**PowerPoint Guidelines**

* **Title Page-Name of Organ and Your Name/HR**
* **5-10 slides with pictures and animations**
* **Vocabulary Slide**
* **Why is this organ important to the body?**
* **What did you learn/found most interesting in your research**

**Choices:**

**-Liver**

**-Heart**

**-Eyes**

**-Ears**

**-Brain**

**Your Liver**

Have you ever seen liver and onions on a diner menu? If so, we're guessing you said "yuck" and ordered something else.

But did you know that there's one liver you don't have to order? It's always right inside your abdomen, up under your ribcage, and it's very important to your health.

Your liver is the largest solid organ in your body. By the time you're grown up, it will be about the size of a football. The liver does many jobs, but here are three big ones:

1. It cleans your blood.
2. It produces an important digestive liquid called **bile**.
3. It stores energy in the form of a sugar called **glycogen**.

**The Liver Cleans Blood**

The liver helps you by taking toxins (substances in the body that are actually like poisons) out of your blood. Wait! Why do you have toxins in your blood in the first place? Sometimes your body produces them as part of its normal function, like breaking down [protein](https://kidshealth.org/en/kids/protein.html), a component in foods such as meat and nuts.

The liver also cleans blood that has just been enriched with vitamins and minerals during digestion. After you've eaten something, the vitamins, minerals, and other nutrients from the food pass from the intestine into the blood. Before going out to the rest of the body, the nutrient-rich blood makes a stop at the liver.

The liver processes the good stuff into forms that the rest of the body can use. Waste or stuff your body doesn't need can be carried by bile back into the intestine and out of the body when you get rid of waste. Other waste processed by the liver goes through your blood to your kidneys and out in your urine.

And, if you ever accidentally ate something that was harmful, your liver would try to break it down and clear it out of your system. But don't put your liver to the test! Steer clear of poisons and other harmful stuff.

**The Liver Makes Bile**

As you probably know, the digestive system does more than just move food through your body until it's time for a trip to the bathroom. During digestion, your body takes everything your body needs from the food you eat. Fat is one of the things the body gets from food.

Bile, a digestive juice produced by the liver, helps the body absorb fat into the bloodstream. You'll find this thick, yellow-green substance in the gallbladder, where it's stored until the body needs some to digest fats.

**The Liver Stores Glycogen**

The liver also helps the body use carbohydrates (carbs), another important component in food. Carbohydrates are found in lots of foods, such as bread, fruit, and milk. The body breaks down most carbs into a type of sugar called glucose, which is the main source of fuel for our cells. Glucose stored in the liver is called glycogen.

Glycogen is like your backup fuel. When the body needs a quick energy boost or when a person's blood glucose level drops the liver breaks down glycogen and releases glucose into the bloodstream.

**And That's Not All!**

Your liver doesn't stop there. It has a hand in making cholesterol, which you might think of as bad, but your body needs some of it. And the liver helps with blood clotting, which is what helps you stop bleeding not long after you get a cut.

You should thank your liver next time you take some medicine, too. For example, when you take a pain reliever for a headache, the liver takes the active ingredient and breaks it down so your body can use it to make your headache go away!

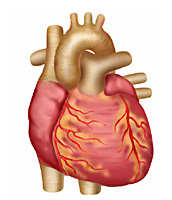
**Loving Your Liver**

Now that you know how much your liver does for you, you're probably wondering what you can do for it. It's easy, really. Living healthy is the best way to care for your liver. The liver can be damaged if a person is very overweight. So be active, eat right, and your liver will keep on loving you back!

**Your Heart & Circulatory System**

We see and hear about hearts everywhere. A long time ago, people even thought that their emotions came from their hearts, maybe because the heart beats faster when a person is scared or excited. Now we know that emotions come from the [brain](https://kidshealth.org/en/kids/brain.html), and in this case, the brain tells the heart to speed up. So what's the heart up to, then? How does it keep busy? What does it look like? Let's find out.

**The Heart Is a Muscle**

Your heart is really a muscle. It's located a little to the left of the middle of your chest, and it's about the size of your fist. There are lots of muscles all over your body — in your arms, in your legs, in your back, even in your behind.

But the heart muscle is special because of what it does. The heart sends blood around your body. The [blood](https://kidshealth.org/en/kids/blood.html)provides your body with the oxygen and nutrients it needs. It also carries away waste.

