Healthy People 2010 Goals

- Reduce the number of teens who are overweight or obese.
- Increase the number of people who are at a healthy weight.
- Increase servings of fruit, vegetables, and whole grain products in the daily diet.
- Decrease amount of fat, especially saturated fat, in the daily diet.
- Reduce daily salt intake.
- Increase the number of people who get adequate calcium in the daily diet.
- Increase the number of teens who eat healthy meals and snacks.
- Increase regular physical activity levels of teens.
- Increase the number of people who meet national dietary guidelines.
- Increase the number of teens and young adults who receive health risk information.
- Improve health literacy and increase public health information dissemination.

Unit Activities

- Your Exercise Circuit
- Muscle Fitness Exercises With Resistance Machines
- Jollyball
- Cooperative Aerobics
- Continuous Rhythmical Exercise
- Active Learning: Isometric Exercise Circuit
In this chapter...

Activity 1  
Your Exercise Circuit

Lesson 13.1  
The Facts About Body Composition  
Self-Assessment  
Skinfold Measurements and Height–Weight Charts

Lesson 13.2  
Controlling Body Fatness  
Taking Charge  
Improving Physical Self-Perceptions  
Self-Management Skill  
Improving Physical Self-Perceptions

Activity 2  
Muscle Fitness Exercises With Resistance Machines

Activity 1  
YOUR EXERCISE CIRCUIT

In previous chapters you learned about various exercise circuits. These circuits were preplanned to help you learn various exercises for specific parts of health-related physical fitness. Now that you have had some experience with circuits, you can plan your own total fitness exercise circuit for building all parts of health-related physical fitness. Guidelines to consider in developing your circuit include choosing exercises for all parts of health-related fitness, not having two stations in a row that work the same muscles, and being sure that you include only safe exercises. Your teacher can provide you with a worksheet to help you in developing your own exercise circuit.
Lesson 13.1

The Facts About Body Composition

Lesson Objectives
After reading this lesson, you should be able to
1. Describe a healthy level of body fatness.
2. Explain how the level of body fatness is related to good health.
3. Explain how body fatness can be assessed.

Lesson Vocabulary
anorexia athletica (p. 224), anorexia nervosa (p. 223), basal metabolism (p. 221), body composition (p. 221), bulimia (p. 224), essential body fat (p. 223), overfat (p. 222), skinfolds (p. 224), underfat (p. 222)

Body fatness is a part of health-related physical fitness. Body fatness refers to the percentage of your total body that is comprised of fat tissue. For good health, it is important to have optimal amounts of body fat. In this lesson you will learn what level of body fat is best for you, how your body fatness affects your health, and how to assess your body fatness.

Body Composition
Together, all the tissues that make up your body are called your body composition. For a typical person, 15 to 25 percent of the body composition is fat and 75 to 85 percent is lean body tissue. Lean tissue includes muscles, bones, skin, and body organs such as the heart, liver, kidneys, and lungs.

People who do regular physical activity typically have a larger percentage of lean body weight, especially from muscle and bone, and less body fat than those who do not do such activity. Having a relatively low percentage of your total body weight as fat is desirable. However, for good health, it is important that your body composition include some body fat.

More than 60 percent of all adults are considered to be too fat or obese. Fewer children are considered to be too fat (13 percent) but this number is nearly three times as many as 20 years ago. About 11 percent of teens are considered to be too fat or obese. Type II diabetes, once thought to be an adult disease, is becoming more common among youth, partly because it is linked to overfatness and obesity (see chapter 3).

Factors Influencing Body Fatness
In chapter 1, you learned about some of the factors that influence physical fitness. Many factors also influence body fat levels.

Heredity
You inherit your body type from your parents. Some people are born with a tendency to be lean, muscular, or fat. Inherited tendencies make keeping body fat levels in the good fitness zone easy for some people but difficult for others. You need to consider heredity when you are determining your goals for body fatness.

Metabolism
Your basal metabolism is the amount of energy your body uses just to keep you living. This energy is measured in units called calories. Your basal metabolism does not include the calories you burn in work, recreation, studying, or even sitting and watching television. Some people have a higher basal metabolism than others. This means that their bodies, at complete rest, burn more calories than the bodies of those with low metabolism. People with a high metabolism can consume more calories than others can without increasing their level of body fat.

Metabolism is affected by heredity, age, and maturation. Most young people have a high metabolism because their bodies are growing and building muscle. As you grow older, your rate of metabolism becomes slower. Then most people need to reduce the number of calories in the diet to avoid gaining fat. How might the rates of metabolism of the people in the picture on page 222 be likely to differ?

Maturation
As you grow older and the hormone levels in the body begin to change, levels of body fat also change. During the teen years, female hormones cause girls to develop
higher levels of body fat than boys. Because of male hormones, teenage boys have greater muscle development than girls.

**Early Fatness**
Children who are too fat develop extra fat cells that make it more difficult to control fat levels later in life. Keeping body fatness within the good fitness zone during the childhood and teen years will help keep body fat levels in check throughout life.

**Diet**
The amount of energy in foods is measured in calories. A typical teenage male needs to consume about 2,500 to 3,000 calories a day to maintain an ideal level of body fat. A typical teenage female needs about 2,000 to 2,500 calories a day. Most males need more calories than females because they are larger and have more muscle mass.

