the bar to chest position. Continue reps until you complete the set.



## 8. Seated Dumbbell Press (using free weights)

**Purpose:** Develops muscular strength and endurance in the shoulder muscles.

**Action:** Grasp the dumbbells and place them at your chest level. With your palms facing outward, press the weights upward and overhead until your arms are fully extended. Slowly lower the weights back down to your chest. Continue reps until you complete the set.



## 9. Upright Rows (using free weights)

**Purpose:** Develops muscular strength and endurance in the shoulder muscles.

**Action:** In a standing position, grasp dumbbells with an overhand grip, placing your hands about two to four inches apart. Rest the dumbbells on your thighs with your arms extended and your feet shoulder-width apart. Exhale while pulling the dumbbell upward along your abdomen and chest. As you pull the dumbbell to your shoulders, keep your elbows higher than your wrists. Pause briefly at the top position, then slowly lower the dumbbell until your arms are fully extended. Continue reps until you complete the set.

**Variation:** Upright rows can also be performed with a barbell.

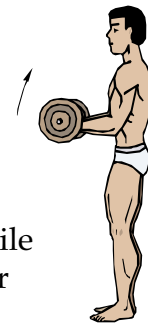


## 10. Military Press (using weight machine)

- Purpose:** Develops muscular strength and endurance in the shoulder muscles.
- Action:** Sit on the stool or bench so that the front of your shoulders are directly below handles of the weight machine. Grip the handles with your palms forward and shoulders directly under the handles. Keep your lower back flat. Exhale while pushing the weight upward to complete the extension. Slowly return back to the starting position without letting the weights touch. Continue reps until you complete the set.

## 11. Biceps Curl (using free weights)

- Purpose:** Develops muscular strength and endurance in the biceps or the upper arm muscles.
- Action:** Stand erect and grasp the dumbbell with an underhand grip with your hands shoulder-width apart. Hold your upper arms against your ribs with your arms down and the dumbbell touching the front of your thighs. Keeping elbows to your sides, curl the dumbbells one at a time to shoulder level while exhaling on the lift. Do not jerk or swing your body to lift the weight. Slowly lower the dumbbells to your sides with your arms fully extended.
- Variation:** The biceps curl can also be performed using a cambered (curved) bar or straight barbells.





## 12. Preacher Curls (using weight machine)

**Purpose:** Develops muscular strength and endurance in the biceps muscle (the muscles on the front of the upper arm).

**Action:** Sit with your chest against the pad. Place your elbows on the pad in line with the machine's axis of rotation. Using an underhand grip, curl the handles upward as far as possible. Exhale on the lift. Slowly lower the bar until your arms are extended, but not locked. Continue the reps until you complete the set.

## 13. Triceps Extension (using free weights)

**Purpose:** Develops muscular strength and endurance in the triceps, the muscles on the back of the upper arms.

**Action:** Start in a standing or sitting position. Grasp a dumbbell using an overhand grip and your hands about six inches apart. Keep your torso erect and your feet shoulder-width apart. Hold your elbows straight up and close to your ears. Lower the dumbbell slowly behind your head to the top of your shoulders. Then push the dumbbell to full extension, exhaling on the most difficult part. Continue reps until you complete the set.



**Variation:** The triceps extension can also be done with a straight barbell or cumbered (curved) bar.

## 14. Kickbacks (using free weights)

**Purpose:** Develops muscular strength and endurance in the triceps muscle.

**Action:** Place your right hand and right knee on a bench. Put your left foot on the floor to support your body. Grasp a dumbbell in your left hand with your arm bent and your upper arm parallel to the floor. Keeping your elbow close to body, raise the dumbbell so that your arm is fully extended behind you. Slowly lower the weight back down, keeping your upper arm parallel to the floor. Continue reps until you complete the set.

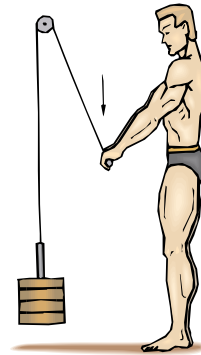




### 15. Pressdowns (using weight machine)

**Purpose:** Develops muscular strength and endurance in the triceps muscle.

**Action:** Assume an erect standing position facing the weight machine with your feet about shoulder-width apart. Grasp the bar using an overhand grip and your hands no more than six inches apart. Begin the exercise with the bar at chest height with your upper arms pressed firmly against your ribs. Exhale while extending your forearms until your arms are fully extended and the bar is touching your thighs. Slowly return the bar to chest height without moving your upper arms and torso. Continue reps until you complete the set.





## Summary

*Muscular fitness* is important for overall health and fitness. Muscular fitness includes both *muscular strength* and *endurance*. Muscular strength is the ability of a muscle to exert a maximum force in a single effort. Muscular endurance is the ability of a muscle to continue to do work repeatedly over time without *fatigue*.

Improving muscular strength and endurance leads to better appearance, greater resistance to injury, decreased fat, and better weight maintenance.

A lack of adequate muscular strength or endurance can increase your risk for muscle and joint injuries, diabetes, heart disease, bone loss, back pain, and posture problems. It is much more difficult to achieve your appropriate body weight without sufficient muscle tissue.



There are three types of *muscle fibers* found in *skeletal muscles*. *Slow-twitch muscle fibers* help in endurance activities, *fast-twitch muscle fibers* are useful for activities requiring speed and *power*, and *intermediate-twitch muscle fibers* are a combination of both.

*Isometrics*, *isotonics*, and *isokinetics* are three methods of exercise that develop muscular strength and endurance. Isometric exercises consist of a muscle contracting, or tightening, while pressing against an immovable object. Isotonics are exercises that cause the muscle to lengthen and shorten through a full *range of motion* while lifting and lowering a weight or resistance. *Calisthenics*, *free weights*, and most weight machines are isotonic. Isokinetic exercises require specially designed machines that work the muscle through the entire range of motion using variable resistance and speed.

To improve muscular strength or endurance, a muscle needs to be consistently overloaded or worked harder than it is used to. Frequency, intensity, and time should be altered periodically to insure continued progress in a muscular fitness program. If *muscle tone* is desired, then high *repetitions* and low weight should be performed. If muscular strength is desired, then lift heavier weights and perform fewer repetitions.



To ensure safety and get the best results from a muscular fitness program, always follow safety guidelines. A few of these include beginning with a warm-up, using proper form on all exercises, using a spotter with free weights, working the large muscles first, exercising through a full range of motion, using slow and controlled movements, breathing correctly, resting between sets, ending with a cool-down, and resting 48 hours between workouts. Also, remember how the laws of motion apply to correct weight training.

Both males and females can benefit from muscular fitness exercises. Females need not worry about bulking up since they do not have enough of the hormone *testosterone*. Testosterone is the male hormone that plays an important role in building muscle.

Strong muscles make the everyday tasks of life, work, and recreation easier and more satisfying.



## Practice

Use the list below to **identify** the **primary area** of the body each **exercise** develops. Write the answer on the line provided. **Terms will be used more than once.**

abdominals  
arms

back  
chest


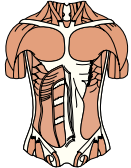




shoulder  
thighs and buttocks

1. half squats: \_\_\_\_\_
2. lat pulldowns: \_\_\_\_\_
3. biceps curl: \_\_\_\_\_
4. seated rows: \_\_\_\_\_
5. military press: \_\_\_\_\_
6. bench press: \_\_\_\_\_
7. crunches: \_\_\_\_\_
8. chair dips: \_\_\_\_\_
9. bent-over rowing: \_\_\_\_\_
10. leg press: \_\_\_\_\_
11. push-ups: \_\_\_\_\_
12. preacher curl: \_\_\_\_\_
13. upright rows: \_\_\_\_\_
14. curl-ups: \_\_\_\_\_



## Practice

List **three** exercises that develop each muscle group listed in the chart below.

Exercise Identification	
<b>back</b> 	1. _____ 2. _____ 3. _____
<b>chest</b> 	1. _____ 2. _____ 3. _____
<b>abdominals</b> 	1. _____ 2. _____ 3. _____
<b>legs</b> 	1. _____ 2. _____ 3. _____
<b>arms</b> 	1. _____ 2. _____ 3. _____
<b>shoulders</b> 	1. _____ 2. _____ 3. _____



## Practice

Write **True** if the statement is correct. Write **False** if the statement is not correct.

- \_\_\_\_\_ 1. Slow-twitch or red muscle fibers have the ability to continue working for long periods of time.
- \_\_\_\_\_ 2. Isometric exercises move the muscles through a full range of motion.
- \_\_\_\_\_ 3. Fast-twitch or white muscle fibers are best for fast, short-term contractions such as sprinting.
- \_\_\_\_\_ 4. A muscle must lift more as the body adapts to the overload if it is to become stronger.
- \_\_\_\_\_ 5. Doing any resistance exercises with proper technique will benefit your muscular fitness, so you do *not* need a training program with specific goals in mind.
- \_\_\_\_\_ 6. The basic unit of the muscular system is the muscle fiber.
- \_\_\_\_\_ 7. Everyone is born with a different number of slow-twitch and fast-twitch muscle fibers.
- \_\_\_\_\_ 8. You cannot improve the fitness and performance of your slow- and fast-twitch muscle fibers.
- \_\_\_\_\_ 9. Inadequate muscular strength and endurance will make it more difficult to maintain your proper body weight.
- \_\_\_\_\_ 10. Isokinetic exercises require the use of special exercise machines and work muscles through a full range of motion.
- \_\_\_\_\_ 11. You should hold your breath when you lift weights.
- \_\_\_\_\_ 12. If you are new to a muscular fitness program, you should first focus on developing muscular strength rather than muscular endurance.



- \_\_\_\_\_ 13. Since the large muscles require the most energy, they should be worked before the smaller muscles.
- \_\_\_\_\_ 14. A spotter helps ensure your safety when you are lifting weights.
- \_\_\_\_\_ 15. You must experience pain in your muscle strengthening workouts to make improvements.
- \_\_\_\_\_ 16. To continually progress in a muscular fitness program, you must continually overload your muscles.
- \_\_\_\_\_ 17. An instrument used to measure leg strength is a dynamometer.
- \_\_\_\_\_ 18. The ability of a muscle or muscle group to exert maximal force in a single effort is called *muscular endurance*.
- \_\_\_\_\_ 19. Repetitions are the number of times a complete exercise is performed.
- \_\_\_\_\_ 20. A lack of muscular fitness can increase the risk of diabetes, heart disease, and certain cancers.
- \_\_\_\_\_ 21. Steroids are not only illegal, but have many dangerous side effects.
- \_\_\_\_\_ 22. Females improve in muscle tone when they weight train without as much gain in muscle size as males.
- \_\_\_\_\_ 23. Calisthenics are exercises that use free weights.



## Practice

Use the list below to complete the following statements.

<b>48 hours</b>	<b>muscle tone</b>	<b>muscular strength</b>
<b>fatigue</b>	<b>muscular fitness</b>	<b>opposing force</b>
<b>injury</b>	<b>muscular endurance</b>	<b>warm up</b>

1. Before a workout, \_\_\_\_\_ your body with some light exercising and stretches.
2. Space workouts \_\_\_\_\_ apart to allow the muscles to recover and rebuild if training for muscular strength.
3. Muscular endurance is the ability of a muscle to continue to do work repeatedly over time without \_\_\_\_\_.
4. Firm and defined muscle quality resulting from muscular strength and endurance exercises is called \_\_\_\_\_.
5. Resistance training are exercises in which a muscle or group of muscles repeatedly push or pull against an \_\_\_\_\_.
6. \_\_\_\_\_ not only improves your appearance but decreases your risk of \_\_\_\_\_ and gives you more energy.
7. Muscular fitness includes two health-related components of physical fitness: \_\_\_\_\_ and \_\_\_\_\_.



## Unit 5: Cardiovascular Fitness

This unit describes cardiovascular fitness and the importance it plays in our lives. Students will learn that the heart is the most important muscle in our body. They will also discover that cardiovascular fitness is the key to all fitness programs.

### Unit Focus

- the cardiovascular system and how it works
- benefits of aerobic and anaerobic exercise
- cardiovascular diseases and risk factors of heart disease
- measuring cardiovascular fitness and heart rate
- training principles which improve cardiovascular fitness
- determining exercise levels
- guidelines for safe aerobic exercises
- types of aerobic exercises



## Fitness Career Opportunity

### Aerobics Instructor

Aerobics instructors are responsible for developing and leading safe exercise routines and aerobic classes at fitness centers or other health facilities, municipal recreation centers, and colleges or other school settings. They have basic knowledge in exercise physiology, anatomy, kinesiology, injury prevention, nutrition, and body composition.

Qualified aerobic instructors are certified by nationally recognized fitness organizations. They are also certified in cardiopulmonary resuscitation (CPR) and standard first aid.

Certification programs train aerobic instructors to evaluate exercise, give fitness assessments, choreograph and design exercise classes, and modify exercises for various populations.

There are many types of aerobic and fitness classes that require separate certifications or training. They include step training, low and high-impact aerobics, aquatic fitness, youth fitness, adaptive fitness, prenatal fitness, senior fitness, fitness for the overweight, funk aerobics, boxing aerobics, interval or circuit training, slide training, and muscle endurance training.

For more information regarding certification, contact:

IDEA: The Association for  
Fitness Professionals  
6190 Cornerstone Court  
East, # 204  
San Diego, CA  
92121-3773  
(800) 999-4332  
[www.ideafit.com](http://www.ideafit.com)

The American  
Council on  
Exercise (ACE)  
4851 Paramount Dr.  
San Diego, CA  
92191  
(800) 825-3636  
[www.acefitness.org](http://www.acefitness.org)

Aerobics & Fitness  
Association of  
America (AFAA)  
15250 Ventura Blvd.,  
Suite 200  
Sherman Oaks, CA  
91403-3297  
(800) 365-5326  
[www.aerobics.org](http://www.aerobics.org)

The American  
College of  
Sports Medicine  
(ACSM)  
401 W. Michigan St.  
Indianapolis, MN  
46202-3233  
(317) 637-9200  
[www.asmg.org](http://www.asmg.org)



## Vocabulary

*Study the vocabulary words and definitions below.*

**aerobic** ..... with oxygen

**aerobic exercise** ..... activity that increases the heart rate, supplies oxygen to the muscles, and *can* be performed for a long period of time; also called *cardiovascular exercise*

**anaerobic** ..... without oxygen

**anaerobic exercise** ..... activities that can increase muscle size and endurance, but *cannot* be performed for a long period of time without resting

**aorta** ..... the largest artery in the body, through which oxygen-rich blood from the heart flows towards the body's tissues

**arteries** ..... blood vessels that carry blood *away from the heart* to the body's tissues

**atrium** ..... one of the two upper chambers of the heart

**blood pressure** ..... the measure of blood force being pushed against the walls of the arteries as blood is pumped by the heart



- capillaries** ..... the smallest blood vessels, located between the arteries and veins, that deliver oxygen and other nutrients to muscle, tissue, and organ cells
- carbon dioxide** ..... the gas which is exhaled by the lungs during respiration as a waste product
- cardiac** ..... refers to the heart
- cardiovascular** ..... refers to the heart and its blood vessels; *cardio* means heart; *vascular* means vessels
- cardiovascular disease (CVD)** .... a condition that narrows the passageways in the coronary arteries, reducing blood flow to the heart muscle; also called *coronary artery disease (CAD)*
- cardiovascular fitness** ..... the body's ability to deliver oxygen to working muscles; a health-related component of fitness
- carotid artery** ..... a major artery on both sides of the neck; often used for measuring heart rate
- cholesterol** ..... a fat-like substance found only in food from animal sources; some foods with high cholesterol include whole milk products, meat, animal fats, and egg yolks
- circulatory system** ..... the heart, blood vessels, and the blood; also referred to as the *cardiovascular system*



<b>cool-down</b> .....	the tapering-off period after exercise that allows the body to gradually return to a resting state
<b>coronary arteries</b> .....	the blood vessels that provide blood to the heart muscle
<b>heart attack</b> .....	the damage or death of part of the heart muscle caused by a lack of blood; may result from coronary artery disease
<b>heart rate</b> .....	the number of times a heart beats or pumps blood per minute; also referred to as <i>pulse rate</i>
<b>high blood pressure</b> .....	an increase in blood pressure above its normal range; also called <i>hypertension</i>
<b>maximum heart rate</b> .....	the highest number of times a person's heart can beat per minute; found by subtracting your age from 220
<b>pulse</b> .....	the beat of the heart felt by the pressure of the blood on the artery walls
<b>radial artery</b> .....	the artery on the inside of your wrist; can be used to measure your heart rate
<b>recovery heart rate</b> .....	heart rate taken after exercise
<b>respiratory system</b> .....	lungs and air passages that help supply oxygen to the body



<b>risk factor</b> .....	a habit or condition that may increase an individual's chance of developing an illness or disease
<b>target heart rate zone (THRZ)</b> .....	the recommended intensity for aerobic conditioning; 60-90 percent of your maximum heart rate
<b>training effect</b> .....	refers to positive physical fitness changes in the body as a result of exercise
<b>valves</b> .....	flaps of tissue in the heart that open and close to control blood flow
<b>veins</b> .....	blood vessels that carry blood <i>back to the heart</i>
<b>ventricle</b> .....	one of the two lower chambers of the heart that pumps blood to the lungs or muscles
<b>warm-up</b> .....	exercises that increase the body's temperature and prepare it for more vigorous exercise



## Unit 5: Cardiovascular Fitness

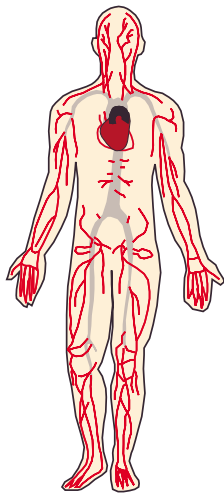
### Introduction

Do you often find yourself gasping for air when you exercise or participate in a sport? Have you ever become winded after walking up a flight of stairs? If you sometimes are short of breath, your body may not be delivering enough oxygen to its muscles and tissues. The body sends oxygen to the muscles through the blood. And the blood can only flow to the many muscles in the body if it is pumped by the heart. Your heart must be strong enough to continuously pump blood through the blood vessels to all parts of your body. No other muscle in your body works as hard as your heart. If your heart cannot meet your body's needs for oxygen, you will feel out of breath and tired.



*Do you often find yourself gasping for air when you exercise?*

Your heart is one of the body's many remarkable features. It is a hollow, muscular organ a little larger than the size of your fist. It is pear-shaped and weighs a mere 12 ounces, about the weight of a large orange. It lies behind the breastbone and between the lungs, slightly to the left of the midline of your body.



*The body has thousands of miles of blood vessels.*

The heart, the body's thousands of miles of blood vessels, and the body's 12 pints of blood make up the **cardiovascular system**. (*Cardio* means heart; *vascular* means blood vessels.) Together, these parts work to deliver oxygen and nutrients to the muscles in the body.

**Cardiovascular fitness** is the body's ability to deliver oxygen to the working muscles. Improving your cardiovascular fitness will give you more energy, make you feel better, and make you look healthier. By keeping your heart strong and fit, you decrease the chance of developing heart problems. A fit heart increases the chance that you will lead a long and healthy life.

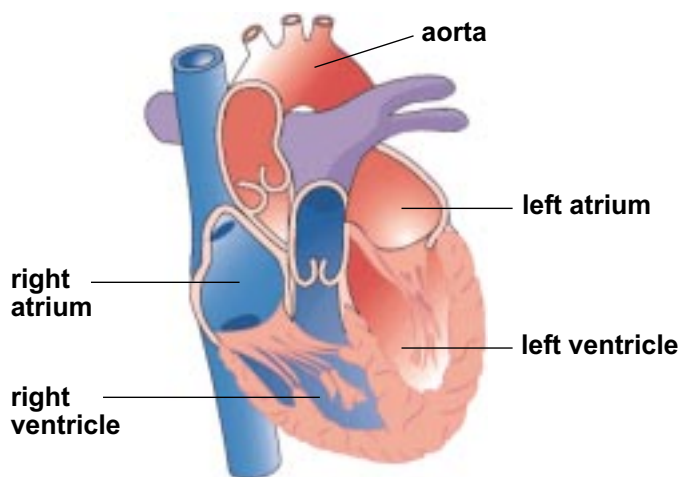


## The Cardiovascular System: The Heart, Blood Vessels, and Blood

All of the muscles in the body use oxygen as a fuel. The muscles need oxygen, or they will eventually die. The cardiovascular system, also called the **circulatory system**, circulates blood throughout the body. This system works by pumping blood through a circular network of blood vessels. Your body holds about 12 pints of blood circulated continuously throughout the body. The heart beats at a rate of about 50-80 beats per minute. As the blood passes muscles, it delivers oxygen and nutrients and carries away waste products.

Your blood receives oxygen from the air you breathe into your lungs. This *oxygen-rich* blood has a bright red color. It travels to your heart, which will pump it throughout your body. You may think of the heart as a single pump. However, the heart is actually two pumps that are side by side.

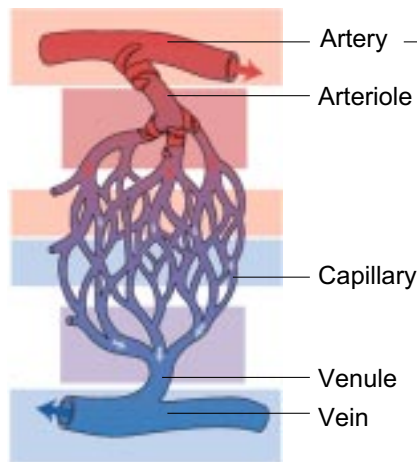
Each pump contains two chambers, or room-like spaces, making a total of four chambers. The blood carrying oxygen flows into the two chambers on the left side of the heart. First this oxygen-rich blood fills the top left



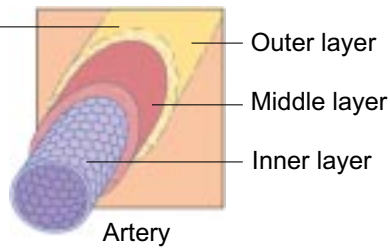
*The Four Chambers of the Heart*

chamber, called the **left atrium**. A **valve**, or flap of tissue that works like a swinging gate, then opens. This allows the blood in the left atrium to flow into the lower left chamber, called the **left ventricle**. The ventricle then pumps the oxygen-rich blood out of the heart through a very large blood vessel called the **aorta**.





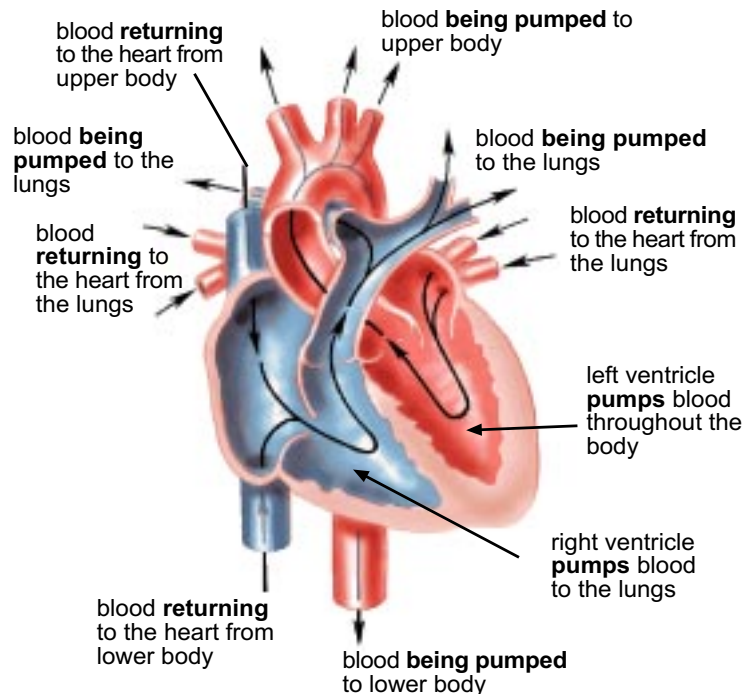
*Blood vessels of the circulatory system: arteries, capillaries, venules, and veins.*



From the aorta, many smaller blood vessels branch out through the body. These blood vessels that carry oxygen-rich blood to the body's muscles are called **arteries**. As arteries branch out through the body they become smaller and smaller.

The smallest blood vessels located between the arteries and veins are called **capillaries**. The oxygen and nutrients in

the blood pass through the thin walls of capillaries and into the cells in the muscles. As the cells in a muscle use oxygen, they produce waste. This waste material passes back through the thin capillary walls and is carried away by the blood. This blood without oxygen carrying waste has a dark, bluish-red color.



*Heart Flow*

*Arteries **pump** oxygen-rich blood **away from** the heart to the body and veins **return** oxygen-empty blood **back to** the heart.*



The oxygen-empty, waste-filled blood is pumped towards the heart. From the capillaries, the blood flows into larger blood vessels called **veins**. When the blood reaches the heart, it flows into the top chamber on the right-side of the heart. This chamber is called the *right atrium*. A valve in the atrium then opens, letting the blood flow down into the *right ventricle*. From there, the heart pumps the blood into the lungs. In the lungs, the blood exchanges its wastes for oxygen. The oxygen-rich blood then repeats its circular journey. The gaseous waste left in the lungs is exhaled as **carbon dioxide**.

### Why is Cardiovascular Fitness Important?

If your muscles are weak, you still may be able to carry your body. Your muscles may be inflexible, and you still may be able to bend. But if your cardiovascular system cannot deliver enough oxygen to your muscles, you will quickly run out of energy. Without energy, your muscles cannot continue to work.

Cardiovascular fitness is *the* most important fitness component. Exercising your cardiovascular system is just plain “heart smart.” And, like all of the other fitness components, cardiovascular fitness will improve your overall health.

## Exercise Provides...

### Physical Benefits

- Tones and strengthens muscles
- Burns off calories for weight control
- Improves body composition in favor of more lean body mass and less body fat
- Helps control appetite
- Improves posture
- Increases reaction speed
- Increases sensory awareness
- Decreases risk for injuries



### Health Benefits

- Lengthens life
- Improves the quality of life
- Reduces risk of premature heart attack and stroke
- Lowers resting blood pressure
- Creates healthy blood cholesterol levels
- Decreases body fat and helps in weight control
- Improves bone mass
- Improves digestion
- Reduces risk of diabetes
- Creates healthy blood vessels
- Improves circulation
- Increases the lungs' ability to process oxygen
- Increases heart's ability to pump blood
- Increases resistance to illnesses and diseases

### Personal Benefits

- Increases energy levels
- Improves self-esteem and self-confidence
- Helps in coping with stress
- Increases resistance to fatigue
- Increases mental efficiency
- Helps counter anxiety and depression
- Helps in relaxation and decreasing tension
- Enhances sleep
- Provides an activity to do with family and friends



## Practice

Use the list below to write the correct term for each definition on the line provided.