Your heart is sort of like a pump, or two pumps in one. The right side of your heart receives blood from the body and pumps it to the lungs. The left side of the heart does the exact opposite: It receives blood from the lungs and pumps it out to the body.

**How the Heart Beats**

How does the heart beat? Before each beat, your heart fills with blood. Then its muscle contracts to squirt the blood along. When the heart contracts, it squeezes — try squeezing your hand into a fist. That's sort of like what your heart does so it can squirt out the blood. Your heart does this all day and all night, all the time. The heart is one hard worker!

**Parts of the Heart**

The heart is made up of four different blood-filled areas, and each of these areas is called a chamber. There are two chambers on each side of the heart. One chamber is on the top and one chamber is on the bottom. The two chambers on top are called the **atria**(say: AY-tree-uh). If you're talking only about one, call it an **atrium**. The atria are the chambers that fill with the blood returning to the heart from the body and lungs. The heart has a left atrium and a right atrium.

The two chambers on the bottom are called the **ventricles** (say: VEN-trih-kulz). The heart has a left ventricle and a right ventricle. Their job is to squirt out the blood to the body and lungs. Running down the middle of the heart is a thick wall of muscle called the **septum** (say: SEP-tum). The septum's job is to separate the left side and the right side of the heart.

The atria and ventricles work as a team — the atria fill with blood, then dump it into the ventricles. The ventricles then squeeze, pumping blood out of the heart. While the ventricles are squeezing, the atria refill and get ready for the next contraction. So when the blood gets pumped, how does it know which way to go?

Well, your blood relies on four special valves inside the heart. A valve lets something in and keeps it there by closing — think of walking through a door. The door shuts behind you and keeps you from going backward.

Two of the heart valves are the **mitral** (say: MY-trul) **valve** and the **tricuspid** (say: try-KUS-pid) **valve**. They let blood flow from the atria to the ventricles. The other two are called the **aortic** (say: ay-OR-tik) **valve** and **pulmonary** (say: PUL-muh-ner-ee) **valve**, and they're in charge of controlling the flow as the blood leaves the heart. These valves all work to keep the blood flowing forward. They open up to let the blood move ahead, then they close quickly to keep the blood from flowing backward.

**How Blood Circulates**

You probably guessed that the blood just doesn't slosh around your body once it leaves the heart. It moves through many tubes called [arteries and veins](https://kidshealth.org/en/kids/word-arteries.html), which together are called **blood vessels**. These blood vessels are attached to the heart. The blood vessels that carry blood away from the heart are called arteries. The ones that carry blood back to the heart are called veins.

The movement of the blood through the heart and around the body is called **circulation**(say: sur-kyoo-LAY-shun), and your heart is really good at it — it takes less than 60 seconds to pump blood to every cell in your body.

Your body needs this steady supply of blood to keep it working right. Blood delivers oxygen to all the body's cells. To stay alive, a person needs healthy, living cells. Without oxygen, these cells would not be able to live.

The left side of your heart sends that oxygen-rich blood out to the body. The body takes the oxygen out of the blood and uses it in your body's cells. When the cells use the oxygen, they make carbon dioxide and other stuff that gets carried away by the blood. It's like the blood delivers lunch to the cells and then has to pick up the trash!

The returning blood enters the right side of the heart. The right ventricle pumps the blood to the lungs for a little freshening up. In the lungs, carbon dioxide is removed from the blood and sent out of the body when we exhale. What's next? An inhale, of course, and a fresh breath of oxygen that can enter the blood to start the process again. And remember, it all happens in about a minute!

**Listen to the Lub-Dub**

When you go for a checkup, your doctor uses a stethoscope to listen carefully to your heart. A healthy heart makes a lub-dub sound with each beat. This sound comes from the valves shutting on the blood inside the heart.

The first sound (the lub) happens when the mitral and tricuspid valves close. The next sound (the dub) happens when the aortic and pulmonary valves close after the blood has been squeezed out of the heart. Next time you go to the doctor, ask if you can listen to the lub-dub, too.

**Pretty Cool — It's My Pulse!**

Even though your heart is inside you, there is a cool way to know it's working from the outside. It's your pulse. You can find your pulse by lightly pressing on the skin anywhere there's a large artery running just beneath your skin. Two good places to find it are on the side of your neck and the inside of your wrist, just below the thumb.