**Physical Activity**
Your body burns calories for energy. The more vigorous activity you do, the more energy your body uses and the more calories you need. An inactive person uses less energy each day than an active person and therefore needs to consume fewer calories.

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**Body Fat: How Much Is Good?**

About one half of your body fat is located deep within your body. The remaining fat is between your skin and muscles. A fit person has the right amount of body fat—neither too much nor too little.

**Weight Versus Fat**
The terms *underweight* and *overweight* do not provide a great deal of information about fitness or about a person’s body composition. Underweight and overweight refer to how much you weigh compared to others. Muscles weigh more than fat. Thus, you can weigh more than someone else of the same size because you are more muscular and have less body fat than the other person. For example, the runners in the picture have strong muscles. They may weigh more than other people who appear to be the same size. On the other hand, you can weigh less than someone else of the same size because you have smaller bones.

The terms *overfat* and *underfat* are very useful because they describe how much of your total body weight is made up of fat. Underfat means having too little body fat; overfat means having too much body fat. Obesity is a term used to describe people who are overfat.
Body Fat in Females and Males
From the late teens on, females generally have a higher percentage of body fat than do males. Teenage girls should not have less than 11 percent or more than 25 percent body fat. Over 35 percent fat is considered obese for females. Teenage boys should not have under 6 percent or over 20 percent body fat. Over 30 percent is considered obese for males.

Overfatness, Health, and Wellness
Having too much fat can be unhealthy. Scientists report that people who are overfat have a higher risk of heart disease, high blood pressure, diabetes, cancer, and other diseases. Being overfat also reduces a person’s chances of successful surgery. Health costs for obese people are about $1,500 a year more than for people with healthy body fat levels. In addition, an overfat person tires more quickly and easily than a lean person. For this reason, an overfat person might be less efficient in work and recreation. Many experts believe that the reason why so many adults are too fat is that they try to achieve an unrealistic weight or fat level. For example, many people try to be as lean as a movie star or an athlete shown in a commercial. When they cannot attain or maintain exceptionally low body fat levels, they give up and become too fat. The experts suggest it is better to set less extreme goals that are achievable and that will result in maintaining a healthy body fat level throughout life.

Too Little Body Fat
Just as having too much body fat can be a health risk, having too little body fat is also a health risk. Eating disorders such as anorexia nervosa, anorexia athletica, and bulimia have many negative health consequences and can be fatal. Identifying the symptoms of eating disorders early is extremely important. Conditions associated with an excessive desire to lose fat and maintain very low body fat levels can be serious health problems.

Many experts believe that our nation’s obsession with leanness as seen on TV, in the movies, and in magazines contributes to eating disorders. Six to 8 percent of girls in grades 9 to 12 are considered to be overweight, but more than one third (33 to 36 percent) of all girls in these grades think they are too fat. This statistic shows that many girls use an unrealistic standard in judging their body composition.

The minimum amount of body fatness is called essential body fat because if fat levels in the body drop below this amount, health problems result. The chart on this page shows several reasons why your body needs some body fat.

Being underfat can result in abnormal functioning of various body organs. In fact, exceptionally low body fat levels can result in serious health problems, particularly among teenagers. Females with especially low levels of body fat experience health problems related to the reproductive system and risk loss of bone density.

Anorexia Nervosa
Anorexia nervosa is a serious eating disorder. A person who has this disorder severely restricts the amount of food he or she eats in an attempt to be exceptionally underfat. In addition, many people with anorexia do extensive physical activity to further lower their levels of body fat to extremely dangerous levels.

Anorexia is most common among teenage girls, though it is becoming increasingly common among teenage boys. People with this disorder are usually very hard workers and high achievers. They have a distorted view of their bodies and see themselves as being too fat even when they are extremely thin. A fear of maturity, and the weight gain associated with adulthood, is a characteristic of persons with this disorder. People with the disorder often try to hide their condition by wearing baggy clothing, only pretending to eat, and...
exercising in private. Anorexia is a life-threatening condition, and those who have the condition need immediate professional help.

**Anorexia Athletica**

Anorexia athletica has many symptoms that are similar to those of anorexia nervosa. It is most common among athletes involved in sports such as gymnastics, wrestling, and cheerleading, in which a low body weight is desirable. This condition can lead to anorexia nervosa. The disorder is thought to be related to the pressure to maintain a low weight and an excessive preoccupation with dieting and exercising for weight loss.

**Bulimia**

Bulimia is an eating disorder in which a person does binge eating, or eats very large amounts of food within a short period of time. Bingeing is followed by purging. Techniques of purging include vomiting and the use of laxatives to rid the body of food and prevent its digestion. Bulimia can result in loss of teeth, gum diseases, severe digestive problems, and other significant health problems.

## Body Fat Assessment

You might wonder how to assess body fatness and make determinations about how much you should weigh. Several methods exist to make such assessments.

**Laboratory Measurements of Fatness**

Until recently, underwater weighing was considered to be the best way to assess your body fat level. With this technique, you are immersed in a tank of water and then weighed. Lean people weigh more under water; they sink. People with more fat weigh less under water; they float. Measurements of your lung capacity are also taken because the amount of air in your lungs influences your weight. A formula is applied to your underwater weight and lung capacity to scientifically determine your body fat level.

