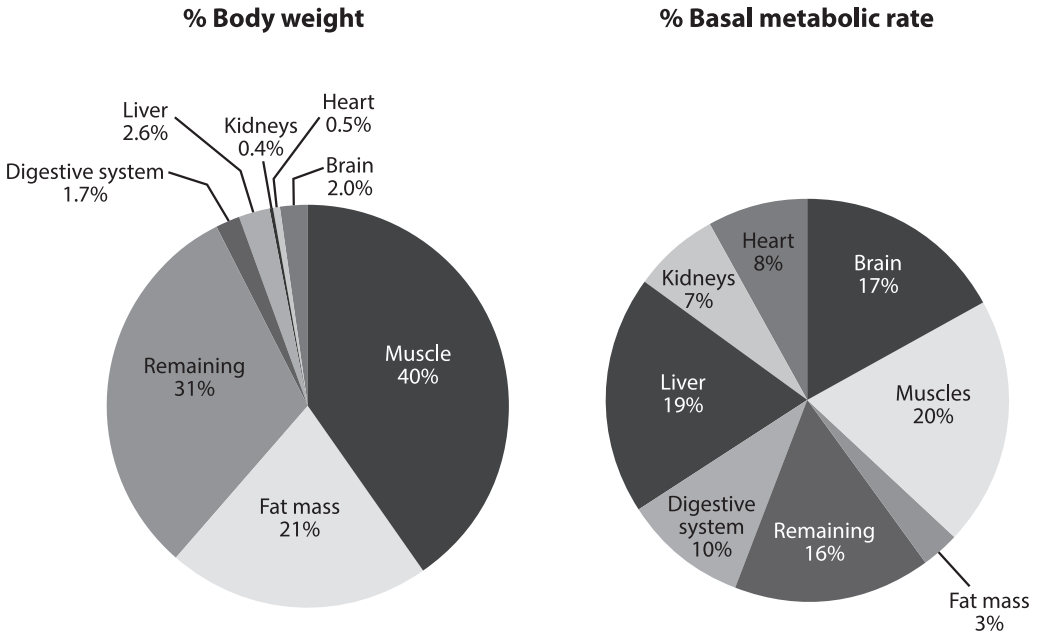
Metabolism

In Lesson 3, we investigated how food can be used to make molecules our bodies need for growth, development, and other life processes. In this lesson, we've been investigating cellular respiration, when food is broken down and energy is transferred to our body system. Both of these processes—using food to build things and breaking down food to release energy—make up our metabolism.

Metabolism is active 24 hours a day in every cell of our body. Our basal metabolic rate is how quickly our body uses energy from food while we're at rest. Of the energy from the food we eat, 60 to 80 percent is utilized by tissues and organs as part of our basal metabolism, another 10 percent is used in the digestion and breaking down of that food, and about 10–30 percent is used as part of physical activity.

Examine the charts below to see how the tissues and organs of our body contribute to consuming energy to keep us functioning.



Source: O'Malley, Grace & Lazzer, Stefano & Vermorel, Michel. (2015). Metabolic And Mechanical Cost Of Sedentary And Physical Activities In Obese Children And Adolescents.

Contribution of organs and tissues to body weight and basal metabolic rate.

How much energy we need is expressed as the number of calories we need to eat. A calorie is a unit of measure for energy. All foods—fats, proteins, and carbohydrates—are systems that can transfer energy that we label as calories. Using 1 gram, we can compare these foods by their calories. (One gram is about the mass of a paper clip.) One gram of protein can provide 4 calories. One gram of carbohydrates can provide 4 calories, and 1 gram of fat can provide 9 calories.

Guidelines for how many calories people need to get by eating food are based upon age, gender, activity level, health, and other factors. For most moderately active adults 2,000 to 2,400 calories a day is recommended. Researchers working in Antarctica consume 5,400 calories a day.