<b>aorta</b>	<b>carbon dioxide</b>	<b>valves</b>
<b>arteries</b>	<b>cardiovascular</b>	<b>veins</b>
<b>atrium</b>	<b>cardiovascular fitness</b>	<b>ventricle</b>
<b>capillaries</b>	<b>circulatory system</b>	

- \_\_\_\_\_ 1. blood vessels that carry blood *away from the heart* to the body's tissues
- \_\_\_\_\_ 2. the heart, blood vessels, and the blood; also referred to as the *cardiovascular system*
- \_\_\_\_\_ 3. the body's ability to deliver oxygen to the working muscles; a health-related component of fitness
- \_\_\_\_\_ 4. one of the two lower chambers of the heart that pumps blood to the lungs or muscles
- \_\_\_\_\_ 5. blood vessels that carry blood *back to the heart*
- \_\_\_\_\_ 6. one of the two upper chambers of the heart
- \_\_\_\_\_ 7. refers to the heart and its blood vessels
- \_\_\_\_\_ 8. flaps of tissue in the heart that open and close to control blood flow
- \_\_\_\_\_ 9. the gas which is exhaled by the lungs during respiration as a waste product



- \_\_\_\_\_ 10. the largest artery in the body, through which oxygen-rich blood from the heart flows towards the body's tissues
- \_\_\_\_\_ 11. the smallest blood vessels, located between the arteries and veins, that deliver oxygen and other nutrients to muscle, tissue, and organ cells



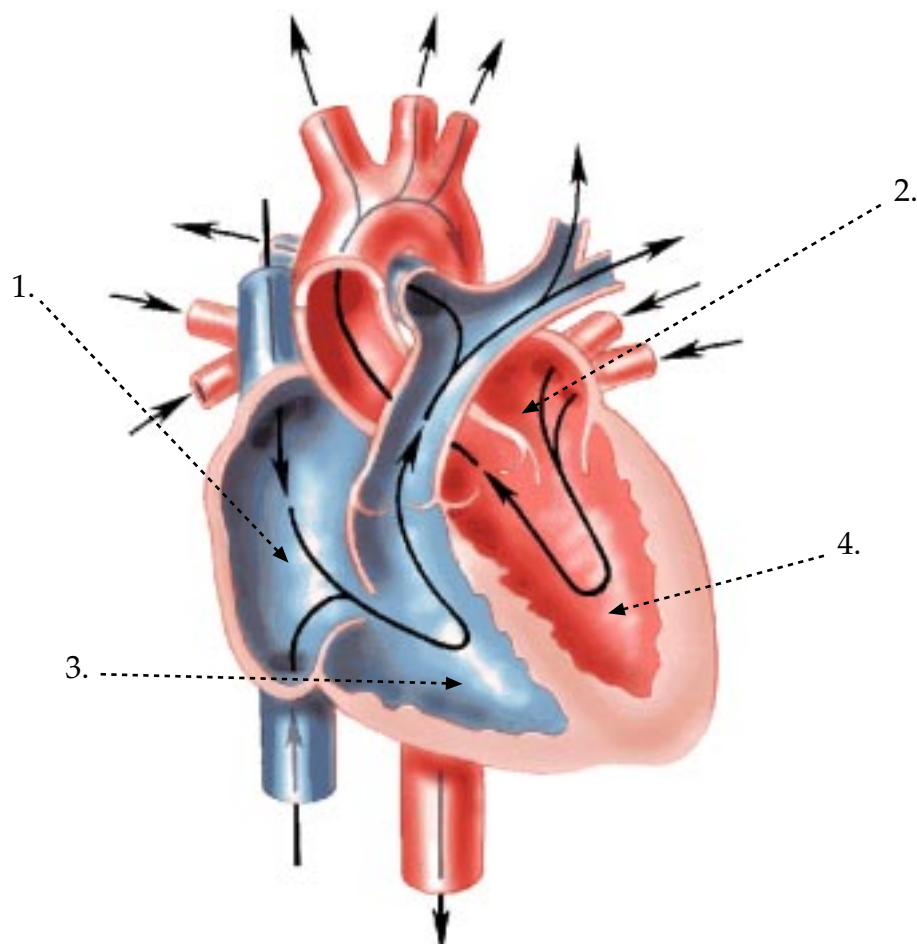
## Practice

Use the list below to correctly label each **chamber** of the heart. Write the term on the line provided.

left atrium  
left ventricle

right atrium  
right ventricle

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_





## Practice

Use the list below to complete the following statements.

atrium	chambers	red
blood vessels	heart	valves
bluish-red	pump	ventricles

1. The heart's function is to \_\_\_\_\_ blood throughout the entire cardiovascular system.
2. *Cardio* means \_\_\_\_\_ ; *vascular* means \_\_\_\_\_ .
3. Your heart has four \_\_\_\_\_ , two on each side.
4. The oxygen-rich blood fills the top left chamber of the heart, called the *left* \_\_\_\_\_ .
5. The \_\_\_\_\_ are located at the bottom of the heart and act as muscular pumps.
6. \_\_\_\_\_ act as doors between the chambers of your heart.
7. The blood which comes from your lungs is bright \_\_\_\_\_ because it has just received a fresh supply of oxygen.
8. Blood that fills the right side of your heart is a dark, \_\_\_\_\_ color because it has given up its oxygen to the muscles.



*Use the list below to complete the following statements.*

<b>aorta</b>	<b>carbon dioxide</b>
<b>arteries</b>	<b>circulatory system</b>
<b>capillaries</b>	<b>veins</b>




9. In the lungs the blood releases a waste gas called \_\_\_\_\_ .
10. The left ventricle contracts to pump blood to the rest of the body by way of a large blood vessel called the \_\_\_\_\_ .
11. The aorta transmits blood away from the heart to all parts of the body through blood vessels called \_\_\_\_\_ .
12. The smallest blood vessels located between the arteries and veins are called \_\_\_\_\_ .
13. Blood vessels that carry blood back to the heart are called \_\_\_\_\_ .
14. The heart, blood vessels, and blood all work together to form the \_\_\_\_\_ .



## The Best Exercise for Developing a Healthy Heart: Aerobic Exercise

The word **aerobic** means *with* oxygen. During **aerobic exercise**, the body uses oxygen for energy. The more oxygen the body uses, the harder the cardiovascular system will work. When the cardiovascular system works hard, it becomes more fit. Aerobic exercise increases cardiovascular fitness better than any other type of activity.

Aerobic exercises, also called *cardiovascular exercises*, are continuous activities that use the large muscle groups of the body, especially in the lower body. The muscles need additional energy to keep working for an extended period of time. The muscles get their energy or fuel from oxygen-rich blood. This increased need for more oxygen-rich blood makes the heart beat faster and pump more blood. Increasing your **heart rate** exercises your heart muscle and makes it stronger.

Aerobic Exercises		
High Level	Moderate Level	Low Level
jogging rowing stationary cycling uphill hiking jumping rope running in place	bicycling basketball handball soccer swimming tennis singles walking racquetball	baseball softball golf bowling volleyball
		

The **high-level** exercises are very vigorous and are sustained exercises that promote cardiac fitness.

The **moderate-level** exercises are moderately vigorous exercises that can promote cardiac fitness if done briskly.

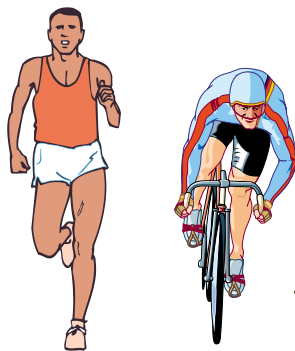
The **low-level** exercises may be vigorous at times but are usually not sustained long enough to promote good cardiac fitness alone.





Jogging for at least 15 minutes is a good example of an aerobic exercise. Jogging uses the large muscle groups, such as your leg and arm muscles, to move you forward. These muscles need fresh supplies of oxygen-rich blood to replace the energy used. To meet these needs, your heart rate increases.

All activities that use the large muscle groups will raise your heart rate. However, some activities do not raise your heart rate enough to improve cardiovascular fitness. An activity must raise your heart rate to a level called the **target heart rate zone (THRZ)**. Continuous activities

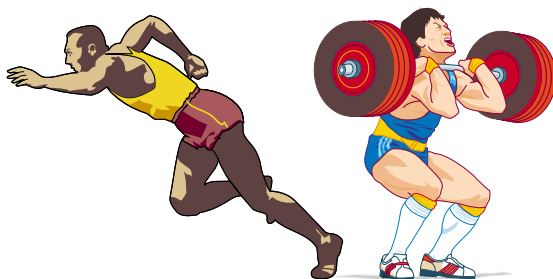


*Continuous exercises train your body to use oxygen more efficiently.*



such as jogging, walking, rope jumping, cycling, and swimming are all aerobic exercises. Inline skating, step aerobics, aerobics classes, and cross-country skiing are also aerobic activities. All of these exercises train your body to use oxygen more efficiently.

**Anaerobic** (*without* oxygen) activities are those performed at a pace which use oxygen faster than the body can replenish it. **Anaerobic exercises** are very strenuous. A person can only do anaerobic activities for a short period of time before rest is needed. Anaerobic exercises demand short bursts of energy. They also involve quick starts and stops. Sprinting and weight lifting are examples of anaerobic activities.



*Sprinting and weight lifting are examples of anaerobic activities.*

Your heart, brain, and most body organs have very limited anaerobic ability. These tissues are mostly aerobic and require a continuous supply of oxygen, or they will die. Skeletal muscles, on the other hand, have both anaerobic and aerobic ability.



## Effects of Aerobic Exercise: Strengthening the Heart and Other Muscles

As you become aerobically fit, your heart and muscles become stronger and work more efficiently. Aerobic exercise leads to many healthy *adaptations*, or changes, in the cardiovascular and **respiratory systems**. The *respiratory system* includes the lungs—air passages that help supply the body with air.

**Increased Stroke Volume.** *Stroke volume* is the amount of blood pumped by the heart during a beat. Regular aerobic exercise allows a fit individual to pump more blood per heartbeat. A fit heart takes fewer beats than an unfit heart to pump the same amount of blood. A fit heart also will have a lower resting heart rate.

**Increased Heart Rate.** During aerobic exercise, your heart rate can increase to almost double your resting heart rate. A fit person can comfortably train aerobically at the target heart rate zone. Your target heart rate zone is the range within which you need to exercise to gain cardiovascular benefit.

**Increased Cardiac Output.** *Cardiac output* is the amount of blood pumped by the heart in one minute. Aerobic training can increase the ability of the cardiac output to pump at almost eight times its resting rate.

**Increased Ability to Regulate Blood Flow.** Regular aerobic exercise trains the body to circulate more blood to the muscles during exercise.

**Increased Oxygen Delivery to the Body.** Oxygen and carbon dioxide exchange is more efficient as you become more fit. Aerobic training increases the body's ability to remove carbon dioxide and other waste products.

**Improved Rate and Depth of Breathing.** This training adaptation allows you to work harder without getting out of breath.



## Practice

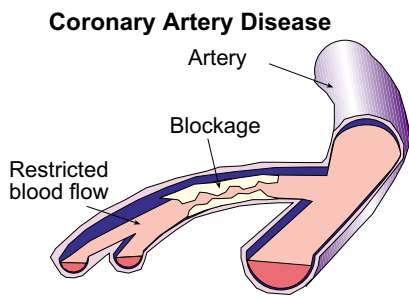
Match each definition with the correct term. Write the letter on the line provided.

- |  |                                  |
|--|----------------------------------|
| _____ 1. the number of times a heart beats or pumps per minute; also referred to as <i>pulse rate</i>  | A. aerobic                       |
| _____ 2. the recommended intensity for aerobic conditioning; 60-90 percent of your maximum heart rate  | B. aerobic exercise              |
| _____ 3. lungs and air passages that help supply oxygen to the body  | C. anaerobic                     |
| _____ 4. refers to the heart   | D. anaerobic exercise            |
| _____ 5. activity that increases the heart rate, supplies oxygen to the muscles, and <i>can</i> be performed for a long period of time; also called <i>cardiovascular exercise</i> | E. cardiac                       |
| _____ 6. with oxygen   | F. heart rate                    |
| _____ 7. activities that can increase muscle size and endurance, but <i>cannot</i> be performed for a long period of time without resting  | G. respiratory system            |
| _____ 8. without oxygen  | H. target heart rate zone (THRZ) |



## Cardiovascular Diseases: The Heart of the Matter

The number one killer in America is **cardiovascular disease (CVD)**. More than two out of every five Americans die from CVD. In fact, someone dies from CVD every 34 seconds. Most forms of CVD start early in a person's life. Therefore, you should begin a regular program of cardiovascular exercise now and make it a permanent part of your lifestyle.



Coronary artery disease (CAD) is the major cause of heart disease and **heart attack**. The most common CAD is known as *atherosclerosis*. Atherosclerosis is a thickening and hardening of the medium- and large-sized arteries. When this affects the coronary arteries, it may cause a heart attack.

**Coronary arteries** are the blood vessels that provide the heart muscle with oxygen. Even though the heart's chambers are filled with blood, this blood cannot cross the heart's walls. The heart can only receive oxygen from the blood flowing through the coronary arteries.

CAD develops when fatty deposits build up on the inner walls of the coronary arteries. When these walls harden and narrow, the heart cannot receive oxygen-rich blood. When oxygen cannot get to the heart muscle, part of the heart muscle is damaged or dies. A heart attack is the damage or death of part of the heart muscle caused by a lack of blood.

## Risk Factors for Heart Disease

A **risk factor** is a habit or condition that may increase an individual's chance of developing an illness or disease. There are several risk factors that may increase your chance of developing CAD. Individuals with CAD have an increased chance of having a heart attack. Many risk factors for heart disease are habits that people can eliminate from their lives.

### Risk Factors That You Can Control: Habits and Choices

How you live your life plays a major role in determining your risk for heart disease. The more risk factors you have, the greater your chance for heart disease. You can eliminate or control most of the risk factors by practicing good health habits.



Good health habits begin with what we put into our bodies. Most of us know we should eat healthy food and limit the unhealthy food we eat. In addition, when we fill our lungs and blood with poisons from cigarettes, we risk heart disease. A person who smokes is twice as likely to have a heart attack as a nonsmoker. Similarly, a person who abuses alcohol increases the chances that he or she will develop heart disease.



*A person who abuses alcohol and smokes increases the chances that he or she will develop heart disease.*

“Heart smart” practices also include what we do with our bodies. Regular cardiovascular exercise helps keep the heart healthy. Other “heart smart” practices include relaxation techniques to lower stress and tension.

Two more risk factors we can lower through good health habits are **high blood pressure** and high levels of **cholesterol**.

**High Blood Pressure.** Each time the heart beats, blood is pushed against the walls of the arteries. The measure of the force of blood against artery walls is called **blood pressure**. If the arteries become hardened or filled with fatty substances, their passageways will narrow. In these cases, blood will back up and put dangerous pressure on the heart. The heart will strain to push blood through the narrow walls of the arteries. This condition is called *high blood pressure*. It is also called *hypertension*.



*High blood pressure is a risk factor for heart disease.*

Some of us may inherit high blood pressure from our parents. However, everyone can practice healthy habits that will help us lower high blood pressure. One way to prevent high blood pressure or lower high blood pressure is through regular cardiovascular exercise. Another good way to avoid or lower high blood pressure is to eat a diet low in salt and fat.

**High Cholesterol Levels.** *Cholesterol* is a fat that is made in our bodies. Cholesterol also comes from foods. There are two kinds of cholesterol, HDL (good) and LDL (bad). Our tissues need a certain amount of



cholesterol to stay healthy. To be healthy, our bodies need a greater amount of HDL or good cholesterol, than LDL or bad cholesterol. However, if we take in or produce too much cholesterol in our bodies, the extra cholesterol will clog the passageways in arteries. High levels of cholesterol can lead to coronary artery disease.

The tendency to have high levels of cholesterol, like high blood pressure, can be inherited. Everyone, however, can practice healthy habits to reduce cholesterol levels. Not smoking and avoiding fatty foods are two “heart smart” ways to lower your cholesterol level. Regular cardiovascular exercise and maintaining the right body composition are also good ways to control cholesterol.

<b>Risk Factor</b>	<b>Risks</b>	<b>Good Health Habits</b>
<b>High Blood Pressure</b>	Increases the force of the blood being pushed against the walls of the arteries as it is pumped; blood pressure remains constantly higher than healthy range.	Regular cardiovascular exercise lowers blood pressure.
<b>High Levels of Cholesterol</b>	Increases fatty substances in blood that can block arteries and restrict blood flow; high levels contribute to artery disease and other forms of heart disease.	Regular exercise combined with a healthy, low-fat diet keeps cholesterol levels normal.
<b>Cigarette Smoking</b>	Number one risk factor for heart disease; more than doubles heart attack rate.	Regular and vigorous exercise increases likelihood of not smoking or quitting.
<b>Diabetes</b>	Increased body weight and unhealthy body composition can increase the body's insulin requirements.	Regular exercise helps to decrease a diabetic's insulin requirements.
<b>Overweight/ Obesity</b>	Excess body fat increases likelihood of high blood pressure, high blood cholesterol, diabetes, and coronary artery disease.	Regular exercise helps to lose extra fat pounds and develop a healthy body composition.
<b>Physical Inactivity</b>	Increases incidence of coronary artery disease.	Regular exercise increases life expectancy, improves quality of life, promotes clearer arteries, and reduces risk of heart disease.
<b>Stress and Tension</b>	Often increases blood pressure and other risk factors that contribute to heart disease.	Regular exercise relieves stress and tension by relaxing muscles.



## Risk Factors You Cannot Control: Age, Heredity, and Gender

Some risk factors are not influenced by lifestyle. We cannot control or reduce these factors. Therefore, it is especially important that we eliminate those risk factors we can.

**Age.** The older you get, the more susceptible to a heart attack you become.

**Heredity.** Heart disease and other cardiovascular disease in your family increase your chance of developing a heart disease.

**Gender (Sex).** Males are much more susceptible than females to a heart attack.

Major Risk Factors for Heart Disease	
Factors We Can Control	Factors We Cannot Control
<ul style="list-style-type: none"><li>• physical inactivity</li><li>• overweight or obesity</li><li>• high blood pressure</li><li>• high stress</li><li>• high cholesterol</li><li>• diet high in saturated fat, excess sugar, and salt</li><li>• smoking, drugs, and alcohol</li></ul>	<ul style="list-style-type: none"><li>• age (the older you are, the higher your risk)</li><li>• gender (males have a higher risk)</li><li>• heredity (conditions and diseases that run in your family)</li></ul>

## Determining Your Cardiac Risk

Complete the *Cardiac Risk Index* chart on the following page. Follow the directions at the top of that page to measure your risk of having a heart attack or developing heart disease.



## Risk of Heart Attack

In each of the eight categories in the chart below, choose one box that describes you. Record your score in the space provided. Add the numbers from each box to find your total score. Refer to the scale at the bottom of the chart to determine your risk of heart attack.

Cardiac Risk Index							
Risk Factor	Index						Score
<b>1. Age</b>	10 to 20 1	21 to 30 2	31 to 40 3	41 to 50 4	51 to 60 6	61 to 70 8	
<b>2. Heredity</b>	No known history 1	1 relative over 60 with cardiovascular disease 2	2 relatives over 60 with cardiovascular disease 3	1 relative under 60 with cardiovascular disease 4	2 relatives under 60 with cardiovascular disease 6	3 relatives under 60 with cardiovascular disease 8	
<b>3. Weight</b>	5 lbs or more below standard weight 1	-5 to +5 lbs standard weight 1	6-20 lbs overweight 2	21-35 lbs overweight 3	36-50 lbs overweight 5	51-65 lbs overweight 7	
<b>4. Tobacco smoking</b>	Nonuser 0	Cigar and/or pipe 1	10 cigarettes or less a day 2	20 cigarettes a day 4	30 cigarettes a day 6	40 cigarettes or more a day 10	
<b>5. Exercise</b>	Intensive occupational & recreational exertion 1	Moderate occupational & recreational exertion 2	Sedentary work & intensive recreational exertion 3	Sedentary work & moderate recreational exertion 5	Sedentary work & light recreational exertion 6	Complete lack of all exercise 8	
<b>6. Cholesterol, or, if unknown, % fat in diet</b>	Cholesterol below 180 mg% No animal or solid fat in diet 1	Cholesterol below 181-205 mg% 10% animal or solid fat in diet 2	Cholesterol below 206-230 mg% 20% animal or solid fat in diet 3	Cholesterol below 231-255 mg% 30% animal or solid fat in diet 4	Cholesterol below 256-280 mg% 40% animal or solid fat in diet 5	Cholesterol below 281-330 mg% 50% animal or solid fat in diet 7	
<b>7. Blood pressure</b>	100 upper reading 1	120 upper reading 2	140 upper reading 3	160 upper reading 4	180 upper reading 6	Upper reading 200 or more 8	
<b>8. Gender</b>	Female under 40 1	Female 40-50 2	Female over 50 3	Male 5	Stocky male 6	Bald stocky male 7	
<b>Your risk of HEART ATTACK:</b> <div> 6-11 Well below average  12-17 Below average  18-24 Average  25-31 Moderate  32-40 Dangerous  41-62 Urgent—DANGER—Make lifestyle changes to reduce your score! </div>							<b>Total Score</b> 





## Practice

Use the list below to write the correct term for each definition on the line provided.

<b>blood pressure</b> <b>cardiovascular disease (CVD)</b> <b>cholesterol</b> <b>coronary arteries</b>	<b>heart attack</b> <b>high blood pressure</b> <b>risk factor</b>
--	---

- \_\_\_\_\_ 1. the damage or death of part of the heart muscle caused by a lack of blood; may result from coronary artery disease
- \_\_\_\_\_ 2. a fat-like substance found only in food from animal sources
- \_\_\_\_\_ 3. the measure of blood force being pushed against the walls of the arteries as blood is pumped by the heart
- \_\_\_\_\_ 4. a habit or condition that may increase an individual's chance of developing an illness or disease
- \_\_\_\_\_ 5. an increase in blood pressure above its normal range; also called *hypertension*
- \_\_\_\_\_ 6. the blood vessels that provide blood to the heart muscle
- \_\_\_\_\_ 7. a condition that narrows the passageways in the coronary arteries, reducing blood flow to the heart muscle



## Your Heart Rate: A Measurement of Your Cardiovascular Fitness



*Your heart beats at different rates depending upon what activity you are doing.*

Your heart beats at different rates depending upon what activity you are doing. Many measurements of cardiovascular fitness are based on your heart rate.

Your *heart rate* is the number of times your heart beats, or pumps, per minute. There are two important heart rates you should measure in order to monitor your cardiovascular fitness. One important heart rate is your **recovery heart rate**, or your heart rate shortly after exercise. You will read about how to measure your *recovery heart rate* later in this unit.

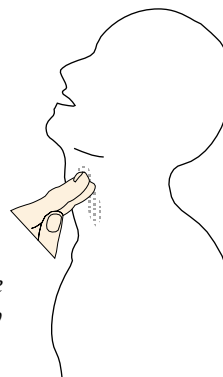
Another important heart rate is your *resting heart rate*, or how many times your heart beats per minute while you are at total rest.

Many exercisers use technology to monitor their heart rates. One type of heart rate monitor is the pulse bar, which is held in your hand. Another type fits on your ear or on your finger and gives you a **pulse** readout. The most accurate type fits around your chest right over your heart and transmits a signal of your pulse to an accompanying wristwatch. However, you can learn to take your own pulse with a watch and measure your heart rate accurately.

### Taking Your Pulse: Counting Your Heart Beats

Your pulse is a wave of slight pressure which can be felt in certain arteries near your skin. Your pulse is caused by the pressure as each heartbeat forces blood against the artery wall. You can measure your heart rate by taking your pulse at the **radial artery**. The radial artery is located on the underside of your wrist. Place the tips of the first two fingers of your right hand just below the wrist bone of your left hand. Then

*To find your carotid artery, place the tips of your first two fingers into the groove on either side of your neck by your windpipe (trachea). Then slide your fingers until they are about one inch below the top of your jaw bone.*





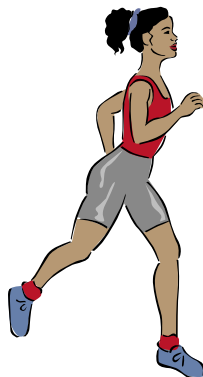
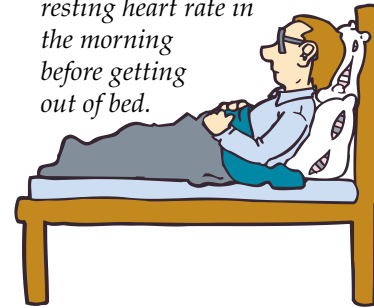
slowly slide your fingertips until they are straight down from your thumb. You should feel a rhythmic beating just below the skin. This beat from your radial pulse is a true measure of your heart beat. **Note:** Do not use your thumb to take your pulse since it has a pulse of its own.

You can also take your pulse at your **carotid artery**. To find your carotid artery, place the tips of your first two fingers into the groove on either side of your neck by your windpipe (trachea). Then slide your fingers until they are about one inch below the top of your jaw bone. Press gently until you feel regular pressure just below the skin. This beat is your carotid pulse, another measure of your heart beat. Do not press hard or on both sides of the neck at the same time. Doing this can reduce the blood flow and cause light-headedness and an inaccurate reading.

### Resting Heart Rate: Measuring Heart Beats While at Rest

One important measure of the condition of your heart is your *resting heart rate*. The resting heart rate is the number of times your heart beats in a minute while at rest. It is best to take your resting heart rate in the morning before getting out of bed.

*It is best to take your resting heart rate in the morning before getting out of bed.*



*The resting heart rate of an aerobically fit person is probably lower than the average resting heart rate.*

The average resting heart rate is 78 to 84 beats per minute for an adult female. It is 72 to 78 beats per minute for an adult male. The resting heart rate of an aerobically fit person is probably lower than the average resting heart rate. A low resting heart rate is desirable and indicates a strong and efficient heart. A strong heart pumps more blood with each beat, leaving more rest time in between beats. This means more energy for you!

You can measure your progress in a cardiovascular fitness program by occasionally recording your resting heart rate. You may notice a decrease of 10 to 25 beats per minute in your resting heart rate after a few months in a cardiovascular fitness program.



