



LETS TALK ABOUT CORNEAS

DID YOU KNOW?

The eyes are the most active muscles in the body. Seeing is so important that it takes up more than 50% of the brain's total function!

MATERIALS:

1. Colored paper or cardstock.
2. A partner to help with the home activity.
3. Pencil.
4. Paper.
5. Sunglasses.
6. Masking tape.

BACKGROUND INFORMATION:

Tissue is a group of cells that works together to help us do many things. We have tissue both inside and outside our bodies, but one vital tissue that allows us to see is the cornea. The corneas can be donated from a donor and used for transplantation to restore a person's sight.

Below are a few of the external components of the eye:

1. The sclera, or the white part of the eye, is a tough material that helps cover most of the eyeball.
2. The iris, or the colored part of the eye, also has a black opening in the middle called the pupil.
3. When the light is bright, the iris closes the pupil to let less light in.
4. The cornea provides a protective covering over the front of your eye. It is transparent and looks like a contact lens. The cornea allows light to pass through it and into the eye so that we can see.

The cornea can become clouded because of disease or an injury. This can cause a loss of sight called corneal blindness. Some reasons a person could need a cornea transplant could be from a severe scratch or tear in the cornea from an injury, or a person could also develop a disease called keratoconus. In this corneal disease, the cornea becomes rounded or cone-shaped, making it very difficult to see.



LETS TALK ABOUT CORNEAS

It is good practice to get an eye examination every few years or whenever you notice a problem or change in your vision, and it is also important to eat colorful and leafy green vegetables to help strengthen and protect your vision.

ACTIVITY:

1. Take out the colored paper.
2. Have one person stand in front of you and look straight ahead. Then, stand directly behind them with the colored paper in your hand. Tell the person in front that you are going to see how well they can identify colors of paper when it is not directly in front of their eyes.
3. Slowly move one of the colored papers from the backside of the person's head to the front. Keep moving the card forward until they can tell you the color of the paper.
4. Repeat with another color.

Interestingly, we cannot see colors very well when using our side vision. This is because the cones in our eyes allow us to see color, and they are located near the front of the eye.

CHALLENGE:

1. Take out the pair of sunglasses and add tape to the outside lenses to make them blurry. The glasses allow you to simulate or pretend what it would feel like if you needed a cornea transplant.
2. Next, take out the paper and pencil. Without the glasses on, write any sentence of your choice, but it must contain five or more words. (Example: I went to the store).
3. Finally, put the simulation glasses on and rewrite the same sentence. Try to refrain from getting close to the paper.

Was it harder to write with the corneal blindness glasses on? How would your life change if you had corneal blindness?



LETS TALK ABOUT THE HEART

DID YOU KNOW?

Did you know that an adult heart is about the size of a softball, but an infant's heart is only about the size of a golf ball? The heart is just one of our lifesaving organs needed for our bodies to function; can you believe it beats an average of 100,000 times each day?

MATERIALS:

1. An empty paper towel tube.
2. An area to perform exercise activities.
3. A timer or a stopwatch.

BACKGROUND INFORMATION:

The heart is not only an organ; it is also a strong muscle that pumps blood through the body. The heart is located between the lungs but is slightly closer to the left lung than the right lung. The heart is protected by the sternum, which is also known as the breastbone. There are four areas – or chambers – in the heart; the upper chambers are known as the atriums, and the lower chambers are the ventricles.

As you might recall, the main job of the lungs is to take oxygen in from outside the body, which starts the breathing process. The breathing process has two phases: inhalation, or the breathing in of air, and exhalation, when you breathe air out. During inhalation, oxygen enters the lungs and the left side of the heart, and the heart pumps blood and oxygen to the entire body, which keeps us healthy. However, once the body uses the oxygen, carbon dioxide develops, which is harmful if it stays in our body. To get rid of the carbon dioxide, it flows back to the right side of the heart, which pushes it into the lungs and is exhaled. Then, the entire process repeats.

There are certain infections, diseases and even birth defects that can cause the heart to no longer function properly. One primary reason a person could need a heart transplant is because the left ventricle becomes enlarged and weakened, which makes it unable to pump blood correctly. We cannot always determine why the heart stops functioning properly, but one thing we can do to help protect it is to exercise, not smoke and try to eat fewer unhealthy fats.

