

## **Grade 6: Healthy Body**

### **Lesson 5: Have a Heart Healthy Body**

#### **Objectives:**

1. Students will understand the significance of calories when discussing fat.
2. Students will define non-aerobic and aerobic activities and their importance to heart health.
3. Students will explain the American Heart Association (AHA) guidelines for daily physical activity.
4. Students will explain the role of calories in body weight.
5. Students will identify two measures used as health indicators: Target Heart Rate and Body Mass Index.

#### **Materials:**

- Animal fat from the meat market or butcher shop (one pound of fat)
- Before the lesson have students measure their height and weight at home and bring those numbers to class.
- Internet Access
- Worksheet (**See Figure 1**)

#### **Activity Summary:**

In this lesson students will learn about aerobic activity, calories, the Body Mass Index and the factors that influence heart health. Students will relate these concepts to themselves by understanding how many calories they need to take in and how to get rid of extra calories to prevent weight gain.

#### **Background Information for the Teacher:**

Reports over the past several years detailing the rise of childhood obesity and its attendant health risks have been well publicized. More than 40% of children are overweight, creating a significant risk factor for diabetes and other chronic ailments.

Helping students understand the basics of good heart health while they are still children helps them learn how to lead healthy lives as adults. Teaching them how to put that knowledge into action by developing their own heart-healthy practices is even more important. The temptations facing children that can sabotage good heart health may seem very compelling to them. Poor diet and lack of exercise are the by-products of eating fast food along with a sedentary lifestyle of too much time spent on computers, video games and watching television.

Some studies show that children don't get as much exercise--especially **aerobic** exercise--as they think they do. Aerobic exercise and busy-ness are **not** the same thing! Aerobic exercise requires steady movement that raises the heart rate.

Also, moderate-to-vigorous physical activity causes the body to use energy and burn calories, which manages weight.

## Heart Rates

Children typically have a resting heart rate that is faster than that of adults. (A rate of 80 is not unusual.) The maximum heart rate (after vigorous physical activity) in healthy children can be up to 200 beats per minute. The American Heart Association makes no recommendations regarding target heart rates in physical activity for children. Target heart rates are used as a guideline for adults to pace physical exercise without over-taxing the heart. **Typically a target heart rate is 50-75% of the individual's maximum heart rate.**

## Activity Recommendations:

The American Heart Association recommends that **all** children, ages two years and older, engage in a **minimum of 60 minutes** of physical activity most days of the week. This includes:

- A minimum of 30 minutes of moderate-intensity activity every day.
- At least 30 minutes of vigorous physical activity at least three to four days each week to maintain cardio-respiratory fitness.
- Daily 30-minute periods can be broken into two 15-minute or three 10-minute sessions of vigorous activity.
- Activities should be appropriate for the child's age, gender, physical and emotional development.

While children can (and should) choose their own activities, they may need guidance. A key to successfully promoting physical activity for children involves engaging in physical activities that are:

- Fun
- Easily accessible
- Safe
- Appropriate to the time available
- Able to involve friends

A balance of aerobic and non-aerobic physical activity is important. Almost any activity that involves brisk movement--such as running or fast walking--requires the heart to pump more blood more quickly. This is necessary for the activity to have aerobic benefit.

Benefits of aerobic activity include:

- Helps control weight
- Reduces blood pressure
- Raises HDL (good) cholesterol
- Reduces the risk of diabetes
- Improves emotional well-being and self-esteem

## Calories

How much we weigh is a factor of calories consumed and calories used. If we eat more than we use, the body will store those extra calories as fat. Originally necessary for survival when the quantity and quality of food supplies fluctuated, today our food supply is generally more plentiful and consistent so our need to store fat is not as crucial as it once was. However, our bodies still respond as if it were.

*(Note: A chart and formula for calculating calories burned per pound per minute is available at the Calories Count! Website at: [www.score.kings.k12.ca.us/lessons/ories/caloriebutn.html](http://www.score.kings.k12.ca.us/lessons/ories/caloriebutn.html))*

The best way to manage weight is to **BALANCE DIET with EXERCISE**. It is important to work with **both** factors for optimum health because this allows for the correct proportion of fuel consumption to fuel use.

## Body Mass Index

The Body Mass Index (BMI) indicates how much body fat we have. It is determined by a calculation using height and weight. A simple calculation is:

- A. Multiply the person's height (total inches) by itself
- B. Divide the weight by the result of the calculation in "A"
- C. Multiply the result of "B" by 703.

The recommended BMI for a child depends on their age and gender. Body Mass is only one factor and used by itself doesn't give the complete story. It is important to understand what the BMI means relative to age, gender, body type, and other factors. A doctor, school nurse, or trained fitness counselor can correctly interpret this information and make proper recommendations.