## Monitoring Your Resting Heart Rate (RHR)

Use the chart on the following page to record your resting heart rate. Measure your resting heart rate once a week. **Note:** a restless night with little sleep, smoking, alcohol, stress, caffeine, a recent meal, or certain medications can increase your resting heart rate.

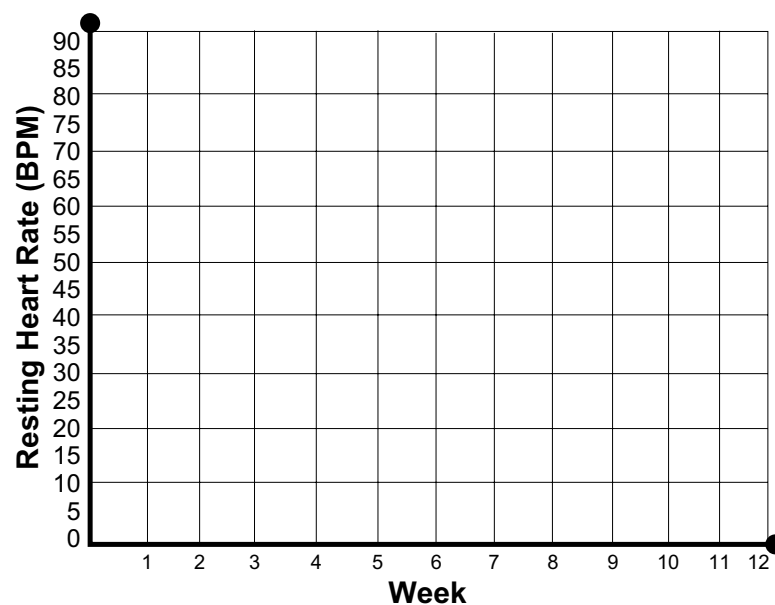
1. The best time to take your resting heart rate is before you get out of bed in the morning. **Note:** You may also measure your resting heart rate when you are relaxed. Be sure you have not done any physical activity for at least 30 minutes and have not eaten for several hours.
2. Find your pulse at either your radial (wrist) artery or your carotid (neck) artery.
3. Use your index and middle finger of your right hand to find your pulse. **Remember:** Use fingertips, and not your thumb since it has a pulse of its own.
4. Apply a slight but steady pressure with your fingertips until you feel a pulse.
5. When measuring your resting heart rate, count your heartbeats for 30 seconds and double it. You may need to measure your pulse more than once to get an accurate reading. If you lose count, begin again. Be patient; it takes practice!
6. Plot your beats per minute (BPM) on the graph on the following page.

Date	Current Resting Heart Rate	Measured for :	
		30 Seconds	1 Minute



## Heart Rate Monitoring Activity

Week	Date	Time	Resting Heart Rate (BPM)
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			



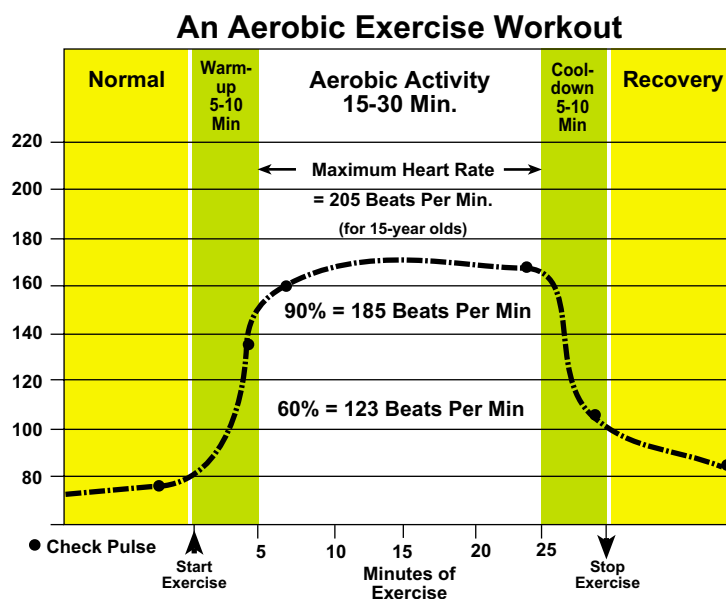


## Improving Cardiovascular Fitness Using Training Principles: Overload, Progression, and Specificity

### The Principle of Overload: Frequency, Intensity, Type, and Time (F.I.T.T.)

You can improve your cardiovascular fitness by regularly making your heart work harder than it normally does. Working hearts grow stronger. A stronger heart can pump more blood with each beat than a weaker heart. There are *four general ways to overload* and gradually increase the work your heart does during aerobic exercise.

**(F) Frequency.** You must work out at least three days per week to develop cardiovascular fitness. Begin an exercise program with three workouts per week. Add workouts to your week after your body has adjusted. To improve your cardiovascular fitness, you must do a minimum of four aerobic workouts per week. Eventually, you will be able to exercise aerobically on a daily basis.



**(I) Intensity.** You can measure the intensity of your aerobic exercise by checking your heart rate. During exercise, your heart should beat between the 60 percent and 90 percent range of your **maximum heart rate**. This range is also called your *target heart rate zone (THRZ)*. Exercising at a lower heart rate will not improve your cardiovascular fitness. Exercising at a higher rate puts a dangerous



strain on your heart muscle. If you are starting an aerobic program, stay near 60 percent of your target heart rate. Gradually increase to higher ranges as your body adapts. (Refer to *Target Heart Rate Zone* section on the following pages.)

**(T) Type.** You need to change the type of exercise you are performing, going from normal to advanced techniques. If you have been walking on only a flat course, you can try walking on an incline or hilly course. You will notice the difference in your heart rate. Keep checking your target heart rate zone as you add more advanced activities to your exercise program.

**(T) Time.** Work your heart in the target heart rate zone for at least 15 minutes. If you are beginning a fitness program, start with 15 minutes of low intensity aerobic exercise. As your fitness improves, lengthen your workout time to 30 minutes. Over time, you can lengthen it to 60 minutes.

### The Principle of Progression: Continually Improving Cardiovascular Fitness

At first your workout will work your body beyond its normal level. However, your heart will eventually adjust to your workout. If you continue to work out for the same length of time and number of times per week, you will *maintain* your cardiovascular fitness. To *improve* your fitness level, you must *overload* your body, or increase your workout. Increasing the difficulty of your workout is called *progression*.



Your heart will eventually adjust to your workout.

Gradually lengthening the time you exercise from a minimum of 15 minutes to a maximum of 60 minutes is a good way to increase your fitness level. After your body adapts to 60 minutes of exercise, add another exercise session per week. Each time you increase the number of exercise sessions, decrease the time of each session. As your body

adjusts to these additional sessions, gradually add more time to each session. Remember to monitor your heart rate and resting heart rate as you become more fit. From time to time, recalculate your heart rate zone and resting heart rate.



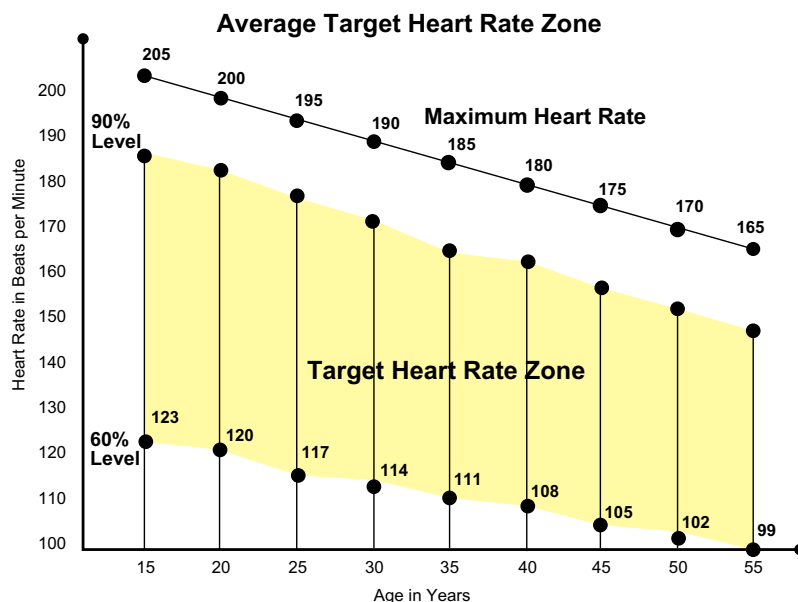
## Principle of Specificity: Training to Reach Certain Goals

If you want to improve a specific area of your body, you must work on that specific area. This idea is called the *principle of specificity*. For example, to improve your cardiovascular fitness, you need to do aerobic exercises. Aerobic exercises are best for improving the fitness of the heart and lungs. To tone the stomach muscles, or abdominal muscles, do sit-ups and crunches to work these particular muscles.

## Target Heart Rate Zone: Determining Exercise Level

To improve your cardiovascular fitness, you need to work your heart within your *target heart rate zone*. Your target heart rate zone is between 60 percent and 90 percent of your *maximum* heart rate. Estimate your maximum heart rate by subtracting your age from 220. Design your workouts to reach the THRZ, but do not exercise beyond this zone. Exercising at your maximum heart rate *can be extremely dangerous*.

Exercising in the target heart rate zone will bring about a **training effect**. *Training effects* are the positive physical fitness changes in the body that occur as a result of exercise. A lower resting heart rate is one possible example of a training effect gained from cardiovascular exercise. Greater endurance is another example of a training effect. The target heart rate zone helps you determine whether to increase or decrease your aerobic exercise.







When beginning an aerobics program, aim your workout towards the lower range of your target zone (60 percent). As you get into better shape, slowly build up to the higher range of your target zone (90 percent).

Another way to monitor your exercise intensity is to check yourself with the *talk test*. You should be able to talk during exercising. If you are breathing deeply but not gasping for air, you are probably exercising aerobically. For example, when walking briskly or jogging you should be able to talk comfortably without getting out of breath. However, if you are able to sing or shout, then you are not exercising hard enough.



## Calculating Target Heart Rate Zone (THRZ)

**Purpose:** To identify your target heart rate zone to achieve a *training effect*.

**Procedure:** To figure your individual THRZ, you need to know your resting heart rate. Study the example provided and then follow each step to determine your own THRZ. **Remember:** Your fitness level will have an effect on your personal target heart rate zone.

The Steps	The Examples	The THRZ Formula
1. First, determine your <b>maximum heart rate (MHR)</b> by subtracting your age from <b>220</b> .	$\begin{array}{r} 220 \\ - 17 \\ \hline 203 \end{array}$	$220 - \text{Age} = \text{MHR}$
2. Next, subtract your current <b>resting heart rate (RHR)</b> from your <b>MHR</b> .	$\begin{array}{r} 203 \\ - 70 \\ \hline 133 \end{array}$	$\text{MHR} - \text{RHR} = \text{HR Reserve}$
3. Multiply both the <b>lower limit (.60)</b> & the <b>upper limit (.90)</b> by the answer in #2.	$\begin{array}{r} 133 \\ \times .60 \\ \hline 79.8 \end{array} \quad \begin{array}{r} 133 \\ \times .90 \\ \hline 119.7 \end{array}$	$\text{HR Reserve} \times .60 = \text{Lower limit}$ $\text{HR Reserve} \times .90 = \text{Upper limit}$
4. Add your <b>RHR</b> to both <b>lower &amp; upper limits</b> . Round off your answers to find your <b>THRZ</b> .	$\begin{array}{r} 79.8 \\ + 70.0 \\ \hline 149.8 \end{array} \quad \begin{array}{r} 119.7 \\ + 70.0 \\ \hline 189.7 \end{array}$	$\text{RHR} \times \text{Lower limit} = \text{Lower zone}$ $\text{RHR} \times \text{Upper limit} = \text{Upper zone}$

Rounded off, the target heart rate zone for the individual in the chart above is 150–190 beats per minute.

What is your individual target heart rate zone? \_\_\_\_\_

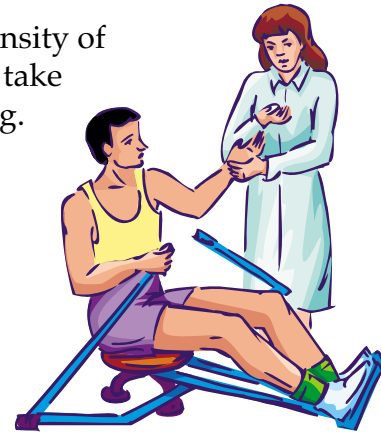
Is your THRZ higher or lower than the average for your age that appears on the graph?

\_\_\_\_\_



## Monitoring Heart Rate during Exercise

Use your target heart rate zone to check the intensity of your workouts. To see if you are in your THRZ, take your pulse immediately after you stop exercising. Quickly find your pulse either at your radial (wrist) artery or your carotid (neck) artery. Count your pulse for 10 seconds. Multiply the number of beats by six to determine your heart beats per minute. If your pulse falls within your target zone, your intensity is just right. If your heart rate is higher than the recommended upper range, reduce the intensity of your exercise. If your heart rate is lower than the recommended lower range, increase the intensity of your exercise.



*To see if you are in your THRZ, take your pulse immediately after you stop exercising.*

Experts recommend that you take your heart rate three different times during an exercise session. First, take a **warm-up** heart rate, or a pulse taken before actual exercise.

Second, take a workout heart rate just after you finish the hardest part of your aerobic exercise. (**Remember:** Your exercising heart rate should be in your THRZ, somewhere between 60 percent and 90 percent of your maximum heart rate.)

Finally, take your heart rate after your **cool-down**. This rate will show whether you have completely recovered from your workout.

## Recovery Heart Rate: How Quickly the Heart Returns to Normal

*Recovery heart rate* is the heart rate taken shortly after exercise. This measure can help indicate if your workout was too strenuous for your fitness level.

After five minutes of cool-down, your heart rate should be no more than 120 beats per minute. After 10 minutes, your heart rate should be 100 beats or less per minute. If your heart rate fails to drop to those levels, then perhaps you did not complete your cool-down. If your cool-down was complete, then perhaps your workout was too hard and needs to be easier.



## Heart Rate Response to Exercise

**Purpose:** To measure how your heart rate responds to a variety of situations. To keep track of your actual heart rate *before*, *during*, and *after* a workout.

**Materials:** stopwatch, jump rope, jogging track or area

### Procedure:

- Measure and record your heart rate in each of the situations and exercises listed.
- Measure your heart rate *during* each activity in which you do *not* move.
- Measure your heart rate *immediately after* each exercise.
- Count your pulse for 10 seconds. Take your pulse either at your carotid (neck) artery or at your radial (wrist) artery.
- Then multiply the number of beats counted by six. The product is your heart rate or beats per minute (BPM).
- Record your BPM in the spaces provided.

Heart Rate Response to Exercise	Heart Rate (BPM) 10-second pulse count x 6
1. Your RHR	
2. Sitting relaxed	
3. Standing	
4. Warm-up & stretch (3 minutes)	
5. Jumping jacks or pedal an ergometer (1 minute)	
6. Jogging in place or push your wheelchair (1 minute)	
7. Jump rope or wheel-chair pushups (1 minute)	
8. Jog or push your wheelchair (440 yards)	
9. Walk slowly & stretch (5 minutes)	
10. Relax & stretch (5 minutes)	



## Practice

Answer the following about what your **heart rate** was during these **situations** and **exercises**.

1. Was there any difference between your resting heart rate and your BPM while sitting? \_\_\_\_\_

Explain: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

2. Did standing up increase your BPM? \_\_\_\_\_

Why or why not? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

3. How did the warm-up and stretching affect your BPM? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Did the warm-up seem to gradually increase your BPM? \_\_\_\_\_



4. What was your BPM after performing 50 jumping jacks? \_\_\_\_\_

Is that what you would expect it to be? \_\_\_\_\_

Explain: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

5. Did jogging in place for a minute elevate your BPM to the training heart rate zone? \_\_\_\_\_

Why or why not? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

6. What was your BPM after jumping rope? \_\_\_\_\_

Did this increase your BPM to the target heart rate zone? \_\_\_\_\_

7. Did moving your body from one place to another, such as in jogging, affect your heart rate differently than staying in place, such as in doing jumping jacks? \_\_\_\_\_

Explain: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



8. What was your five-minute recovery heart rate? \_\_\_\_\_

Your 10-minute recovery heart rate? \_\_\_\_\_

Did your heart rate come down to at least 120 BPM after five minutes? \_\_\_\_\_

Why or why not? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Did your heart rate come down to at least 100 BPM after 10 minutes? \_\_\_\_\_

Why or why not? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



## Practice

Use the list below to write the correct term for each definition on the line provided.

<b>carotid artery</b>	<b>radial artery</b>
<b>cool-down</b>	<b>recovery heart rate</b>
<b>maximum heart rate</b>	<b>training effect</b>
<b>pulse</b>	<b>warm-up</b>

- \_\_\_\_\_ 1. refers to positive physical fitness changes in the body as a result of exercise
- \_\_\_\_\_ 2. the tapering-off period after exercise that allows the body to gradually return to a resting state
- \_\_\_\_\_ 3. the beat of the heart felt by the pressure of the blood on the artery walls
- \_\_\_\_\_ 4. a major artery on both sides of the neck; often used for measuring heart rate
- \_\_\_\_\_ 5. the artery on the inside of your wrist; can be used to measure your heart rate
- \_\_\_\_\_ 6. heart rate taken after exercise
- \_\_\_\_\_ 7. the highest number of times a person's heart can beat per minute; found by subtracting your age from 220
- \_\_\_\_\_ 8. exercises that increase the body's temperature and prepare it for more vigorous exercise





## Practice

*Circle the letter of the correct answer.*

1. The most important muscle in your body is your \_\_\_\_\_.
  - a. aorta
  - b. liver
  - c. heart
  - d. right lung
2. There are \_\_\_\_\_ chambers in your heart.
  - a. 5
  - b. 4
  - c. 3
  - d. 2
3. The blood vessels that carry blood *to* your heart are called \_\_\_\_\_.
  - a. arteries
  - b. veins
  - c. cells
  - d. capillaries
4. The blood vessels that carry blood *away from* your heart are called \_\_\_\_\_.
  - a. veins
  - b. cells
  - c. arteries
  - d. coronaries
5. The most important gas your blood carries to your body's muscles is \_\_\_\_\_.
  - a. carbon dioxide
  - b. nitrogen
  - c. oxygen
  - d. carbon monoxide



6. The major function of your heart is to \_\_\_\_\_.
  - a. pump bacteria out through your lungs
  - b. pump nitrogen through your body
  - c. keep germs out of your lungs
  - d. pump blood through your body
7. The movement of blood from your heart through your body and back to your heart is called \_\_\_\_\_.
  - a. digestion
  - b. respiration
  - c. gestation
  - d. circulation
8. You will be able to tell when aerobic exercise has strengthened your heart because your resting heart rate will become \_\_\_\_\_.
  - a. faster
  - b. softer
  - c. inconsistent
  - d. slower
9. You can tell how fast your heart beats by \_\_\_\_\_.
  - a. putting your hand on your stomach
  - b. counting your breaths
  - c. taking your pulse
  - d. all of the above
10. Heart disease is any disease that affects the \_\_\_\_\_.
  - a. heart
  - b. upper body
  - c. blood vessels
  - d. both *a* and *c*
11. Leading a healthy lifestyle while you are young will \_\_\_\_\_ your chance of having heart disease.
  - a. increase
  - b. decrease
  - c. reverse
  - d. not affect



12. People with heart disease often \_\_\_\_\_ .
- a. are overfat
  - b. smoke cigarettes
  - c. have hypertension
  - d. one or all of the above
13. Conditions that increase the chance of heart disease are commonly called \_\_\_\_\_ .
- a. bad habits
  - b. risk factors
  - c. heart stoppers
  - d. bad luck
14. You can easily and accurately take your pulse by pressing your \_\_\_\_\_ .
- a. carotid artery
  - b. finger against your thumb
  - c. radial artery
  - d. both *a* and *c*
15. When taking your pulse, you shouldn't use your \_\_\_\_\_ because it has its own pulse.
- a. index finger
  - b. ring finger
  - c. thumb
  - d. little finger
16. During exercise the cells of your muscles need extra nutrients and \_\_\_\_\_ .
- a. air
  - b. oxygen
  - c. carbon dioxide
  - d. tissue
17. Your maximum heart rate is about 220 beats per minute minus your \_\_\_\_\_ .
- a. pulse rate
  - b. oxygen ratio
  - c. exercising time
  - d. age



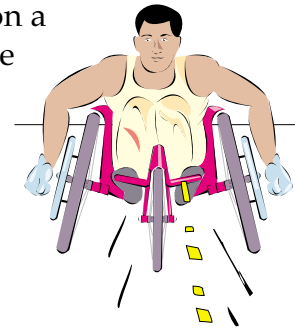
18. Your target heart rate zone is 60 percent to 90 percent of your \_\_\_\_\_ .
- a. exercise rate
  - b. resting heart rate
  - c. maximum heart rate
  - d. heart and lung rate
19. In order to gain cardiovascular benefits, your heart should beat at its target heart rate while you are exercising for at least \_\_\_\_\_ minutes.
- a. five
  - b. two
  - c. six to 10
  - d. 15
20. Of the following exercises, the *best* one to help you develop a stronger heart is \_\_\_\_\_ .
- a. volleyball
  - b. walking or jogging
  - c. football
  - d. weight lifting



## Determining Your Level of Aerobic Fitness

Many tests designed to measure cardiovascular fitness require special equipment and trained personnel. One such test performed in a doctor's office or hospital is called a *stress test*. A stress test measures your heart rate during and after strenuous exercise on a treadmill or stationary bicycle. A doctor then uses the results to evaluate your cardiovascular system.

However, there are easier ways to measure your level of cardiovascular fitness. These methods include distance runs and step tests.



### One-Mile Run/Walk

**Purpose:** To measure cardiovascular fitness (heart and lung endurance) by walking, jogging, or running a mile as fast as you can.

*Wheelchair adaptation*—push yourself in your wheelchair as fast as you can.

**Materials:** stopwatch, quarter-mile track or marked off jogging path

#### Procedures and Guidelines:

**Note:** You should only take this test *after* you have been exercising regularly for several weeks.

1. Warm up with a brisk walk or easy jog. Gently stretch all your major muscle groups. Drink water before beginning your test.
2. Begin the test at a pace, or speed, that you can maintain throughout the mile. Avoid starting out too fast and having to stop or slow down. Walking is permitted, but try to finish the mile in the shortest amount of time possible.



3. Do the best you can for your own current level of cardiovascular fitness. Avoid competing with others.
4. At the completion of the mile run, note your time in minutes and seconds.
5. Continue jogging slowly or walking for an additional lap (quarter mile) to cool down. Stretch all of your major muscle groups after you have cooled down to reduce muscle soreness.
6. Record your score and rating below.

One-Mile Run/Walk Ratings (minutes/seconds)			
Age	Male (minutes/seconds) Good—Better	Female (minutes/seconds) Good—Better	Fitness Zone*
13	10:00 - 7:30	11:30 - 9:00	Healthy
14	9:30 - 7:00	11:00 - 8:30	Healthy
15	9:00 - 7:00	10:30 - 8:00	Healthy
16	8:30 - 7:00	10:00 - 8:00	Healthy
17	8:30 - 7:00	10:00 - 8:00	Healthy
17+	8:30 - 7:00	10:00 - 8:00	Healthy
*Scores below age-appropriate numbers are considered low.			

1. What was your time on your mile run? \_\_\_\_\_
2. What was your rating on your mile run? \_\_\_\_\_
3. Did you perform better or worse than you expected? \_\_\_\_\_



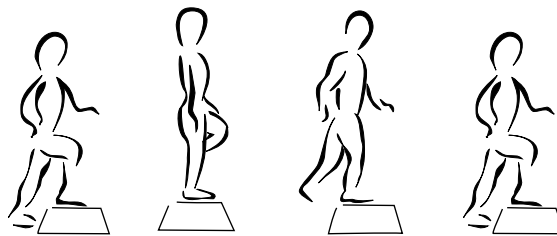
## Three-Minute Step Test

**Purpose:** To measure the heart rate as an indicator of your level of cardiovascular fitness.

**Materials:** 12-inch high step bench, metronome for accurate pacing, watch or timer, partner

### Procedures and Guidelines:

1. The step test is done by stepping up and down off a 12-inch step bench. Continue for three minutes to a rhythm of 96 beats per minute (bpm). Four clicks equals one step cycle for a stepping rate of 24 steps per minute. A *step* counts as stepping on to the bench or stepping off the bench.
2. Warm up and stretch the major muscle groups before the test. Practice stepping up and down off the bench for a few cycles as a warm-up. Step to a four-beat cycle—up, up, down, down.
3. You can choose which foot you will lead with during the test. Half-way through the test you may want to switch the lead foot.
4. When given the signal to begin, start stepping up and down off the step bench. Make sure to contact the bench with your whole foot. Keep your arms down by your sides and your body upright during the three-minute test. Do not talk during the test.





5. After three minutes, sit down immediately on the step and begin counting your pulse within five seconds. Find your pulse at your carotid (neck) artery and count the beats for one minute. Your partner will count your pulse at the radial (wrist) artery at the same time. It may help to close your eyes and take deep breaths to concentrate on the pulse rate.
6. Compare your one-minute recovery heart rate with your partner's count of your heart rate. Average them together for your answer if you both believe you took the pulse correctly. If one of you did not find the pulse or take it correctly, disregard those readings.
7. Record your one-minute pulse rate and rating below.

**Note:** A person's heart rate after exercise reflects the cardiovascular system's ability to recover from exercise.

Three-Minute Step Test Rating	
Recovery Pulse Rate Number of Seconds	Fitness Zone
less than 85	High
85-95	Healthy
120 or higher	Low

1. How did you feel after the three-minute step test? \_\_\_\_\_  
\_\_\_\_\_
2. What was your one-minute recovery heart rate? \_\_\_\_\_
3. Did your heart rate seem to lower quickly? \_\_\_\_\_





## Guidelines for Safe Aerobic Exercise: Smart Exercise

**Get medical clearance.** Make sure you are in good health prior to beginning an aerobic exercise program. If you have a pre-existing medical condition, get medical clearance from a physician before exercising.

**Warm up before exercise.** A *warm-up* is the beginning phase of exercise. It should include mild exercise and static stretching.



*Your warm up should include mild exercise and static stretching.*

The warm-up prepares the heart and lungs for more vigorous exercise. It also increases the blood flow to your working muscles.

**Wear loose, comfortable, layered clothing.**

Dress in layers of clothing for outdoor workouts.

You can then peel off clothing as you warm up.

Wear cotton or other porous materials that will allow sweat to evaporate.

**Wear appropriate footwear.** Shoes should be comfortable and not too small. Do not lace them too tightly. They should have good support and cushioning.