You'll know that you've found your pulse when you can feel a small beat under your skin. Each beat is caused by the contraction (squeezing) of your heart. If you want to find out what your heart rate is, use a watch with a second hand and count how many beats you feel in 1 minute. When you are resting, you will probably feel between 70 and 100 beats per minute.

When you run around a lot, your body needs a lot more oxygen-filled blood. Your heart pumps faster to supply the oxygen-filled blood that your body needs. You may even feel your heart pounding in your chest. Try running in place or jumping rope for a few minutes and taking your pulse again — now how many beats do you count in 1 minute?

**Keep Your Heart Happy**

Most kids are born with a healthy heart and it's important to keep yours in good shape. Here are some things that you can do to help keep your heart happy:

* Remember that your heart is a muscle. If you want it to be strong, you need to[exercise](https://kidshealth.org/en/kids/work-it-out.html) it. How do you do it? By being active in a way that gets you huffing and puffing, like jumping rope, dancing, or playing basketball. Try to be active every day for at least 30 minutes! An hour would be even better for your heart!
* Eat a variety of healthy foods and avoid foods high in unhealthy fats, such as saturated fats and trans fats (reading [food labels](https://kidshealth.org/en/kids/labels.html) can help you figure out if your favorite snacks contain these unhealthy ingredients).
* Try to eat at least five servings of fruits and vegetables each day.
* Avoid sugary soft drinks and fruit drinks.

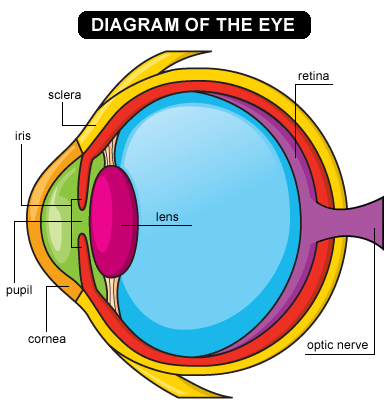
**Your Eyes**

Which part of your body lets you read the back of a cereal box, check out a rainbow, and see a softball heading your way? Which part lets you cry when you're sad and makes tears to protect itself? Which part has muscles that adjust to let you focus on things that are close up or far away? If you guessed the eye, you're right!

Your eyes are at work from the moment you wake up to the moment you close them to go to sleep. They take in tons of information about the world around you — shapes, colors, movements, and more. Then they send the information to your brain for processing so the brain knows what's going on outside of your body.

You can see that the eye's pretty amazing. So, come on — let's take a tour of its many parts.

**The Parts of the Eye**

You can check out different parts of the eye by looking at your own eye in the mirror or by looking at (but not touching) a friend's eye. 

**Big as a Ping Pong Ball**

The eye is about as big as a ping-pong ball and sits in a little hollow area (the eye socket) in the skull. The eyelid protects the front part of the eye. The lid helps keep the eye clean and moist by opening and shutting several times a minute. This is called **blinking**, and it's both a voluntary and involuntary action, meaning you can blink whenever you want to, but it also happens without you even thinking about it.

The eyelid also has great [reflexes](https://kidshealth.org/en/kids/reflexes.html), which are automatic body responses, that protect the eye. When you step into bright light, for example, the eyelids squeeze together tightly to protect your eyes until they can adjust to the light. And if you flutter your fingers close (but not too close!) to your friend's eyes, you'll be sure to see your friend's eyes blink. Your friend's eyelids shut automatically to protect the eye from possible danger. And speaking of fluttering, don't forget eyelashes. They work with the eyelids to keep dirt and other unwanted stuff out of your eyes.

The white part of the eyeball is called the **sclera** (say: SKLAIR-uh). The sclera is made of a tough material and has the important job of covering most of the eyeball. Think of the sclera as your eyeball's outer coat. Look very closely at the white of the eye, and you'll see lines that look like tiny pink threads. These are blood vessels, the tiny tubes that deliver blood, to the sclera.

The **cornea** (say: KOR-nee-uh), a transparent dome, sits in front of the colored part of the eye. The cornea helps the eye focus as light makes its way through. It is a very important part of the eye, but you can hardly see it because it's made of clear tissue. Like clear glass, the cornea gives your eye a clear window to view the world through.

**Iris Is The Colorful Part**

Behind the cornea are the iris, the pupil, and the anterior chamber. The **iris** (say: EYE-riss) is the colorful part of the eye. When we say a person has blue eyes, we really mean the person has blue irises! The iris has muscles attached to it that change its shape. This allows the iris to control how much light goes through the **pupil** (say: PYOO-pul).