Many people love food with unhealthy fats, such as pizza, cheeseburgers, desserts and donuts. It is perfectly fine to eat these foods in moderation because our bodies need certain types of fat to give us energy and to help our brains function. However, it is also highly important to exercise and eat a variety of foods that are lower in fat, such as fruits and vegetables, to keep the heart healthy.



LETS TALK ABOUT THE HEART

ACTIVITY:

1. Find an empty paper towel tube to create a stethoscope and go to a quiet space with another person.
2. Place one end of the tube to your heart and instruct another person to place his or her ear on the other end.
3. Ask them what they hear. Do they hear a thumping sound?
4. Switch roles and see if you can hear the thumping sound of a heartbeat.
5. Try doing 10 jumping jacks, then listen again. Did the heartbeat speed up?

CHALLENGE:

1. Place your palm up, then put two fingers on your wrist. While slightly pushing down, count the number of times you feel a light thumping — your pulse — for 30 seconds. The light thumping is your heart pushing blood through the body.
2. Next, do a light activity, such as walking back and forth, for a few minutes. Check your pulse again for 30 seconds. Did the number of times you felt a light thumping increase from the first time?
3. Finally, do a more strenuous activity, such as running or jumping rope, for a few minutes.
4. Check your pulse again for 30 seconds. Did the number increase even more?

When you exercise, your body needs more blood and oxygen, so the heart will speed up and pump more. Exercise is important for all muscles, including the heart. It allows for better blood flow in the small blood vessels around your heart.



LETS TALK ABOUT THE KIDNEYS

DID YOU KNOW?

The kidneys are lifesaving organs needed for our bodies to function. A living donor can donate one kidney to someone else in need and still lead a normal life. One example of a living kidney donor is actress Francia Raisa, who is singer and actress Selena Gomez's best friend. Selena received a kidney from Francia in 2017.

MATERIALS:

1. A variety of foods that have a nutrition label (frozen pizza, sauces, canned foods, breads, boxed foods, fruits, etc.).
2. Pencil or pen.
3. Calculator or paper.

BACKGROUND INFORMATION:

Each kidney is about the size of your fist and shaped like a bean. Most people are born with two kidneys; however, some are born with only one. Your kidneys are located by your lower back, which is different from where many other organs are (near the stomach). Kidneys help remove toxins and excess water from the blood.

There are certain genetic diseases and even birth defects that can cause the kidneys to no longer function properly. We cannot always determine why the kidneys stop functioning, but one thing we can do to help protect them is to exercise and eat less sodium (salt). Too much sodium in a person's diet can cause high blood pressure. High blood pressure is bad for your kidneys. Our bodies typically only need around half a teaspoon or 1,000 milligrams of sodium per day, but the average American eats about two-and-a-half teaspoons or 6,000 milligrams per day!



LETS TALK ABOUT THE KIDNEYS

ACTIVITY:

1. Gather 5-7 different food items that have a nutrition label.
2. Without looking at the nutrition label, try to put the foods in order from the smallest to the largest amount of sodium (by serving size).
3. Check the nutrition labels to see if you're correct.

CHALLENGE:

Gather several of the foods you typically eat in a day. Using a pen and paper or a calculator, add up the total amount of sodium by looking at each of the nutrition labels. Were you over 2,000 mg? If so, write down a few things you could do to reduce your sodium intake.

The maximum amount of sodium we should eat per day is around one teaspoon or 2,000 milligrams.



LETS TALK ABOUT THE LIVER

DID YOU KNOW?

Did you know that the liver is the largest organ inside your body? A living donor can donate a part of their liver to someone in need, and the liver will regenerate — or grow back — just like a lizard's tail!

MATERIALS:

1. A scale to weigh objects of up to four pounds.
2. 1-2 coffee filters or paper towels.
3. A rubber band.
4. A small, clear container that a coffee filter can cover.
5. A large cup or pitcher of water.
6. Cooking oil spray.
7. A variety of seasonings, such as parsley or oregano, plus other small objects like candy or buttons.

BACKGROUND INFORMATION:

The liver is the largest organ inside the body and weighs about four pounds. The liver is located beneath the heart and has two parts – the right lobe and the left lobe.

The liver has about 500 different functions, so we will only discuss some of its main jobs. First, it is like a giant warehouse because it stores and releases iron, vitamins, minerals and sugar for use when you need it later. It also is like a factory because it makes bile to help digest food, protein and blood-clotting factors. Additionally, the liver is like a cleaning service because it filters out bad things that a person might put into their bodies, like alcohol and drugs. It also filters out poisons like exhaust, smoke and chemicals that can enter the body accidentally through the air we breathe.

