

Chapter 1 The Human Body

What you choose to put into your body has a big effect on how healthy you are. It's very important to understand just how your body works and what it needs to stay strong and healthy. This chapter will take a good look at the different systems found within you, how those systems work together, and how **nutrition** is the key to keeping your body systems in great shape.

WORDS TO KNOW:

| | |
|----------------------|------------------|
| Skeleton | B cell |
| Protein Fibers | T cell |
| Voluntary Muscles | Capillaries |
| Involuntary Muscles | Veins |
| Esophagus | Nutrients |
| Cardiac Muscle | Antigens |
| Phagocyte | Epidermis |
| Muscles | Dermis |
| Circulatory System | Subcutaneous |
| Respiratory System | Antibody |
| Microscopic | Intestines |
| Cells | Nutrition |
| Calcium | Digestive System |
| Skin | Vitamin(s) |
| Lungs | Mineral(s) |
| Organ(s) | Oxygen |
| Integumentary System | |

NEWS FLASH

Did you know that your body is made up of tiny, **microscopic** parts called **cells**?

If your cells are well fed, they work together so that you can do things like play sports, learn, and win at video games!



The Plain Facts:

Take a look at two of your body's systems. First, read about what parts make up these systems and then you'll learn about how these two systems work together.

The Muscular System

- **Muscles** allow your bones to move
- Muscles are made of **protein fibers**
- Your muscles need oxygen to make them work
- Your heart is a muscle

The Skeletal System

- 206 bones make up your **skeleton** and hold you together
- Bones are made of minerals like **calcium**
- Bones protect your **organs**
- Provides support to your body



How the skeletal and the muscular systems work together.

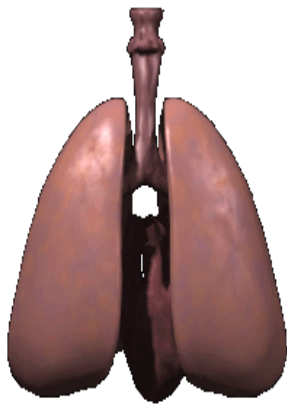
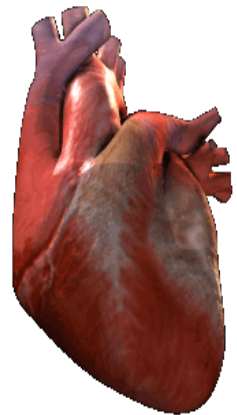
- Skeletal muscles connect to your bones, which allow you to run, jump, and swim.
- **Voluntary muscles** or striated do the moving because your brain tells them to. You have to think about these muscles.
- **Involuntary muscles** or smooth move blood and food through the digestive system without you having to think about it.
- The **cardiac muscle** or heart works hard to pump blood and oxygen through out your whole body.

The Plain Facts:

Here are two more systems for you to discover. After you read about them, you'll learn more about how they all work together.

The Circulatory System

- Your heart muscle belongs to this group
- This system moves blood and oxygen around your body
- Moving blood delivers oxygen to your cells and picks up wastes



The Respiratory System

- Your **lungs** belong to this group
- Oxygen is taken into your lungs
- Your mouth, nose, and throat are a part of this system



Food For Thought:

In Shakespeare's day, they believed that the liver was the center of emotions. Love, for instance, made your liver glow! Some people believe that your heart is the organ that comes alive when you love something or someone. Some people believe the center of emotions is in the brain. Who do you think is right? We'll never know. So, just to be sure, eat well and be good to all organs!

How do these two systems work together? Check it out:

- The lungs take in air and pass oxygen on to the blood
- As the blood moves through the lungs, it picks up oxygen
- Every time you breathe, more oxygen enters your blood stream
- The circulatory system moves blood from your heart into passageways called **arteries, capillaries and veins**



The Digestive System:

- Food enters through your mouth
- When you swallow, food is pushed though your **esophagus**
- The food then enters your stomach
- Your stomach releases acid which breaks down the food
- Your intestinal muscles move the food particles to your intestines
- Your intestines separate nutrients from waste material
- Every time you eat, **nutrients** also enter your blood stream

So far, you’ve read about five major systems your body uses to keep you alive. There is one more system for you to read about. Without help from these other systems, you wouldn’t be complete.

The Plain Facts:

Think of B cells and T cells as scouts. B and T cells travel around the body looking for foreign invaders that are **antigens**. When B cells locate and antigen, they make an **antibody**, which grabs on the antigen. When T cells locate an antigen, they destroy the target with that antigen using a “lethal injection.” If an invader enters your body, and it has been there before, your body will recognize it and be better prepares for a second attack.

NEWS FLASH

Immunization, or “shots” is the practice of exposing the body to an antigen without the active invader and prepares the body for a second attack.