Recently an X-ray technique called DEXA has been developed and is considered to be the new gold standard for measuring body fatness. DEXA and underwater weighing are the most accurate methods of measuring body fat, but these procedures require time, are expensive, and must be done by an expert.

**Skinfold Measurements**

Your body fat levels can also be determined by measuring the thickness of skinfolds, the fat under the skin.
too fat. This is one reason why skinfolds or laboratory techniques are considered to be better measures for very active people.

**Height–Weight Charts**

A common method of assessing body weight is through the use of height–weight tables. The tables, shown in the self-assessment on page 228, list normal weight ranges for people according to age, height, and sex. Note that this procedure does not assess body fatness. As noted, measures that use weight and height only can mistakenly classify a thin, muscular person as overweight. Height–weight techniques may also mistakenly classify an overfat person who has little muscle as within a normal weight range. These tables are convenient but should not be the only source of information about body composition. You will use height–weight charts in the self-assessment in this chapter.

**Waist-to-Hip Ratio**

Evidence indicates that people with a very large waist compared to hip size tend to have more fat inside the body and may be at risk for health problems. This is because excessive body fat in the abdominal area is associated with high blood fat levels. You can measure the circumference of your hips and waist and calculate a ratio. It is a useful health risk indicator that can be used throughout life. You will learn more about waist-to-hip ratio in chapter 14.

**Other Measurements**

Computers and other machines have been developed to test body fat levels. Many are expensive and require trained people to do the assessment. Others are unreliable. Many fitness and health clubs, as well as some schools, use some of these techniques. One technique, bioelectrical impedance analysis, can be accurate when done properly. However, unless you can use the same machine from measurement to measurement, errors may occur. Advantages of skinfolds and the other methods listed are that they are relatively easy to do, they do not require expensive machines, and you can do them yourself. Research has shown that inexpensive plastic calipers such as those shown in the photos on page 226 are quite accurate if used properly by a person who is trained in using them and who practices measurement technique.

**Ideal Body Weight**

What is my ideal body weight? Even after learning about the different forms of body composition assessment, this is the question many people ask. Experts agree that there is no such thing as an ideal body weight for all people that can be provided in a chart or a table. The self-assessments you do in this book provide you with several ways to get an idea of your body composition. The best advice is to have a long-term goal of achieving the healthy zone for body fatness (see table 13.1 on page 227).

If you are in the marginal or too much fat zone, then you should develop a plan that will gradually move you from the zone you are in to the next zone. Trying to achieve the healthy zone when you are too far from it is an unrealistic goal. If you are already in the healthy zone for body fat, a good goal is to stay there.

If you are in the healthy zone and want to be leaner to enhance your performance in a sport, you may want to achieve the high performance zone. It should be emphasized that being in the high performance zone is not necessary for good health and may not be a realistic goal for all people. Trying to be leaner than the high performance zone is not a desirable goal.

If you are in the too little fat zone, it is desirable to increase your weight by gaining body fat. Those with eating disorders often try to reduce body fat even when they already have too little for good health.

If you achieve and maintain the healthy zone for body fat, you will probably also have a desirable waist-to-hip ratio, a healthy BMI, and be in the normal weight range for your age and sex. However, as noted earlier in this chapter, it is possible to have a healthy body fat level and be above BMI and normal weight standards because people with a lot of muscle may weigh more than other people but not be overfat.

Once you have achieved a body fat level that puts you in the healthy zone, you can weigh yourself. Maintaining this weight while maintaining a fat level in the healthy zone is a desirable lifetime goal. Learning to eat well and perform regular physical activity is essential in achieving this goal.

**Lesson Review**

1. What is a good level of body fat?
2. How is a person’s body fatness related to good health?
3. What are three methods of assessing body fat? Explain the accuracy of each method.
Self-Assessment

Skinfold Measurements and Height–Weight Charts

One way to estimate your body fat percentage is to use skinfold measures. You can assess your body weight using height–weight charts. When you do this assessment, keep in mind these points:

- Your fitness scores are your personal information and should be kept confidential.
- Be sensitive to the feelings of others when body fat measurements are being taken. Taking the measurements privately may be appropriate.
- You can use your results to help build a fitness profile.

Skinfold Measurements

You can use skinfold measurements to estimate body fat percentage and target weight. For teenagers, upper arm (triceps) and calf measurements provide a good estimate of body fat percentage. Work with a partner to take each other’s measurements. When you are performing the skinfold measurements on your partner use the instructions that follow. Write your results on your record sheet.

- **Triceps skinfold:** Pick up a skinfold on the middle of the back of the right arm, halfway between the elbow and the shoulder. The arm should hang loose and relaxed at the side.

- **Calf skinfold:** The person being tested stands and places the right foot on a chair. Pick up a skinfold on the inside of the right calf halfway between the shin and the back of the calf, where the calf is largest.