**Exercise on soft surfaces.** Try to exercise on soft, level surfaces such as a level grass field, a dirt path, a nature trail, or a track. Hard, uneven surfaces such as cement or rough fields are more likely to cause injuries.

**Exercise in a well-ventilated room.** Try to exercise in a room that is not too hot or too cold.

**Be cautious in hot, humid environments.** Adjust your exercise intensity and duration in hot, humid weather or poorly ventilated rooms.



*Your shoes should have good support and cushioning.*

**Drink water.** Drink water before, during, and after exercise to prevent dehydration and heat illness.

**Build your fitness gradually.** It takes times to get fit! Build up your level of activity gradually over the weeks. Be careful not to extend yourself too much right away. Many enthusiastic beginners have been side-tracked injuring themselves. Be patient!



**Listen to your body.** Pay attention to early warning pains. Too much exercise can cause injuries to your joints, feet, ankles, and legs.

**Check your intensity.** Take your pulse before exercise, immediately after the most intense portion, and after the cool-down.

**Be aware of signs of heat stroke.** Early signs include feeling dizzy, weak, lightheaded, excessively tired. Seek medical attention if you stop sweating or your body temperature becomes dangerously high.

**Jog using the correct technique.** If you walk, jog, or run, land on your heels. Then roll onto the balls of your feet. This will reduce the strain on your feet and lower legs.

**Avoid wearing rubberized or plastic exercise suits.** Such clothing will not help you lose weight any faster by making you sweat more. The weight lost will quickly be replaced as soon as you begin drinking fluids again. This type of clothing can cause dangerously high body temperatures, possibly resulting in heat stroke.



*Jog with correct technique.*

**Always cool down.** A cool-down is the tapering-off period after exercise that helps the body to *gradually* return to a resting state. The cool-down helps the body readjust to less strenuous physical demands. It also helps prevent blood from pooling in the muscles that have been active. The first part of the cool-down should include walking or another light activity. The last part should include static stretching.

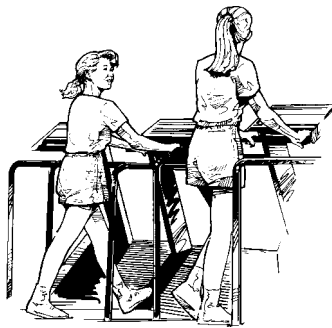


## Selecting Your Cardiovascular Program

Exercise that improves the condition of your heart and lungs must be brisk, sustained, and regular. Excellent cardiovascular programs include walking, jogging, swimming, bicycling, aerobics classes, rowing, and cross-country skiing. For an activity to be considered aerobic it must raise the heart rate and breathing rate. It must be performed continuously for at least 15 minutes. And it must be done at least three times per week.

### Considerations Before Choosing an Activity: A Checklist

**How physically fit are you?** Before choosing an activity, determine your health needs. What are your strengths and what are your weaknesses? Looking back to the fitness assessments will help you see the areas of fitness you should focus on most.



*Do you like to exercise with other people?*

**Do you like to exercise alone or with other people?** Many people like to be alone during physical activity. Others like to exercise with a group. Some people are more likely to stick to their exercise program if they exercise with others. You need to decide what type of person you are and select an activity that fits.

**Do you prefer to exercise outdoors or indoors?** Outdoor activities offer a variety of scenery and weather, which helps to prevent boredom. Indoor activities, such as stationary cycling, bench stepping, or jumping rope, can always be relied upon even if the weather can't be!

**Do you like sports and competition?** Your skill level can influence your success and participation in sports activities. If you enjoy competition, find a variety of sports activities in which you can participate. **Remember:** Exercise at your own level. Don't let the excitement of competition push you to over-extend yourself and risk injury.

What activities are available to you where you live? Do you live in an area that is safe to exercise outside alone? Are there programs in your area that support activities for your age group?



**Are you willing and able to purchase sports/fitness equipment or a membership in a health facility?** Some individuals need an instructor or coach to motivate them. There are many inexpensive public recreation facilities and physical activity classes. Private clubs cost more but may fit your needs. An activity such as fitness walking only requires buying a good pair of walking shoes.

## Aerobic Activities

The following programs will help you plan an aerobic exercise program that increases safely week by week. **Remember:** Do not begin a program at a level that is too difficult for your present fitness condition. Start slowly and work up to a more intense level. You have a lifetime to improve your fitness level.

### Fitness Walking: An Exercise for Everyone

Walking is a great cardiovascular exercise that can be done by nearly everyone anywhere! Walking is an everyday activity that you can make into a regular exercise program. Walking is a good way to develop and maintain fitness.

**Technique:** Stroll easily for the first five minutes of your walk to warm up your muscles and reduce your chance of injury. Stretch the muscles of your legs with static stretching. As you walk, keep your head up, eyes forward, and body upright. Gently contract your abdominal muscles, holding them in as you walk. Land on your heel, and roll heel to toe. Let your stride length come naturally. Increase your pace gradually. As you pick up the pace, thrust harder with your legs and arms. Let your elbows bend naturally (up to 90 degrees) as you swing your arms faster. Breathe deeply and naturally. Cool down by strolling leisurely. Finish your cool-down by static stretching the major muscles of your legs.



**Place:** Find a place where you can walk all the time. If outdoors, choose a smooth, soft surface. If weather prevents outdoor walking, find an indoor track, recreation center, or even a shopping mall.

**Attire:** A good pair of walking shoes is important. They should fit comfortably and have a roomy toebox. They should be light yet have a supportive arch.

Walking Calories Used per Hour			
Speed	75 lbs	100 lbs	150 lbs
2.0 mph	125	160	240
3.0 mph	175	210	320
4.5 mph	245	295	440
5.5 mph	365	440	740
7.0 mph	510	610	920

For example, a 100-pound person walking three mph should use the following formula: number of calories per hour (210) x number of hours ( $\frac{1}{2}$ ) = 105 calories.

10-Week Cycling Program				
Week	Distance (miles)	Time Goal (minutes)		Frequency per Week
		Female	Male	
1	5.0	30:00	28:00	3
2	5.0	28:00	25:00	3
3	5.0	27:00	23:00	4
4	6.0	34:00	26:00	4
5	6.0	30:00	24:00	4
6	7.0	38:00	30:00	4
7	7.0	35:00	28:00	4
8	8.0	48:00	35:00	4
9	8.0	44:00	34:00	4
10	8.0	< 40:00	< 32:00	4

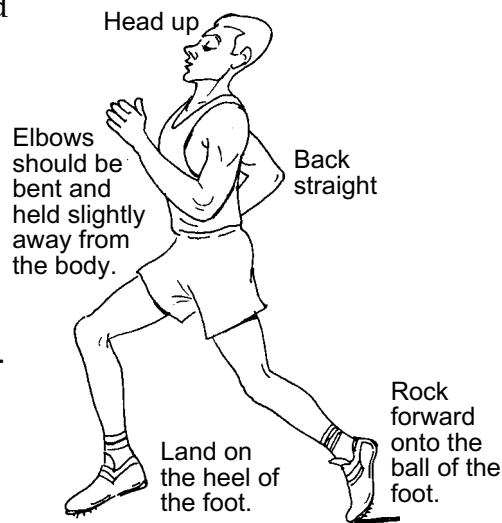
During the first four weeks, walk continuously but do not worry about distance covered.



## Jogging: An Exercise to Run for

Jogging is a great aerobic exercise that requires very little skill or expensive athletic equipment. You can run alone, with someone, or with a group of people. You can run year round, indoors or outdoors.

**Technique:** Jogging can be done by alternately walking and running at a slow to moderate pace. Jogging can also be done by running at a slow, even pace. Warm up by walking or with some light jogging and then stretch the leg muscles. When jogging, keep your head up and back straight. Elbows should be bent and held slightly away from the body. Land on the heel, then rock forward onto the ball of the foot. Avoid landing on the balls of the feet. This places too much strain on the lower legs. Slowly cool down by walking for about three minutes. Finish cooling down by doing static stretching for two minutes.



**Place:** Find a place where you can run all the time. For outdoor running, find a course with a smooth, soft surface. Fitness trails are often located in recreation parks and on school grounds. Fitness trails are established routes with exercise stations along the way. When the weather prevents outdoor running, run around a track at a health club or school.



**Attire:** Good running shoes are an important investment. Running shoes have thick, flexible soles that cushion the bottom of the foot. The soles also absorb shock of the rest of the body. This helps prevent injuries to the bones, ligaments, joints, and muscles.

Jogging Calories Used per Hour				
Activity	Speed	75 lbs	100 lbs	150 lbs
Jogging	5.5 mph	365	440	660
Jogging	7.0 mph	510	610	920
Running in place	0.0 mph	360	430	650
Running	10.0 mph	710	850	1280

For example, a 100-pound person running at 10 mph should use the following formula: number of calories per hour (850) x number of hours ( $\frac{1}{2}$ ) = 425 calories.

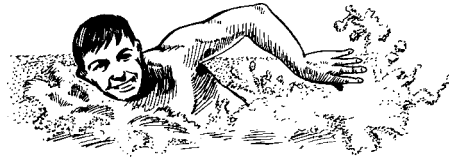
10-Week Jogging Program Progression					
Week	Activity	Distance (miles)	Time Goal (minutes)		Frequency per Week
			Female	Male	
1	walk	2.0	32:00	30:00	3
2	walk	3.0	48:00	45:00	3
3	walk/jog	2.0	26:00	24:00	4
4	walk/jog	2.0	24:00	22:00	4
5	jog	2.0	22:00	20:00	4
6	jog	2.0	20:00	18:00	4
7	jog	2.5	25:00	23:00	4
8	jog	2.5	23:00	21:00	4
9	jog	3.0	29:00	26:30	4
10	jog	3.0	< 27:00	< 24:00	4



## Swimming: An Exercise with a Cushion

Swimming is one of the most popular activities in this country. Swimming has several advantages that are not found in other sports activities. Water cushions the body. There is less stress put on bones, joints, and muscles than in some dry-land sporting activities. Regular swimming tones and strengthens the major muscles of the body, including legs, arms, back, and waist.

The resistance of the water is similar to exercising with weights. However, it is not considered a weight-bearing exercise and will not help with bone density problems.



**Technique:** Each swimming workout should begin with a five- to 10-minute warm-up. This can include flutter kicks, walking in the shallow end of the pool, or slow laps. Perform static stretches on the side of the pool after you warm up.

When starting out, begin with as many laps as you can, even if it's only one or two laps. As your body adjusts, you can increase the number of laps gradually. Focus on building your distance rather than speed, even if that means resting occasionally. Include a variety of swimming strokes. Alternate the crawl, backstroke, or butterfly with the breaststroke and sidestroke.

End your workout with a cool-down. Slowly swim two laps to help reduce your heart rate. Perform static stretching at the side of the pool after your heart rate has decreased. Always wait at least an hour after a heavy meal before you swim.

**Place:** Some people choose to swim in open water, but doing so subjects you to nature's elements. Always make sure there are lifeguards present. Be sure to check with the Marine Patrol, under





the Florida Fish and Wildlife Conservation Commission, for information regarding weather, tides, depth, current, undergrowth, marine life, and other factors that could affect your swim. When swimming at a pool, observe the rules and policies on lap sharing and using kickboards and fins. Don't swim alone. There should always be a lifeguard, or you should swim with a "buddy."

**Attire:** A good swimming suit is lightweight and made of nylon or a nylon blend. The suit should fit snugly to streamline your body but still be comfortable.

Swimming Calories Used per Hour				
Activity	Yards Per Min	75 lbs	100 lbs	150 lbs
Swimming per hr.	25	155	185	275
Swimming per hr.	50	270	325	500

For example, a 100-pound person swimming at 50 yds./min. should use the following formula: number of calories per hour (325) x number of hours (1) = 325 calories.

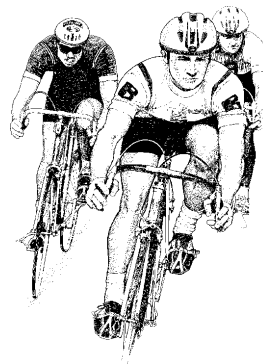
10-Week Swimming Program				
Week	Distance (yards)	Time Goal (minutes)		Frequency per Week
		Female	Male	
1	400	15:00	14:00	3
2	400	13:00	12:00	3
3	500	15:00	14:00	4
4	500	13:00	12:00	4
5	600	18:00	17:00	4
6	600	16:00	15:00	4
7	700	19:00	18:00	4
8	800	21:00	20:00	4
9	900	23:00	22:00	4
10	1000	< 25:00	< 24:00	4



## Bicycling: An Exercise That Takes You Places

Bicycling is a great way to keep fit and have fun. Bicycling is used for many different activities—shopping, getting to and from work or school, or just touring the trails on the weekends. Cycling can be done alone, with a partner, or with a group.

In some countries cycling is considered to be transportation and not exercise. In many countries people cannot afford cars and use bikes as transportation. Cycling would probably not be a choice of exercise or leisure activity in these countries.



**Technique:** Before riding, make sure that your bicycle seat height is adjusted properly. Adjust the handle bars to a position that suits your riding style. A trained technician at a local bicycle store can help you adjust your bicycle.

Begin with a warm-up, which could consist of slowly riding your bike. After you warm up, perform static stretches on the major muscles of your legs.

Start your ride at a moderate pace so your leg muscles can adjust to the increased activity. Learn to handle your bike well before attempting difficult situations such as heavy traffic or places with steep, winding roads. Be alert to holes or objects. Know the basics of bike safety. Pedaling needs to be steady, vigorous, and continuous to achieve real benefits. End your workout by slowing down gradually and stretching your leg muscles.



**Place:** Finding a regular place to ride helps you stick to your cycling program. Is there a scenic bike trail nearby that is away from automobiles? If you ride through city streets, take care to avoid dangerously busy intersections. Some cities now have special “bike traffic” lanes designated along major thoroughfares. Always follow traffic rules.

**Attire:** A sturdy, well-made bike and a hard-shell helmet are necessities. Dress for comfort and protection against the weather, chafing, and occasional spills. Heavier fabrics offer more protection from falls.

Cycling Calories Used per Hour				
Activity	Speed	75 lbs	100 lbs	150 lbs
Bicycling	6.0 mph	155	185	275
Bicycling	12.0 mph	270	325	500

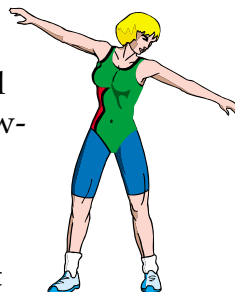
For example, a 150-pound person bicycling at 6 mph for 30 minutes should use the following formula:  
number of calories per hour (275) x number of hours ( $\frac{1}{2}$ )  
= 137.5 calories.

10-Week Cycling Program				
Week	Distance (miles)	Time Goal (minutes)		Frequency per Week
		Female	Male	
1	5.0	30:00	28:00	3
2	5.0	28:00	25:00	3
3	5.0	27:00	23:00	4
4	6.0	34:00	26:00	4
5	6.0	30:00	24:00	4
6	7.0	38:00	30:00	4
7	7.0	35:00	28:00	4
8	8.0	48:00	35:00	4
9	8.0	44:00	34:00	4
10	8.0	< 40:00	< 32:00	4



## Other Popular Aerobic Activities

**Aerobic Dance.** Aerobic dance is a fun, popular exercise program set to music. Aerobic classes design routines that incorporate combinations of dance steps and calisthenics. Aerobic classes can be either high-impact, low-impact, or a combination of both. High-impact aerobics includes bouncing, skipping, jumping, and running movements. Low-impact aerobics includes vigorous arm and upper-body movements with one foot kept in contact with the ground at all times. You can participate in these activities at home, on video, or at a fitness club or recreation center.



**Step Aerobics.** Step training consists of stepping up and down on a platform (four inches to twelve inches in height) while performing creative step combinations to music. This low-impact, high-intensity athletic activity appeals to both men and women of all ages.

**Water Aerobics.** Water aerobics uses the basic moves of traditional aerobics classes. However, these movements are performed in the water. Many aquatic classes include water walking, deep-water running, and aquatic bench stepping. They may also include muscle-toning and strengthening exercises with props.

**Rope Jumping.** Jumping rope is a perfect all-around aerobic exercise. It uses maximum energy and a minimum amount of space. Jumping rope can be simple and basic or made complex with advanced step patterns. It not only improves cardiovascular fitness, but develops coordination, speed, and agility as well.



**Slide Training.** Slide training is a form of aerobic and anaerobic conditioning using lateral movements. It is necessary to have a specially designed slide board that allows you to slide in a side-to-side motion similar to speed skating.

**Inline Skating.** Inline skating, often referred to as *roller blading*, is a fun activity that can be done almost anywhere. It involves wearing snow ski-type boots that have a row of three to five wheels underneath. The most important skill in successful skating is to keep your balance as you push



yourself forward. Learning to stop is another tricky skill. The side-to-side motion used to push forward gives your large muscle groups in the lower body a great cardiovascular and muscle-toning workout!

## Cardiovascular Machines



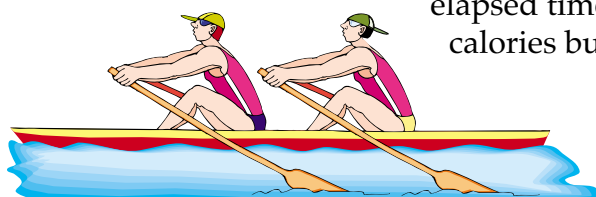
**Steppers.** High-tech steppers have become one of the most popular aerobic exercise machines for home and gym use. These machines work the lower body's large muscle groups. They give your heart and lungs an excellent workout. Steppers are much safer than running up stairs because they reduce impact stress to your joints. Better models have a readout monitor showing your time, speed, steps climbed, and calories burned. These models also let you select pre-designed programs.

**Stationary Bicycles.** Stationary bicycles come in several varieties. Some of these bikes are upright and similar to outdoor bikes. And some stationary bikes work your upper and lower body at the same time. Riding a stationary bike is a low-impact aerobic activity. Stationary bikes can be set at different levels of resistance to fit your needs. You can develop excellent fitness by riding a stationary bike. Better models include a readout of elapsed time, speed, and distance. Models may even include a readout of total calories burned and your heart rate.



**Treadmills.** Treadmills, also known as *running machines*, offer fitness walkers and runners a chance to tackle difficult slopes. Many of the better models can be programmed to change the difficulty of the hills automatically.

**Rowers.** Rowers simulate the workout of being on a rowing team. Rowing provides an excellent non-impact workout for nearly the entire body! Many models monitor your speed, strokes per minute, elapsed time, and total calories burned.





**Cross-Country Ski Simulators.** With a cross-country ski machine, you won't enjoy beautiful snowy landscapes, but this is a good way to exercise all the muscles in your upper and lower body. It takes some time to master the coordination needed for using a cross-country skier, but the effort is worth it! Cross-country skiing uses a great amount of body mass during the exercise, which means more energy and calories are expended. High-quality models let you adjust the level of difficulty. They also have

readouts of elapsed time, distance, calories burned, and heart rate. A more advanced cross-country type machine is called the elliptical trainer. The elliptical trainer combines the physical movements of cross-country skiing with the movements used on a stair climber, treadmill, and stationary cycle.

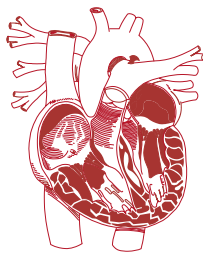


## Summary

Exercising your heart improves your health and wellness more than any other type of exercise. Having a fit and healthy heart improves your energy level, burns off body fat, and helps you to relax. A fit heart also reduces your risk for heart disease and improves your quality of life.

*Cardiovascular fitness*, or the body's ability to deliver oxygen to working muscles, is basic to all fitness programs.

The cardiovascular system, also referred to as the *circulatory system*, includes your heart, blood vessels, and blood. It is this system that circulates oxygen-rich blood to the muscles throughout your body. Your heart is the muscle that continuously pumps blood. It is the most important muscle in your body. The body cannot survive for long once the heart stops beating.



Blood passes through the lungs and picks up oxygen. This oxygen-rich blood then enters the left side of the heart. This side of the heart pumps it out through a large blood vessel, the *aorta*. The blood then continues through the smaller blood vessels called *arteries* to all parts of the body. As the blood delivers oxygen to the muscles, it picks up waste. This waste-filled blood flows to the right side of the heart. The heart then pumps this oxygen-empty blood to the lungs, where it exchanges its waste for oxygen. The blood then returns to the left side of the heart and repeats its circular route.

A fit cardiovascular system efficiently circulates oxygen-rich blood through the body. Having a strong cardiovascular system helps you feel better, look better, and reduces your risk of heart disease. Staying fit helps control *risk factors* for heart disease such as *high blood pressure* and high *cholesterol*. Not smoking, staying at the proper body weight, reducing stress, and being physically active all help reduce your risk of heart disease and keep you healthy.

*Aerobic exercises* are the best types of activities to aid cardiovascular fitness. Aerobic exercises are continuous activities that use the large muscle groups. They create an increased demand for oxygen. The increased need for oxygen-rich blood raises your *heart rate*. There are many ways to



exercise your heart. Walking, jogging, swimming, bicycling, aerobics classes, inline skating, and cross-country skiing are all *aerobic* exercises. Aerobic exercise improves your body's ability to use oxygen.

By monitoring your *pulse* when you exercise, you can be sure you are working in your *target heart rate zone*. The target heart rate zone is 60 percent to 90 percent of your *maximum heart rate*. Exercising in this zone will develop your aerobic fitness.

You will notice a drop in your resting heart rate as your fitness level improves. You will find yourself recovering from exercise more quickly. You will also find that you are able to do more work with less effort.

Factors such as age, gender, race, ethnicity, socioeconomic standing, and culture affect people's decisions about participation in exercise activities. However, no matter who you are or where you live, exercise opportunities are available.

The lifestyle you lead today will affect your health in future years. Treat your heart and body properly, and you can be rewarded with good health! Regular aerobic exercise can lengthen your life and also improve the quality of your life. Have a healthy heart!





## Practice

*Answer the following using short answers.*

1. What is the beginning phase of any exercise that involves mild or light movements and gentle static stretching? \_\_\_\_\_
2. What type of activities do not use oxygen for energy and can only be performed for a short period of time? \_\_\_\_\_
3. What are two ways to test cardiovascular fitness? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
4. What is the best indicator of the intensity of your workout? \_\_\_\_\_  
\_\_\_\_\_
5. What is the leading cause of death in the United States? \_\_\_\_\_  
\_\_\_\_\_
6. What is a fat-like substance found only in animal tissue that can clog or narrow arteries? \_\_\_\_\_
7. Why is it dangerous to exercise in a rubber or plastic suit? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



8. What are some of the benefits of a proper cool-down? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
9. How long does it generally take the heart rate to return to 120 beats per minute or below after exercise? \_\_\_\_\_
10. What are three aerobic exercises? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
11. What are the unique advantages of swimming? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
12. In order to achieve real cardiovascular benefits in bicycling, how must you pedal? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



## Practice

Write **True** if the statement is correct. Write **False** if the statement is not correct.

- \_\_\_\_\_ 1. The target heart rate zone during exercise for young adults should fall between 60 percent and 90 percent of the maximum heart rate.
- \_\_\_\_\_ 2. Three days per week is the minimum number of aerobic exercise sessions needed to develop cardiovascular fitness.
- \_\_\_\_\_ 3. Cardiac output is the amount of blood pumped by the heart in one minute.
- \_\_\_\_\_ 4. Adaptation to aerobic activity occurs during a single session of exercise.
- \_\_\_\_\_ 5. The heart's function is to pump blood.
- \_\_\_\_\_ 6. When the resting heart rate is low, less oxygen is delivered to the muscles.
- \_\_\_\_\_ 7. Arteries carry blood away from the heart.
- \_\_\_\_\_ 8. To take your pulse, use your thumb and find a vein in either your neck or your wrist.
- \_\_\_\_\_ 9. Smoking is one of the risk factors for heart disease.
- \_\_\_\_\_ 10. You must reach your maximum heart rate if you wish to achieve a training effect.
- \_\_\_\_\_ 11. Doing 20 push-ups daily is one of the best methods for achieving cardiovascular endurance.
- \_\_\_\_\_ 12. Aerobic exercise promotes cardiovascular fitness better than any other type of activity.
- \_\_\_\_\_ 13. Cardiovascular disease is the number one killer in the United States.



- \_\_\_\_\_ 14. Coronary artery disease is a condition that causes hardening and narrowing of the coronary arteries, reducing blood flow to the heart.
- \_\_\_\_\_ 15. High blood pressure and high blood cholesterol are risk factors that you cannot control.
- \_\_\_\_\_ 16. Age, heredity, and gender are risk factors for heart disease that you cannot control.
- \_\_\_\_\_ 17. Your pulse is the beat of the heart felt by the pressure of blood on the artery walls.
- \_\_\_\_\_ 18. A person in good cardiovascular condition usually has a higher than average resting heart rate.
- \_\_\_\_\_ 19. Your recovery heart rate can be used as an indicator of whether your exercise session was too intense and needs to be reduced.
- \_\_\_\_\_ 20. The one-mile run and three-minute step test are effective methods of assessing your cardiovascular fitness.
- \_\_\_\_\_ 21. Try to exercise on soft, level surfaces such as a level grass field, a dirt path, nature trail, or running track.
- \_\_\_\_\_ 22. If you walk, jog, or run you should land on the balls of your feet.
- \_\_\_\_\_ 23. The carotid artery is on both sides of the neck and often used for measuring heart rate.



## Practice

Use the list below to complete the following statements.

cool-down  
hypertension  
older

overload  
recovery heart rate  
resting heart rate

risk factor  
training effects  
warm-up

1. The \_\_\_\_\_ prepares the heart and lungs for more vigorous exercise.
2. An increase in blood pressure above its normal range is called \_\_\_\_\_.
3. A habit or condition that may increase an individual's chance of developing an illness or disease is called a \_\_\_\_\_.
4. A \_\_\_\_\_ is the tapering off period after exercise that helps the body to *gradually* return to a resting state.
5. One important heart rate is your \_\_\_\_\_, or your heart rate shortly after exercise.
6. Another important heart rate is your \_\_\_\_\_, or the rate at which your heart beats per minute while you are at total rest.
7. The \_\_\_\_\_ you get, the more susceptible you are to having a heart attack.



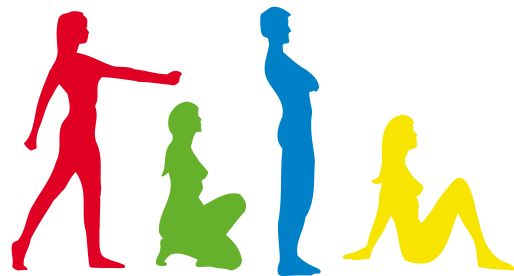
8. The four principles of \_\_\_\_\_ are frequency, intensity, type, and time (F.I.T.T.).
9. \_\_\_\_\_ are the positive physical fitness changes in the body that occur as a result of exercise.