BMI calculators are available at:

- KidsHealth.Org: [www.kidshealth.org/teen/nutrition/weight/bmi.html](http://www.kidshealth.org/teen/nutrition/weight/bmi.html)
- Centers for Disease Control: [www.cdc.gov/nccdphp/dnpa/bmi/calc-bmi.htm](http://www.cdc.gov/nccdphp/dnpa/bmi/calc-bmi.htm)

## Factors That Influence Weight

Many factors influence how our bodies use and store fuel. Heredity, environment, and lifestyle are important influences in determining size and weight. These can also be risk factors for chronic heart disease.

Being overweight and having poor exercise habits can run in families because of family lifestyles as well as hereditary factors. If the family environment does not actively practice and model exercise and vigorous activity then it will be more difficult for children to create their own physically active lifestyle.

There is a multi-layered circle connecting heredity, environment, and lifestyle factors with:

- body weight and body mass
- body image and eating dysfunctions
- chronic heart disease

Heredity, environment and lifestyle influence our proclivity to exercise and eat properly. While nutrition and exercise impact body weight and body mass (body fat), conversely, our weight directly influences our body image, which can influence what and how we eat, leading to problems with overweight or eating disorders. Being overweight or having an eating disorder may have a significant impact on heart health and serious chronic heart disease.

Tilting just **one** of those factors in the direction of health may create an opportunity to change the others. There is really only one factor, heredity, which cannot be altered. All the others are subject to influence and change. Physical activity offers an excellent opportunity to positively influence body image, lifestyle, weight, and heart health. Good exercise habits can form the foundation for lifelong physical, emotional and mental wellbeing. Getting children to adopt good exercise habits as part of their daily routine is crucial.

### **Vocabulary:**

Physical activity  
Aerobic  
Non-aerobic  
Calorie  
Body Mass Index

### **Engage:**

Bring in one pound of fat from a meat locker or butcher shop. If possible, also bring in another five pounds in order to make a comparison. Show the students what one extra pound of fat looks like. Let the students look at it, feel how heavy it is, etc. Now imagine what five pounds of extra fat looks like. Discuss how it looks. Talk about the effects of being 25 pounds overweight.

During the past 20 years, obesity among adults has risen significantly in the United States. Recent data from the National Center for Health Statistics indicates that 30 percent of U.S. adults 20 years of age and older—**over 60 million people**—are obese.

This increase is not limited to adults. The percentage of young people who are overweight has more than tripled since 1980. Among children and teens aged six to 19 years, 16% (more than nine million young people) are considered overweight. (Centers for Disease Control: <http://www.cdc.gov/nccdphp/dnpa/obesity>.)

### Explore: How do we acquire fat?

1. Ask: “**What are calories?**” (*Calories measure the energy value of food.*) “**Why do we want to know about calories?**” (*Calories can help us know how much food our body needs.*)
2. Everything we do requires energy. Calories are a way to measure how much energy we are using.
3. Engage in two physical activities (one aerobic and one non-aerobic) and have students try to determine the number of calories used in each activity.
  - **Non-aerobic:** Walking at a moderate pace around the schoolyard for five minutes. **Calculate: .035 calories per pound times the number of minutes.**
  - **Aerobic:** Running at a moderate pace around the schoolyard for five minutes. **Calculate: .061 calories per pound times the number of minutes.**
4. Have students calculate the number of calories burned for each activity and compare the results. (Source: Calories Count! A chart and formula for calculating calories burned per pound per minute is available at their website: [www.score.kings.k12.ca.us/lessons/calories/caloriebutn.html](http://www.score.kings.k12.ca.us/lessons/calories/caloriebutn.html).)
5. Ask: “**How do calories relate to body weight?**” (*How much we weigh is a factor of calories consumed and calories used. If we eat more than we use, the body will retain the extra calories as fat.*)
6. Have students figure out how many calories they need a day. Students will need their height and weight to complete the activity. Go to the following website:  
[http://www.kidsnutrition.org/bodycomp/energy/energyneeds\\_calculator.html](http://www.kidsnutrition.org/bodycomp/energy/energyneeds_calculator.html)
7. You may choose to do this in different ways. If you have a computer lab available for all students to use at one time you may have everyone enter their information. (If you only have a few computers available you may choose to have students **take turns** entering their information.)  
*NOTE: If you don't have time for this you may want to average out the weight and height of your class for boys and for girls, then tell the students the average number of calories they need each day.*
8. Have students write down the amount of calories they need and keep that number for a later activity.