The pupil is the black circle in the center of the iris, which is really an opening in the iris, and it lets light enter the eye. To see how this works, use a small flashlight to see how your eyes or a friend's eyes respond to changes in brightness. The pupils will get smaller when the light shines near them and they'll open wider when the light is gone.

The **anterior** (say: AN-teer-ee-ur) **chamber** is the space between the cornea and the iris. This space is filled with a special transparent fluid that nourishes the eye and keeps it healthy.

**Light, Lens, Action**

These next parts are really cool, but you can't see them with just your own eyes! Doctors use special microscopes to look at these inner parts of the eye, such as the lens. After light enters the pupil, it hits the lens. The lens sits behind the iris and is clear and colorless. The lens' job is to focus light rays on the back of the eyeball — a part called the **retina** (say: RET-i-nuh).

The lens works much like the lens of a movie projector at the movies. Next time you sit in the dark theater, look behind you at the stream of light coming from the projection booth. This light goes through a powerful lens, which is focusing the images onto the screen, so you can see the movie clearly. In the eye's case, however, the film screen is your retina.

Your retina is in the very back of the eye. It holds millions of cells that are sensitive to light. The retina takes the light the eye receives and changes it into nerve signals so the brain can understand what the eye is seeing.

**A Muscle Makes It Work**

The lens is suspended in the eye by a bunch of fibers. These fibers are attached to a muscle called the **ciliary** (say: SIL-ee-air-ee) **muscle**. The ciliary muscle has the amazing job of changing the shape of the lens. That's right — the lens actually changes shape right inside your eye! Try looking away from your computer and focusing on something way across the room. Even though you didn't feel a thing, the shape of your lenses changed. When you look at things up close, the lens becomes thicker to focus the correct image onto the retina. When you look at things far away, the lens becomes thinner.

The biggest part of the eye sits behind the lens and is called the **vitreous** (say: VIH-tree-us) **body**. The vitreous body forms two thirds of the eye's volume and gives the eye its shape. It's filled with a clear, jelly-like material called the vitreous humor. Ever touch toy eyeballs in a store? Sometimes they're kind of squishy — that's because they're made to feel like they're filled with vitreous humor. In a real eye, after light passes through the lens, it shines straight through the vitreous humor to the back of the eye.

**Rods and Cones Process Light**

The retina uses special cells called **rods** and **cones** to process light. Just how many rods and cones does your retina have? How about 120 million rods and 7 million cones — in each eye!

Rods see in black, white, and shades of gray and tell us the form or shape that something has. Rods can't tell the difference between colors, but they are super-sensitive, allowing us to see when it's very dark.

Cones sense color and they need more light than rods to work well. Cones are most helpful in normal or bright light. The retina has three types of cones. Each cone type is sensitive to one of three different colors — red, green, or blue — to help you see different ranges of color. Together, these cones can sense combinations of light waves that enable our eyes to see millions of colors.

**Helping You See It All**

Rods and cones process the light to give you the total picture. You're able to see that your friend has brown skin and is wearing a blue hat while he tosses an orange basketball.

Sometimes someone's eyeball shape makes it difficult for the cornea, lens, and retina to work perfectly as a team. When this happens, some of what the person sees will be out of focus.

To correct this fuzzy vision, many people, including many kids, wear [glasses](https://kidshealth.org/en/kids/glasses.html). Glasses help the eyes focus images correctly on the retina and allow someone to see clearly. As adults get older, their eyes lose the ability to focus well and they often need glasses to see things up close or far away. Most older people you know — like your grandparents — probably wear glasses.

**To the Brain!**

Think of the optic nerve as the great messenger in the back of your eye. The rods and cones of the retina change the colors and shapes you see into millions of nerve messages. Then, the optic nerve carries those messages from the eye to the brain!

The optic nerve serves as a high-speed telephone line connecting the eye to the brain. When you see an image, your eye "telephones" your brain with a report on what you are seeing so the brain can translate that report into "cat," "apple," or "bicycle," or whatever the case may be.

**Have No Fear, You Have Tears**

For crying out loud, the eye has its own special bathing system — tears! Above the outer corner of each eye are the **lacrimal** (say: LAK-ruh-mul) **glands**, which make tears. Every time you blink your eye, a tiny bit of tear fluid comes out of your upper eyelid. It helps wash away germs, dust, or other particles that don't belong in your eye.