## Unit 6: Consumer Health Issues

This unit describes the facts and fallacies of consumer health issues. Students will learn what an informed consumer is and how to become one. Students will also learn to understand their buying habits so that they can become better-informed consumers.

### Unit Focus

- definition of an informed consumer
- what influences your buying decisions
- avoiding a rip off
- common fitness fallacies
- fad diets and weight loss drugs
- performance-altering drugs
- health clubs and how to find the right one for you



## **Fitness Career Opportunity**

### **Sports-Medicine Physician**

Sports-medicine physicians practice in sports-medicine clinics or work as team physicians. They treat sports-related injuries and help educate athletes in the prevention of injuries. Most sports-medicine physicians specialize in orthopedic surgery. An orthopedist treats muscular and skeletal injuries. Employment outlook is very good for this medical field.

For more information on sports-medicine physicians, contact:

American Sports Medicine  
Association Board of  
Certification, Inc.  
660 West Duarte Road,  
Ste. 1  
Arcadia, CA 91007  
(818) 445-1978

American Academy of  
Orthopaedic Surgeons  
6300 N. River Road  
Rosemont, IL  
60018-4242  
(800) 346-2267  
[www.aaos.org](http://www.aaos.org)

American Medical Society  
for Sports Medicine  
(AMSSM)  
11639 Earnshaw  
Overland Park, KS 66210  
(913) 327-1415  
[www.amssm.org](http://www.amssm.org)

American College of  
Sports Medicine (ACSM)  
401 W. Michigan St.  
Indianapolis, IN 46202-3233  
(317) 637-9200  
[www.acsm.org](http://www.acsm.org)





## Vocabulary

*Study the vocabulary words and definitions below.*

<b>active exercise equipment</b>	..... exercise devices that require a person to use muscle power and aerobic energy
<b>anabolic steroids</b>	..... an artificial version of testosterone, the male sex hormone that stimulates muscle growth
<b>appetite suppressants</b>	..... drugs that block feelings of hunger
<b>cellulite</b>	..... a term used to describe the dimpled, bumpy fat that often appears on the hips, thighs, and buttocks
<b>consumer</b>	..... any person who buys products and services
<b>dehydration</b>	..... unhealthy loss of fluid from the body's tissues
<b>diuretics</b>	..... drugs used to increase the amount of fluids lost through urine
<b>ergogenic aids</b>	..... substances or techniques that claim to enhance a person's performance
<b>fad</b>	..... a practice or interest that, for a short time, is followed enthusiastically by many people
<b>fad diet</b>	..... a diet based on unsound nutritional practices



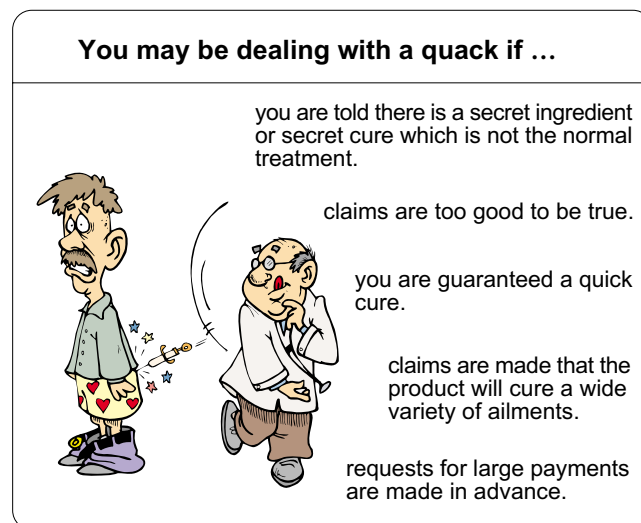
- metabolic rate** ..... a measure of how fast your body burns energy, or calories
- passive exercise equipment** ..... exercise devices that do the work for a person; they do not build fitness or help the user lose weight
- quackery** ..... dishonest, false practices or claims made by untrained persons pretending to have scientific knowledge
- sauna** ..... a steam bath treatment in which the bather is subjected to heat and steam produced by pouring water over heated rocks
- spot reduction** ..... a fallacy stating that exercising muscles in a particular area of the body will remove fat from that area
- stimulants** ..... drugs that cause an increase in heart rate and blood pressure and decrease appetite; often used to enhance performance, increase alertness, and delay fatigue
- testosterone** ..... a male sex hormone
- thyroid hormones** ..... drugs used to control problems that may cause weight gain or other medical problems



## Unit 6: Consumer Health Issues

### Introduction

Nearly every week there is a new advertisement for a quick and easy way to lose weight or get in shape. You can see an ad on TV about magic pills that melt away the fat on your body no matter how much ice cream you eat. You can read in a magazine about a vibrating machine that can massage the fat right off your hips. You can hear on radio about an electric exercise machine that moves your legs for you so you can burn hundreds of calories without doing any work. With all of these simple ways to get fit “just a phone call away,” you would expect everyone in America to be fit and trim. Well, all of those ads that seem too good to be true really are just that: too good to be true.



Many people believe these and many other false claims. The more we want a claim to be true, the easier it is for us to believe it is true. Finding a pill that will let us eat endlessly without gaining weight is the kind of claim that answers our wildest dreams.

Dishonest people prey on our hope that fabulous and magical products will

work. These people engage in a practice called **quackery**. Quackery uses false practices or claims made by untrained persons pretending to have scientific knowledge. *Quacks* and *hucksters* are people who try to cheat people out of money by convincing them to buy gimmicks and gadgets. *Gimmicks* are attention-getting devices used to cheat, deceive, or trick. *Gadgets* are unnecessary mechanical devices that make a product seem “advanced” or “hi-tech.” Both are ways to get people to buy products. Millions of people fall for quackery and are ripped off. Quackery is the basis of some very big and profitable businesses.



Teenagers are often taken in by quackery. During our teen years, we have a particularly strong wish to look attractive. Teenagers are likely to believe in a quick fix that will make them look more attractive. Teenagers also want to believe that a product can make them look more masculine or feminine.

**Consumers**, or people who buy products and services, spend billions of dollars on fitness, health, and weight-loss products each year. Almost all of us will be a consumer of health and fitness products at some time in our life. Although some products are worthless, many health products can be helpful and improve your fitness. How can we become wise consumers when searching for health products?



We can use a little bit of knowledge to protect ourselves from products that don't work. Knowledge can help us choose those products that will help us reach our fitness goals. And knowledge will help us recognize those products that offer nothing but an empty promise.

Before you read any further in the unit, stop and test your consumer awareness of fitness, health, and weight-loss claims or products on the following page. Read each statement very carefully. Think about what you already know and what you have been told by others. Good luck!



## Practice

### Consumer Health Issues Pre-Test

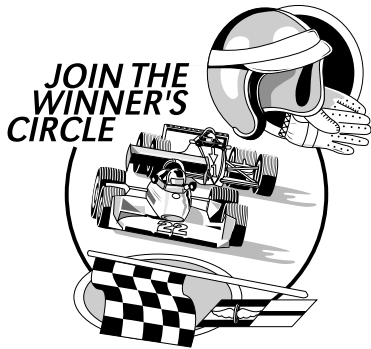
**Purpose:** To test your consumer awareness of fitness, health, and weight-loss claims or products.

Write **True** if the statement is correct. Write **False** if the statement is not correct.

- \_\_\_\_\_ 1. Eating extra protein or taking vitamin or mineral supplements will help you build bigger and stronger muscles.
- \_\_\_\_\_ 2. Diuretics help you lose fat by getting rid of fluids in your body.
- \_\_\_\_\_ 3. Rubberized sweat suits speed up your rate of sweating and help you lose fat.
- \_\_\_\_\_ 4. Electric stimulators, body wraps, constricting bands, and saunas will help you lose fat.
- \_\_\_\_\_ 5. Anabolic steroids are a safe way to increase strength and lean muscle mass.
- \_\_\_\_\_ 6. Massage not only loosens up tight muscles but helps to break up fat.
- \_\_\_\_\_ 7. You can get rid of fat in a particular area of your body by using the latest fitness gadget.
- \_\_\_\_\_ 8. Name-brand athletic gear always offers more value than athletic gear that is *not* a name brand.
- \_\_\_\_\_ 9. Advertisements for products shown on TV are guaranteed to be legitimate.
- \_\_\_\_\_ 10. Passive exercise devices are the most effective products for fitness and weight loss.
- \_\_\_\_\_ 11. Fad diets are a healthy way to lose weight and keep it off.



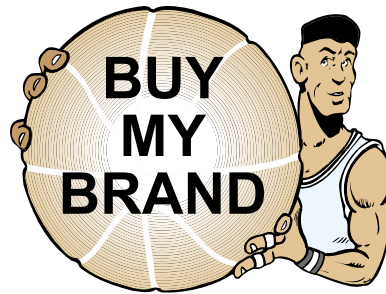
## What Influences Your Buying Decision?



Do you buy athletic gear, clothes, and other fitness items because your favorite professional athletes wear them or endorse them in advertisements? Do you buy certain name-brand health and fitness products because everyone else buys them? Do you compare all brands of health and fitness products? Do you then make your selection on which ones give you the best value for your money? To become a wise consumer, you must begin to understand the different reasons we buy products and services.

### Celebrity Testimonials: The Famous Face

Consider what many of us feel when we see a star athlete selling athletic gear on TV. We respect and like these sports heroes. We would like to believe that these athletes advertise only high-quality products that improve performance. But this is not often the case. Rarely do celebrities have anything to do with the design or testing of products. Most often, athletes endorse or sell products because they are being paid huge amounts of money. Some star athletes get paid more money to endorse products than they do to play their sport.



Who pays star athletes millions of dollars to endorse products?

You do—every time you buy a product these celebrities are pushing. The cost of having professionals endorse a product can easily double its price!

*Some star athletes get paid more money to endorse products than they do to play their sport.*

#### Smart-Consumer Rule #1

Smart consumers do *not* let professional endorsements persuade them to buy a product.



## Peer Pressure: Following the Crowd

Not only are many people influenced by celebrity advertisements, they are also influenced by their friends. Teenagers are often persuaded by their *peers*—their classmates and friends—to buy a certain name-brand product. One year everyone is wearing a certain make of basketball shoe or sweatshirt. The next year everyone seems to be wearing a certain make of athletic shorts or T-shirts. It feels good to “fit in” with a group and conform to what your friends are doing.



*It feels good to “fit in” with a group and conform to what your friends are doing.*

You may want to buy health and fitness items in order to fit in with the crowd. If so, be aware of the reason why you are buying a certain product. Do not fool yourself into believing that you are making your decision strictly on the quality or value of the product. The next time you desire something, ask yourself these questions before you buy.

- Am I buying this item because everyone else has bought it?
- Is it a **fad** that will soon be out of fashion? A *fad* is a practice or an interest followed by many with great enthusiasm. Fads are short-lived. (Check your closet or garage for products that were once fads. After a few weeks or months, you lost interest and “retired” the items to a place where they now take up space.)
- Am I getting the best product or value for my money?
- Am I spending more money than necessary just for a certain name-brand item?

### Smart-Consumer Rule #2

Smart consumers buy a product because it fits their needs and offers them value, not because everyone else is wearing or using it. Consumers who are independent thinkers and do *not* always follow the crowd often make wise consumers.



## Avoiding a Rip Off

When you are *ripped off*, you are being sold a product or service that is over-priced or even worthless. Protect yourself against rip offs. Learn to recognize ads that use false information or clever language to persuade you to buy a product.



A smart consumer knows how to separate fact from fallacy. A *fallacy* is a false or mistaken idea, often the result of deception or inaccurate information.

Techniques that will help you separate fact from fallacy include the following.

- Develop a questioning attitude. Ask yourself if the facts support the claims being made.
- If the claims sound too good to be true, they probably are! For example, does the product claim to have a secret ingredient? Does it claim to be good for almost anything? Is it available only from a particular source with payment in advance? Beware of advertisements that play on your emotions and your desire to believe in a magic product.
- Ads frequently use “evidence” that is based on opinion. Unfortunately, people making claims in ads are being paid by the company that makes the product. Many companies use stars or celebrities to make their products appear more attractive.
- Claims should be backed up with repeated studies that can be confirmed. Does the advertisement include a number or address that you can contact to check on the studies or findings mentioned? Is the study available to consumers? Are the persons who did the study qualified to do research in this particular area?
- Examine the qualifications of the people giving you advice. Even physicians often endorse products for money, not because they believe in the product.





- Seek advice from professionals whom you trust to help you analyze the claims being made.
- Be aware that quacks often encourage people to distrust health professionals such as doctors and registered dietitians.
- Beware of ads that promise...
  - ... to save you money and time.
  - ... “guaranteed satisfaction or your money back.”
  - ... you will “see quick and easy results without diet or exercise.”
  - ... “no side effects.”
  - ... to “flatten and firm your stomach in just minutes a day.”
  - ... to “burn several inches off” various body parts.
  - ... a “new scientific breakthrough.”
  - ... “instant success.”
  - ... to “slim the thighs in just minutes a day.”
  - ... “to melt off fat effortlessly.”
  - ... a “unique weight-loss system.”
  - ... to “burn fat and boost metabolism.”
  - ... to “increase your energy and fitness.”

## Fitness Gimmicks and Gadgets: Empty Promises and Devices

The news media bombards us with advertisements of fitness and weight-loss products that guarantee to change our bodies from “spud” to “stud” with little effort or time! The different forms of news media include newspapers, magazines, TV, and radio.

Many fitness products are promoted by hucksters and quacks who try to cheat others out of money. They try to sell





products that are worthless. Hucksters and quacks are not qualified to make claims about these products. These products fall far short of their makers' claims. Gimmicks and gadgets are a waste of your time and money.

### Passive Exercise Equipment: Too Good to Be True

Exercise equipment can be classified as either *active* or *passive*. **Active exercise equipment** requires your body to do the work. When you use items such as stationary bicycles, stairsteppers, treadmills, rowing machines, or weight machines, you exercise your body. Using active equipment is an effective way to improve your fitness.

On the other hand, **passive exercise equipment** does all the work for you. This kind of equipment can also be called *no-effort exercise equipment*. However, there is no such thing as no-effort exercise that can improve your fitness. Passive exercise equipment does not build fitness or help you to lose weight. Passive exercise equipment includes items such as body wraps, rubberized sweat suits, inversion boots, and electric bicycles. Passive devices are essentially a waste of time and money. Let's take a look at these passive devices and their empty promises.

**Body Wraps.** Some health clubs feature body wraps as a way to lose weight. They claim that being wrapped with tapes soaked in a special solution will dissolve several inches of body fat. However, any weight that a person loses from this method is due to fluid loss. Fluid loss is only temporary. **Dehydration**, an unhealthy loss of body fluids, and heat illness can result from this method. Wraps do not promote the loss of fat, and they can be dangerous.

**Constricting Bands.** Constricting bands are placed around a specific body part, such as the waist, in an attempt to trim that area. These items give you the illusion of losing fat by squeezing water out of your tissues. Like the fluids lost by using body wraps, the water lost from constricting bands is quickly replaced with your next drink. These items do not work and can be dangerous.

**Electric Bicycles.** The workout on an electric bicycle is minimal. All an individual has to do is hang on as a motor turns the pedals. The electric cycle does all of the work. The electric bicycle does not produce a fitness training effect or loss of weight.



**Inversion Boots.** Inversion boots are strapped around the ankles and allow a person to hang upside down. They claim to stretch the spine, improve muscle tone, improve mental function, and relieve stress. Inversion boots have been shown to be dangerous. They increase blood pressure and cause the heart to beat abnormally.

**Plastic or Rubberized Sweat Suits.** These insulated sweat suits keep the body from getting rid of heat during exercise. Rubberized sweat suits block the body's ability to cool itself. They cause an increase in water loss. Quick water loss makes the body quickly feel tired and exhausted. The fluid lost will be replaced with your next drink. These sweat suits can cause two dangerous conditions: dehydration and heat illness.

**Steam or Sauna Bath.** The temperature and humidity in steam rooms are high, which causes a person to sweat a lot. A steam bath should never be taken immediately after exercising. Steam baths keep the body from getting rid of the body heat created during a workout. In addition, steam baths will cause your body to lose even more body fluids after exercising. This can be very dangerous.



*Always drink plenty of cool liquids before using a steam room.*

Always cool down and drink plenty of cool liquids before using a steam room. While the moist heat of steam baths can help ease the ache of sore muscles, this does not contribute to real weight loss. Any loss of weight in a steam room is due to fluid loss and is replaced with the next drink.

The **sauna** features high temperatures but very low humidity. Sweat does evaporate, but the high heat and high sweat rate make it dangerous to use immediately following exercise. Many people claim that sweating cleanses or removes toxins from the body. However, losing a large amount of sweat also means losing a large amount of important substances found in sweat. If you use a sauna, be sure to drink plenty of cool fluids. The sauna and steam bath are ineffective weight-loss techniques.

**Electric Stimulators/Toning Beds.** Electric stimulators are machines that cause a mild electric current to move muscles and increase circulation. These devices do not enhance weight loss or increase muscle tone. They can be dangerous.



**Thigh, Buttock, or Stomach Reducers.** A device that promises to melt away the fat with no effort is a definite rip off! There are no special appliances that can accomplish **spot reduction** or the elimination of fat from your problem areas. Ads that make this guarantee are making false and dishonest claims.

**Bust Developers.** These devices promise females that their breasts will become bigger through certain exercises. It is true that certain weight training exercises for the chest can improve the appearance of breasts. These exercise firm and tone the muscles underneath the breasts. But, short of surgery, nothing can be done to increase the size of the actual breasts themselves.

**Vibrating Exercise Belts.** Exercise belts consist of a wide strap of material attached to an electric motor. The belt is placed around a body part that is to be reduced. Supposedly, the belt vibrates, shakes, or massages fat from the body. These devices do not break up fat or help you to lose weight. They are a waste of time and money.

**Massage.** A massage may make you feel good, be great for relaxation, and help loosen up tight muscles. However, massage does not break up fat and is useless for weight loss. There is no proven method for kneading, beating, slapping, or rubbing fat off the body!



*There is no proven method for kneading, beating, slapping, or rubbing fat off the body!*

Devices that make you work and allow you to apply the training principles of physical fitness development are worthwhile. The no-effort approaches to fitness and weight control, however, are a waste of time and money. Gimmicks and gadgets that promise fitness, firmness, and weight loss effortlessly in just a few minutes a day are a rip off. The ways to acquire fitness and weight loss require time, patience, and effort.



## Practice

Use the list below to write the correct term for each definition on the line provided.

active exercise equipment  
consumer  
dehydration  
fad

passive exercise equipment  
quackery  
sauna  
spot reduction

- \_\_\_\_\_ 1. unhealthy loss of fluid from the body's tissues
- \_\_\_\_\_ 2. a steam bath treatment in which the bather is subjected to heat and steam produced by pouring water over heated rocks
- \_\_\_\_\_ 3. a practice or interest that, for a short time, is followed enthusiastically by many people
- \_\_\_\_\_ 4. dishonest, false practices or claims made by untrained persons pretending to have scientific knowledge
- \_\_\_\_\_ 5. exercise devices that do the work for a person; they do not build fitness or help the user lose weight
- \_\_\_\_\_ 6. exercise devices that require a person to use muscle power and aerobic energy
- \_\_\_\_\_ 7. any person who buys products and services
- \_\_\_\_\_ 8. a fallacy stating that exercising muscles in a particular area of the body will remove fat from that area



## Common Fitness Fallacies: Separating Fact from Fiction

Advertisements lead people to believe many fallacies about the ways to achieve health, fitness, and weight loss. *Fallacies* are false or mistaken ideas. The wise consumer learns the common fallacies used to sell fitness, health, and weight-loss products.

**Fallacy:** If I do enough repetitions with a special device, I can “spot reduce,” or burn the fat off that area of the body.

**Fact:** Performing endless repetitions using the latest thigh melter or abdominal exerciser will not trim fat in those areas. We cannot reduce body fat from a selected part of the body through exercise. The way fat is distributed in our body is due to our genetics, a kind of master blueprint that each of us is born with. Exercising a specific body part can increase muscle tone and firm up that particular area. However, even though the muscle may become stronger, no one will notice if it is buried under a layer of fat.

The only way to reduce fat and tone up your body is with regular vigorous exercise that is continuous for at least 20 minutes and involves entire body movement. An effective plan for reducing overall body fat includes a combination of low-fat eating, aerobic exercise, and muscular fitness activity.

**Fallacy:** **Cellulite** is a special kind of fat that can be specifically targeted.

**Fact:** Cellulite is a term coined to describe the dimpled, bumpy fat that often appears on the hips, thighs, and buttocks. Cellulite is nothing more than a lot of fat in certain areas with a slightly different skin texture. This stubborn fat has inspired various therapies, from liposuction (surgical removal) to massage, body wraps, and, most popular of all, “anticellulite” creams. These creams affect only the skin’s appearance and have absolutely no effect on the fat itself. No cosmetic product can change the structure of your body. A poor diet and lack of physical activity can result in poor



muscle tone and excess weight gain. This can cause more fat in specific areas of the body. This excess fat creates a cottage cheese appearance.

Where the additional fat is located depends upon your genetics. Females typically have extra layers of fat on the hips and thighs. Males usually gain fat in the abdominal region.

Instead of worrying about those specific areas, try getting involved in total body aerobic exercises. This will help burn fat all over the body. Aerobic exercise is the only way to rid excess fat from the body.

**Fallacy:** If I wear a rubberized sweat suit or body constricting bands when I work out, I will lose more weight.

**Fact:** There are many products such as rubberized sweat suits that claim to assist you in losing weight. However, a high volume of sweat loss does not equal a high amount of fat lost. When you work out, especially in a hot or humid environment, your body attempts to cool itself by sweating.

The weight you lose while sweating comes from water loss, not fat. That temporary weight loss will be replenished as you drink. If you lose too much water, you will risk dehydration and heat illness. This causes a lack of energy and early fatigue.

Exercising in clothing that does not allow the skin to breathe is dangerous. You should wear clothing that allows your sweat to evaporate and thus allows your body to keep cool.

It is important to drink plenty of water before, during, and after physical activity to prevent overheating and dehydration. Staying cool during exercise helps you last longer and perform better.



**Fallacy:** Fashion in our culture tells us that thin individuals are the ideal, “model” body type.

**Fact:** The model ideal presented by the media is, in fact, an unhealthy standard. Many of today’s models suffer from eating disorders, malnutrition, poor muscle tone, and fitness. There are many health risks associated with this lifestyle. Skinny does not necessarily mean healthy or fit. People can look thin but have a high percentage of body fat. You may be at the appropriate body weight or even lower than the weight standards suggest, yet you may be very flabby and out-of-shape!

Looks can be very deceiving. Good health and fitness require regular exercise and proper nutritional habits.

**Fallacy:** If I eat only low-fat foods, I won’t gain weight.

**Fact:** Many low-fat products on the market are designed for health-conscious individuals. Fancy advertising claims falsely mislead people into believing that they can eat unlimited low-fat foods and not worry about counting calories or gaining weight.

Low-fat does not necessarily mean low calorie, healthy, or nutritious. Many such products are actually loaded with sugar and calories and often offer little nutrient value.

## Fad Diets: A Losing Strategy That Leads to Weight Gain

Most people who want to lose fat think the solution is to find a diet that promises quick weight loss. Americans are willing to pay nearly any price and try any quick-fix method to lose body fat. So Americans continue to buy the endless products and **fad diets** on the market that promise to get rid of fat. However, the only answer is a lifetime commitment to regular exercise and a low-fat diet.







*Fad diets* promote weight loss *without* using sound nutritional practices. Most fad diets severely limit the number of calories a person takes in daily. When the body does not get enough calories, it begins to feed upon itself. However, instead of feeding on its fat, the body feeds on its muscle protein for fuel. While on most fad diets, a person loses mostly muscle and water—with relatively little loss of body fat.

While some diets may result in a temporary weight loss, most do not result in permanent fat loss. They can also be hazardous to your health. Scientists have shown that fad diets actually slow your **metabolic rate**. The *metabolic rate* is a measure of how fast your body burns energy, or calories. When you *significantly* decrease the amount of food you normally eat, your body slows the rate at which it burns calories. If you don't increase the amount you exercise, a fad diet may actually cause your body to gain fat!

There are no quick-fixes to healthy and permanent weight loss. Do not believe the advertising of crash diets, drugs, or any “miracle cures” that promise quick weight loss. Temporary diets produce temporary results.



Excess pounds gained on the body have been gained slowly through poor eating habits and lack of exercise. Likewise, permanent weight loss is also a slow process consisting of regular exercise and proper nutrition.

## Drugs Used for Weight Control: Harmful Side Effects

**Appetite suppressants** and **thyroid hormones** are two general categories of drugs commonly used by doctors to treat overweight or obese people.

Appetite suppressants are drugs designed to keep people from feeling hungry. Thyroid hormones are drugs used to treat individuals with thyroid problems that may cause weight gain or other medical problems. These drugs are believed to increase the body's metabolic rate.

These drugs can be used safely when used under a doctor's care. However, these drugs can be dangerous when misused. They have unpleasant or dangerous side effects such as insomnia, dizziness, depression, nausea, and an increase in heart rate. They can also be habit-forming.

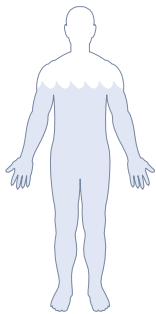




Research has shown that very few overweight or obese individuals have a hormone problem. Most people are overweight or obese simply because they have poor nutritional and exercise habits.

### **Diuretics: Leading to a Dangerous Loss of Water**

**Diuretics** are drugs used to increase the amount of fluids lost through urine. Many individuals take diuretics to increase the amount of water their bodies eliminate. They believe that water loss is true weight loss. Of course, water loss is only temporary. You will replace lost water by drinking fluids.



Using drugs to make your body rid itself of important fluid is dangerous. Diuretics can make you weak and diminish your athletic performance. This extreme loss of fluids upsets the body's chemical balance and potassium levels which can even lead to heart problems. If used for extended periods of time, they can damage the kidneys and cause blood clotting during menstruations. Diuretics are a poor solution to weight loss. Water loss is not true weight reduction because no calories are burned.

### **The Solution to Weight Loss: Exercise and a Low-Fat, Nutritious Diet**

Exercise helps to keep your metabolic rate at a consistently high level. It helps you develop and maintain muscle mass when you are trying to lose weight. Permanent weight control comes from a lifelong commitment to regular exercise and good eating habits. Fad diets and occasional exercise programs will only end in disappointment. Here are some facts to remember regarding weight loss.