9. Ask: “**What are two important factors for ensuring that our calories consumed and our calories used balance out?**” (*By balancing our DIET with our EXERCISE. It is important to work with both factors for optimum health. This allows the correct proportion of fuel consumption and fuel use to take place.*)
10. Have students consider the following question: “**What are the best activities that use the most calories?**” Working in small groups, have students brainstorm as many play and sports activities that they can think of. Ask the groups to organize all the activities. Rank them in an order indicating the most benefit in using calories to the least benefit. Discuss the reasons considered in creating their activity rankings.
11. Present results to the class. Discuss the information provided and clarify if some activities actually give more benefit for strength or flexibility. All are important for well-rounded physical activity. Our focus now is on the **aerobic** benefits of physical activity.
12. Almost any activity that involves brisk movement (such as running or fast walking) requires the heart to pump more blood more quickly. This is necessary for the activity to have aerobic benefit. These activities require more body fuel so they use more calories.

**Explain:**

1. The American Heart Association recommends that all children, aged two and older, engage in a minimum of 60 minutes of physical activity most days of the week, including:
  - Minimum of 30 minutes of moderate-intensity activity every day.
  - At least 30 minutes of vigorous physical activity at least three to four days each week to maintain cardio-respiratory fitness.
  - Daily 30-minute periods can be broken into two 15-minute or three 10-minute sessions of vigorous activity.
  - Activities should be appropriate to the child’s age and gender, as well as to their physical and emotional development.
2. A balance of aerobic and non-aerobic physical activity is important. To get the most benefit two things are important: a) The kind of activity you do; and b) How long you do it.

Ask: “**How does engaging in this type and amount of activity help you to be healthy?**”

- Helps us attain and maintain our best weight
- Makes us feel better about ourselves

- Helps our heart by lowering blood pressure and raising good cholesterol level (HDL)
  - Lowers the risk of diabetes
3. Ask: “**What are some measurements we can take with our body that give us health guidelines?**” (*Target heart rates and body mass index.*)
  4. Ask: “**What do they measure? How do we use them?**” (Have students suggest answers.)
  5. Target heart rates are used as a guideline to pace physical exercise without over-taxing the heart. To help us engage in vigorous exercise safely, the American Heart Association (AHA) suggests certain guidelines for how fast our heart should be doing the activity. This is called a **target heart rate**. AHA’s recommendations include:
    - **Adults:** target heart rate at 50-75% of the individual’s maximum heart rate.
    - **Children:** No specific recommendations are given regarding target heart rates in physical activity for children.

The maximum heart rate (after vigorous physical activity) in healthy children can be up to 200 beats per minute. Children typically have a resting heart rate that is faster than the resting heart rate of an adult. (A resting heart rate of 80 would not be unusual.)

- **Note to Teachers:** *The concept of a Target Heart Rate may be beyond what a typical student this age is thinking about. Explain that basically they need to get their heart beating faster than usual, so they feel like they are working harder.*

**Body Mass Index (BMI)** indicates how much body fat we have. It can help us estimate our ideal weight/height ratio, and is determined by a calculation using height and weight. To determine your BMI go to: [www.nhlbisupport.com/bmi](http://www.nhlbisupport.com/bmi).

It is important to remember that Body Mass is only **one** factor in evaluating a person’s health status. It doesn’t give the whole picture when it is used independently of other data. BMI needs to be understood relative to age, gender, body type, and other factors. A doctor, school nurse, or trained fitness counselor can correctly interpret this information and make proper recommendations.

**Extend:**

1. Give students a list of snack foods. (**See Figure 1**) Have students choose three foods they like to eat as snacks for the day. Write down the number

- of calories in each, then pretend that you have already consumed enough calories for the day and these snack calories are extra.
2. Ask: **“What will happen if you still eat them?”** (*They will be converted into fat.*) **“How can we get rid of these extra calories?”** (*Engage in an activity that will burn up that same number of extra calories.*)
  3. Write down some of your favorite activities. Figure out how long you would typically do that activity. Then use the calculations above to figure out how many calories you would burn. Subtract that from the amount of extra calories consumed. If you still have extra calories figure out another activity you like to do and again subtract. Do this until all the extra calories have been “burned” through exercises that you like to do.
  4. Draw conclusions.

### **Evaluate: Home Activity**

1. At home, find one of your favorite snacks in the cupboard. Write down how many calories are in one serving. Have a parent measure out how much **one serving** is, then consider: **do you typically have more than one serving?** If so, measure out another serving, being sure to add an additional serving of calories. Pretend that this snack made you go over the number of calories you needed for the day. Write down activities and how long you will have to do them to burn off the extra calories.
2. Answer the following questions:
  - What is fat?
  - What are calories?
  - What is your BMI?