Tears also keep your eye from drying out. Then the fluid drains out of your eye by going into the lacrimal duct (this is also called the tear duct). You can see the opening of your tear duct if you very gently pull down the inside corner of your eye. When you see a tiny little hole, you've found the tear duct.

Your eyes sometimes make more tear fluid than normal to protect themselves. This may have happened to you if you've been poked in the eye, if you've been in a dusty or smoking area, or if you've been near someone who's cutting onions.

And how about the last time you felt sad, scared, or upset? Your eyes got a message from your brain to make you cry, and the lacrimal glands made many, many tears.

Your eyes do some great things for you, so take these steps to protect them:

* Wear protective goggles in classes where debris or chemicals could go flying, such as wood shop, metal shop, science lab, or art.
* Wear eye protection when playing racquetball, hockey, skiing, or other sports that could injure your eyes.
* Wear sunglasses. Too much light can damage your eyes and cause vision problems later in life. For instance, a lens could get cloudy, causing a [cataract](https://kidshealth.org/en/kids/cataracts.html). A cataract prevents light from reaching the retina and makes it difficult to see.

# Your Ears

Sounds are everywhere, and you have two cool parts on your body that let you hear them all: your ears!

### What Are Ears and What Do They Do?

The ear is made up of three different sections that work together to collect sounds and send them to the brain: the outer ear, the middle ear, and the inner ear.

#### The Outer Ear: Collecting Sounds

The outer ear is made up of the pinna — also called the auricle (say: OR-ih-kul) — and the ear canal. The pinna is the part of the ear you see on the side of your head. It's made of tough cartilage covered by skin. Its main job is to gather sounds and funnel them to the ear canal, which is the pathway that leads to the middle ear. Glands in the skin lining the ear canal make [earwax](https://kidshealth.org/en/kids/earwax.html), which protects the canal by cleaning out dirt and helping to prevent infections.

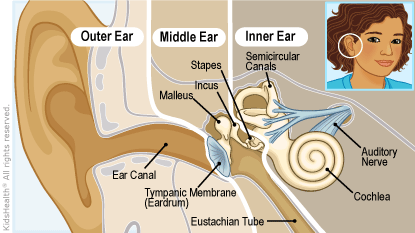
#### The Middle Ear: Good Vibrations

The middle ear is an air-filled cavity that turns sound waves into vibrations and delivers them to the inner ear. The middle ear is separated from the outer ear by the [eardrum](https://kidshealth.org/en/kids/word-eardrum.html), or tympanic (say: tim-PAN-ik) membrane, a thin piece of tissue stretched tight across the ear canal. Sounds hit the eardrum, making it move.

This movement leads to vibrations of three very small bones in the middle ear known as the ossicles (say: AH-sih-kuls). The ossicles are:

* the malleus (say: MAH-lee-us) ("hammer"), which is attached to the eardrum
* the incus (say: IN-kus) ("anvil"), which is attached to the malleus
* the stapes (say: STAY-peez) ("stirrup"), which is attached to the incus and is the smallest bone in the body

To hear properly, the pressure on both sides of your eardrum must be equal. When you go up or down in elevation, the air pressure changes and you may feel a popping sensation as your ears adjust. They adjust thanks to the narrow Eustachian (say: yoo-STAY-she-en) tube that connects the middle ear to the back of the nose and acts as a sort of pressure valve, so the pressure stays balanced on both sides of the eardrum.



#### The Inner Ear: Nerve Signals Start Here

The vibrations from the middle ear change into nerve signals in the inner ear. The inner ear includes the cochlea (say: KOH-klee-uh) and the semicircular canals. The snail-shaped cochlea changes the vibrations from the middle ear into nerve signals. These signals travel to the [brain](https://kidshealth.org/en/kids/brain.html) along the cochlear nerve, also known as the auditory nerve.

The semicircular canals look like three tiny connected tubes. It's their job to help you balance. The canals are filled with fluid and lined with tiny hairs. When your head moves, the fluid in the canals sloshes around, moving the hairs. The hairs send this position information as signals through the vestibular (say: veh-STIB-yuh-ler) nerve to your brain. The brain interprets these signals and sends messages to the muscles that help keep you balanced.

When you spin around and stop, the reason you feel dizzy is because the fluid in your semicircular canals continues to slosh around for awhile, giving your brain the idea that you're still spinning even when you aren't. When the fluid stops moving, the dizziness goes away.