- No foods or pills have been scientifically shown to burn fat.
- There is no easy and quick way to lose fat.
- Excess calories, that is, calories consumed above your daily needs, will be stored by your body as fat. In addition, your body readily stores fatty foods as fat.
- Diets that eliminate one of the basic food groups are usually not based on sound principles.



## Performance-Altering Drugs: Facts and Fallacies

Fitness and sports enthusiasts want to believe claims that certain drugs or supplements can improve their athletic performance. Many athletes are looking for magic pills or potions that may just offer that winner's edge.

It is difficult to improve upon a well-balanced diet. However, various nutritional supplements are popularly used as **ergogenic aids**. *Ergogenic aids* are substances or techniques that distributors claim will enhance performance. Unlike drug manufacturers, supplement distributors can release unproven information and untested products to the public. Health claims made about them do not have to be proven before they are introduced on the market.

Every year Americans spend millions of dollars on useless products that claim to give them a competitive edge. The following are just a few of the more common supplements and what their distributors claim they will do.

**Amino Acids/Protein Supplements.** Amino acids and protein supplements do not enhance muscle strength or size—training does. Most athletes have protein intakes that exceed recommendations. Too much protein in the diet can harm the kidneys.

**Sports Drinks.** Most sports drinks offer little advantage over water, especially when you exercise for a short time and at a moderate intensity. Many companies try to attract athletes to their products by claiming that these sports drinks help replace important minerals lost through sweat.



Adequate fluid intake is vital for optimum performance, but no ergogenic benefit has been proven from sports drinks. However, for intense exercise of 90 minutes or more in extreme heat and humidity, sports drinks may be helpful for replacing fluid and lost nutrients.

**Stimulants.** Various **stimulants** are often taken by active individuals in an attempt to improve their physical performance. *Stimulants* are drugs or substances that cause an increase in heart rate and blood pressure and decrease the appetite. They are often used to enhance performance, increase alertness, and delay fatigue. Caffeine, amphetamines, and




ephedrine are stimulants commonly used. Stimulants can be dangerous and cause unwanted side effects such as increased anxiety, dizziness, nervousness, irritability, headaches, abnormal heart rate, and addiction.

**Vitamins and Minerals.** Many companies and writers claim that vitamins and minerals increase energy levels. No vitamin or mineral supplement can provide energy. They should not be used to compensate for a poor diet. While some individuals may require vitamin and mineral supplements, the actual benefit of taking vitamins is doubtful for anyone who eats a well-balanced diet. Regardless of the supplements you take, you still need to eat properly to be healthy and fit.

Some individuals may benefit from a simple multivitamin supplement. Those individuals for whom supplements can be appropriate include dieters on a restricted-calorie diet, athletes who exercise heavily, pregnant women, total vegetarians, and individuals with food allergies. Supplements do not enhance performance, increase strength, provide energy, or build muscles.

**Anabolic Steroids.** *Anabolic steroids* are a synthetic version of the male sex hormone, **testosterone**. Steroids have become an ergogenic aid to increase strength and lean muscle mass. For steroids to help build muscle, they have to be taken along with a strenuous weight training program and diet. However, steroids have many serious and dangerous side effects. Steroids are illegal unless prescribed by a physician.

 <b>Side Effects of Steroids...</b>	
<b>For Men</b>	<b>For Women</b>
Stunted growth	Facial hair
Baldness	Male pattern baldness
Development of breasts	Breast shrinkage
Shrunk testicles	Increase of masculinity
Impotence and sterility	Enlarged clitoris
Severe acne	Severe acne
Increased aggression	Depression
Hallucinations	Hallucinations
Cancer	Menstrual irregularities
Heart disease	Heart disease
High blood pressure	High blood pressure
Bad breath	Bad breath
Liver and kidney damage	Liver damage
	Deepened voice

Steroids have many negative side effects that differ for males and females.

Doctors prescribe steroids to patients only for medical reasons. The use of steroids to improve performance, or gain strength or muscle size is not a medical reason and is clearly not worth the health risks.

Once again, the answer to improving your physical appearance or performance is *not* found in drugs.



## Practice

*Match each definition with the correct term. Write the letter on the line provided.*

- |  |                          |
|--|--------------------------|
| _____ 1. drugs used to increase the amount of fluids lost through urine  | A. anabolic steroids     |
| _____ 2. an artificial version of testosterone, the male sex hormone that stimulates muscle growth   | B. appetite suppressants |
| _____ 3. drugs that block feelings of hunger   | C. cellulite             |
| _____ 4. a measure of how fast your body burns energy, or calories   | D. diuretics             |
| _____ 5. a male sex hormone  | E. ergogenic aids        |
| _____ 6. drugs used to control problems that may cause weight gain or other medical problems   | F. fad diet              |
| _____ 7. a diet based on unsound nutritional practices   | G. metabolic rate        |
| _____ 8. substances or techniques that claim to enhance a person's performance   | H. stimulants            |
| _____ 9. drugs that cause an increase in heart rate and blood pressure and decrease appetite; often used to enhance performance, increase alertness, and delay fatigue | I. testosterone          |
| _____ 10. a term used to describe the dimpled, bumpy fat that often appears on the hips, thighs, and buttocks  | J. thyroid hormones      |



## Practice

### Identifying Quack Products

**Purpose:** To become more familiar with quack products in fitness, health, and weight loss; to become more familiar with the fallacies many people believe about losing weight.

**Procedure:** *Complete the following activity by **polling five different individuals**. Write their responses to the following questions on the lines provided.*

1. What would you do to lose weight in your stomach area?

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2. How would you attempt to lose fat on your thighs or buttocks?

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3. If you could take a pill with a secret ingredient that guaranteed that you would lose 10 pounds in the first week, would you do it? What if there were dangerous side effects?

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4. What fitness or health gimmicks or gadgets have you purchased? Did they do for you what they claimed they would? Explain.

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5. Have you ever been on a diet? What program did you use? Did you lose the weight you desired? Did you keep the weight off?

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6. What gimmicks or gadgets on the market today do you think are the biggest rip offs? Why do you think people buy them?

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## Practice

Write **True** if the statement is correct. Write **False** if the statement is not correct.

- \_\_\_\_\_ 1. Amino acids and protein supplements do not enhance muscle strength or size—training does.
- \_\_\_\_\_ 2. Diuretics help you lose fat by getting rid of fluids in your body.
- \_\_\_\_\_ 3. Body wraps and rubberized sweat suits are essentially a waste of time and money.
- \_\_\_\_\_ 4. The sauna and steam bath are ineffective weight-loss techniques.
- \_\_\_\_\_ 5. Anabolic steroids are a safe way to increase strength and lean muscle mass.
- \_\_\_\_\_ 6. A massage may make you feel good, but it does not break up fat and is useless for weight loss.
- \_\_\_\_\_ 7. You can get rid of fat in a particular area of your body by using the latest fitness gadget.
- \_\_\_\_\_ 8. Name-brand athletic gear always offers more value than athletic gear that is *not* a name brand.
- \_\_\_\_\_ 9. Smart consumers do not let professional endorsements persuade them to buy a product.
- \_\_\_\_\_ 10. Passive exercise devices are the most effective products for fitness and weight loss.
- \_\_\_\_\_ 11. On most fad diets, a person loses mostly muscle and water—with relatively little loss of body fat.



## Health Clubs: Finding One That Fits Your Needs

Over 10 million Americans work out in health clubs. Before you join one, find out all you can about it. Some are reputable; some may not be. And some will fit your needs better than others. The following is a list of some of the things you should know before joining a local health, fitness, or sports club.

**Get referrals.** When you are in the market to join a health club, get recommendations from people who have goals and interests similar to your own. Ask club members what they like and dislike about their health club.

**Visit the club.** Go to the facility during the time you will be working out. This will give you an idea of how busy the club and how available the equipment is. See if the club is well maintained. Inspect the equipment and machines, weight room, aerobics room, and locker room. Are weight-room rules and safety reminders posted? Are there enough instructors or employees to assist you? Do members receive adequate instructions on how to use the equipment? Are they knowledgeable about all the equipment? Do they explain how to use the equipment in easy-to-follow language? Is the environment clean and safe? Is the facility handicapped accessible?



**Does the club have a good record?** Call your local consumer protection agency and Better Business Bureau to see if any complaints or negative reports have been filed against the club. You may want to look for an established club that has been in business for a while.

**Is the club adequately insured?** Many states require health clubs to post bond money. Bond money protects members from losing their money if the club goes out of business.



**Does the club have qualified instructors?** Ask if the club employs certified personal trainers and fitness and aerobic instructors. Instructors should be certified by a nationally recognized certification program and /or have a college degree in physical education or other fitness-related major. In addition, all instructors and employees should be certified in cardiopulmonary resuscitation (CPR) and first aid.



**Does the club offer a variety of fitness classes?** Check to see that the club offers a variety of fitness classes. Do they offer many types of fitness classes at different intensity levels? Attend a trial class at peak times or when you might be regularly attending the club.

**Watch out for hard-sell.** Try the club out before becoming a member. Even if you are highly interested in joining, ask for a trial membership to make sure the club fits your needs and desires. Hard-sell advertising often means that a club needs a large membership to support high operating costs. And a large membership may mean the facility is overcrowded.

**Avoid signing your life away.** Many clubs try to get you to sign long-term contracts. Since a large number of new members quit using a health club after a few months, it might be better to sign up on a monthly basis.

**Read the membership contract.** Make sure you understand all portions of the membership contract. Ask if the membership includes access to the whole facility and all programs offered. Find out if you can work out anytime the club is open for business. See that there is a clause in the contract that gives you a refund in the event you become ill, disabled, or move before it expires. Don't rely on verbal agreements. Carefully read the "waiver of liability." If you sign a contract and then change your mind, most states have a three-day period during which you can back out of the contract.



## Checking Out a Health Club

**Purpose:** To become aware of the features to look for in a health club when deciding whether or not to join.

**Procedure:**

1. Visit a local health club, fitness center, or sports club.
2. Get answers to the following questionnaire about the facility, membership, and programs available.
3. Get copies of brochures, flyers, or schedules describing the club, the programs, and membership information.
4. Draw conclusions from your findings and record them.



## Health Club Questionnaire

<b>Name of Facility:</b>		<b>Your Name:</b>		<b>Date:</b>	
<b>Manager or Salesperson:</b>		<b>Club Address:</b>			
<b>Club Hours:</b> M ____ - ____ T ____ - ____ W ____ - ____ T ____ - ____ F ____ - ____ S/S ____ - ____					
<b>Membership Costs:</b>	Per Week: \$	Per Month: \$	Per Six Months: \$	Per Year: \$	
<b>Write in the number available:</b>	Instructors:	Weight Rooms:	Fitness/Aerobic Rooms:	Personal Trainers:	Others:
<b>Type of Equipment:</b>	Weight Training Equipment (pcs.):	Cardiovascular Equipment (pcs.):	Locker Rooms:	Showers:	
<b>Check ALL Special Programs/Services that apply:</b>					
<input type="checkbox"/> Child care <input type="checkbox"/> Personal training <input type="checkbox"/> Nutritional Analysis <input type="checkbox"/> Physical fitness evaluation <input type="checkbox"/> Body composition testing <input type="checkbox"/> Aerobics classes <input type="checkbox"/> Beginner's programs <input type="checkbox"/> Body conditioning/calisthenics classes <input type="checkbox"/> Others					
<b>Write yes or no to answer:</b>					
<input type="checkbox"/> Are there special student rates? <input type="checkbox"/> Are there locker rooms and shower facilities? <input type="checkbox"/> Are there different types of membership plans available? <input type="checkbox"/> Is instruction given to individuals? <input type="checkbox"/> Are there extra charges for any of the activities, programs, or classes? <input type="checkbox"/> Is instruction given only to groups? <input type="checkbox"/> Are there any restrictions on the availability of certain pieces of exercise equipment or facilities? <input type="checkbox"/> Is instruction given by appointment? <input type="checkbox"/> <input type="checkbox"/> Is instruction given at all times? <input type="checkbox"/> <input type="checkbox"/> Is instruction given at only established times?					
<b>Any other important information about the facility, its programs, etc.:</b>					
_____					
_____					
_____					
_____					
_____					
_____					
_____					



### Your Conclusions

1. Would you be personally interested in joining this health club?

\_\_\_\_\_

Why or why not? \_\_\_\_\_

\_\_\_\_\_

2. Would you recommend this health club to someone? \_\_\_\_\_

Why or why not? \_\_\_\_\_

\_\_\_\_\_

3. What did you like the most about the health club? \_\_\_\_\_

\_\_\_\_\_

4. What did you feel was the greatest drawback to the health club?

\_\_\_\_\_

5. Did the people in charge seem concerned, knowledgeable, and

enthusiastic? \_\_\_\_\_

6. Did this health club provide a clean and safe exercise environment?

\_\_\_\_\_

7. Was the facility handicapped accessible? \_\_\_\_\_

8. Additional comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



## Summary

Have you ever been tempted to buy a product that promises bulging biceps, a flat stomach, thinner thighs, or endless energy?

Before you buy any product to improve your fitness, become informed. Fat-fighting advertisements bombard us with the “sure cure” to the problem of obesity. Hucksters and quacks often claim that just by ordering the latest “proven method” for fighting flab, one can have a “toned, lean, and muscular body” overnight. Protect yourself from being ripped off by understanding some basics on how the body responds to exercise. Use different resources to research products. Do not let someone sell you worthless products. Do not be taken in by products that claim to do the work for you or promise miraculous results. Learn to be a smart *consumer*. Do not buy worthless products.

As interest in fitness and health has increased, so has the number of health clubs. Your decision on whether to join a club and how to select one should depend on many factors. For example, what does a membership cost and what are your personal needs or desires? Get answers to the *Health Club Questionnaire*, and inspect the club before you sign a contract to become a member.

Top performance cannot be achieved through pills, powders, or drinks but only through a rigorous training schedule. Your energy needs are best filled through a variety of foods and adequate fluid intake. There’s only one way to improve your performance: You have to train hard and regularly, eat properly, and get plenty of rest.



## Practice

Write **True** if the statement is correct. Write **False** if the statement is not correct.

- \_\_\_\_\_ 1. No vitamin or mineral supplement can provide energy.
- \_\_\_\_\_ 2. Extra protein is helpful for building bigger and stronger muscles.
- \_\_\_\_\_ 3. Using electric stimulating devices will help you develop muscle tone and strength.
- \_\_\_\_\_ 4. Rubberized sweat suits are one of the best ways to lose weight.
- \_\_\_\_\_ 5. Name-brand athletic gear is always the best value for your money.
- \_\_\_\_\_ 6. Performing endless abdominal exercises using a special device will remove fat from the stomach quickly.
- \_\_\_\_\_ 7. Toning beds will not improve fitness or help you lose weight.
- \_\_\_\_\_ 8. Losing excessive fluids while exercising in a rubberized sweat suit or body constricting bands can lead to dehydration and heat illness.
- \_\_\_\_\_ 9. Diuretics can upset the body's chemical balance.
- \_\_\_\_\_ 10. Massage helps break up fat cells by kneading and rubbing the body.
- \_\_\_\_\_ 11. Knowledge and awareness are the keys to recognizing false information and worthless products.
- \_\_\_\_\_ 12. Testimonials on TV are always a true sign that a product is worth your money.
- \_\_\_\_\_ 13. Anabolic steroids can cause kidney damage, heart disease, and stunted growth.





- \_\_\_\_\_ 14. Quacks and hucksters are people who can help you avoid being ripped off.
- \_\_\_\_\_ 15. Active exercise equipment has the potential to improve physical fitness.
- \_\_\_\_\_ 16. Body wraps, constricting bands, and electric stimulators are passive exercise devices that assist in weight loss.
- \_\_\_\_\_ 17. Cellulite is a special kind of fat that can be reduced using thigh-reducing creams.
- \_\_\_\_\_ 18. The only way to achieve fitness is through proper exercise.
- \_\_\_\_\_ 19. Although some physical fitness quackery may not harm you, quackery *cannot* help you become fit.
- \_\_\_\_\_ 20. A fact is a false or mistaken idea, often the result of deception or inaccurate information.
- \_\_\_\_\_ 21. A measure of how fast your body burns energy, or calories, is called its *metabolic rate*.
- \_\_\_\_\_ 22. Ads that make a product seem too good to be true really are just that: too good to be true.
- \_\_\_\_\_ 23. Anabolic steroids are a synthetic version of the male sex hormone, testosterone.
- \_\_\_\_\_ 24. If you use a sauna, be sure to *not* drink fluids first.
- \_\_\_\_\_ 25. The healthy way to lose weight is to find a diet that promises quick fixes, diet powders, and diet pills.
- \_\_\_\_\_ 26. Most people are overweight or obese simply because they have poor nutritional and exercise habits.
- \_\_\_\_\_ 27. Steroids have many negative side effects that differ for males and females.



## Practice

*Circle the letter of the correct answer.*

1. An effective method for losing fat is the use of a(n) \_\_\_\_\_.
  - a. rubberized sweat suit
  - b. electric stimulator
  - c. body wrap
  - d. none of the above
2. Exercising in a rubberized suit will \_\_\_\_\_.
  - a. hinder the body's ability to cool itself
  - b. cause an increase in water loss
  - c. lead to dehydration
  - d. all of the above
3. You can tell if the claims of a product are true if \_\_\_\_\_.
  - a. a professional athlete endorses the product
  - b. testimonials are made by people in TV advertisements
  - c. claims are backed up by sound scientific studies
  - d. physicians promote the product
4. You should check \_\_\_\_\_ before deciding whether to join a health club.
  - a. the qualifications of the instructors
  - b. the maintenance and cleanliness of the equipment and facility
  - c. whether the club offers a variety of fitness classes, cardiovascular machines, and weight-training equipment
  - d. all of the above
5. A false or mistaken idea, often the result of deception or inaccurate information, is a \_\_\_\_\_.
  - a. quack
  - b. fallacy
  - c. fact
  - d. none of the above



6. A dishonest, false practice or claim made by untrained persons pretending to have medical knowledge is called \_\_\_\_\_.
  - a. gimmickry
  - b. huckstery
  - c. quackery
  - d. fallacy
7. The special dry heat produced by pouring water over heated rocks to make people sweat is found in a \_\_\_\_\_.
  - a. sauna
  - b. diuretic room
  - c. gadget booth
  - d. quackery
8. \_\_\_\_\_ are people who buy products and services.
  - a. Hucksters
  - b. Quacks
  - c. Consumers
  - d. Frauds
9. \_\_\_\_\_ are drugs which block feelings of hunger.
  - a. Thyroid hormones
  - b. Diuretics
  - c. Steroids
  - d. Appetite suppressants
10. \_\_\_\_\_ are people who cheat other people out of money by selling gimmicks and gadgets.
  - a. Fads
  - b. Hucksters
  - c. Salesmen
  - d. Consumers
11. Exercise devices that do the work for you and do *not* build fitness or help you to lose weight are called \_\_\_\_\_.
  - a. passive exercise equipment
  - b. active exercise equipment
  - c. weight training equipment
  - d. both *a* and *b*



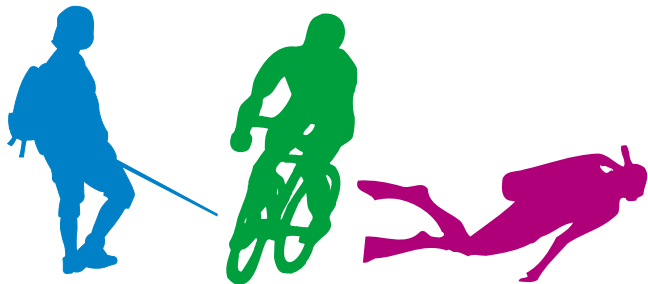
12. \_\_\_\_\_ describe substances or techniques that claim to enhance performance.
- a. Gimmicks
  - b. Diuretics
  - c. Ergogenic aids
  - d. Inversion facts
13. Drugs used to control problems that may cause weight gain or other medical problems are \_\_\_\_\_ .
- a. appetite suppressants
  - b. diuretics
  - c. thyroid hormones
  - d. all of the above
14. Drugs often used to enhance performance and that can cause a dangerous increase in heart rate and blood pressure are \_\_\_\_\_ .
- a. thyroid hormones
  - b. stimulants
  - c. vitamins
  - d. depressants
15. A term used to describe the dimpled, bumpy fat that often appears on the hips, thighs, and buttocks is \_\_\_\_\_ .
- a. obesity
  - b. cellulite
  - c. cottage cheese
  - d. liposuction
16. Before joining a health club, you should check \_\_\_\_\_ first.
- a. qualifications of the instructors
  - b. equipment and facility
  - c. contract
  - d. all of the above
17. Beware of ads that promise \_\_\_\_\_ .
- a. no side effects
  - b. burn fat and melt away inches
  - c. claims that are too good to be true
  - d. all of the above

## Unit 7: Personal Fitness Program

This unit is a culmination of everything the student has learned in this book. The student will learn how to apply the knowledge gained from previous units into a personal fitness program that will affect the student for a lifetime.

### Unit Focus

- what a personal fitness program is
- benefits of a personal fitness program
- designing your personal fitness program
- understanding each physical activity and how to choose the one for you
- other considerations when designing your personal fitness program
- attitude and personal goals evaluation



## **Fitness Career Opportunity**

### **Athletic Directors**

They manage athletic programs in schools or colleges. They direct coaches, ticket sales, athletic facilities, trainers, and sports information offices. Some athletic directors also teach and coach.

### **Broadcasters**

Broadcasters work on-air doing sports reporting or providing commentary on radio or television. Technicians work behind the scenes in production, direction, or technical operations.

### **Exercise Physiologists**

They study the effects of exercise on the body. They design individual exercise programs. These scientists are often employed by universities. They may also work at sports medicine clinics, in competitive sports programs, and at health clubs.

### **Fitness/Sports Psychologists**

They help athletes improve their attitude and ability to focus in athletic activities. They work with individual athletes or teams, or teach and conduct research at the college level.

### **Health Club Managers**

They manage the day-to-day operations, marketing, membership sales, and athletic and fitness programming in a health club.

### **Orthopedists**

These doctors treat muscular or skeletal injuries. Doctors who specialize in sports-medicine may practice in sports-medicine clinics. They also may work as a team physician, treating, and preventing sports-related injuries.

### **Recreation Planners**

They run recreational programs for governments or private companies. Their work may include scheduling sports leagues, developing camp programs, managing parks, or managing company wellness programs.

### **Writers or Editors**

They cover sports or fitness for different types of publications. They may write or edit for local papers, or national sports or fitness magazines. They may write or edit books on sports or fitness topics.

### **Youth/Recreational/Pro Officials**

They enforce the rules of athletic games from grade schools to recreation leagues to professional sports. Working as a sports official is a good way to stay involved in a sport you love.

### **Other Active Career Opportunities**

- Athletic Managers
- Chiropractors (spinal manipulation, realignment)
- Massage Therapists
- Dance Instructors
- Facility Designers
- Podiatrists (treat foot, ankle problems)
- Sports photographers
- Public Relations Specialists
- Team Owners
- Scouts
- Sporting Goods Retailers and Salespeople



## Vocabulary

*Study the vocabulary words and definitions below.*

- aerobic exercise** ..... activity that increases the heart rate, supplies oxygen to the muscles, and *can* be performed for a long period of time; also called *cardiovascular exercise*
- body composition** ..... the percentage of body weight that is fat compared to lean body tissue such as muscle, bone, and other tissues and organs; one of the measurements of your physical fitness
- calisthenics** ..... exercises that use the weight of one's body as resistance
- cardiovascular fitness** ..... the body's ability to deliver oxygen to working muscles; a health-related component of fitness
- cool-down** ..... the tapering-off period after exercise that allows the body to gradually return to a resting state
- F.I.T.T.** ..... the formula used to achieve overload and increase your level of physical fitness:  
Frequency (how often to exercise);  
Intensity (how hard to exercise);  
Type (what kind of exercise); and  
Time (how long to exercise)
- flexibility** ..... the ability to move joints and muscles through a full range of motion without pain or injury



<b>heart rate</b> .....	the number of times a heart beats or pumps blood per minute; also referred to as <i>pulse rate</i>
<b>muscle fitness</b> .....	the two health-related components of physical fitness: muscular strength and muscular endurance
<b>muscular endurance</b> .....	the ability to use certain muscles repetitively for a long period of time
<b>muscular strength</b> .....	the ability of muscles to exert a force one time
<b>physical fitness</b> .....	the ability of the whole body to perform at maximum capability
<b>pulse</b> .....	the beat of the heart felt by the pressure of the blood on the artery walls
<b>repetitions</b> .....	the number of times a complete exercise is performed; also called <i>reps</i>
<b>resistance training</b> .....	exercises in which a muscle or group of muscles repeatedly push or pull against an opposing force; also called <i>weight training</i>
<b>set</b> .....	a group of repetitions performed without resting
<b>target heart rate zone (THRZ)</b> .....	the recommended intensity for aerobic conditioning; 60-90 percent of your maximum heart rate





- warm-up** ..... exercises that increase the body's temperature and prepare it for more vigorous activity
- weight training** ..... exercises performed against resistance to develop and improve muscular strength and endurance; also called *resistance training*





## Unit 7: Personal Fitness Program

### Introduction

Everyone should want to achieve total fitness and wellness. Totally fit and well people are physically and mentally healthy. They enjoy life and gain satisfaction from their social and spiritual self. Achieving total fitness and wellness is a process. You need to work towards it one step at a time. The first step in achieving total fitness and wellness is to begin a personal fitness program.

### What Is a Personal Fitness Program?

*A personal fitness program is a plan you design to help improve your total fitness. Designing your own fitness program allows you to make choices. You can include activities that you enjoy. You can plan your workout schedule around your school day and work hours. And you can set goals that fit your needs.*



*Set goals that fit your needs.*

As your fitness level improves, you can change your fitness program to meet your new needs. You can also alter your program to work around injuries or other problems.

A complete personal fitness program aims at developing all of the health-related components of **physical fitness**. Health-related components include **body composition, flexibility, muscular strength, muscular endurance, and cardiovascular fitness**. To improve in these components, you may need to make some changes in your *lifestyle*. Your lifestyle is the way you conduct your life. For example, you may need to modify your diet to improve your nutrition. Or you may need to exchange a few hours of weekly TV watching with your workout schedule. Your personal fitness program should include health related activities, sports skills, stress diversion activities, and good nutrition.



