



JROTC Virtual Learning

LET 2 Health and Fitness

May 12th, 2020



JROTC Virtual Learning

LET 2 Body Image Lesson 4

What You Will Learn to Do

Learning Objectives:

Define body image

Describe how to measure body composition

Compare the factors that influence overweight and underweight people

Explain how to balance exercise and calories for an appropriate weight

Body Image



Key words

- anorexia nervosa
- Basal Metabolic Rate
- body composition
- body image
- Body Mass Index
- bulimia nervosa
- empty calories
- endocrine system
- fasting
- obsession

What You Will Learn to Do

Examine how body image, eating, and physical activity affect whole health

Linked Core Abilities

- Apply critical thinking techniques
- Build your capacity for life-long learning
- Communicate using verbal, non-verbal, visual, and written techniques
- Take responsibility for your actions and choices
- Treat self and others with respect

Learning Objectives

- **Define** body image
- **Describe** how to measure body composition
- **Compare** the factors that influence overweight and underweight people
- **Explain** how to balance exercise and calories for an appropriate weight

Essential Question

How can you develop a healthy body image?



Learning Objectives (cont'd)

- **Describe** the symptoms of eating disorders
- **Define** key words: anorexia nervosa, Basal Metabolic Rate, body composition, body image, Body Mass Index, bulimia nervosa, empty calories, endocrine system, fasting, obsession

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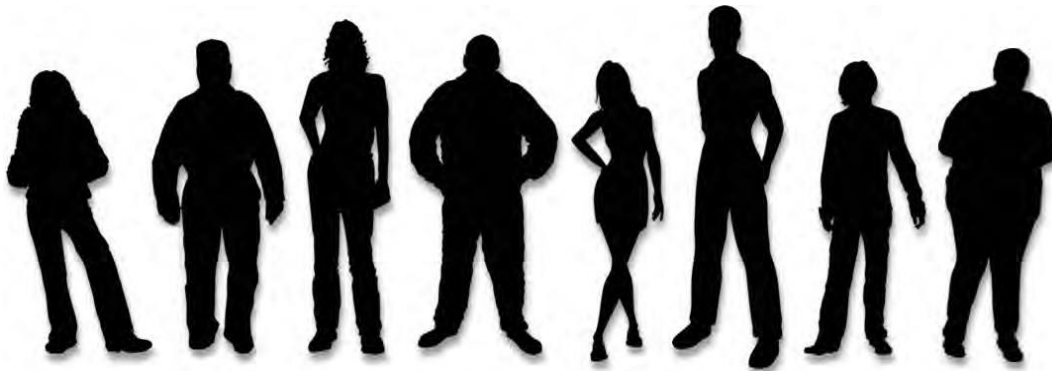


Figure 6.4.1

Introduction



Figure 6.4.2

How do you react when you look at yourself in the mirror? How do you feel about your appearance? Trying to look the same as a model, movie star, athlete, or anyone else can be unhealthy and unrealistic. It can also harm your health. In this lesson, you'll learn about developing a healthy body and a healthy body image. You'll learn the factors that affect your weight and dangers of eating disorders.

What is Body Image?

Key words

Body image:

The way you see your physical self

body composition:

The ratio of body fat to lean body tissue, such as bone, muscle, and fluid

Body Mass Index:

A measurement that allows you to assess your body size, taking your height and weight into account

Body image is the way you see your physical self. Someone who feels good about his or her looks is more likely to have a positive self-image.

You should recognize that no individual weight or body type is ideal for a specific age. Your body will grow and change throughout your teen years. A few extra pounds now, for example, could disappear in a few months after you grow an inch. Someone who feels too skinny may gain weight after he or she stops growing. Physical activity will also have an effect on your body weight and shape.

Many magazines and websites alter photographs of models so they appear thinner, more muscular, or taller than they really are. These images may influence your ideas about what you are supposed to look like or how your body should be shaped. Don't be influenced! People come in all shapes and sizes, not just the ones you see in photographs. Ideas about attractive body shapes are not the same in all parts of the world, nor have they been the same throughout history. Look at paintings of people during Europe's Renaissance period; the paintings show body shapes that are plump and curvy because that was considered attractive. No doubt, people from that era would have considered today's ultra-thin muscular models to be quite unattractive!