1. Use your left thumb and index finger to pick up the skinfold. Do not pinch or squeeze the skinfold.

2. Hold the skinfold with your left hand while you pick up and use the caliper with the right hand to get a reading.

3. Place the caliper over the skinfold about one-half inch below your finger and thumb. Hold the caliper on the skinfold for 3 seconds, and then note the measurement. Read the caliper measurement to the nearest one-half millimeter (mm), if possible.

4. Make three measurements each for the triceps and the calf skinfolds. Use the middle of the
1. Once you have had your skinfold measurements taken add the triceps and calf scores. Use the figure below to estimate your body fat percentage. Use a ruler to connect your sum of skinfolds with the percent fat figure. For example, if you are a male and your skinfold sum is 27 mm, your body fat percentage is approximately 22 percent. Then look at the rating chart at the left to determine your rating for body fatness.

2. Once you have determined your percent body fat using skinfold measures, you can determine your target weight. Target weight is an estimate of a weight that would put you in the healthy zone for body fatness and is based on your current weight and your current sum of skinfolds. To do this you will need to use the Target Body Weight worksheet provided by your teacher. The worksheet contains tables (one for males and one for females). Using the appropriate table, find the row showing your current body weight and the column with your current sum of skinfolds. Your target weight is located in the box where the two columns intersect. If your sum of skinfolds is less than 27 mm for females and 22 mm for males, you are already at or below your target weight. People should determine their own targets based on the factors that influence body fatness discussed earlier in this chapter.

"Triceps Plus Calf Skinfolds: Males" and "Triceps Plus Calf Skinfolds: Female" reprinted by permission of Dr. Tim G. Lohman, Department of Exercise and Sport Sciences, University of Arizona.
Height–Weight Charts

You can also use height–weight charts to estimate your appropriate weight range.

1. Remove your shoes.
2. Take your own height and weight measures or ask a partner to help you.

3. Use Table 13.2 to determine the normal weight range for a person of your sex, age, and height.
4. Record your height, weight, and normal weight range on the record sheet. Compare your target weight from skinfolds and your normal weight range. Then answer the questions on your record sheet.

Table 13.2

Normal Weight Ranges

<table>
<thead>
<tr>
<th>HEIGHT</th>
<th>MALES</th>
<th>AGE</th>
<th>FEMALES</th>
<th>AGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>ft</td>
<td>in.</td>
<td>13-14</td>
<td>15-16</td>
<td>17-20</td>
</tr>
<tr>
<td>4</td>
<td>6</td>
<td>69-72</td>
<td>73-76</td>
<td>78-81</td>
</tr>
<tr>
<td>4</td>
<td>7</td>
<td>73-76</td>
<td>79-82</td>
<td>82-85</td>
</tr>
<tr>
<td>4</td>
<td>8</td>
<td>78-81</td>
<td>82-85</td>
<td>87-90</td>
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<tr>
<td>4</td>
<td>9</td>
<td>82-85</td>
<td>86-89</td>
<td>91-94</td>
</tr>
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<td>10</td>
<td>87-90</td>
<td>91-94</td>
<td>98-101</td>
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<td>11</td>
<td>88-91</td>
<td>96-99</td>
<td>104-107</td>
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<td>89-92</td>
<td>101-104</td>
<td>107-109</td>
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<td>5</td>
<td>1</td>
<td>97-100</td>
<td>101-104</td>
<td>106-109</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>100-103</td>
<td>106-109</td>
<td>114-117</td>
</tr>
<tr>
<td>5</td>
<td>3</td>
<td>106-109</td>
<td>111-114</td>
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<td>4</td>
<td>113-116</td>
<td>115-118</td>
<td>124-127</td>
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<td>5</td>
<td>116-119</td>
<td>120-123</td>
<td>129-132</td>
</tr>
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<td>5</td>
<td>6</td>
<td>120-123</td>
<td>126-129</td>
<td>134-137</td>
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<td>7</td>
<td>126-129</td>
<td>132-135</td>
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<td>135-138</td>
<td>140-143</td>
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<td>139-142</td>
<td>147-150</td>
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<td>158-161</td>
<td>162-165</td>
<td>167-170</td>
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<td>160-163</td>
<td>167-170</td>
<td>177-180</td>
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<tr>
<td>6</td>
<td>3</td>
<td>177-180</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Lesson 13.2

Controlling Body Fatness

Lesson Objectives
After reading this lesson, you should be able to
1. Explain how to use the FIT formula for fat control.
2. Explain how physical activity helps a person maintain a healthy body fat level.

Lesson Vocabulary
calorie (p. 229)

Balancing Calories

Balancing calorie intake and expenditure affects body fat levels. The foods you eat contain calories that your body uses for energy. Fat is stored energy (stored calories). If you take in (eat) more calories than you expend (in exercise), you will gain weight (store calories as fat). If you expend more calories than you take in, you will lose weight. If you balance the calories consumed and expended, you maintain your current weight.

FIT FACTS

One pound of fat contains 3,500 calories. Therefore, you can lose a pound of fat by eating 3,500 calories less than you normally eat in a given time or by burning 3,500 calories more than normal in physical activity. Eating foods that provide more calories than your body uses will cause you to gain weight. Therefore, you can gain a pound of fat by eating 3,500 calories more than you usually eat within a given time or expending 3,500 calories fewer in physical activity within a given time.

