Digestive system
The system that breaks down food into parts that can be used by the body. The stomach and intestines are part of the digestive system.

Circulatory system
The system that transports nutrients and oxygen to body cells; it also carries waste away from cells. Blood, arteries, and veins are important parts of the circulatory system.

Respiratory system
The system that is used to exchange gases (especially oxygen and carbon dioxide) with the environment, and that allows us to breathe. Lungs are part of the human respiratory system.

Skeletal system
The skeletal system is made up of bones and provides support to the rest of the body's structures.
Muscular system
The system that allows humans and animals to move around. The muscles are attached to the bones, causing the bones to move when a muscle contracts.

Excretory system
The system that eliminates (gets rid of) waste products. When you use the bathroom.

Reproductive system
The system that allows plants and animals to produce offspring. Have Babies!
SKELETAL SYSTEM

The body has a supporting frame called a skeleton, which is made up of bones. The skeleton has several purposes.

- It gives the body its shape.
- It protects organs in the body.
- It works with muscles to move the body.

Skeletal systems come in many forms. You have a skeleton inside of your body (endoskeleton) made up of bones. Insects and crustaceans have skeletal systems on the outside or their bodies (exoskeletons) that are made of hard plates. Organisms like starfish do not have bones or plates. They have skeletons made up of fluids inside of tubes within their bodies. The fluid skeletal systems are called hydrostatic. All animals such as humans that live outside of the water need some kind of skeletal system to support or protect them. Without the skeletal system, we would be a blob of fat, meat and muscle.

INTERACTING WITH OTHER SYSTEMS

Your skeletal system does not work alone. We already mentioned the interaction with your muscular system. Muscles connect to your skeleton and they contract and move the skeleton along.

MUSCULAR SYSTEM - MEAT ON THE BONES

Many advanced animals have muscular systems. There is more to the muscular system than the muscles that help you move. The big purpose of the muscles found in your body is movement. We could be talking about the movement of your legs while you walk. We could be talking about the beating of your heart. We could also be talking about the contraction of a very small blood vessel in your brain. You have no control over most of the muscular system. You do control the voluntary muscle in your arms, legs, neck, and torso. You have little or no control over the heart or smooth muscle.

INTERACTING WITH OTHER SYSTEMS

Your muscular system is closely connected to the nervous system. That makes sense since you usually have to think before you can move. Muscles also connect to your skeleton and they contract and move the skeleton along.
CIRCULATORY SYSTEM

The circulatory system consists of the heart, blood vessels (veins & arteries), and blood. Circulation is the flow of blood through the body. The circulatory system touches every organ and system in your body. The system is connected to all of your body's cells so that it can **transport oxygen** efficiently. When you breathe, the circulatory system carries oxygen to your cells and carries dissolved carbon dioxide back to the lungs.

INTERACTING WITH OTHER SYSTEMS

The circulatory system works in conjunction with the respiratory system, so the oxygen pumped through the lungs are passed to the blood to be carried to the heart, the brain and every other organ in the body.

RESPIRATORY SYSTEM

The process of getting and using oxygen in the body is called respiration. Your respiratory system is made of your nose and mouth, a tube called the pharynx, another tube called the **trachea**, and your lungs. You have two lungs and the exchange of gases between the circulatory and respiratory systems happens in the lungs. Its purpose is to bring oxygen into your body. Your respiratory system also helps your body get rid of the carbon dioxide. Whatever animal it is, oxygen is taken in and carbon dioxide is let out.

INTERACTING WITH OTHER SYSTEMS

Although it does not happen in all animals, it does happen in humans, your respiratory system also interacts with your digestive system. Your mouth is used to swallow and to breathe. Your respiratory system even connects with the nervous system in your nose where you smell.

DIGESTIVE SYSTEM

The digestive system is all about getting food into your body, digesting the food, absorbing the **nutrients** you need, and elimination (pooping) of the materials you don’t need (**feces**). All animals have one sort of digestive system or another. Digestion begins the mouth, where you chew and break down the food and moistens it with your saliva. Then your small intestine can absorb them into the blood stream. The material you don’t absorb continues into the large intestine where water is removed from the material and then whatever is left can be eliminated (waste).