Remember, the way you look is not the most important thing in life. People who have accomplished great things did not spend inordinate amounts of time worrying about their looks. They focused on the goals they wanted to accomplish in life.

Body Composition

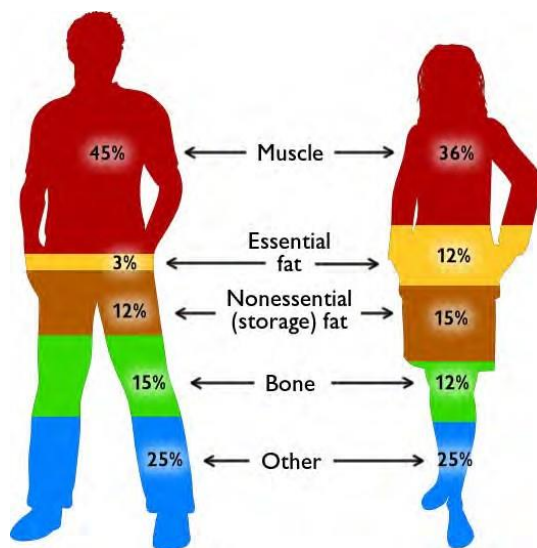


Figure 6.4.3

Many factors influence your appropriate weight, or the weight that is best for your body. Gender, height, age, body frame (small, medium, or large), and during your teen years, your growth pattern are among these factors.

In a previous lesson, you learned about the first three elements of fitness. They are aerobic capacity, muscular strength and endurance, and flexibility. The fourth element is **body composition**, the ratio of body fat to lean body tissue, such as bone, muscle, and fluid. One way to measure body composition is to use **Body Mass Index (BMI)**, a measurement that allows you to assess your body size, taking your height and weight into account.

BMI is used to compare your weight relative to your height and to estimate your total body fat. However, because your body is still growing, BMI is not the final word on having a healthy weight.

Here's the formula to calculate your BMI:

$$\text{BMI} = \frac{(\text{Weight in pounds})}{(\text{Height in inches}) \times (\text{Height in inches})} \times 703$$

Figure 6.4.4

For example, a male 15-year-old who weighs 190 pounds and is 6 feet 3 inches tall has a BMI of 23.7, which is considered a healthy BMI for his age-weight-height.

$$\frac{190}{75 \times 75} \times 703 = 23.7$$

Figure 6.4.5

WHAT DOES BMI TELL YOU?

BMI is used as a screening tool to identify possible weight problems for young people. The Centers for Disease Control and Prevention (CDC) and the American Academy of Pediatrics (AAP) recommend the use of BMI to screen for overweight and obesity in young people beginning at two years old.

For young people, BMI is used to screen for obesity, overweight, healthy weight, or underweight. However, BMI is not a diagnostic tool. Individuals with the same BMI may have different amounts of body fat. The BMI for teenagers fluctuates as they grow; some young people grow tall quickly, and then fill out with muscle and fat. Others fill out first, and then gain in height. So while BMI is a useful number to watch, it can change quite a bit as you are growing.

The Centers for Disease Control website has a BMI calculator for teens. You can enter your age, weight, height, and gender into the calculator. It will tell you if your BMI is too high or too low.

Figure 6.4.6

WEIGHT PROBLEMS AND DIET

Being overweight or underweight is unhealthy. People who are overweight weigh more than the appropriate weight range for gender, height, age, body frame, and growth pattern. People who are underweight weigh less than the appropriate weight range for gender, height, age, body frame, and growth pattern. Because of pressure placed on young people from family, friends, and social images, they can become overly concerned that they have a weight problem. In reality, most young people don't need to lose or gain weight. In fact, unnecessary dieting can interfere with normal growth and development.

OVERWEIGHT

Eating foods with high amounts of sugar and fat or eating more food than needed can lead to weight gain. This is especially true for people who are sedentary—they don't get much exercise.

Key words

empty calories:

Calories that contain little nutritional value

Many times, people tend to eat foods with **empty calories** or low nutritional value; this may result in overeating because you may not feel full. Empty calorie foods have high amounts of sugar and fats, and do not contain the full range of vitamins and nutrients the body needs to be healthy.

