



ACTIVITY #2

CALCULATING BODY MASS INDEX

A healthy body is fit and energetic

In Activity 1, we learned that we all come in different shapes and sizes, and we can begin to evaluate whether we are at a healthy weight by looking at our height and weight. However, there are other factors besides height and weight that come into play when determining a healthy weight. Health professionals may determine body composition or body mass in order to evaluate health status. **Body composition** is the term used to describe the percentage of fat, bone, water, and muscle in your body. A healthy body needs an amount of each to be fit and energetic. **Body mass index (BMI)**, which is calculated by dividing height in inches by weight in pounds, is an easier, but less precise, formula doctors use to determine health status. Your BMI tells you if your weight is appropriate in relation to your height. The formula looks like this:

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

Health professionals and researchers can use a **BMI Growth Chart** to track and compare growth patterns in teenagers that are the same age and gender. Over time, your health care provider might use the BMI Growth Chart to follow your growth to make sure you are growing as expected and to determine if you are at a higher risk for future health concerns. Expected growth is

measured on the chart within a range of percentiles. A **percentile** is a percentage out of a 100 that compares a teenager’s growth to other teenagers who are the same age and gender. For example, if a teenager is in the 75th percentile for BMI, then 75% of teenagers are shorter and/or lighter while 25% of teenager are taller and/or heavier. Percentile ranges look like this:

Weight Status Category	Percentile Range
Greater Health Risks	Less than the 5 th percentile
Healthy	Between the 5 th and 85 th percentile
Health Risks	Between the 85 th and 95 th percentile
Greater Health Risks	Greater than the 95 th percentile

It’s important to know your BMI and to track BMI percentiles on the growth chart in order to monitor your health and growth. However, don’t worry if you are below or above the recommended percentile because various factors can affect growth. BMI calculations do have limitations, such as not taking body composition into account. Your overall body weight includes the weight of muscles, water, and bone – not just body fat. As a result, even individuals who are athletes could be in the “Greater Health Risk” percentile range simply because their higher percentage of muscle—rather than body fat—contributes to their overall weight. However, an unplanned weight loss may require a visit to your healthcare provider.

FUN FACT:

A more accurate measure of your health status is body composition. **Bioelectrical impedance** is a machine that finds your body composition by sending harmless electrical impulses throughout your body.

CHECK YOUR THINKING

Use the reading to find and support your answers.

1. What does your BMI tell you about yourself? Draw a box around the correct answer.
2. Using the BMI Growth Chart in the Appendix (page 65-66), circle the percentile range a 16-year-old boy would be in if his BMI was in the 95th percentile.
3. If your BMI was in the 30th percentile,
 - a. What percentage of teenagers on the chart would be shorter and/or lighter than you? _____ %
 - b. What percentage of teenagers would be taller and/or heavier than you? _____ %

LET'S TRY IT TOGETHER

Calculating Body Mass Index

Here's the Story

Lately, Savannah has been wondering if her shape and size are normal. She plays soccer almost every weekend, and most of the girls on her team are taller and heavier. Last week, at 59 inches tall, she weighed in at 110 pounds and she is 17 years old. Her coach often lets her play in games because she is able to run fast and maneuver quickly around the bigger players. While Savannah's size is an advantage to her athletically, sometimes the other girls upset her because they make comments about her being so small. Savannah has thought about increasing the amount of food she eats to try to gain weight. Should Savannah be concerned about her weight? Let's determine if Savannah is at a healthy weight for her height. How does Savannah's BMI compare to other girls her age?

Directions

First, underline Savannah's height and weight in the above paragraph. Don't forget your units! *For this formula we will be using pounds and inches.* (See the growth charts in the appendix, page 66.)

Next, let's calculate her BMI. Round to the nearest **tenth**.

$$\text{BMI} = \frac{\text{Weight (lbs)}}{\text{Height (in)} \times \text{Height (in)}} \times 703$$
$$\frac{110 \text{ lbs}}{59 \text{ in} \times 59 \text{ in}} \times 703 = \underline{22.2 \text{ BMI}}$$

What is Savannah's BMI? 22.2 BMI

Last, we need to use the Girls BMI chart to figure out Savannah's BMI percentile. Find Savannah's BMI and age on the growth chart. Use the horizontal (x) axis to locate Savannah's age. Use the vertical (y) axis to locate Savannah's BMI. Place a circle at the point where Savannah's age and BMI meet on the chart.

What is Savannah's BMI percentile? Between the 50th and 75th percentile

What does Savannah's BMI percentile tell you about her health status?

A little bit over 25% of children have a higher BMI and a little bit over 50% of children have a lower BMI. Savannah is in the healthy percentile range.

Weight Status Category	Percentile Range
Greater Health Risks	Less than the 5 th percentile
Healthy	Between the 5 th and 85 th percentile
Health Risks	Between the 85 th and 95 th percentile
Greater Health Risks	Greater than the 95 th percentile

TRY IT ON YOUR OWN

James is 67 inches tall, weighs 185 pounds, and is 17 years old. He knows he is one of the bigger teens in his class, but he generally does not mind. No one bothers him about his size, and the coaches want him to play football since he would be great on defense. James' grandmother tells him that their whole family is just built bigger, so he has come to accept his size. The only time James becomes concerned about his size is when he finds it hard to keep up with the other boys while playing football. Is James at a healthy weight for his height? How does James' BMI compare to the BMI of other boys his age? **(See the growth charts in the appendix, page 65.)**

Directions

First, identify James' height and weight. *For this formula we will be using pounds and inches.*

Next, let's calculate his BMI. Round to the nearest **tenth**.

Last, find James' BMI percentile and circle it on your chart.

Summarize it

1. What is James' height?
2. What is James' weight?
3. What is James' BMI?
4. What percentile is James' BMI?
5. What does James' percentile for BMI say about his health status?

Thinking More Deeply

Based on their BMI Percentile, who has a greater risk for future health issues, Savannah or James? Explain your answer.

Suppose James remained at the same height but gained 10 pounds. What would be his new BMI?

TAKE IT HOME: HOW ABOUT YOU?

Directions

Use the BMI chart to determine your BMI percentile.

Measurement: You will need a tape measure and a scale to determine your height and weight. Round to the nearest **whole number**.

First, write down your height and weight. *For this formula we will be using lbs and in.*

Next, calculate your BMI.

Last, use the BMI chart to locate your BMI percentile.

Summarize it

1. What is your height?
2. What is your weight?
3. What is your BMI?
4. What percentile is your BMI?
5. What does your BMI percentile say about your health status?

Weight Status Category	Percentile Range
Greater Health Risks	Less than the 5 th percentile
Healthy	Between the 5 th and 85 th percentile
Health Risks	Between the 85 th and 95 th percentile
Greater Health Risks	Greater than the 95 th percentile