### **Optional Enrichment Activities: Aerobic Workout Plan with Optional Activities**

1. Have each student design their own 60-minute activity plan based on the AHA guidelines. The plan should include an appropriate buildup of exercise levels based on the assessment of their current activity level. It should also include appropriate warm-up and cool-down movements. Students can also project the calories used with these activities.
2. Provide guidance to the students in creating their plan by having them answer the following questions:
  - Is it fun?
  - How convenient is it? (Amount of equipment and/or specialized location)
  - Is it safe?
  - Is it appropriate for the time I have available?
  - Can I do this with my friends?



3. The following activities can be used as appropriate by all or some of the students:
- **Assessment:** Have students track their activity levels for two time periods. One period should track one or two weekdays and the other should track one or two weekend days. List various activities throughout the day and the amount of time spent in that activity. These should include **minimal** levels of activity (watching television, sitting in class), **moderate** levels of activity (walking to school, doing light chores), and **vigorous** levels of activity (running, biking, playing active sports, etc.)

Compare and contrast the kinds of activities and the amount of time spent for both time periods. What conclusions can the student draw from this information?

Have the student or class develop definitions and activity standards for being Minimally Active, Moderately Active, and Very Active in relation to the AHA guidelines. (For example, if a student's daily activity level is equal to 50% of the activity recommended by the AHA, is that a minimal or moderate activity standard?)

- **Heart Rates:** Have students implement their plans and do practice them for a minimum of **one** week. Have the students record their resting and active heart rates each time they engage in each activity, making a bar chart which compares the resting and active rates. Draw conclusions about the effect of their activities on the heart.
- **Body Mass Index:** Have students calculate their Body Mass Index using the formula provided or the calculators on the websites listed.

A simple calculation is:

- A. Multiply the person's height (total inches) by itself
- B. Divide the weight by the result of the calculation in "A"
- C. Multiply the result of "B" by 703.

BMI information and calculators are available at the KidsHealth website: [www.kidshealth.org/teen/nutrition/weight/bmi.html](http://www.kidshealth.org/teen/nutrition/weight/bmi.html), and at the Centers for Disease Control website: [www.cdc.gov/nccdphp/dnpa/bmi/calc-bmi.htm](http://www.cdc.gov/nccdphp/dnpa/bmi/calc-bmi.htm)

**Note:** *Kids Health.org* also has a well-written article for students that explains BMI and weight, entitled, "What's the Right Weight for My Height?"

**Missouri Standards:**  
Health and Physical Education Frameworks

## II. Health Maintenance and Enhancement

### A. Personal and Family Health

#### What All Students Should Know:

1. There are seven behaviors that if performed regularly can contribute to a healthy lifestyle. These include maintaining a normal weight and exercising regularly.

#### What All Students Should Be Able To Do:

- a. Analyze the relationship between behaviors and health.

## V. Physical Activity and Lifetime Wellness

### A. Personal Fitness/Wellness

#### What All Students Should Know:

4. Health-related fitness tests are administered to assess personal fitness levels, set personal goals and develop plans for self-improvement

#### What All Students Should Be Able To Do:

- b. Analyze and evaluate the relationship of regular exercise to the development of the individual.

**Figure 1:**

## Home Activity

**Name:** \_\_\_\_\_

Choose three snacks you like. List the snack and the amount of calories you would consume from eating that snack:

### Snacks and Calories (one serving)

<u>Calories</u>		<u>Snack</u>
Snickers Bar	279	
Brownie	218	Snack 1: _____
Choc. Chip Cookie	69	
Granola Bar	120	
M & M's	135	Snack 2: _____
Oreo Cookie	53	
Gold Fish Crackers	140	
Cheez-It Crackers	73	Snack 3: _____
Yogurt	190	
Chocolate cake	174	
Chocolate pudding	162	
Muffin	118	Total Extra Calories: _____
Coca cola	139	
Orange juice	56	
Ice cream (choc)	147	
Potato chips	155	
Fruit roll-ups	110	

### Activities:

- **Non-aerobic:** Calculate  $.035$  calories per pound x number of minutes
- **Aerobic:** Calculate  $.061$  calories per pound x number of minutes

**Directions:** Show your work below. Write down an exercise you like, noting whether the activity is non-aerobic or aerobic. Write down how many minutes you typically would do this exercise and calculate how many calories would be burned during that time period. Subtract this number from the number of extra calories you consumed. If there are still leftover calories, write down another exercise and repeat the activity until there are no extra calories left.

**Explain** what this activity illustrates.