Many young people tend to grab food from fast-food places and convenience stores. Much of this food is high in fat, sugar, and empty calories. Some fast-food restaurants even allow supersize portions, which attract people to them through bargain prices and other selling techniques. These supersize portions may come at a bargain price, but they also come with much more fat, sugar, and calories.

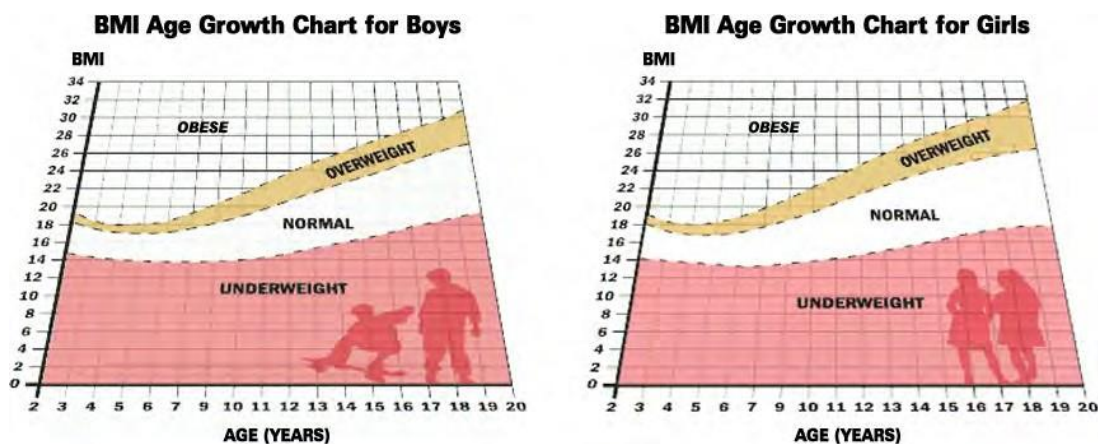


Figure 6.4.7

If you have a sedentary lifestyle, this may make you more prone to weight gain. Many people watch too much television, play video games, or stay on a computer for long periods. These activities burn fewer calories than those involving physical movement.

As we have discussed in previous lessons, excess weight puts strain on the heart and lungs. Overweight people have an increased risk of developing high blood pressure, diabetes, heart disease, cancer, and stroke. If you think that you are overweight, check your BMI, review the results, and if necessary check with a health care professional.

You may just be gaining weight before getting taller. This is the body's way of storing up extra energy for growing.

UNDERWEIGHT

Young people who appear skinny are not necessarily underweight. Some are simply growing taller first. After reaching a certain height, the body may take time to catch up and add shape and muscle.

Some people are underweight because they do not consume enough nutrients, eating mostly empty calorie foods. Others are underweight because of extreme dieting or excessive exercise. As we have learned in previous lessons, foods with the right amount of nutrients and calories provide the best foundation for staying healthy. Being underweight increases health risks just as much as being overweight.

Being underweight may indicate malnutrition, a condition in which the body doesn't get the nutrients it needs to grow and function properly.

Being underweight may lower your body's ability to recover from illness, fight infections, and heal wounds.

According to a study published in 2010 in *The Baltic Journal of Health and Physical Activity*, underweight people have lower bone mass densities. This may lead to osteoporosis, a condition marked by bone loss, brittle and fragile bones, bone pain, and increased risk of fractures to bones. Although seen more in older people, being underweight can lead to osteoporosis in young people.

People who often feel tired due to the lack of nutrients that supply energy may be more likely to develop medical issues such as anemia, which is related to this low nutrient intake. Anemia is a deficiency of red blood cells. Red blood cells help transport oxygen to our organs and muscles. Being underweight can also lower your immune system, making you more likely to catch colds or the flu.

THE ROLE OF CALORIES

The calories you take in and use every day affect your weight. As you remember, calories measure both the energy available in food and the energy your body uses. The more calories a food contains, the more energy it provides.

You consume calories whenever you eat and drink. When you take in the same number of calories that your body burns, your weight should remain the same. When your body burns more calories than you take in, you should lose weight. When you take in more calories than your body burns, you will gain weight. Your body converts and stores the extra calories as fat.