A major health goal is to help Americans achieve and maintain acceptable body fat levels throughout life. In this lesson, you will learn the FIT formula for fat control and appropriate activities for gaining weight and losing body fat.

Balancing caloric input and output.

Caloric input (diet) - Caloric output (exercise)

Intake - Output

Weight gain - Fat loss
**The FIT Formula**

As noted in the previous section, both diet and physical activity play an important role in maintaining a healthy body fat level. Because both diet and physical activity are important for fat control, each has a target zone, shown in table 13.3.

**Gaining Weight**

Combining proper physical activity and diet is the best weight gain method. Strength and muscular endurance exercises can help you gain weight. Resistance exercises that help build muscle are especially effective because they build muscle and muscle weighs more than fat.

Remember that physical activity burns calories. Therefore, when you are active, you need to increase your intake of calories in order to gain weight. You will learn in chapter 14 that you do not need to eat special diets or take protein supplements to gain weight; you need only eat a well-balanced diet that contains an increased number of calories.

**Physical Activity and Calories**

Every physical activity burns calories. You might wonder how many calories are burned by different activities. Table 13.4 shows the approximate number of calories burned each hour during vigorous recreational activities. Find the weight value nearest your own weight. Add 5 percent to the number of calories for each 10 pounds you weigh above the listed weight value. Or, subtract 5 percent from the number of calories for each 10 pounds you weigh below the listed weight value. Use this table to determine which physical activities are best for burning calories. Then see which activities appeal to you.

**Physical Activity and Fat Loss**

A combination of physical activity and eating fewer calories is the best way to lose fat. Research shows that a person who reduces calorie intake without increasing activity will lose both fat and muscle tissue, while a person who increases physical activity and reduces calorie consumption loses mostly body fat. Notice that physical activities from all levels of the Physical Activity Pyramid, except the top level indicating inactivity, are appropriate for helping to control body fatness.

**Lifestyle Activities**

Lifestyle physical activities are especially effective in long-term fat control. Studies indicate that lifestyle

---

**Table 13.3**

<table>
<thead>
<tr>
<th>Diet</th>
<th>Physical activity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Frequency</strong></td>
<td><strong>Exercise for flexibility</strong></td>
</tr>
<tr>
<td>Eat 3 regular meals or 4-5 small meals daily. Regular, controlled eating is best for losing fat. Skipping meals and snacking is usually not effective.</td>
<td>Participate in physical activity daily. Regular physical activity is best for losing fat. Short or irregular physical activity does little for controlling body fat.</td>
</tr>
<tr>
<td><strong>Intensity</strong></td>
<td><strong>Exercise for strength and muscular endurance</strong></td>
</tr>
<tr>
<td>To lose 1 pound of fat, you must eat 3,500 fewer calories than normal.</td>
<td>To lose 1 pound of fat, you must use 3,500 more calories than normal.</td>
</tr>
<tr>
<td>To gain a pound of fat, you must eat 3,500 more calories than normal.</td>
<td>To gain a pound of fat, you must use 3,500 fewer calories than normal.</td>
</tr>
<tr>
<td>To maintain your weight, you must keep the number of calories you eat the same.</td>
<td>To maintain your weight, you must keep your level of physical activity the same.</td>
</tr>
<tr>
<td><strong>Time</strong></td>
<td><strong>Level 1 (Lifestyle physical activity)</strong></td>
</tr>
<tr>
<td>Neither diet nor physical activity results in quick fat loss. Medical experts recommend that a person lose no more than 2 pounds of weight each week without medical supervision. Both diet and physical activity can be used to safely lose 1 or 2 pounds each week.</td>
<td>Rest or inactivity</td>
</tr>
</tbody>
</table>
Body Composition

Activities are just as effective as organized sports and games for losing fat, and more effective for permanent fat loss.

**Aerobic Activities**

Aerobic activities are effective for fat loss. You can do them for relatively long periods, burning many calories.

<table>
<thead>
<tr>
<th>Activity</th>
<th>100 lb</th>
<th>120 lb</th>
<th>150 lb</th>
<th>180 lb</th>
<th>200 lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>Backpacking/Hiking</td>
<td>307</td>
<td>348</td>
<td>410</td>
<td>472</td>
<td>513</td>
</tr>
<tr>
<td>Badminton</td>
<td>255</td>
<td>289</td>
<td>340</td>
<td>391</td>
<td>425</td>
</tr>
<tr>
<td>Baseball</td>
<td>210</td>
<td>238</td>
<td>280</td>
<td>322</td>
<td>350</td>
</tr>
<tr>
<td>Basketball (half-court)</td>
<td>225</td>
<td>240</td>
<td>300</td>
<td>345</td>
<td>375</td>
</tr>
<tr>
<td>Bicycling (normal speed)</td>
<td>157</td>
<td>178</td>
<td>210</td>
<td>242</td>
<td>263</td>
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<td>330</td>
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</tr>
</tbody>
</table>

**Active Sports and Active Recreation**

Active sports and recreation that are equal in intensity to aerobic activities such as jogging are effective in fat loss because they can be done for long periods of time. Vigorous sports and recreational activities also burn calories but are often so intense that they cannot be performed for long periods of time.
Strength, Muscular Endurance, and Flexibility Exercises