The cochlear nerve, which is attached to the cochlea and sends sound information to the brain, and the vestibular nerve, which carries balance information from the semicircular canals to the brain, together make up the vestibulocochlear (say: vess-tib-yuh-lo-KOH-klee-er) nerve.

### How Can I Keep My Ears Healthy?

Take good care of your ears! Here are some smart steps:

* Don't stick things like cotton swabs and fingernails into them. Doing so can scratch the ear canal, push earwax deeper into the ear, and even [rupture the eardrum](https://kidshealth.org/en/kids/eardrum.html). If earwax bothers you, talk to a parent, who can let your doctor know.
* Protect your hearing. Turn down the volume on video games, TV and, especially, portable music players. Wear hearing protection (like earplugs or protective earmuffs/headphones) if you'll be around loud noises (at a concert, car race, etc.). [Hearing damage](https://kidshealth.org/en/kids/hearing-impairment.html) builds over time. But it doesn't take long for problems to develop.

**Your Brain & Nervous System**

How do you remember the way to your friend's house? Why do your eyes blink without you ever thinking about it? Where do dreams come from? Your brain is in charge of these things and a lot more.

In fact, your brain is the boss of your body. It runs the show and controls just about everything you do, even when you're asleep. Not bad for something that looks like a big, wrinkly, gray sponge.

[More To Do!](https://kidshealth.org/en/kids/center/htbw-main-page.html)[Movie](https://kidshealth.org/en/kids/nsmovie.html)[Activity](https://kidshealth.org/en/kids/bfs-nsactivity.html)[Quiz](https://kidshealth.org/en/kids/nsquiz.html)[Word Find](https://kidshealth.org/en/kids/bfs-nswordsearch.html)

Your brain has many different parts that work together. We're going to talk about these five parts, which are key players on the brain team:

1. cerebrum (say: suh-REE-brum)
2. cerebellum (say: sair-uh-BELL-um)
3. brain stem
4. pituitary (say: puh-TOO-uh-ter-ee) gland
5. hypothalamus (say: hy-po-THAL-uh-mus)

**The Biggest Part: the Cerebrum**

The biggest part of the brain is the cerebrum. The cerebrum makes up 85% of the brain's weight, and it's easy to see why. The cerebrum is the thinking part of the brain and it controls your voluntary muscles — the ones that move when you want them to. So you can't dance — or kick a soccer ball — without your cerebrum.

When you're thinking hard, you're using your cerebrum. You need it to solve math problems, figure out a video game, and draw a picture. Your memory lives in the cerebrum — both short-term memory (what you ate for dinner last night) and long-term memory (the name of that roller-coaster you rode on two summers ago). The cerebrum also helps you reason, like when you figure out that you'd better do your homework now because your mom is taking you to a movie later.

The cerebrum has two halves, with one on either side of the head. Scientists think that the right half helps you think about abstract things like music, colors, and shapes. The left half is said to be more analytical, helping you with math, logic, and speech. Scientists do know for sure that the right half of the cerebrum controls the left side of your body, and the left half controls the right side.

**The Cerebellum's Balancing Act**

Next up is the cerebellum. The cerebellum is at the back of the brain, below the cerebrum. It's a lot smaller than the cerebrum at only 1/8 of its size. But it's a very important part of the brain. It controls balance, movement, and coordination (how your muscles work together).

Because of your cerebellum, you can stand upright, keep your balance, and move around. Think about a surfer riding the waves on his board. What does he need most to stay balanced? The best surfboard? The coolest wetsuit? Nope — he needs his cerebellum!

**Brain Stem Keeps You Breathing — and More**

Another brain part that's small but mighty is the brain stem. The brain stem sits beneath the cerebrum and in front of the cerebellum. It connects the rest of the brain to the spinal cord, which runs down your neck and back. The brain stem is in charge of all the functions your body needs to stay alive, like breathing air, digesting food, and circulating blood.

Part of the brain stem's job is to control your involuntary muscles — the ones that work automatically, without you even thinking about it. There are involuntary muscles in the heart and stomach, and it's the brain stem that tells your heart to pump more blood when you're biking or your stomach to start digesting your lunch. The brain stem also sorts through the millions of messages that the brain and the rest of the body send back and forth. Whew! It's a big job being the brain's secretary!