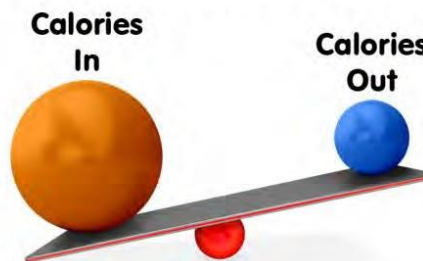
On average, teen females require 2,200–2,400 calories per day, and teen males require 2,800–3,200. If you are counting calories, eating too much or too little in a given day is less important than focusing on your average intake over the long term.

Managing a healthy weight also requires more than counting calories. Not all calories are the same. Studies consistently show that sugary beverages, potato chips, and other processed foods are associated with weight gain. Studies also show that calories from different foods are not absorbed the same. When people eat high-fiber foods like nuts and some vegetables, for example, only about three-quarters of the calories they contain are absorbed. The rest are excreted from the body unused. Therefore, the calories listed on the labels of high fiber foods are not necessarily what the body is actually getting. Make sure you consider the nutrient value of the foods you eat and stay away from empty calorie foods.

WEIGHT MAINTAINED



WEIGHT GAIN



WEIGHT LOSS

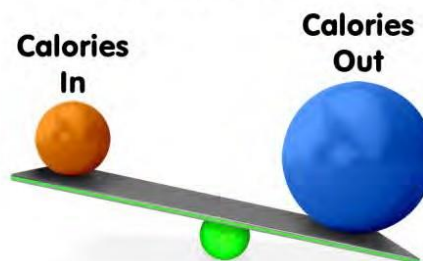


Figure 6.4.8

Managing Your Appropriate Weight

If you think you might be over or under your appropriate weight, you should check with a health care professional. This person can analyze your situation and suggest the best approach for you to manage weight. Most successful weight-change programs combine increased physical activity with a healthy eating plan that includes nutrient-dense foods.

INCREASING PHYSICAL ACTIVITY

There is one key ingredient whether you are trying to lose or gain weight. Physical activity is the key to keeping a healthy weight. Physical activity helps tone muscles and reduces body fat. You can also burn more calories by increasing your level of activity.

ADJUSTING YOUR CALORIE INTAKE

Whether the goal is to lose or gain weight, eating foods with nutritional value will provide the best chance for reaching your goal. Instead of fried foods, you should eat foods that are broiled, baked, or steamed. If you do a little of your own cooking, you can add flavor by using herbs and spices instead of oils or cream sauces. Drinking fewer drinks with high amounts of sugar or caffeine will also help. Drinking more water or drinks that replenish nutrients will also help manage your intake of calories.

When you are increasing or reducing calorie intake, it's always best to eat more servings of lean and low-fat foods, including those with complex carbohydrates, such as whole grain breads, pastas, and fresh vegetables. Whether you want to reduce or increase calorie intake, use information from the Dietary Guidelines for Americans or ChooseMyPlate.gov.

MANAGING WEIGHT CHANGE

Have you tried any of the following to manage your weight?

- Following weight-loss programs that promise quick results
- Relying on special products or formulas
- Trying to lose more than 1/2 to 1 pound per week
- Eating fewer calories a day than recommended for your age and height
- Skipping meals

These are examples of things NOT to do! There are no shortcuts to managing your weight. Exercise and a good diet provide the best chance for success and long-lasting results. Experimenting with fad diets, pills, and other “procedures” that promote quick weight loss can be dangerous to your health. For example, diet pills can be addictive and can have serious side effects. Body wraps cause water loss rather than loss of fat. Most of these are short-term solutions at best, and they cannot replace informed, healthy choices about weight change. Managing a healthy weight is about:

- What you eat
- How much you eat
- How much you exercise



Figure 6.4.9

In an earlier lesson, you learned that metabolism is the way your body processes everything you eat and drink—changing sugar, protein, and fat into energy. Everyone’s body works differently, and everyone will have a different metabolic rate. The trick is to figure out how fast or slow your metabolism is. If you measure your **Basal Metabolic Rate (BMR)**, you can then tailor your caloric and exercise needs to fit how your body works.