INTERACTING WITH OTHER SYSTEMS

The digestive system works very closely with the circulatory system to get the absorbed nutrients distributed through your body. The digestive system also works in parallel with your excretory system (kidneys and urination). While the digestive system collects and removes undigested solids, the excretory system filters compounds from the blood stream and collects them in urine.
EXCRETORY SYSTEM

EXCRETION IS NOT ELIMINATION
The excretory system is very important to your body and only has a few parts. In a similar way the digestive system removed solid waste from your body, you must also get rid of fluids. The results of the excretory system is urine! When you sweat, that is also part of the Excretory system (that is how your body gets rid of access salt). Sweating also allows your body not to over heat on hot days.

Urine is the result of the excretory system balancing the amount of water and salts in your body. We said the system is small. Your kidneys are the core organs involved in the excretory system. Related body parts include the ureters, bladder, and urethra. Once the urine passes through your urethra, that’s it, it’s out of your body.

INTERACTING WITH OTHER SYSTEMS
The excretory system is a close partner with both the circulatory and endocrine system. The circulatory system sends the blood to the liver to be cleaned from waste. Blood that circulates through the body passes through one of the two kidneys. Urea, uric acid, and water are removed from the blood and most of the water is put back into the system.

THE NERVOUS SYSTEM
The nervous system is the most important system. Your nervous system is divided into two parts. Your central nervous system includes your brain and your spinal cord. Your peripheral nervous system is made up of the network of neurons (nerves) that spans your organs, muscles, and body. The neurons (nerves) in both systems work together to help you think, survive, and control all movements of your body. They also allow you to feel pain.

INTERACTING WITH OTHER SYSTEMS
Your nervous system interacts with every other system in your body. In the same way that all of your cells need oxygen transported by the circulatory system, all of your tissues and organs require instruction and direction from the nervous system. It controls your whole body!

EXTRA!
Digestion steps!
You get hungry and you eat. Once you put the food in your mouth, you start to chew and begin a process of digestion that grinds food down into a pulp. You swallow.

Your body also starts to release enzymes that start the process of digestion in the stomach. The food moves through your digestive system and is eventually broken down into compounds and nutrients that your small intestine can absorb into the blood stream. The material you don’t absorb continues into the large intestine where water is removed from the material and then whatever is left can be eliminated at your convenience. That’s a decent overview of the process.
Your Digestive System

by Cynthia Sherwood

This may seem like a trick question, but are you bigger than a tennis court? The answer is no, of course not! But think about this fact—your intestines have a surface area about the size of a tennis court all coiled up inside your body. They fit inside of you because your large and small intestines are like a giant Slinky that scrunches up.

These organs have a giant role to play too. They are part of your digestive system. That means they break down the food you eat. Digestion begins in the mouth when you chew and swallow. From there, your food travels through the esophagus (ee-saw-fuh-gus), which connects the bottom of your throat to your stomach. Your stomach mixes up food with liquids and then dumps it all into the small intestine.

The small intestine is a very long narrow tube. Its spongy walls soak up nutrients from your food. Then those nutrients flow into your bloodstream to be carried off to other parts of your body. Some nutrients get stored until you need them and others are used right away for all the different things your body needs to work well.

Your body cannot use every single bit of the food you eat. There will always be some that needs to be changed into waste by the large intestine. From the small intestine, leftover food gets pushed into the large intestine where it is dried up and turned into feces, or poop.

If you want to keep your digestive system healthy, you should be careful about what you eat. Healthy whole grains, fruits, and vegetables all pass through your digestive system quickly and easily. They also contain fiber, which is a nutrient that helps in digestion. Your body has a harder time digesting fatty foods, so be careful how much fat is in your diet.
Your Digestive System
by Cynthia Sherwood

1. What is the purpose of your body’s digestive system?
   a. to help your blood move through the body
   b. to help you breathe
   c. to help your body make food
   d. to help your body break down food

2. After you swallow your food, what does it travel through to get to your stomach?

3. Which organ takes nutrients from your food and puts it in your bloodstream?
   a. stomach
   b. esophagus
   c. small intestine
   d. large intestine

4. Place these events in the correct order. Number each sentence 1 - 5.
   ___ Food ends up in the small intestine.
   ___ Food is chewed up.
   ___ Food is in the large intestine.
   ___ Food travels through the esophagus.
   ___ Food waste leaves the body.

5. What is fiber?
Your Brain
by Cynthia Sherwood

You may not realize that you have a boss, just like adults do at work. But when it comes to your body, your brain is your boss! It is in charge of just about everything you do. When you remember what you ate for breakfast, you use your brain. When you jump up and down, you use your brain. When you draw a picture, you use your brain. Even when you are dreaming, you use your brain.