The liver is also a security service that helps protect your body by attacking germs, but there are still certain infections, diseases and even birth defects that can cause the liver to no longer function properly. One primary reason a person could need a liver transplant is due to cirrhosis. This is the scarring of the liver because many of the healthy cells on the liver have died; it could be due to drinking alcohol excessively, but can also be caused by other factors.



LETS TALK ABOUT THE LIVER

We cannot always determine why the liver stops functioning properly, but some things we can do to help keep the liver healthy are:

1. Exercise and maintain a healthy weight.
2. Eat a variety of healthy foods and avoid foods with lots of unhealthy fats.
3. Don't drink alcohol.
4. Don't use illegal/street drugs.
5. Be careful with all medicines — follow the directions and check with your doctor or pharmacist.
6. Be cautious of poisons you might breathe in or that might get on your skin, such as aerosol sprays, bug killers, paints, etc.

ACTIVITY:

1. How heavy is an average liver? Take a scavenger hunt around the room and see if you can identify items that weigh around four pounds.
2. Once you have a few items, take them to the scale and weigh them.
3. Did any of the items weigh close to four pounds? These would be the approximate weight of an adult liver.

CHALLENGE:

1. Fasten a clean coffee filter over a clear container and secure with a rubber band. The coffee filter represents the filtering work done by the liver.
2. Fill a cup or pitcher with water and begin slowly pouring a little water through the filter.
3. Do you see how easily it is filtered and passes through? This is what happens when you have a healthy liver.
4. Now, replace the filter and spray lots of cooking oil on top; this represents aerosol sprays. Next, pour some dried seasoning flakes (to represent tobacco/smoke) on the filter, and you can also add some candy pieces or buttons (to represent other toxins) onto the filter.
5. Lastly, slowly repour water on the filter. How well does the coffee filter – which represents the liver – work now?



LETS TALK ABOUT LUNGS

DID YOU KNOW?

The lungs are just one of the lifesaving organs needed for our bodies to function. Most people are born with two lungs, but a person can live a relatively normal life with only one lung. A living donor can even donate part of his or her own lung to help someone in need.

MATERIALS:

1. A clean stirring straw or other type of straw.
2. A timer or a person to time you

BACKGROUND INFORMATION:

The lungs are located in the upper chest and have a surface area about the size of one side of a tennis court. They are pink and squishy, like a sponge. The right lung has three lobes, and the left is a bit smaller with two lobes, leaving room for the heart. We inhale oxygen through our mouth and nose, and then it goes down the trachea where alveoli sacs of air fill the lungs to help us breathe. We then exhale carbon dioxide.

Genetic diseases, such as cystic fibrosis, as well as birth defects can cause the lungs to function poorly. Rarely do doctors suggest a lung transplant for patients with severe asthma, but there have been some cases.

We cannot always determine why the lungs stop functioning, but one thing we can do to help protect them is to exercise and not smoke cigarettes. The chemicals in cigarette smoke damage the cells of the lungs, making it harder to breathe. Smoking can also cause cancer.



LETS TALK ABOUT LUNGS

ACTIVITY:

1. Use a timer or have another person time you.
2. Locate a small stirring straw or other type of straw. If using a larger straw, vertically fold it to make the openings on each end smaller.
3. Place one end of the straw in your mouth and practice using your lungs by sucking air in through the straw and blowing it back out. Do this while carefully walking back and forth for 30 seconds
4. Stop and see how you feel; you should feel okay.
5. Now repeat the activity, but this time while breathing in and out through the straw, pinch your nose and carefully walk back and forth for 30 seconds. If you feel light-headed, let go of your nose.
6. Stop and answer these questions:
 - When you held your nose, was it easier, or more difficult, to walk?
 - How does it feel when your lungs are not working well?
 - What would it be like to have problems breathing all the time?

CHALLENGE:

On average, adolescents breathe around 12-16 times per minute when resting. Use a timer and check how many times you breathe when resting. Next, complete a 30-60 second exercise activity and see how many times you breathe per minute.

Lastly, complete the above straw activity again, then count your breaths per minute. Did your number of breaths increase? How did this activity make you feel about those waiting on a lifesaving lung transplant?



LET'S TALK ABOUT THE PANCREAS AND SMALL INTESTINE

DID YOU KNOW?

Today, we will learn about two new lifesaving organs that are connected inside of our bodies; they are the pancreas and the small intestine. If we were to unravel the small intestine, it is approximately 20 feet long.