BMR measures how many calories you burn when you’re doing nothing. Remember that even when you are not active, your body is still using energy for breathing and other basic functions that keep you alive. BMR is calculated based on your age, gender, height, and weight factors.

[Figure 6.4.10](#) shows the formula for calculating BMR.

Key words

Basal Metabolic Rate:

A measurement that shows how many calories you burn when you’re doing nothing



Content Enhancement: BASAL METABOLIC RATE FORMULA

The BMR formula uses the variables of height, weight, age, and gender to calculate the Basal Metabolic Rate. This is more accurate than calculating calorie needs based on body weight alone. The only factor it omits is lean body mass and the ratio of muscle to fat a body has. Remember, leaner bodies need more calories than less lean ones. Therefore, this equation will be very accurate in all but the very muscular (will underestimate calorie needs) and the very overweight (will overestimate calorie needs).

Women:

$$\text{BMR} = 655 + (4.35 \times \text{weight in pounds}) + (4.7 \times \text{height in inches}) - (4.7 \times \text{age in years})$$

Men:

$$\text{BMR} = 66 + (6.23 \times \text{weight in pounds}) + (12.7 \times \text{height in inches}) - (6.8 \times \text{age in years})$$

Figure 6.4.10

Your metabolism is individual to you. It is based on a combination of your genetics, age, gender, muscle mass, and certain environmental factors. While your best friend who is able to eat anything and still stay slim seems to have a faster metabolism; it’s not likely her metabolic rate is creating such a difference. She’s working with a balance of how many calories she eats, how much she exercises, how much muscle mass she has, and how much she sleeps.

Basically, weight management comes down to this—the more active you are, the more calories you burn. That means how much physical activity you get in a day has more impact on your weight loss and gain than a fast or slow metabolism. When you’re trying to lose or maintain weight, physical activity is one of the most important factors because it’s under your control—you choose how sedentary or active you want to be.

The Harris Benedict Equation (*Figure 6.4.11*) is one way to determine your daily calories needs.



Content Enhancement:

HARRIS BENEDICT EQUATION

The Harris Benedict Equation is a formula that uses your BMR and then applies an activity factor to determine your total daily energy expenditure (calories). The only factor omitted by the Harris Benedict Equation is lean body mass. Remember, leaner bodies need more calories than less lean ones. Therefore, this equation will be very accurate in all but the very muscular (will underestimate calorie needs) and the very overweight (will overestimate calorie needs).

To determine your total daily calorie needs, multiply your BMR by the appropriate activity factor, as follows:

Little or no exercise:

Calorie calculation = $BMR \times 1.2$

Light exercise/sports 1-3 days/week:

Calorie calculation = $BMR \times 1.375$

Moderate exercise/sports 3-5 days/week:

Calorie calculation = $BMR \times 1.55$

Hard exercise/sports 6-7 days/week:

Calorie calculation = $BMR \times 1.725$

Total Calorie Needs Example:

If you are sedentary, multiply your BMR (1745) by 1.2 = 2094. This is the total number of calories you need in order to maintain your current weight.

Figure 6.4.11

STRENGTH TRAINING

Muscle mass makes us strong, and it also helps us burn calories—during and after workouts. Strength training applies resistance to help build muscle mass. It usually includes exercises such as weightlifting or using a resistance band. Adding strength training to your workout routine will help build muscle mass and keep your bones strong. One pound of muscle burns about 15 calories a day, and while that's still not much, it's more about your total weight from muscle mass.

SLEEP

A University of Chicago study found that when we don't get enough sleep, our **endocrine system's** functions change. That includes our metabolism. Lack of sleep can slow your metabolism.

Key words

endocrine system:

Parts of the body that produce hormones to regulate metabolism, growth and development, tissue function, sleep, mood, and other aspects of the body

Getting half of the recommended sleep—four instead of eight hours of sleep each night—for just six nights alters how our bodies regulate blood sugar levels and store energy so much that the study’s otherwise healthy participants suddenly began to show early symptoms of diabetes.

If you average seven or eight hours of sleep per night, an hour more or less won’t make much of a difference. However, if you’re getting only four or five hours, another two or more hours will promote weight loss.