Remember that muscle fitness exercises can help you gain weight by building muscle tissue. However, these exercises, combined with the proper diet, also can contribute to fat loss because they do burn calories. Flexibility exercises do not expend as many calories as the other four types of activities in the Physical Activity Pyramid; however, they do expend calories above resting. Any calories expended above normal can help in controlling body fatness.

www.fitnessforlife.org/student/13/6

Calculating Your Daily Calorie Expenditure

If you keep a record of all of the activities you perform in a day, you can determine the total calories you expended. You can use special forms (available from your teacher) to make record keeping easier. After keeping a record of the activities you do for a full day, you can use the formula at the Web site to help you calculate your daily calorie expenditure. Later you can compare your daily expenditure to your daily calorie intake (see chapter 14). To maintain weight, you must expend as much energy as you take in. To lose weight, you must expend more energy than you take in. To gain weight, you must take in more calories than you expend.

www.fitnessforlife.org/student/13/7

Table 13.5
Myths and Facts About Fat Loss

<table>
<thead>
<tr>
<th>Myths</th>
<th>Facts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exercise cannot be effective for fat loss because it takes many hours of exercise to lose even 1 pound of fat.</td>
<td>You can lose body fat over time with regular physical activity if your calorie intake remains the same. Fat lost through physical activity tends to stay off longer than fat lost through dieting alone.</td>
</tr>
<tr>
<td>Exercise does not help fat loss because it increases your appetite and encourages you to overeat.</td>
<td>If you are mildly active instead of inactive, your appetite should not increase. Even moderate to vigorous activity will not cause your appetite to increase so much that you overeat. People who overeat usually do so for reasons other than appetite.</td>
</tr>
<tr>
<td>Most overfat people have glandular problems.</td>
<td>Most overfat people eat too much, do too little physical activity, or both.</td>
</tr>
<tr>
<td>You can spot reduce by exercising a specific body part to lose fat in a particular area.</td>
<td>Any exercise that burns calories will cause the body’s general fat deposits to decrease. One exercise does not cause one area of fat to decrease more than another.</td>
</tr>
</tbody>
</table>
Taking Charge: Improving Physical Self-Perceptions

All people have a mental picture of themselves. If you think you do well in a certain activity, you will probably take part in that activity. If you feel embarrassed about your appearance or ability level while doing an activity, you probably will avoid that activity.

Michael was not sure that he wanted to go back to school after the summer break. It seemed as if all of his friends had grown several inches taller in the last few months, and he had stayed the same height. Michael felt embarrassed and a little jealous, even though none of his friends seemed to notice. His height certainly did not alter his ability to play tennis. In fact, friends still called him “King of the Court” because he usually won the match whenever he played.

Raul was one of the shortest in his class, but height did not stop him from being involved in activities. He realized he had never been a great basketball player, but he still liked to play with his friends from school. He discovered that height had nothing to do with his ability to go hiking, and it did not prevent him from being a good wrestler.

For Discussion

Michael's self-perception about his appearance has changed from positive to negative. What can he do to change his negative perception? How does Raul keep a positive self-perception? What else can a person do to develop a positive self-perception? Fill out the questionnaire provided by your teacher to find out about your own self-perception. Consider the guidelines on page 234.

Myths About Fat Loss

Some people have incorrect ideas about physical activity and fat loss. Read table 13.5 to identify some mistaken ideas and learn some facts about losing body fat.

No matter what your body is like now, regular physical activity and proper diet will help you control body fatness. When you are fit, you look better, feel better, and have fewer health problems than people who are overfat and unfit.

Myths

1. The faster you run, the more fat you will lose.
2. The more muscle you build, the more fat you will have.
3. The only way to lose fat is to have a low-calorie diet.
4. You can lose fat overnight.

Facts

1. Fat loss and muscle gain are separate issues.
2. Losing body fat takes time and is not a overnight process.
3. Eating a balanced diet is necessary for fat loss.
4. Losing fat requires both a calorie deficit and exercise.

FIT Facts

Interviews with teens show that 44 percent of overweight youth were, or are, teased about their body weight. Studies show that four to five times as many teens think they are overweight than really are. Being teased or having feelings of being overweight can result in low physical self-perceptions. Teens can help other teens improve self-perceptions by being supportive rather than critical.

Lesson Review

1. How can you use the FITT formula to control your body fatness?
2. How can physical activity help you maintain a healthy body fat level?
Self-Management Skill

Improving Physical Self-Perceptions

A self-perception is an awareness you have about your own thoughts, actions, or appearance. It is how you think other people view you. Some of the many kinds of self-perceptions are academic, social, and artistic. In this book the focus is on physical self-perceptions. This refers to the way you view your physical self. Four areas of physical self-perceptions are strength, fitness, skill, and body attractiveness. People with good physical self-perceptions are happy with their current strength and fitness levels, they feel that the skills that they have are adequate to meet their needs, and they like the way they look. We know that people who have positive physical self-perceptions are more likely to be active than those who do not have such good perceptions of themselves. The following list includes some guidelines that can be used to help people improve physical self-perceptions.

- **Assess your current physical self-perceptions.** You may use the worksheet provided by your teacher.