The brain looks like a wrinkled, wet sponge. In adults, it weighs only about three pounds, but it is made up of billions of nerve cells. These cells send and receive electrical signals that direct all of your body's activities. Sometimes, like when you are learning at school, you know you are using your brain. Many times, though, your brain controls your body without you even thinking about it. The "brain stem" takes care of things your body does automatically, like breathing air, pumping blood, and digesting food.

The biggest part of your brain is called your “cerebrum” (suh-ree-brum). This is the thinking part of your brain. It controls your memory, the movements you choose to make, your ability to figure things out, and your imagination. The cerebrum is made up of two halves. It may sound mixed up, but the left side controls the right side of your body and the right side controls your left side.

Even your feelings come from your brain. Scientists think emotions are controlled by a part of your brain called the “amygdala” (uh-mig-duh-luh). It is shaped like an almond and is only an inch long. So next time you get in a bad mood, you can blame it on your brain.

You should be glad you have a human brain. It is very complex, which means we can think in different, more complicated ways than other animals. In fact, every day your brain produces about 70-thousand thoughts. No wonder your head hurts when you have too much homework!
Your Brain
by Cynthia Sherwood

1. According to the information in the article, what does your brain look like and how much does it weigh?


2. Which part of your brain controls your memory?


3. Which part of your brain automatically controls parts of your body without you having to think about them?


4. Which part of your brain controls feelings, like happiness, sadness, frustration, and anger?


5. Why does the author say that your cerebrum seems “mixed up”?


6. Your brain is made of nerve cells. What do nerve cells do?


7. Which statement from the article is an opinion?
   a. Even your feelings come from your brain.
   b. Sometimes, your brain controls your body without you even thinking about it.
   c. You should be glad you have a human brain.
   d. Every day your brain produces 70-thousand thoughts.
Your Heart

by Cynthia Sherwood

Have you ever watched as your mom or dad pumps gas into your car? You may not realize it, but the most vital part of your body—your heart—is simply a fancy pump. It is designed to move your blood around your body. The heart is located a little to the left of the center of your chest and is about the size of your fist.

Your heart works very hard. When you run around a lot, you can feel your heart beating fast because it is pushing blood filled with oxygen and nutrients to the cells in your body. Your heart is a muscle too! It is divided into two parts. The right side receives blood from your body and pumps it into your lungs. The left side receives blood from the lungs and returns it to the rest of the body.

Your heart muscle beats between 80 and 120 times every minute. With each beat, blood is both entering and leaving your heart. The vessels that carry blood away from your heart are called arteries. The vessels that carry blood back to your heart are called veins.

Heart disease is common among older Americans because the heart can become clogged over time. The heart will not pump as well if someone smokes or eats a lot of unhealthy fats and sugary foods. To take good care of your heart, you should eat plenty of whole grains, fruits, vegetables, and lean proteins. You should also exercise often to get your heart pumping hard. Just like other muscles in your body, your heart needs exercise to keep strong.

If you wonder why it is so important to have a strong heart, just think about this—your heart will beat about three billion times in your lifetime!
1. Where is your heart located?

2. What does your heart do for your body?

3. How is the left side of your heart different from the right side?

4. Complete the Venn diagram to compare and contrast the functions of arteries and veins.

   Arteries

   Both

   Veins

5. What are some things you can do to keep your heart healthy?
Your Lungs
by Cynthia Sherwood

You do something about twenty times a minute without even thinking about it—you breathe! In fact, every day you take about twenty-thousand breaths.
The organs of your body that allow you to breathe are called your lungs. You have two of them that work together, located in your chest inside the rib cage.

The main purpose of your lungs is to breathe in good air and breathe out bad air. The good air contains oxygen, which your body needs. The bad air is a gas called carbon dioxide, which your body cannot use.

When you breathe in through your nose or mouth, air travels down the back of your throat. It passes through your voice box and into your trachea, or windpipe. Your trachea is divided into two air passage tubes. One leads to your left lung. The other leads to your right lung. Inside your lungs, oxygen is removed from the air you breathe and pumped into blood cells. Your lungs also get rid of harmful carbon dioxide from these cells. This process takes place inside hundreds of millions of tiny air sacs.

Each adult lung is about the size of a football. When they are healthy, your lungs feel a little like a sponge and are pinkish-gray. When lungs are damaged by smoking, they can appear gray or have black spots on them.

One disease that is very common in children involves the lungs. Asthma narrows the breathing tubes, making it harder to breathe. As many as nine million kids in the United States have asthma.