HYDRATION

Another factor that can affect your metabolic rate is hydration—how much water you consume to keep your body in balance. A study at the University of Utah found that people who are better hydrated have higher metabolic rates. Eight to twelve 8-oz. glasses of water every day will help your metabolic rate.

FASTING AND METABOLISM

If you skip meals or severely reduce the number of calories you eat, your body compensates by slowing down your metabolism. This allows your body to save calories to handle basic functions. **Fasting**, or not eating for long periods, is also a potentially dangerous way to lose weight. Fasting slows your metabolism, causing side effects including muscle tissue loss, heart damage, digestive problems, and stunted growth.

WEIGHT MANAGEMENT TIPS

Maintaining a healthy weight means learning to eat smart and staying active for a lifetime. Working with a health care professional can help you develop a safe weight management program. A professional can assist you in setting realistic goals that are both safe and effective.

Managing your portions will allow you to balance the calories you take in with those you burn. A good program of enjoyable physical activities like bike riding, dancing, volleyball, or swimming will help you burn enough calories to help you manage your weight.

Key words

fasting:

Not eating for long periods



Figure 6.4.12

The Dangers of Eating Disorders

Key words

obsession:

An emotional state in which something seems so important that you are always thinking about it

anorexia nervosa:

An eating disorder characterized by self-starvation leading to extreme weight loss

bulimia nervosa:

An eating disorder in which a person eats large amounts of food and then tries to purge the food

Many young people spend a great deal of time worrying about their weight or other problems. Sometimes these worries get out of control. An **obsession** can develop.

An obsession is an emotional state in which something seems so important that you are always thinking about it. If food intake is coupled with mental and emotional problems, eating disorders can be the result. Eating disorders are extreme and damaging eating behaviors that can lead to sickness and even death.

Eating disorders can be triggered by many psychological factors. These include low self-esteem, poor body image, and depression. Young people are at risk because of the normal stresses during the teen years and the natural growth patterns of their bodies. Eating disorders are serious; they can be fatal. People with eating disorders need professional help.

Three dangerous eating disorders are **anorexia nervosa**, **bulimia nervosa**, and binge-eating disorder.



Figure 6.4.13

ANOREXIA NERVOSA

Anorexia nervosa is an eating disorder characterized by self-starvation leading to extreme weight loss. Teenage girls and young women seem to be especially susceptible to this disorder, though men and teenage boys can also experience it. Many also have trouble coping with everyday stresses, such as high expectations, the need to achieve, or the need to be popular.

Signs of anorexia nervosa include:

- An intense fear of gaining weight or being overweight.
- A highly distorted body image that continues to see fat where none exists.
- A refusal to maintain a normal body weight.
- A refusal to eat or eating patterns that tightly restrict food intake.

Because people with anorexia nervosa eat very little, they suffer malnutrition and develop shrunken organs, bone loss, low body temperature, low blood pressure, and a slowed metabolism.

Some people with anorexia can develop an irregular heartbeat that may lead to cardiac arrest. Treatment for anorexia nervosa may require a stay at a hospital or clinic.

BULIMIA NERVOSA

Another type of eating disorder is bulimia, or bulimia nervosa. Bulimia nervosa is a condition in which a person eats large amounts of food and then tries to purge. Many people with bulimia force themselves to vomit. Others take laxatives to force the food quickly through their body.

Although bulimia is more common among young women and teenage girls, young men and teenage boys can also develop the disorder. People with bulimia are extremely concerned about being thin and attractive. They have an overwhelming need to maintain control over their bodies. They might gorge on large amounts of food. Then, fearing that they are losing control of their bodies, they may take drastic steps to regain control. Some go on crash diets, including fasting, to try to make up for overeating.



Figure 6.4.14

Bulimia damages the body in many ways. Stomach acids from frequent vomiting can damage teeth and injure the mouth and throat. Vomiting can also cause the stomach to rupture. Repeated use of laxatives can damage the kidneys and liver, causing long-term health problems. Many people with bulimia suffer from malnutrition as a result of emptying the body of nutrients.