- **Consider your self-assessment results.** Use the self-assessment to determine whether you have any areas in which your physical perceptions are especially low (strength, fitness, skill, or body attractiveness).

- **Perform regular physical activity to improve yourself physically or practice to improve your physical skills.**

- **Consider a new way of thinking about yourself.** Often people set unrealistic standards such as trying to look like someone on television or in the movies. It is important to understand that in real life these people do not look the way they look on the screen. In fact, special cameras and computers are often used to change the way they look. Also you do not know whether a movie star has eating disorders or practices healthy habits. Consider your heredity and set realistic standards for yourself.

- **Think positively.** Almost all people have a physical characteristic that they would like to change. Studies show that the things people don’t like about themselves are rarely seen as problems by other people. You are often your own worst critic, so thinking positively can help you present yourself in a positive way.

- **Do not let the actions of a few insensitive people cause negative feelings about yourself.** People who are insensitive to others’ feelings will always exist. These people often have low perceptions of themselves and try to build themselves up by tearing other people down. Recognize that criticism from these people is their problem, not yours.

- **Consider how your behavior and actions influence how other people view you.** Acting happy and friendly has as much to do with how others perceive you as your physical characteristics.

- **Realize that all people have some imperfections.** Try to build on your strengths and improve your areas of weakness.

- **Find a realistic role model and be a role model for others.** Instead of trying to be like someone who is totally unlike you, try to find someone who you admire who has characteristics you can realistically achieve. Just as you look to others for models, remember that others look to you as a model. Providing a positive model for others can help you think positively about yourself.
Activity 2

Muscle Fitness Exercises With Resistance Machines

Although physical activity from each of the levels of the Physical Activity Pyramid (including lifestyle activity from level 1 and active aerobics, active recreation, and active sports from level 2) is essential for improving body composition, it is also important to do exercises for muscular strength and endurance because they can significantly decrease your percentage of body fat as well as increase your lean body mass. Strength and muscular endurance exercises from level 3 of the pyramid build muscles so that you look your best.

In this activity, you will perform 10 basic exercises using resistance machines. The exercises are called the Basic 10 because they build muscle fitness in 10 of the basic, or large, muscle groups of the body. Use your 1RM values from the self-assessment in chapter 11 to determine the amount of weight or resistance you should be able to lift. If you did not have time to do the 1RM self-assessments for each exercise, complete this process before performing the exercises. Follow these instructions and guidelines to perform the exercises:

► Your teacher will demonstrate or have a class member demonstrate proper technique for each of the lifts. After the demonstration, travel from one machine to the next. Practice each exercise using no resistance or weight. Have a partner or partners evaluate your technique while you perform the exercise, and make changes if necessary. Exchange places with your partner(s). Continue this procedure at each machine. Use the guidelines on page 189 to help evaluate your partner.

► Next, determine 40 percent of your 1RM for each exercise. Perform 10 reps of each exercise at this resistance. Perform 1 set using proper form.

► If you have the opportunity to continue this program over several weeks, use the double progressive system to increase your overload (see page 187).

► Do exercises for the abdominal and back muscles. Some simple exercises not requiring machines are just as effective as resistance machine exercises. They are included in the Basic 10 exercises even though they do not use machines.

► When performing PRE, be sure to follow exercise etiquette. Carry a towel with you and wipe off the exercise bench after you do your exercise. Get off the machine between exercises so that another person can use it. Take your proper turn.

► You may have to wait between exercises to find an available machine. If a machine is not available, perform the curl-up or the back extension exercise on a table or bench. Once you complete these exercises, if you still have waiting time, perform a cardiovascular exercise such as bench stepping or rope jumping.
**Bench Press**

1. Lie on your back on the bench with your feet flat on the floor. Grasp the handles with your palms facing away from your body. Flatten your back. If possible, place your feet on the floor to help flatten your back and avoid arching it. If your feet do not reach the floor easily, you can bend your knees and place your feet on the bench to accomplish the same purpose.

   **Caution:** Do not place your feet on the bench if it is so narrow that your feet might slip off the bench or if the bench is unstable.

2. Push upward on the handles, extending your arms completely.

   **Caution:** Do not lock your elbows. Do not arch your back.

3. Return to the starting position.

4. You may choose either this exercise or the seated arm press (see page 183). You may also substitute this exercise in the self-assessment if you have a bench press machine and do not have a seated press machine.

**Knee Extension**

1. Sit on the bench. Hook one of your ankles under the pad. Grasp the handles on the bench.

2. Extend your knee. Bend the knee through its full range of motion.

3. Return to the starting position. Repeat the exercise with the other leg.

4. You may choose either this exercise or the seated leg press (see page 183).
Hamstring Curl

1. Lie facedown on the bench with your kneecaps extending over the edge of the bench. Hook your heels under the cylindrical pads. Grasp the handles on the bench.
2. Bend your knees so that you lift the cylindrical pads. Bend the knees through their full range of motion. The pads will almost touch your buttocks at the top of the lift.
3. Lower to the starting position.

**Caution:** Do not lock the knees when putting your heels under the pads. If necessary, have a partner lift the pads so that you can avoid this.

This exercise uses the hamstring muscles.