You probably already know that your lungs are important when you swim. But you may not know this—your lungs are the only part of your body that can float on water!
1. Where are your lungs located?

2. Complete the graphic organizer.

| Type of air that your lungs remove from your blood cells | Type of air that your lungs put into your blood cells |

3. What is your trachea?

4. What do lungs look like when they've been damaged from smoking?

5. Why does asthma make it hard for people to breathe?
Your Bones
by Cynthia Sherwood

Without your bones, you would be as floppy as a jellyfish. Our bones allow us to stand up straight. They support us and help us move, but they also protect our body organs.

Our skeleton is made up of all of our bones working together. If you have ever seen a real skeleton in a science class or museum, you might think that bones are dry and dead feeling. But that is not the case. Bones are made of living, growing cells. Inside most bones is soft marrow, which is where many of our blood cells are made. As a baby, you were born with nearly 300 bones. But adults only have about 206 bones because some of the smaller ones join together to form big ones.

Certain bones are especially important. The skull inside your head acts like a helmet for your soft, squishy brain. Your skull helps protect you from injuries to your head. Your spine, or backbone, lets you stand up tall. Your spine also protects the spinal column with all of its nerves inside. Your ribs make a cage to protect your vital organs like the heart, lungs, and liver.

Even though bones are very light, they are also very strong. That is why it usually takes a very bad fall or other serious accident to break a bone. If that does happen, you might wear a cast until new bone cells heal the break in a month or two.

To protect your bones, wear a helmet whenever you ride your bike or skateboard. Knee pads, wrist guards, and other safety gear for sports are a good idea too. Strong bones need the mineral calcium, so drink lots of milk and eat dairy products. Bones also need active exercise, so go out and run, jump, and dance for healthy, strong bones.
Your Bones
by Cynthia Sherwood

1. Tell whether each statement is true or false.
   a. ___________ Your bones are hollow.
   b. ___________ Blood cells are made inside your bones.
   c. ___________ Adults have more bones than babies do.

2. Why are dairy products good for your bones?

   ____________________________________________

3. Complete the graphic organizer.

<table>
<thead>
<tr>
<th>Bone(s)</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>ribs</td>
<td>helps you to stand up tall and protects the nerves in</td>
</tr>
</tbody>
</table>
<pre><code>             | your spinal column                                      |
</code></pre>
<p>| skull        |                                                        |</p>

4. How many more bones do babies have than adults?
   Use your math skills. Show your work.

   ____________________________________________
Your Muscles
by Cynthia Sherwood

When you think of muscles, you might picture a bodybuilder with big, bulging arm and chest muscles. But your muscles do not have to look like that to work well. Every time you write your name, you use the twenty different muscles in your hand. Every time your heart beats, you use your cardiac muscle. When you chew your food, you use your tongue muscles. You’re even using muscles when you blink your eyes. In fact, every time you move, you are using some of the amazing muscles in your body.

A muscle is made of tiny fibers. Fiber is a type of tissue that feels a little like a rubber band. Thousands of these fibers are packed together to make a single muscle. We all have the same number of muscles—around 700 or so. Men and women with extra-big muscles simply have thicker bundles of fibers.

There are three different types of muscles. Smooth muscles are ones you cannot control. They work behind-the-scenes to keep your body running. Smooth muscles include the ones that help you digest your food. The cardiac muscle makes the heart pump blood in and out. Skeletal muscle is the kind you can control. These are the muscles you use to raise your hand, swim laps, or ride your scooter. Usually, a skeletal muscle is attached to the end of a bone. Muscles and bones work together to give your body power, strength, and movement. In fact, every year, your leg muscles help you take about five-million steps!

Even your face uses muscles. But if you want to save your energy, try smiling instead of frowning. It takes seventeen muscles in your face to smile, but forty-three muscles to frown!
Your Muscles
by Cynthia Sherwood

1. Which statement is true?
   a. Muscles in your brain help you think.
   b. All of your muscles are attached to bones.
   c. Muscles help you digest food.
   d. All of these statements are true.

2. What are muscle fibers?

3. How are smooth muscles different from skeletal muscles?

4. Draw straight lines to match each fact on the left with the correct number on the right.
   a. Number of muscles it takes to frown
   b. Number of muscles it takes to smile
   c. Number of muscles in your body
   d. Number of steps you take in a year
   e. Number of muscles you use to write

   17
   20
   5 million
   700
   43