Signs of bulimia nervosa include:

- Regular binge eating episodes, at a rate of at least two per week for several months.
- Binges followed by purging, strict dieting, or excessive exercise to prevent weight gain.
- Using self-induced vomiting or laxatives as part of purging.
- An obsession with weight and body shape.

BINGE-EATING DISORDER

Another eating disorder is binge-eating disorder, or the rapid consumption of an excessive amount of food. This disorder may be the most common eating disorder, affecting one to two million Americans. People with binge eating disorder eat unusually large amounts of food at a time. Unlike people with bulimia, though, they do not rid their bodies of the food. Afterward, they often feel a sense of guilt and shame.

People with binge-eating disorder may use food as a way of coping with depression and other mental or emotional problems. However, the guilt and shame they feel after bingeing adds to the depression. This creates a cycle that can be difficult to break without professional help. Because binge eating disorder often leads to excess weight, it contributes to many health problems, such as obesity, diabetes, and heart disease.

Signs of binge-eating disorder include:

- Eating large amounts of food in a relatively short period, whether you are hungry or not, at least twice a week
- Eating until you feel overly full
- Eating large amounts of food when you are alone
- Eating personal “comfort foods,” such as a certain type of cookies, ice cream, or other foods you find especially pleasurable, during sessions of excessive eating



Figure 6.4.15

OTHER UNHEALTHY EATING BEHAVIORS

There are other unhealthy eating behaviors that do not qualify as full-blown eating disorders. However, they still have serious effects on weight, mental health, and well-being. These behaviors are classified as disordered eating, a range of habits in which food is used primarily to deal with emotional issues.

- *Compulsive overeating* – Feeling the need to eat constantly and quickly, even when full. Often snacking around the clock instead of eating meals at a set time.
- *Extreme dieting* – Dieting and weight loss that become obsessions focused on each bite of food eaten and every pound of weight shed. While extreme dieters do not lose enough weight to have anorexia nervosa, they are at greater risk for developing anorexia nervosa.



Figure 6.4.16

HELP FOR PEOPLE WITH EATING DISORDERS

Eating disorders are potentially life-threatening. They affect people’s emotional and physical health. People who have eating disorders usually need professional help.

Sometimes this help can come from a counselor or psychologist. Help is also available at community clinics and through support groups such as Overeaters Anonymous.

A useful online resource is The National Eating Disorders Association (NEDA) website. If a friend develops an eating disorder, you might want to speak to a school nurse or counselor. It is natural to want to solve your friend's problem by yourself. However, you can help most by showing support. Guide this individual to a health professional, if possible. Family and friends can also provide much needed support for a person with an eating disorder. Often their role is to encourage the person to seek help.

Conclusion

In this lesson, you learned that body image is affected by outside influences. You learned that most teenagers don't need to gain or lose weight because their weight goes up and down as they are growing. What's important is taking care of your body—eating right and getting enough exercise. Eat nutritious food and avoid processed foods with empty calories. Exercise to build muscle mass, drink plenty of water, and get enough sleep to keep a healthy metabolic rate.

Lesson Check-up



- How do media images influence body image?
- What factors determine a person's appropriate weight?
- Why would you calculate your BMR?
- Describe three eating disorders and explain how they can damage health?

Performance Assessment Task

Body Image

This performance assessment task gives you an opportunity to document your achievement of the lesson's competency:



Directions

For this performance assessment task you will participate in Body Image. For this assessment you will:

1. Apply critical thinking techniques.
2. Build your capacity for life-long learning.
3. Communicate using verbal, non-verbal, visual, and written techniques.
4. Take responsibility for your actions and choices.
5. Treat self and others with respect.

RECOMMENDATION: It is recommended that you add this performance assessment task to your Cadet Portfolio.

Benefits of physical activity Performance Assessment Task Scoring Guide

Criteria	Ratings
Define body image	met not met
Describe how to measure body composition	met not met
Compare the factors that influence overweight and underweight people	met not met
Explain how to balance exercise and calories for an appropriate weight	met not met
Define key words: anorexia nervosa, basal Metabolic Rate body composition, Body Mass Index (BMI), bulimia nervosa, empty calories, endocrine system, fasting, obsession	

Comments:

Name: _____ **Date:** _____

Evaluator's Signature: _____ **Date:** _____