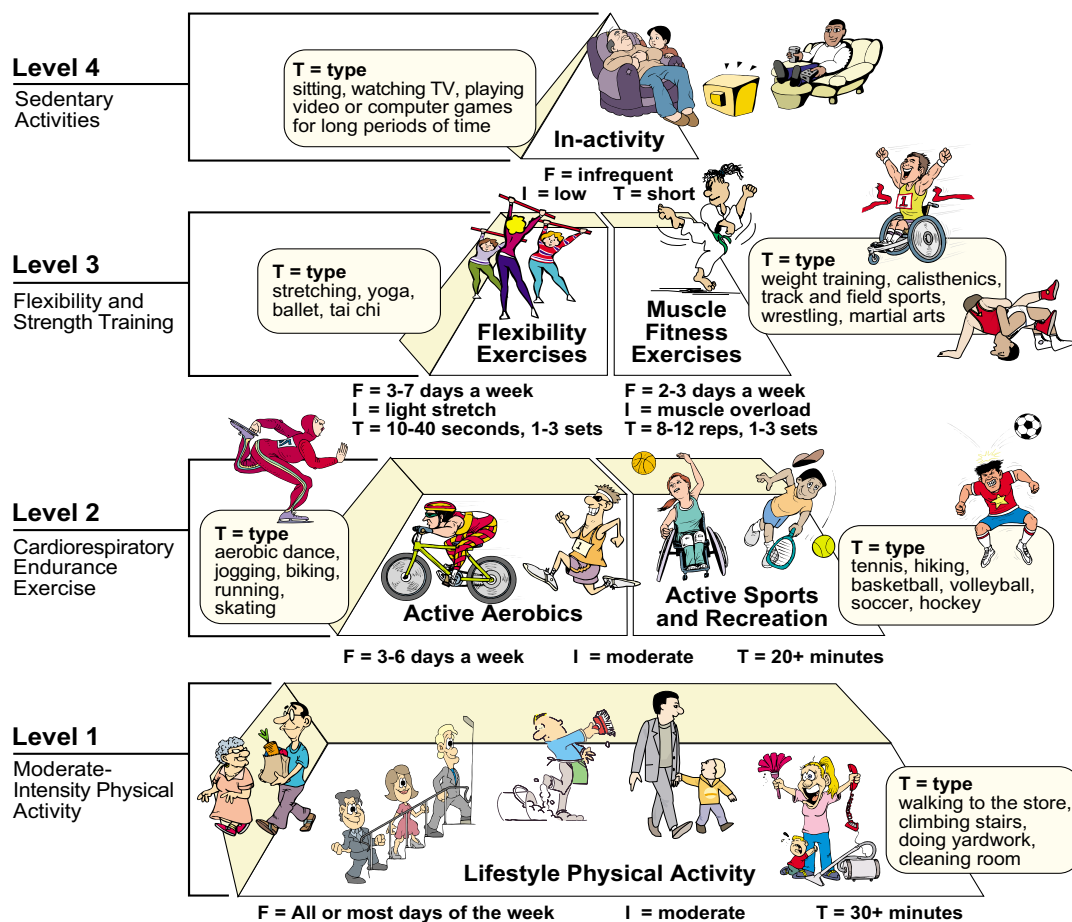
*Totally fit and well people are physically and mentally healthy.*



## Why Is a Personal Fitness Program Important?

Commit yourself to a regular program of aerobics, strengthening, stretching, and proper nutrition, and you will look better and feel fantastic! You will also *decrease* your chance of health-related diseases and *increase* your chances for a long, healthy life.

The Physical Activity Pyramid below is similar to the Food Guide Pyramid (see Unit 2, page 83). The Food Guide Pyramid was developed as a general guide of what to eat each day. The Physical Activity Pyramid was designed to help people live an active lifestyle and reduce the health risks associated with inactivity.



F.I.T.T. formula (F = frequency; I = intensity; T = type; T = time) recommendations

*The Physical Fitness Pyramid*



The four levels of the Physical Activity Pyramid on the previous page are arranged according to their **F.I.T.T.** formula recommendations. Activities that should be performed most frequently are at the base of the pyramid. Activities that should be performed less frequently are at the top of the pyramid. Activities that should be performed less frequently are at the top of the pyramid.

If you are currently inactive, begin at the bottom of the pyramid. Gradually increase the amount of moderate-intensity activity in your life. If you are already moderately active, begin an exercise program that includes cardiorespiratory endurance exercise, flexibility training, and strength training to help you develop all the health-related components of fitness.

### Steps in Designing Your Personal Fitness Program

Follow the steps below to design a sound and complete personal fitness program.

1. Evaluating Health-Related Fitness Components
2. Setting Personal Goals
3. Selecting Appropriate Activities
4. Applying the **F.I.T.T.** Formula
5. Tracking Your Progress with Periodic Assessments

#### 1. Evaluating Health-Related Fitness Components

Before you can decide what kinds of exercise you need, you must determine your levels of fitness. You should be aware of your current levels of cardiovascular fitness, muscular strength and endurance, flexibility, and body composition.

Give the greatest attention in your personal fitness program to your weakest areas. For example, if you scored low in muscular strength, make weight resistance a key part of your program. However, do not ignore the areas in which you scored well. Include activities to *challenge* your strong areas. You must continue to exercise regularly to *maintain* physical fitness. (Preview pages 327-329.)



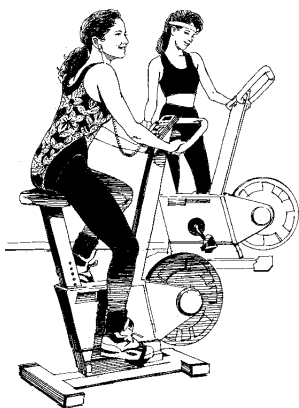
*You must determine your level of fitness.*



## 2. Setting Personal Goals

Ask yourself what you would like to accomplish with your exercise program. Determine what areas of fitness you need to improve and also what areas you would like to improve.

Setting goals you can reach will encourage you to stay with your exercise program. Do not set goals in order to compete with friends or classmates.



*Exercising with a friend can be motivating and enjoyable.*

Try to avoid comparing your fitness level and progress with others. Competition can add stress to your exercise program rather than reduce it!

However, exercising with a friend can be motivating and enjoyable. Make it fun, and you will be more compelled to stick with it.

Set short-term as well as long-term goals for each of the health-related fitness components. Make your goals specific. For example, a short-term goal might be to improve your scores on the various health-related fitness assessments. Another short-term goal might be to eat healthier foods.

Long-term goals might include improving your body composition (less fat and more muscle) or improve your posture. Other long-term goals might include to tone and define your leg muscles and become stronger in the upper body. (Preview pages 330-331.)



*Stretching exercises need to be included in the warm-up.*

**Establish a reward system for your goals.** Try to remain focused on the process of physical exercise rather than an end result. Focus on your journey to a healthy destination! However, enjoy a sense of pride and accomplishment when you reach your goals. Reward yourself each time you reach a small goal. Try not to use unhealthy food as a reward.

## 3. Selecting Appropriate Activities

For overall fitness and health, a combination of **aerobic exercise** and **muscle fitness** activities are both necessary. In addition, stretching exercises for *flexibility* need to be included in the **warm-up** and **cool-down** portion of every workout session.



Consider your health and physical fitness level when selecting activities. Pick activities in which you either have some knowledge, skill, or ability, or that you are interested in learning and enjoy doing.

Try to select a variety of activities, some indoors and some outdoors. Choose an exercise that you can do anytime and anywhere, even if you are alone. This is a perfect time to gain an



understanding of different cultures by studying multicultural activities such as tai chi or yoga. Explore your exercise options.

Change your routine occasionally and learn to cross train. Perform *cross training* by participating in different activities to improve fitness components and a specific part of the body. For example, to improve your cardiovascular fitness, you can run one day and then bicycle the next day. Cross training helps to prevent boredom, burnout, and makes your workout routine more enjoyable. (Preview pages 332-333.)



## Practice

Use the list below to write the correct term for each definition on the line provided.

aerobic exercise	F.I.T.T.	muscular strength
body composition	flexibility	physical fitness
cardiovascular fitness	muscle fitness	warm-up
cool-down	muscular endurance	

- \_\_\_\_\_ 1. the ability of the whole body to perform at maximum capability
- \_\_\_\_\_ 2. the tapering-off period after exercise that allows the body to gradually return to a resting state
- \_\_\_\_\_ 3. the ability to move joints and muscles through a full range of motion without pain or injury
- \_\_\_\_\_ 4. the formula used to achieve overload and increase your level of physical fitness
- \_\_\_\_\_ 5. the body's ability to deliver oxygen to working muscles
- \_\_\_\_\_ 6. the percentage of body weight that is fat compared to lean body tissue such as muscle, bone, and other tissues and organs
- \_\_\_\_\_ 7. the two health-related components of physical fitness: muscular strength and muscular endurance
- \_\_\_\_\_ 8. the ability of muscles to exert a force one time





- \_\_\_\_\_ 9. the ability to use certain muscles repetitively for a long period of time
- \_\_\_\_\_ 10. activity that increases the heart rate, supplies oxygen to the muscles, and *can* be performed for a long period of time; also called *cardiovascular exercise*
- \_\_\_\_\_ 11. exercises that increase the body's temperature and prepare it for more vigorous activity



## Rating Physical Activities

The following chart lists each health-related component of physical fitness. Below each component is a rating number that describes the level of benefit you'll receive from a particular activity. Remember, the way in which you participate in an activity affects the benefits you can receive.

Physical Activity Ratings					
1 = Low Benefit 2 = Average Benefit 3 = Very Effective/High Benefit					
Activity	Flexibility	Cardio-fitness	Muscular Strength	Muscular Endurance	Body Composition
Aerobic Dance	3	3	1	2	3
Baseball	1	1	1	1	1
Basketball	1	3	1	2	3
Bicycling	1	3	2	2	3
Boxing	1	3	2	3	3
Calisthenics	3	1	2	3	2
Football	1	1	1	2	1
Golf (walking)	1	1	1	2	1
Gymnastics	3	1	3	3	2
Hockey	1	3	1	2	2
Jogging	1	3	1	2	3
Jumping Rope	1	3	1	2	3
Karate	3	1	2	2	1
Racquetball	1	2	1	2	2
Rowing	1	3	1	2	3
Scuba Diving	1	2	1	2	1
Skiing (Downhill)	1	2	2	2	1
Skiing (Cross County)	1	3	2	2	3
Skating (Ice/Roller/In-line)	1	2	2	2	2
Soccer	1	3	1	2	3
Step Aerobics	2	3	2	2	3
Swimming	2	3	2	2	3
Tennis	1	1	1	2	1
Volleyball	1	1	1	2	1
Walking	1	2	1	2	2
Waterskiing	1	1	2	2	1
Weight Training	2	1	3	3	2
Yoga	3	1	1	2	1



## Choosing Physical Activities

**Purpose:** To help you brainstorm ideas and feelings about various physical activities before designing your personal fitness program.

**Procedure:** Think about each statement below. Then write down your response. You may want to use the *Physical Activity Ratings* chart on page 312 for a list of possible physical activities.

1. Sports or recreational activities that I enjoy include \_\_\_\_\_ .  
\_\_\_\_\_
2. Exercises I like include \_\_\_\_\_ .  
\_\_\_\_\_
3. Activities that promote flexibility that I enjoy or would consider participating in are \_\_\_\_\_ .  
\_\_\_\_\_
4. Activities that promote cardiovascular fitness that I enjoy or would consider participating in are \_\_\_\_\_ .  
\_\_\_\_\_
5. Activities that promote muscular strength that I enjoy or would consider participating in are \_\_\_\_\_ .  
\_\_\_\_\_
6. Activities that promote muscular endurance that I enjoy or would consider participating in are \_\_\_\_\_ .  
\_\_\_\_\_



7. Activities that will improve my body composition are \_\_\_\_\_  
\_\_\_\_\_ .
8. Do I prefer to exercise by myself or with others? (Explain your answer.) \_\_\_\_\_
9. The best times and days for me to exercise are \_\_\_\_\_  
\_\_\_\_\_ .
10. I would consider exercising \_\_\_\_\_ times (frequency) per week and for \_\_\_\_\_ (length of time).
11. The place(s) I would like to exercise is (are) \_\_\_\_\_  
\_\_\_\_\_ .
12. Clothing, equipment, or other resources needed for the exercises or activities I want to do include \_\_\_\_\_  
\_\_\_\_\_ .
13. The costs for the activities, facilities, special programs or classes, equipment, or clothing would be approximately \_\_\_\_\_ .



#### 4. Applying the F.I.T.T. Formula: Training Principles



**F** is for *frequency*—how often to exercise. Begin an exercise program by working out three times a week. When your body has adjusted to the demands of this exercise, you may increase the frequency of your workouts to four or five times per week. Exercising three times a week helps to maintain fitness. Exercising four or five times a week helps to increase your level of fitness.

**I** is for *intensity*—how hard to exercise. Your personal goals and current level of fitness will determine how intense your exercise program should be. For most people, regular exercise at a moderate intensity is best. Try to pace yourself, listen to your body, and challenge your body gradually.

The first **T** is for *type*—what kind of exercise. During *aerobic* exercises, the body uses oxygen for energy. The more oxygen the body uses, the harder the cardiovascular system will work and become more fit. Be sure to exercise aerobically a minimum of three times each week.

*Anaerobic* exercises are performed at a pace which use oxygen faster than the body can replenish it. They are strenuous and can only be performed for short periods of time before rest is needed. Anaerobic exercises demand bursts of energy and quick starts and stops. Do **resistance training** (weight-training) a minimum of two times per week. Always perform stretching exercises before and after each workout session to increase flexibility and prevent injury.

As a general rule, when exercising aerobically, you should be able to carry on a conversation (the “talk test”) without becoming short of breath. Measure your exercise **heart rate** once a week or so to check the intensity of your exercise. First, take your **pulse** before you begin exercising. Second, take your pulse at the peak or completion of the most intense part of your aerobic workout. And, third, take your pulse after the cool-down. An activity must raise your heart level to a level called the **target heart rate zone (THRZ)**.

The second **T** is for *time*—how long to exercise. Continuous activities such as jogging, walking, jumping rope, cycling, and swimming are all aerobic exercises. To maintain a good level of aerobic conditioning, work up to 20 minutes or more of aerobic exercise per session.



In an overall, moderate **weight training** program, do a minimum of two to three workouts per week for 30 minutes to an hour. You may choose to do **calisthenic**, free weight, or weight machine exercises. Your muscular fitness program should include exercises for all the major muscle groups of the upper and lower body.

What type of muscular fitness exercises or program you will choose depends upon your personal goals. To develop muscle tone and general strength, use low weight and perform high **repetitions**. To develop muscular strength and growth, use high weight and perform a low number of reps. Perform one to three **sets**, or group of repetitions without resting, for a general fitness program.

Work on all the major muscles in your muscle fitness program. This will help prevent overdeveloping one muscle group while neglecting the muscles on the opposite side of the joint.



*When exercising aerobically, you should be able to carry on a conversation without becoming short of breath.*

## 5. Tracking Your Progress with Periodic Assessments

Keeping a workout log will encourage you to keep up your exercise program. A workout log will also help you measure your progress. Writing down the activity, days you exercise, and the distance or duration of each exercise session helps you keep track of your improvements. It can also be helpful to make a notation about how you felt during and after each workout.

You may want to periodically re-evaluate your exercise program. Re-evaluating your program after four weeks and then again after eight weeks will show if you have reached short-term goals. It will also help you see if you are getting closer to long-term goals. Realize that you will not make drastic improvements in a short amount of time. Also, it is important to be aware that you may improve at a quicker rate in some areas than others. Use the results of these evaluations to update your personal goals. (Preview pages 337-341.)



## Practice

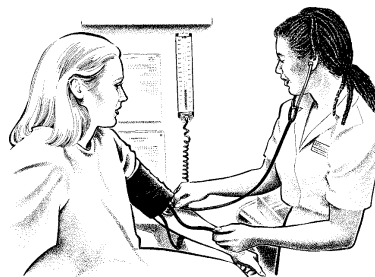
*Match each definition with the correct term. Write the letter on the line provided.*

- |  |                    |
|--|--------------------|
| _____ 1. exercises performed against resistance to develop and improve muscular strength and endurance | A. heart rate      |
| _____ 2. the number of times a heart beats or pumps blood per minute                                   | B. pulse           |
| _____ 3. the beat of the heart felt by the pressure of the blood on the artery walls                   | C. repetitions     |
| _____ 4. the number of times a complete exercise is performed  | D. weight training |
- 
- |  |                                  |
|--|----------------------------------|
| _____ 5. exercises in which a muscle or group of muscles repeatedly push or pull against an opposing force | A. calisthenics                  |
| _____ 6. exercises that use the weight of one's body as resistance   | B. resistance training           |
| _____ 7. a group of repetitions performed without resting  | C. set                           |
| _____ 8. the recommended intensity for aerobic conditioning; 60-90 percent of your maximum heart rate      | D. target heart rate zone (THRZ) |



## Other Considerations When Designing Your Personal Fitness Program

**Medical Exam.** Get a medical checkup before beginning any exercise program, especially if you have had a serious illness or injury, or are at risk for heart disease. A doctor may approve your exercise program. Or, based on your medical history and present level of fitness, the doctor may tell you to proceed with caution and outline which activities to avoid.



*Get a medical checkup before beginning any exercise program.*

**Warm Up and Cool Down.** Before engaging in any exercise, take the time to warm up. A warm-up includes exercises that increase the body's temperature and prepares the muscles for more vigorous activities. An adequate warm-up prevents sudden strain on the heart and circulatory system. A warm-up is the best insurance against injury and muscle soreness. Injury and soreness are common reasons for dropping out of an exercise program.

Cooling down after exercise is also essential. The cool-down is the tapering-off period after exercise that allows the body to gradually return to a resting state. The cool-down helps to eliminate body heat and return the blood from the muscles to the heart. Warm-up and cool-down exercises should include some cardiovascular exercises and some flexibility exercises.

**Order of Workout.** Many people choose to alternate days for aerobic workouts and muscle fitness workouts. For instance, you might do aerobics on Mondays, Wednesdays, and Fridays, and do weight training on Tuesdays, Thursdays, and Saturdays. You can participate in aerobics and strength training on the same days if you prefer. Always make sure to first warm up, workout, and then cool down.

### Motivation: Reasons to Continue Exercising

Do you need a reason to exercise or to continue your program? You are not alone. We all need *motivation*, or encouragement, to stick with a program. Starting an exercise program is not the difficult part. Staying with the program, or committing yourself to a healthy, active lifestyle is!





Beginning an exercise program doesn't necessarily improve your health and fitness, but staying with your exercise program on a long-term basis will! Here are some tips to help you keep it up.

- **Make it fun.** Find an activity that you enjoy and you are more likely to stick with!
- **Start slowly.** Begin your exercise routine slowly and build gradually as your body adapts to the new demands. The quickest way to ruin your enthusiasm and risk injury is to do too much, too soon.
- **Be patient.** Don't expect dramatic changes overnight! Changes occur gradually over weeks and months. You will begin to see and feel changes after about four to six weeks of working out. Don't just measure improvement on weight loss. Remember muscle weighs more than fat. As you develop your fitness habit, you will notice increases in energy and other healthy side effects in addition to looking and feeling better!
- **Listen to your body.** It takes muscles time to become well conditioned. Expect a little stiffness and soreness after strenuous physical exercise or a new activity. However, sharp, specific pain or unusual discomfort is the body's signal that something is wrong. Never push through pain. If it hurts, stop. If the pain continues, seek medical advice. Work within your abilities.
- **Keep it convenient.** Choose an exercise or activity that you can do anytime, anywhere, even if you are alone. If exercise is convenient, you are more likely to do it.
- **Be disciplined.** Remind yourself of the image you have created of how you want to be. Consistently work towards that image in a healthy way.
- **Gain knowledge.** Read and learn as much as you can about health and fitness. Ask experts for advice or to explain anything you may be confused about.





- **Keep a positive attitude.** Focus on all the benefits of exercise. Be proud of yourself as you gain new strength, endurance, energy, confidence, and a healthy lifestyle!
- **Exercise with a friend.** Working out with a buddy can help increase your chances of continuing your new fitness habit. Both you and your partner need to be reliable and committed to sticking with the program. Working out with someone can be twice as much fun as exercising alone!
- **Join a support group.** Enlist support from your family and friends. They can encourage you as you make strides in your exercise program. Perhaps a parent can initial your workout log after your exercise session to assure you have actually performed it!
- **Join a club.** You might want to consider joining a health club or signing up for a fitness class or other program of interest to you. The more appealing your fitness program is to you, the more likely you'll make it a regular part of your daily routine!
- **Schedule exercise time.** Make exercise a part of your lifestyle by setting aside a certain period of time each week for it. Make appointments with yourself to exercise. Treat these appointments as seriously as you would any of your other responsibilities. Take responsibility for your health and fitness!
- **Keep a balanced perspective.** Total fitness and wellness involve more than exercising. Eating properly, coping with stress, and getting sufficient rest are also important ingredients for your physical health.
- **List possible setbacks.** Make a list of obstacles you could face on your road to fitness. For example, some people may find their workout schedule inconvenient. Others may find the program they have designed too hard. Some may suffer from "burnout" or sickness or injury. And some people will fall back into poor habits. Take the time to develop a plan to prevent and overcome setbacks.





Before you start your personal fitness program, identify certain attitudes and feelings that you have about physical activity. Your past experiences will influence how you feel about exercising. Being aware of a poor attitude towards physical activity can help you understand why you may not be motivated to exercise.

Take the attitude profile on the following page on your past record of exercise and your attitudes about physical activity.



## Attitude Profile

1. What has made you decide to begin an exercise program?

\_\_\_\_\_

2. Do you have any negative feelings toward or have you had any bad experiences with physical activity programs?

yes \_\_\_\_\_ no \_\_\_\_\_

Explain: \_\_\_\_\_

\_\_\_\_\_

3. On a scale from 1 to 5 (5 = highest), rate how you feel about your body in the following areas.

Strength: \_\_\_\_\_

Health: \_\_\_\_\_

Attractiveness: \_\_\_\_\_

Fitness: \_\_\_\_\_

4. Rate yourself on a scale of 1 to 5 (5 = highest) in the following areas.

Your present athletic ability: \_\_\_\_\_

Your need to compete when exercising or playing a sport: \_\_\_\_\_

Your present level of cardiovascular fitness: \_\_\_\_\_

Your present level of muscular fitness: \_\_\_\_\_

Your present level of flexibility: \_\_\_\_\_

5. When you do not exercise as often as you should, it is usually

because \_\_\_\_\_ .



6. Are you currently involved in a regular exercise program?

yes \_\_\_\_\_ no \_\_\_\_\_

If yes, specify the type of exercise(s): \_\_\_\_\_

7. What types of exercise or activities interest you? \_\_\_\_\_

\_\_\_\_\_

8. Rank your goals in beginning this exercise program. What do you want to gain from an exercise program? Use the scale on the following page to rate each goal separately.



Ranking Personal Fitness Goals										
Personal Goals	Extremely Important			Somewhat Important				Not at All Important		
To lose body fat and improve body composition	1	2	3	4	5	6	7	8	9	10
To increase lean muscle/muscle strength	1	2	3	4	5	6	7	8	9	10
To improve cardiovascular fitness	1	2	3	4	5	6	7	8	9	10
To reshape or tone my body	1	2	3	4	5	6	7	8	9	10
To improve athletic performance	1	2	3	4	5	6	7	8	9	10
To improve physical health	1	2	3	4	5	6	7	8	9	10
To improve my mood and help in coping with stress	1	2	3	4	5	6	7	8	9	10
To improve my flexibility	1	2	3	4	5	6	7	8	9	10
To increase my energy level	1	2	3	4	5	6	7	8	9	10
To improve self-esteem	1	2	3	4	5	6	7	8	9	10
To meet social needs	1	2	3	4	5	6	7	8	9	10
To improve overall lifestyle	1	2	3	4	5	6	7	8	9	10
To improve dietary habits	1	2	3	4	5	6	7	8	9	10
Other_____	1	2	3	4	5	6	7	8	9	10

9. Would you like to change your body weight?

yes \_\_\_\_\_ no \_\_\_\_\_

By how much? \_\_\_\_\_ (+/-) pounds



10. What is your current percentage of body fat? \_\_\_\_\_

Is your body composition what you would like it to be?

yes \_\_\_\_\_ no \_\_\_\_\_

Explain: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

11. What is your current body weight? \_\_\_\_\_

Is your body weight what it should be or what you would like it to be?

yes \_\_\_\_\_ no \_\_\_\_\_

Explain: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

12. How would you like for your body to look? \_\_\_\_\_

Explain: \_\_\_\_\_

\_\_\_\_\_

Considering your particular body type, is this realistic?

yes \_\_\_\_\_ no \_\_\_\_\_

13. How would you like for your body to function? \_\_\_\_\_

\_\_\_\_\_

Explain: \_\_\_\_\_

\_\_\_\_\_



## Summary

A complete personal fitness program involves all of the health-related components of physical fitness. By itself, no single activity or exercise can help you accomplish flexibility, cardiovascular fitness, muscular strength, muscular endurance, or a healthy body composition. You must include a variety of activities in your exercise program to develop all areas of physical fitness. You also must build a healthy lifestyle.



Strength training and aerobic conditioning should be the primary focus of your personal fitness program. Strength training will lift and tone the muscles. Aerobic conditioning will strengthen the heart and decrease the overall amount of body fat. Flexibility can be developed and improved by stretching before and after any exercise. Proper nutrition and a well-rounded exercise program will help improve your body composition.

There are important steps to take in designing your personal fitness program. They include evaluating your health-related fitness components, setting personal goals, selecting appropriate activities, applying the F.I.T.T. formula, tracking your progress, and periodically re-evaluating your fitness level.

Motivation is important to include in your personal fitness program to help you continue with your exercise program. All of us need encouragement to help us stay on a workout schedule and eat nutritiously.

The positive effects of exercise occur as a result of regular and consistent efforts. Treat your body well and feel the benefits. Become fit so you can enjoy a full and long life!





## Physical Fitness/Body Composition Profile (See Units 2, 3, and 4)

**Purpose:** To evaluate your current level of physical fitness and body composition. To periodically assess all health-related components of physical fitness for comparison and to check for improvements.

**Procedure:** Record all scores from earlier assessments on the profile on pages 328-329. Refer to the previous units on body composition, flexibility, muscular fitness, and cardiovascular fitness. Reassess all or part of the tests after four weeks and then again after eight weeks of your personal fitness program.