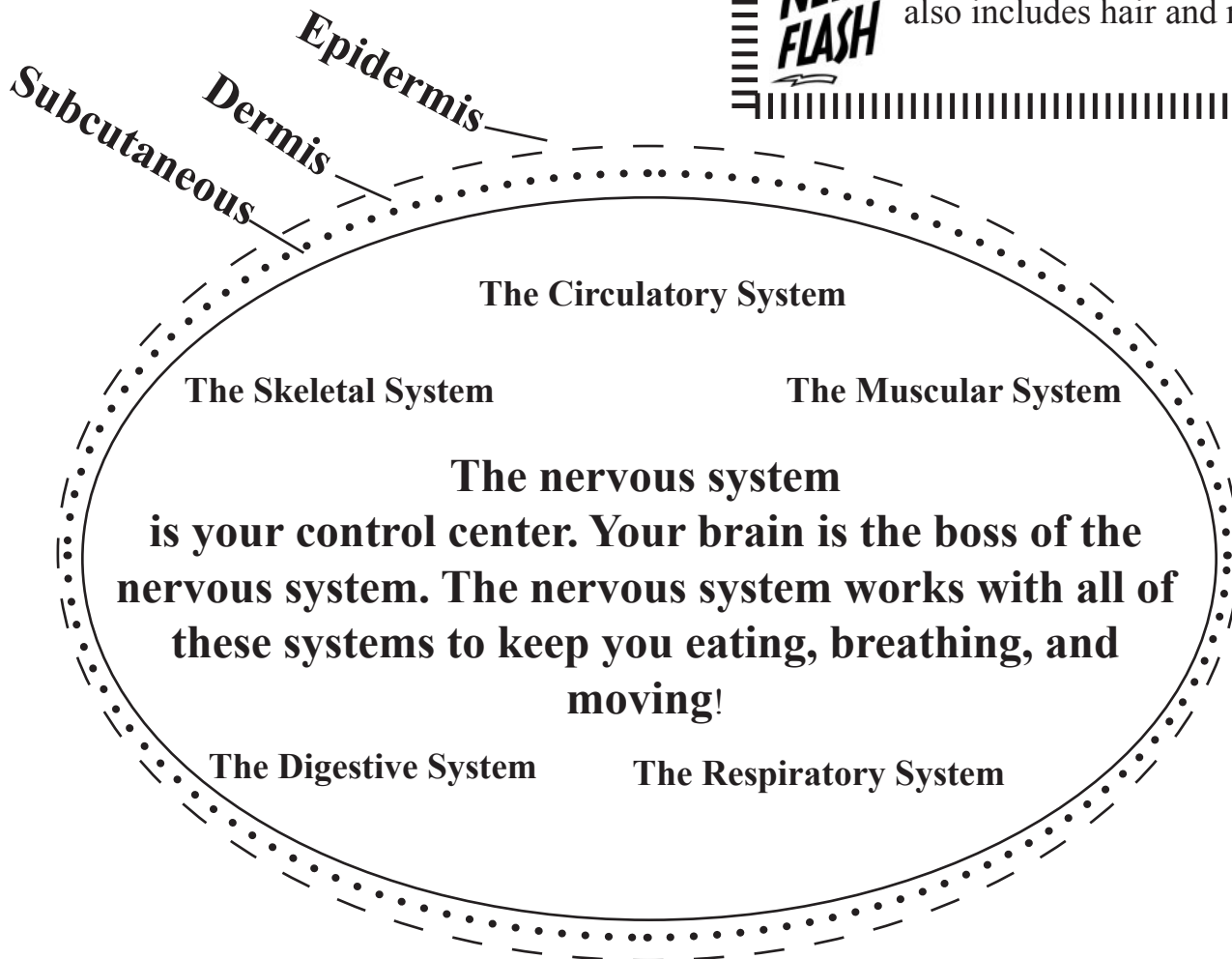
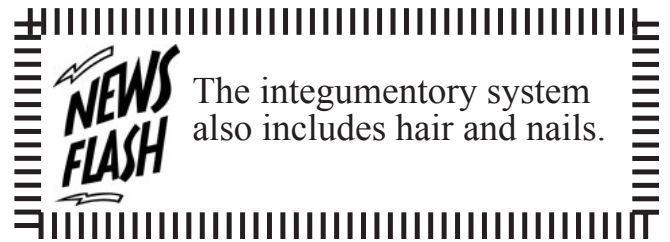
After the battle is over, the phagocytic cell cleans up the mess by eating the dead invaders. The T cells and B cells fight slightly different invaders, just like the Navy fighters are mostly sea battles and the Air Force fight mostly air battles.

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“So,” you think, “if I have all of these amazing, disease fighting cells hanging around, how come I get colds?” The answer is, the B cells and T cells are not always enough to protect you. Your body also needs nutrients containing **vitamins** and **minerals** to help keep all of your cells strong enough to fight those nasty antigens. Even B cells and T cells can become undernourished and weak!

The last system is shown below as the large oval around the other systems. This system you may think of as the **skin** is actually called the **Integumentary System**. This system is made up of three layers. The **epidermis** makes new skin cells and protects your body. The middle layer of skin, the **dermis**, helps with your sense of touch. It contains blood vessels, nerves, oil and sweat glands. The innermost layer of skin, the **subcutaneous** layer, is made up of fat. It cushions you when you fall and helps keep you warm. It also contains your hair follicles.



All of the body’s systems work together so you can be strong and healthy. These systems also need you to make good choices, as you will see in future chapters, so you can be the strongest and healthiest young person possible.

Language Arts

It's Cartoon Time!

Pick a vocabulary word and draw a cartoon showing how that part or system works in your body.

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Math

Fraction Figures



If there are 206 bones in the entire body and your foot contains 26 of them. Create a fraction that shows how many bones are in both of your feet compared to the rest of your body.

Math/Science

Create A Chart

Read the chart below to see the percentage of elements found in the human body. Create a pie chart using the data.

| Element | Percentage |
|----------------|------------|
| Oxygen | 65% |
| Carbon | 18% |
| Hydrogen | 10% |
| Nitrogen | 3% |
| Other elements | 4% |