**Pituitary Gland Controls Growth**

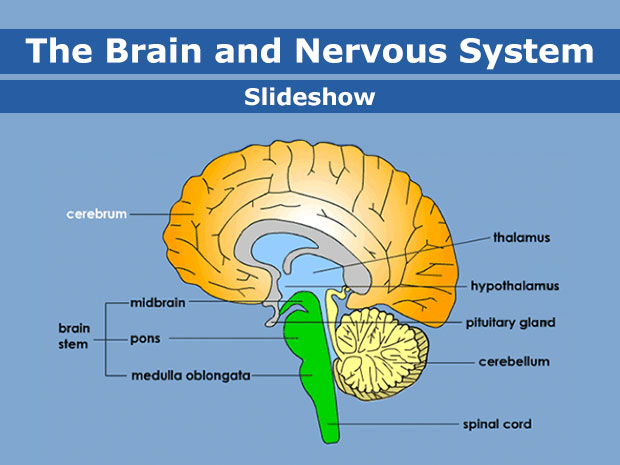
The pituitary gland is very small — only about the size of a pea! Its job is to produce and release hormones into your body. If your clothes from last year are too small, it's because your pituitary gland released special hormones that made you grow.

This little gland also plays a role with lots of other hormones, like ones that control the amount of sugars and water in your body. And it helps keep your metabolism (say: muh-TA-buh-lih-zum) going. Your metabolism is everything that goes on in your body to keep it alive and growing and supplied with energy, like breathing, digesting food, and moving your blood around.

**Hypothalamus Controls Temperature**

The hypothalamus is like your brain's inner thermostat (that little box on the wall that controls the heat in your house). The hypothalamus knows what temperature your body should be (about 98.6°F or 37°C). If your body is too hot, the hypothalamus tells it to sweat. If you're too cold, the hypothalamus gets you shivering. Both shivering and [sweating](https://kidshealth.org/en/kids/sweat.html) are attempts to get your body's temperature back where it needs to be.

**1**/16



The Brain and Nervous System

The brain is like a computer that controls the body's functions, and the nervous system is like a network that relays messages to parts of the body.   
  
Click through this slideshow to learn more about the brain and nervous system.

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**You Have Some Nerve!**

So the brain is boss, but it can't do it alone. It needs some nerves — actually a lot of them. And it needs the spinal cord, which is a long bundle of nerves inside your spinal column, the vertebrae that protect it. It's the spinal cord and nerves — known as the nervous system — that let messages flow back and forth between the brain and body.

If a spiky cactus falls off a shelf headed right for your best friend, your nerves and brain communicate so that you jump up and yell for your friend to get out of the way. If you're really good, maybe you're able to catch the plant before it hits your friend!

But you might wonder about these nerves, which you can't see without a microscope. What are they anyway? The nervous system is made up of millions and millions of neurons (say: NUR-onz), which are microscopic cells. Each neuron has tiny branches coming off it that let it connect to many other neurons.

When you were born, your brain came with all the neurons it will ever have, but many of them were not connected to each other. When you learn things, the messages travel from one neuron to another, over and over. Eventually, the brain starts to create connections (or pathways) between the neurons, so things become easier and you can do them better and better.

Think back to the first time you rode a bike. Your brain had to think about pedaling, staying balanced, steering with the handlebars, watching the road, and maybe even hitting the brakes — all at once. Hard work, right? But eventually, as you got more practice, the neurons sent messages back and forth until a pathway was created in your brain. Now you can ride your bike without thinking about it because the neurons have successfully created a "bike riding" pathway.

**Emotion Location**

With all the other things it does, is it any surprise that the brain runs your emotions? Maybe you got the exact toy you wanted for your birthday and you were really happy. Or your friend is sick and you feel sad. Or your little brother messed up your room, so you're really angry! Where do those feelings come from? Your brain, of course.

Your brain has a little bunch of cells on each side called the amygdala (say: uh-MIG-duh-luh). The word amygdala is Latin for almond, and that's what this area looks like. Scientists believe that the amygdala is responsible for emotion. It's normal to feel all different kinds of emotions, good and bad. Sometimes you might feel a little sad, and other times you might feel scared, or silly, or glad.

**Be Good to Your Brain**

So what can you do for your brain? Plenty.

* Eat healthy foods. They contain potassium and calcium, two minerals that are important for the nervous system.
* Get a lot of playtime (exercise).
* Wear a helmet when you ride your bike or play other sports that require head protection.
* Use your brain by doing challenging activities, such as puzzles, reading, playing music, making art, or anything else that gives your brain a workout!