### Results of Physical Fitness/Body Composition Profile

1. List in order your strongest areas of fitness. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
2. Beginning with the weakest area, list the areas of fitness that you need to improve. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
3. List the areas of fitness that you need to maintain at your current level. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



## Physical Fitness/Body Composition Profile

		1 <sup>st</sup> Test	2 <sup>nd</sup> Test	3 <sup>rd</sup> Test
<b>Muscle Fitness</b>				
1. Grip Strength	Date:			
	Score:			
	Rating:			
	Goals:			
2. Isometric Leg Squat	Date:			
	Score:			
	Rating:			
	Goals:			
3. Curl-Ups	Date:			
	Score:			
	Rating:			
	Goals:			
4. Push-Ups	Date:			
	Score:			
	Rating:			
	Goals:			
5. Pull-Ups (male only)	Date:			
	Score:			
	Rating:			
	Goals:			
6. Flexed-Arm Hang (females)	Date:			
	Score:			
	Rating:			
	Goals:			
<b>Cardiovascular Fitness</b>				
1. Resting Heart Rate	Date:			
	Score:			
	Rating:			
	Goals:			
2. One-Mile Run	Date:			
	Score:			
	Rating:			
	Goals:			
3. Three-Minute Step Test	Date:			
	Score:			
	Rating:			
	Goals:			

## Physical Fitness/Body Composition Profile

		1 <sup>st</sup> Test	2 <sup>nd</sup> Test	3 <sup>rd</sup> Test
<b>Body Composition</b>				
1. Waist-to-hip ratio	Date:			
	Score:			
	Rating:			
	Goals:			
2. Body fat percentage	Date:			
	Score:			
	Rating:			
	Goals:			
3. Body mass index	Date:			
	Score:			
	Rating:			
	Goals:			
4. Ideal body weight	Date:			
	Score:			
	Rating:			
	Goals:			
<b>Flexibility</b>				
1. Shoulder	Date:			
	Score:			
	Rating:			
	Goals:			
2. Hip flexion	Date:			
	Score:			
	Rating:			
	Goals:			
3. Hamstring	Date:			
	Score:			
	Rating:			
	Goals:			
4. Back extension	Date:			
	Score:			
	Rating:			
	Goals:			
5. Trunk flexion	Date:			
	Score:			
	Rating:			
	Goals:			





## Designing a Body Composition Program (See Unit 2)

1. My current
  - a. waist-to-hip ratio is \_\_\_\_\_ .
  - b. body mass index is \_\_\_\_\_ .
  - c. body fat percentage is \_\_\_\_\_ .
  - d. ideal body weight (too low, okay, or too high) \_\_\_\_\_ .
2. I need to improve my body composition in the following ways.  
(*Examples:* to add more muscular strength in the upper body; to decrease body fat, etc. )  
  
\_\_\_\_\_  
  
\_\_\_\_\_
3. My current body type is \_\_\_\_\_.  
(*Examples:* ectomorph—long and lean; mesomorph—trim and athletic; endomorph—round and soft; or a combination of two. See Unit 2, pages 61-62.)
4. The following areas of my body composition are adequate.  
(*Examples:* good upper body muscle strength; low body fat in lower body.)  
  
\_\_\_\_\_  
  
\_\_\_\_\_
5. The following activities, exercises, or nutritional habits can help to improve my body composition. \_\_\_\_\_  
  
\_\_\_\_\_  
  
\_\_\_\_\_  
  
\_\_\_\_\_



6. I need to work on the following eating disorder or problem.

---

---

7. I will include the following tips for healthy eating and weight control in my program. (Refer to Unit 2, page 84.)

---

---

8. Goals to improve my body composition include the following:

**Short-term:** (*Examples:* eliminate one junk food from my daily diet; eat at a fast-food restaurant only once a week.)

- a. 

---
- b. 

---
- c. 

---
- d. 

---
- e. 

---

**Long-term:** (*Example:* reduce my body fat composition by one or two percent in the next eight weeks.)

- a. 

---
- b. 

---
- c. 

---
- d. 

---
- e. 

---



## Designing a Flexibility Program (See Unit 3)

1. My current flexibility rating in my  
upper body is \_\_\_\_\_ .  
hamstrings and hips is \_\_\_\_\_ .  
back and trunk is \_\_\_\_\_ .
2. I need to improve my flexibility in the following areas or muscles of  
the body. \_\_\_\_\_  
\_\_\_\_\_
3. I have adequate flexibility in these areas or muscles of the body.  
\_\_\_\_\_
4. I intend to use the following activities and exercises to improve my  
flexibility. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
5. I intend to spend \_\_\_\_\_ minutes on flexibility every time I  
work out. I will include the following activities and exercises in my  
warm-up. \_\_\_\_\_  
\_\_\_\_\_  
I will use the following activities and exercises in my cool-down.  
\_\_\_\_\_  
\_\_\_\_\_



6. Goals to improve my flexibility include the following:

**Short-term:** (*Examples:* improve the flexibility of my hamstrings; be able to touch my toes.)

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_
- e. \_\_\_\_\_

**Long-term:** (*Examples:* improve hamstring flexibility rating from average to good; improve flexibility in calf muscles to prevent shin splints.)

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_
- e. \_\_\_\_\_



## Designing a Muscular Fitness Program (See Unit 4)

1. My current rating in my  
overall body strength or grip strength is \_\_\_\_\_.  
lower body is \_\_\_\_\_.  
abdominals is \_\_\_\_\_.  
upper body is \_\_\_\_\_.
2. I need to improve my muscular fitness in the following areas or  
muscles of the body. \_\_\_\_\_  
\_\_\_\_\_
3. I am strongest in muscular fitness in the following areas or muscles  
of the body. \_\_\_\_\_  
\_\_\_\_\_
4. In my muscular fitness program, I want to accomplish the following.  
(*Examples: to build muscular strength and firm muscles; to increase  
strength in certain areas, etc.*)  
\_\_\_\_\_
5. I will develop my muscular strength and/or endurance by using the  
following activities and exercises. \_\_\_\_\_  
\_\_\_\_\_
6. I intend to perform muscular fitness exercises for \_\_\_\_\_  
(time) on \_\_\_\_\_ (days).





7. Goals to improve my muscular strength and/or endurance include the following:

**Short-term:** (*Examples:* to be able to do two pull-ups; to increase upper body strength.)

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_
- e. \_\_\_\_\_

**Long-term:** (*Examples:* to increase abdominal strength rating from average to good; to improve posture by strengthening abdominals and back muscles.)

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_
- e. \_\_\_\_\_



## Designing a Cardiovascular Fitness Program (See Unit 5)

1. My current cardiovascular fitness rating is \_\_\_\_\_.
2. I will participate in the following activities and exercises to improve my cardiovascular fitness. \_\_\_\_\_  
\_\_\_\_\_
3. I intend to set aside \_\_\_\_\_ (amount of time) on \_\_\_\_\_ (days) for aerobic exercise.

The following are goals to improve my cardiovascular fitness.

**Short-term:** (*Examples:* to increase the length I can participate in an activity; to be able to move from walking to jogging.)

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_
- e. \_\_\_\_\_

**Long-term:** (*Examples:* to work at 80-85% of maximum heart rate for 45-60 minutes; to lower resting heart rate by five beats per minute.)

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_
- e. \_\_\_\_\_

It is important to try to burn around 300 calories each time you exercise aerobically. To determine your calorie usage, refer to Unit 2, page 82.



## My Personal Fitness Program

Fill in the blanks to design your personal fitness program.

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Activities/Sports/Exercises:

---

---

---

---

Clothing/Equipment:

---

---

---

Where:

---

Alone or with others:

---

When:

---

Frequency:

---

Intensity:

---

Amount of time:

---

Warm-up and cool-down activities:

---

---

---

Support group:

---

Comments:

---

---

Motivational strategies:

---

---

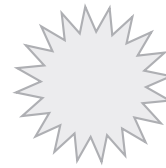
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## Behavioral Contract for Exercise

Making a **written agreement with yourself** can help you to stay on track to meet your goals. Fill out the **behavioral contract** below. This contract will help commit you to a healthier lifestyle.

### My Personal Fitness Contract



I, \_\_\_\_\_, am making the commitment to myself

to change the following behaviors: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

I will do this by (write how you will do it) \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

I will do this (write how often you will do it) \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

I am doing this because \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

I will reward myself by feeling good about myself and by \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

My penalty will be \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

Signature

Date

Support Person's Signature

Review Date



## My Exercise/Workout Log


**Purpose:** To help you monitor your physical fitness activities. This can help in determining your rate of progress and also aid in goal-setting.

**Procedures:** Record your activities on the following pages each time you exercise. Include the date, the fitness activity, intensity (heart rate), time spent, component of fitness it develops, and your personal comments. See examples below.

Note how you felt during the actual exercise as well as afterwards.

Include comments about where you performed the exercise and whether you were alone or with others.

Have a support person, such as a parent, initial your exercise log each time to verify that you completed the activity.

 <b>Workout Log</b> Week # <u>2</u>						
Date	Activity	Intensity (heart rate)	Time	Component (fitness/health)	Comments (feelings/attitude)	Initials
1. 11/12	rowing	180	20 min.	cardiovascular	I really enjoyed this workout and felt good. I worked out alone on a rowing machine, but people were around because I was at the gym.	S.P.
2. 11/14	tennis	130	1 hour	coordination	A fun way to exercise. Played tennis at school with a friend.	S.P.

### Workout Log

Exercise	Date	
	9/16	
knee extensions	Weight	50
	Sets	2
	Reps	12
bench press	Weight	80
	Sets	2
	Reps	12
	Weight	



<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="display: flex; gap: 10px;">    </div> <div style="text-align: center;"> <h2 style="margin: 0;">Workout Log</h2> <p style="margin: 0;">Week # _____</p> </div> <div style="display: flex; gap: 10px;">    </div> </div>						
Date	Activity	Intensity (heart rate)	Time	Component (fitness/health)	Comments (feelings/attitude)	Initials
1.						
2.						
3.						
4.						
5.						
6.						
7.						



**Muscular Fitness Activities**

**Workout Log**

Name: \_\_\_\_\_

Exercise	Date		
	Weight		
	Sets		
	Reps		
	Weight		
	Sets		
	Reps		
	Weight		
	Sets		
	Reps		
	Weight		
	Sets		
	Reps		
	Weight		
	Sets		
	Reps		
	Weight		
	Sets		
	Reps		
	Weight		
	Sets		
	Reps		



## Practice

*Answer the following using short answers.*

1. What are the health-related fitness components that a fitness program should focus on? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
2. What are the five steps necessary in designing your personal fitness program? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
3. What five things can motivate you to stick with your exercise program for a long time? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_





4. Why is it important to re-evaluate your physical fitness periodically? \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
5. What are three of the benefits of keeping a workout log? \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
6. What kinds of experiences might cause you to change your personal fitness program? \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_



## Practice

Use the lists below to **identify each exercise and the major muscle group it helps**. Write the **name of the exercise on line a**, and the **muscle group it helps on line b** on the lines provided. **One or more muscle groups will be used more than once.**

### muscle group

abdominals  
arms  
back  
chest  
thighs

### exercise

bench press  
curl-ups  
knee extensions  
one-arm dumbbell rowing  
peck deck  
press downs  
pull-ups  
push-ups



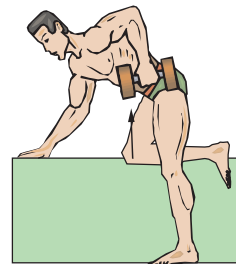
1. a) \_\_\_\_\_  
b) \_\_\_\_\_



2. a) \_\_\_\_\_  
b) \_\_\_\_\_



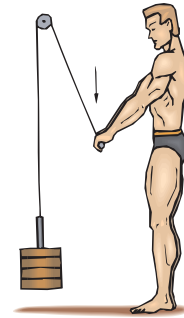
3. a) \_\_\_\_\_  
b) \_\_\_\_\_



4. a) \_\_\_\_\_  
b) \_\_\_\_\_



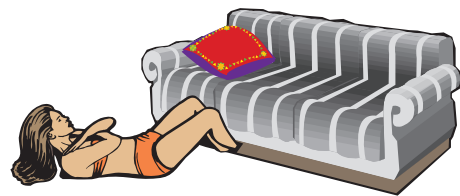
5. a) \_\_\_\_\_  
b) \_\_\_\_\_



6. a) \_\_\_\_\_  
b) \_\_\_\_\_



7. a) \_\_\_\_\_  
b) \_\_\_\_\_



8. a) \_\_\_\_\_  
b) \_\_\_\_\_



## Practice

Write **True** if the statement is correct. Write **False** if the statement is not correct.

- \_\_\_\_\_ 1. A total personal fitness program can include only intense aerobic exercise.
- \_\_\_\_\_ 2. Regular exercise will enable a person to have more energy for daily activities.
- \_\_\_\_\_ 3. Once you become physically fit or reach your goals, you do not need to continue exercising regularly.
- \_\_\_\_\_ 4. To improve your cardiovascular fitness, you can run on one day and then bicycle on the next day.
- \_\_\_\_\_ 5. After exercising vigorously, you should stop immediately and rest until your heart rate returns to normal.
- \_\_\_\_\_ 6. Sports such as golf, baseball, and football are good for developing cardiovascular fitness.
- \_\_\_\_\_ 7. Karate, calisthenics, gymnastics, and aerobic dance are all activities that can improve your flexibility.
- \_\_\_\_\_ 8. There is no single exercise or activity that will develop all of the health-related fitness components.
- \_\_\_\_\_ 9. If your strength rating is good, you do not need to include muscular fitness exercises in your personal fitness program to maintain that level.
- \_\_\_\_\_ 10. A running program will improve all of the health-related components of physical fitness.
- \_\_\_\_\_ 11. A physical fitness program can be designed to help you either gain muscle weight or lose fat weight.
- \_\_\_\_\_ 12. As you get older, a medical exam is usually not necessary before starting an exercise program.



- \_\_\_\_\_ 13. Setting personal goals is an important ingredient to achieving success in your personal fitness program.
- \_\_\_\_\_ 14. Cross training can help to prevent boredom and burnout in an exercise program.
- \_\_\_\_\_ 15. A warm-up and cool-down are only necessary before strenuous workouts.
- \_\_\_\_\_ 16. Evaluation of your physical fitness can help you to determine where you should begin in your exercise program.
- \_\_\_\_\_ 17. Evaluating your fitness, setting goals, selecting activities, applying the training principles, and tracking your progress are the steps in designing a personal fitness program.
- \_\_\_\_\_ 18. Effectiveness of the exercise, enjoyment of the activity, your schedule, and location are a few of the factors to consider in the selection of activities.
- \_\_\_\_\_ 19. Motivation is only necessary for individuals lacking will power and discipline.
- \_\_\_\_\_ 20. The positive effects of exercise occur as a result of regular and consistent efforts, or lifestyle commitment.



## Practice

*Circle the letter of the correct answer.*

1. A personal fitness program should be designed \_\_\_\_\_.
  - a. so you won't ever need to change it
  - b. to fit your needs and goals
  - c. to include competition
  - d. to be extremely difficult
2. A personal fitness program should \_\_\_\_\_.
  - a. include activities you enjoy
  - b. be changed from time to time
  - c. follow the principles of training (F.I.T.T. formula)
  - d. all of the above
3. Regular exercise can \_\_\_\_\_.
  - a. help you to look and feel better
  - b. help you cope with everyday stress
  - c. improve your overall physical fitness and health
  - d. all of the above
4. \_\_\_\_\_ is not a health-related component of fitness.
  - a. Muscular strength
  - b. Body composition
  - c. Coordination
  - d. Cardiovascular fitness
5. \_\_\_\_\_ is not considered an aerobic activity and therefore would not increase your cardiovascular fitness.
  - a. Swimming
  - b. Weight lifting
  - c. Bicycling
  - d. Jogging



6. \_\_\_\_\_ is fitness of the whole person including the physical, mental, social, emotional, and spiritual self.
  - a. Perfect health
  - b. Total fitness and wellness
  - c. Optimal health
  - d. None of the above
7. A \_\_\_\_\_ is a program you design to improve your total fitness.
  - a. strength and endurance workout
  - b. personal self-help activity
  - c. personal fitness program
  - d. fitness and diet support group
8. \_\_\_\_\_ refers to the way a person conducts his or her daily life.
  - a. Possessed
  - b. Intuition
  - c. Lifestyle
  - d. Obsessive compulsive
9. \_\_\_\_\_ includes using a variety of activities to improve a fitness component or specific part of the body.
  - a. Fitness hiking
  - b. Physical education
  - c. Running cross country
  - d. Cross training
10. Encouragement, or \_\_\_\_\_ , will help you to stick with your exercise program.
  - a. enthusiasm
  - b. dedication
  - c. motivation
  - d. commitment





# Appendices



# Index

## A

active exercise equipment ..... 263, 272  
aerobic ..... 193, 206  
aerobic exercise ..... 193, 206, 301, 308  
agility ..... 3, 17  
anabolic steroids ..... 263, 282  
anaerobic ..... 193, 207  
anaerobic exercise ..... 193, 207  
anorexia nervosa ..... 55, 87  
aorta ..... 193, 198  
appetite suppressants ..... 263, 279  
arteries ..... 193, 199  
atrium ..... 193, 198

## B

balance ..... 3, 17  
ballistic stretching ..... 99, 108  
blood pressure ..... 193, 211  
body composition ..... 3, 11, 55, 59,  
..... 301, 305  
bulimia ..... 55, 87

## C

calisthenics ..... 139, 149, 301, 316  
calorie ..... 55, 81  
capillaries ..... 194, 199  
carbohydrate ..... 55, 83  
carbon dioxide ..... 194, 200  
cardiac ..... 194, 208  
cardiovascular ..... 194, 197  
cardiovascular disease (CVD) ..... 194, 210  
cardiovascular exercise ..... 3, 11  
cardiovascular fitness .. 194, 197, 301, 305  
carotid artery ..... 194, 217  
cellulite ..... 263, 276  
cholesterol ..... 194, 211  
circulatory system ..... 194, 198  
consumer ..... 263, 266  
cool-down ..... 99, 112, 195, 225, 301, 308  
coordination ..... 3, 17  
coronary arteries ..... 195, 210  
cross-train ..... 3, 21

## D

dehydration ..... 263, 272  
diuretics ..... 55, 85, 263, 280  
dynamic stretching ..... 99, 108

## E

ectomorph ..... 55, 61  
electrolyte ..... 56, 85  
endomorph ..... 56, 61  
ergogenic aids ..... 263, 281

## F

F.I.T.T. .... 3, 20, 99, 109, 301, 307  
fad ..... 263, 269  
fad diet ..... 263, 278  
fallacy ..... 56, 85  
fast-twitch muscle fiber ..... 139, 145  
fat ..... 56, 59  
fatigue ..... 139, 145  
flexibility ..... 4, 9, 99, 103, 301, 305  
flexion ..... 99, 116  
free weights ..... 139, 149

## H

health-related fitness components ..... 4, 11  
heart attack ..... 195, 210  
heart rate ..... 195, 206, 302, 315  
heat cramp ..... 4, 31  
heat exhaustion ..... 4, 31  
heat stroke ..... 4, 31  
high blood pressure ..... 195, 211

## I

ideal body weight ..... 56, 61  
isokinetic exercise ..... 139, 149  
isometric exercise ..... 139, 149  
isotonic exercise ..... 139, 149

## J

joint ..... 99, 103

## L

lean body mass ..... 56, 59  
ligament ..... 99, 104

## M

maximum heart rate ..... 195, 220  
mesomorph ..... 56, 61  
metabolic rate ..... 264, 279  
muscle ..... 100, 103  
muscle fiber ..... 139, 145  
muscle fitness ..... 302, 308  
muscle tone ..... 140, 144  
muscular endurance ..... 4, 11, 140, 143,  
..... 302, 305  
muscular fitness ..... 140, 143  
muscular strength ..... 4, 11, 140, 143,  
..... 302, 305

## N

nutrients ..... 56, 83

## O

obese ..... 56, 60  
overfat ..... 57, 59  
overload ..... 4, 19, 100, 109  
overweight ..... 57, 59

## P

passive exercise equipment ..... 264, 272  
passive stretching ..... 100, 108  
physical fitness ..... 5, 7, 302, 305  
power ..... 5, 17, 140, 146  
progression ..... 5, 19, 100, 109  
protein ..... 57, 86  
pulse ..... 195, 216, 302, 315

## Q

quackery ..... 264, 265

## R

radial artery ..... 195, 216  
range of motion ..... 5, 13, 100, 103  
reaction time ..... 5, 17  
recovery heart rate ..... 195, 216  
repetitions ..... 140, 152, 302, 316  
resistance training ..... 140, 143, 302, 315  
respiratory system ..... 195, 208  
risk factor ..... 196, 210

## S

sauna ..... 264, 273  
sedentary ..... 5, 9  
set ..... 140, 152, 302, 316  
skeletal muscles ..... 140, 145  
skill-related fitness components ..... 5, 17  
skinfold calipers ..... 57, 65  
slow-twitch muscle fiber ..... 141, 145  
somatotype ..... 57, 61  
specificity ..... 5, 19, 100, 109  
speed ..... 5, 17  
spot reduction ..... 264, 274  
static stretching ..... 100, 108  
stimulants ..... 264, 281  
stress ..... 5, 8  
stretching ..... 101, 104  
stretching point ..... 101, 108

## T

target heart rate zone (THRZ) ..... 196, 207,  
..... 302, 315  
tendon ..... 101, 104  
testosterone ..... 264, 282  
thyroid hormones ..... 264, 279  
training effect ..... 196, 222

## U

underfat ..... 57, 59

## V

valves ..... 196, 198  
veins ..... 196, 200  
ventricle ..... 196, 198

## W

warm-up ..... 101, 112, 196, 225, 303, 308  
weight training ..... 141, 143, 303, 316

## Help Agencies

The following is a listing of suggested help agencies and Web site addresses for *Personal Fitness*. These help agencies and sites may be used to expand and enrich student involvement. For example, sites may be used to stimulate discussion on research or to develop a scavenger hunt for current events. (Teachers should visit sites beforehand to verify the site address has not changed and contains appropriate information.)

American Anorexia and Bulimia  
Association  
133 Cedar Lane  
Teaneck, NJ 07666  
1-201-836-1800  
[www.aabainc.org](http://www.aabainc.org)

American Cancer Society  
National Headquarters  
1599 Clifton Rd. NE  
Atlanta, GA 30329  
[www.americancancer.org](http://www.americancancer.org)

American College of Sports Medicine  
P.O. Box 1440  
Indianapolis, IN 46206  
1-317-637-9200  
[www.acsm.org](http://www.acsm.org)

American Dietetic Association  
216 W. Jackson Blvd., Suite 800  
Chicago, IL 60606-6995  
1-800-877-1600  
[www.eatright.org](http://www.eatright.org)

American Heart Association  
National Center  
7320 Greenville Avenue  
Dallas, TX 75231  
1-214-750-5300  
[www.americanheart.org](http://www.americanheart.org)

American Medical Association  
535 N. Dearborn Street  
Chicago, IL 60610  
1-800-621-8335  
[www.ama-assn.org](http://www.ama-assn.org)

American Running and Fitness  
Association  
2420 K Street  
Washington, DC 20037  
[www.arfa.org](http://www.arfa.org)

Anorexia Nervosa and Related  
Eating Disorders  
P.O. Box 5102  
Eugene, OR 97045  
1-503-344-1144  
[www.anred.com](http://www.anred.com)

Bureau of Health Professions,  
Health Resources, and Services  
Administration  
Parklawn Bldg., Room 8-05  
5600 Fishers Lane  
Rockville, MD 20857  
1-800-338-2382 or 1-800-767-6732  
[www.health.gov/nhic/NHICScripts/Entry.cfm?HRCODE=HR0043](http://www.health.gov/nhic/NHICScripts/Entry.cfm?HRCODE=HR0043)

Centers for Disease Control and  
Prevention  
1600 Clifton Road  
Atlanta, GA 30333  
1-800-311-3435  
[www.cdc.gov](http://www.cdc.gov)

## Help Agencies continued

Consumer Information Center  
General Services Administration  
Pueblo, CO 81009  
1-719-948-3334  
[www.pueblo.gsa.gov](http://www.pueblo.gsa.gov)

Harvard Medical School Health  
Letter  
Department of Continuing Education  
25 Shattuck Street  
Boston, MS 02115  
[www.health.harvard.edu](http://www.health.harvard.edu)

National Dairy Council  
111 North Canal Street  
Chicago, IL 60606  
[www.milk.co.uk](http://www.milk.co.uk)

Nutrition Action Health Letter  
Center for Science in the Public  
Interest  
1875 Connecticut Avenue., NW,  
Suite 300  
Washington, DC 20009-5728  
[www.cspinet.org](http://www.cspinet.org)

Office of Disease Prevention and  
Health Promotion  
P.O. Box 1133  
Washington, DC 20013-1133  
1-800-336-4797  
<http://odphp.osophs.dhhs.gov>

Office of Prevention, Education and  
Control  
The National Heart, Lung, and  
Blood Institute  
Bethesda, MD 20892  
1-301-496-0054  
[www.nhlbi.nih.gov](http://www.nhlbi.nih.gov)

President's Council on Physical  
Fitness and Sports  
701 Pennsylvania Avenue NW,  
Suite 250  
Washington, DC 20004  
1-202-272-3421  
[www.fitness.gov](http://www.fitness.gov)

Project LEAN  
Low-Fat Eating for America Now  
P.O. Box 8049  
Young America, MN 44351-8049

U.S. Department of Agriculture  
Human Nutrition Research Branch  
14th Street and Independence  
Ave. SW  
Washington, DC 20250  
[www.usda.gov](http://www.usda.gov)

U.S. Public Health Service  
Public Inquiries Branch  
200 Independence Ave. SW  
Washington, DC 20201  
[www.hhs.gov](http://www.hhs.gov)

WebMD Corporation  
669 River Drive  
Center 2  
Elmwood Park, NJ 07407  
1-201-703-3400  
[www.webmd.com](http://www.webmd.com)

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Meredith, Marilu D. and Gregory J. Welk. *Fitnessgram Test Administration Manual*, 2<sup>nd</sup> edition. Champaign, IL: Human Kinetics, 1999.

Moore, Clancy and Roberta Stokes. *Personal Fitness and You*. Winston-Salem, NC: Hunter Textbooks, 1999.

Rainey, Don L. and Murray D. Tinker. *Foundations of Personal Fitness*. St. Paul, MN: West Publishing Company, 1997.

Williams, Charles S., et. al. *Personal Fitness: Looking Good, Feeling Good*. Dubuque, IA: Kendall/Hunt, 2000.

## **Production Software**

Adobe PageMaker 6.5. Mountain View, CA: Adobe Systems.

Adobe Photoshop 5.0. Mountain View, CA: Adobe Systems.

Macromedia Freehand 8.0. San Francisco: Macromedia.

Microsoft Office 98. Redmond, WA: Microsoft.