Biceps Curl

1. Stand in front of the station and grasp the handle of the low pulley, palms up. Tighten your abdominals and buttocks (gluteal muscles).
2. Pull the handle from thigh level to chest level. Bend your elbows, but keep them close to your sides.

**Caution:** Do not move other body parts.

3. Return to the starting position.

This exercise uses the biceps and other elbow flexor muscles.
**Heel Raise**

1. Place a 2-inch-thick board on the floor. Stand with the balls of your feet on the board and the handles even with your shoulders.
2. Grasp the handles with your palms facing away from your body. Keep your hands and arms stationary during the lift.
3. Rise on to the balls of your feet, and then lower to the starting position.

This exercise uses the calf muscles.

**Lat Pull-Down**

1. Sit on the bench (or floor depending on the machine). Adjust the seat height so that your arms are fully extended when you grab the bar.
2. Grab the bar with your palms facing away from you. Your arms should be at least shoulder-width apart.
3. Pull the bar down to chest level.
4. Return to the starting position.

This exercise uses the muscles of the back (latissimus dorsi), shoulder (deltoids), chest (pectoralis), and arm (biceps).
**Triceps Press**

1. Adjust the seat height so that your hands are on the handles just above shoulder height.
2. With your thumbs toward your body, grab the handles.
3. Keeping your back straight, push forward with your arms until they are straight.
4. Return to the starting position.

This exercise uses the muscles on the back of the arm (triceps).

**Seated Row**

1. Adjust the machine so that your arms are almost fully extended and parallel to the ground.
2. Grab the handles with your thumbs up.
3. Keeping your back straight, pull straight back toward your chest.
4. Return to the starting position.

This exercise uses the muscles of the back and shoulders.
Back Extension Exercise (Trunk Lift)

1. Lie facedown on a table (or bench). Slide forward until your upper body extends over the edge at the waist. With a partner holding your legs, allow the upper body to lower.
2. From the low position, lift your upper body until it is even with the edge of the table.

**Caution:** Do not lift any higher.

3. Lower to the beginning position. Repeat the exercise up to 10 times.

**Safety Tip:** As you do these exercises, move only as far as the directions specify.

Abdominal Exercise (Curl-Up)

The curl-up, sometimes referred to as the crunch, is a good substitute for the straight-leg sit-up, bent-knee sit-up, and hands-behind-the-head sit-up.

1. Lie on your back with your knees bent and your feet close to your buttocks.
2. Hold your hands and arms straight in front of you and curl your head, shoulders, and upper back off the floor.
3. Slowly roll back to the starting position.

**Caution:** Do not hold your feet while doing a trunk curl.

As you improve, you might hold your arms across your chest. When you become very good, you might place your hands on your face (cheeks).

**Safety Tips:**
1. Perform all movements slowly.
2. Exhale on the lift; inhale on the return to the starting position. Do not hold your breath.
13. Body Composition

Project

Keep a record of your calorie intake and your physical activity for one week. How might you adjust your calorie intake and your amount of physical activity to better maintain or improve your levels of body fat? What short-term goals might you have for calories eaten each day and calories expended each day for the one-week period? Make a written plan for the following week incorporating changes that might help you reach or maintain ideal levels of body fat. Use the worksheets provided by your teacher.

Chapter Review

Reviewing Concepts and Vocabulary

Number your paper from 1 to 6. Next to each number, write the word (or words) that correctly completes the sentence.

1. An eating disorder characterized by bingeing and purging is called ________.
2. The minimum amount of body fat needed for good health is ________.
3. Your ________ is the amount of energy your body uses at complete rest.
4. A term used to describe a person who is very overfat is ________.
5. People with ________ see themselves as too fat even when they are extremely thin.
6. A technique for assessing body fat levels that involves being weighed under water is called ________.

Number your paper from 7 to 12. Next to each number, choose the letter of the best answer.

<table>
<thead>
<tr>
<th>Column I</th>
<th>Column II</th>
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<tbody>
<tr>
<td>7. overfat</td>
<td>a. fat under the skin</td>
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<tr>
<td>8. skinfolds</td>
<td>b. too much body fat</td>
</tr>
<tr>
<td>9. anorexia athletica</td>
<td>c. all the tissues that make up your body</td>
</tr>
<tr>
<td>10. underfat</td>
<td>d. eating disorder most common among athletes</td>
</tr>
<tr>
<td>11. caliper</td>
<td>e. used for skinfold measurements</td>
</tr>
<tr>
<td>12. body composition</td>
<td>f. too little body fat</td>
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Number your paper from 13 to 15. On your paper, write a short answer for each statement or question.

13. Explain why maintaining essential body fat levels is important for good health.
14. Describe one myth about fat loss and explain how it is incorrect or misleading.
15. Why is a combination of diet and physical activity best for maintaining ideal levels of body fat?

Thinking Critically

Write a paragraph to answer the following question.

Each year people spend billions of dollars on weight loss or muscle building products that do not work. Look in the newspaper or a popular magazine. Find an advertisement for a weight loss product. Read the ad and make a list of its claims. Place a checkmark by those that are consistent with the information in this chapter. Place an X by those that appear to be false. Write a paragraph evaluating the advertisement.