MATERIALS:

1. A variety of beverages or drink boxes, other than water, that have a nutrition label (soft drinks, orange juice, fruit punch, tea, etc.).
2. A long item such as a jump rope or a few shoelaces.
3. Measuring tape (if you do not have measuring tape, you can use a ruler, but you will need help marking your measurements)

BACKGROUND INFORMATION:

The pancreas is shaped like a flat pear and is similar to the size of a sweet potato. It is about six inches long and is located behind the stomach and liver. As stated above, the pancreas connects to the first section of the small intestine.

The pancreas has two main jobs:

1. To make essential or special proteins called enzymes that help you digest food.
2. To make insulin or sugar for your body.

The enzymes made by the pancreas are sent to the small intestine; they help break down the food you eat into proteins, carbohydrates and fats to be absorbed by the body. This process is what gives you energy. The insulin helps raise and lower your blood sugar levels. It's like a key that unlocks the body's cells so that sugar can get into the cells and be changed into energy.



LET'S TALK ABOUT THE PANCREAS AND SMALL INTESTINE

There are certain genetic diseases and even birth defects that can cause both of these organs to no longer function properly. One of the most common reasons someone might need a pancreas transplant is diabetes, which can be caused when the pancreas makes too much or too little insulin. Also, sometimes, a person can be born with intestines that are entangled.

We cannot always determine why these organs stop functioning properly, but one thing we can do to help protect them is drink a lot of water and eat a healthy diet so the pancreas doesn't have to work as hard to help digest food.

ACTIVITY:

1. Find an item in your house that is several feet long, such as a shoelace or jump rope.
2. First, measure out five feet. This is the length of your large intestine.
3. Now, measure the entire length of the object. Is it around 20 feet? If not, add on to it, making it 20 feet. This is how long your small intestine is — and it's all inside of you!

CHALLENGE:

Gather several different beverages or drink boxes from your house without looking at the nutrition label. Try to arrange the drinks in order from the least amount of sugar to the most. Lastly, turn each beverage around to look at the sugar content on the food label. Were you correct?

It's important to drink a lot of water and fewer sugary beverages to keep your insulin levels steady and to keep your pancreas from working too hard.



LETS TALK ABOUT TISSUE

DID YOU KNOW?

The skin is our largest organ, totaling 10 pounds. However, it is also considered a tissue because skin grafts can be recovered and used as transplants. For example, a skin graft can help save the life of a burn victim. One donor can save and heal up to 83 lives – eight lives through organ donation and 75 through tissue donation!

MATERIALS:

1. Rubber bands.
2. A device with internet access.

BACKGROUND INFORMATION:

Tissue is made up of groups of cells that work together to help us to do many things like run, jump and dance. We have tissue throughout our bodies, both internally and externally. Some tissue can be donated and used for transplantation including bone grafts, skin grafts, tendons, ligaments, veins and heart valves.

Tissue helps our bodies in many ways. Here are just a few:

1. Skin is a protective covering that helps keep dirt and germs out of our bodies.
2. Veins are hollow tubes that carry blood through the body and back to the heart.
3. Bones make up the skeleton and support and protect our bodies.
4. Tendons connect muscles to bones, and ligaments connect bone to bone. They give us the ability to move and hold everything together.
5. Heart valves open and close to allow blood to flow correctly through our hearts.

There are certain infections, accidents, diseases and birth defects that can cause tissue to need to be replaced. Some reasons a person could need a tissue transplant could be a tendon repair from a sports injury, veins for bypass surgery, heart valve replacements for pediatric patients, and bone grafts to help cancer patients or to replace badly broken bones.



LETS TALK ABOUT TISSUE

ACTIVITY:

1. Stand up and bend one knee up and down. Then, straighten and curl your arms. Can you feel the tendons and ligaments helping to move your knee and arms?
2. Next, find a rubber band and gently pull it back. Tendons and ligaments are stretchy like rubber bands. What would happen if you stretched the rubber band (tendon) too far?
3. Do you know the names of tendons and ligaments in your body? Use a device with internet access to look up “ligaments or tendons” in a search engine.

CHALLENGE:

1. There are 206 bones in the adult human body. Either alone or with another person, stand up and try to point to as many bones as you can.
2. Next, see if you can name any bones, such as the femur, one of the longest bones located within the thigh.
3. Do you know the names of other bones throughout your body? Search the internet for diagrams or videos to learn more.