

Science

Grades 2-5

Printables

Activities

Circulatory System

By Heart2HeartTeaching.com



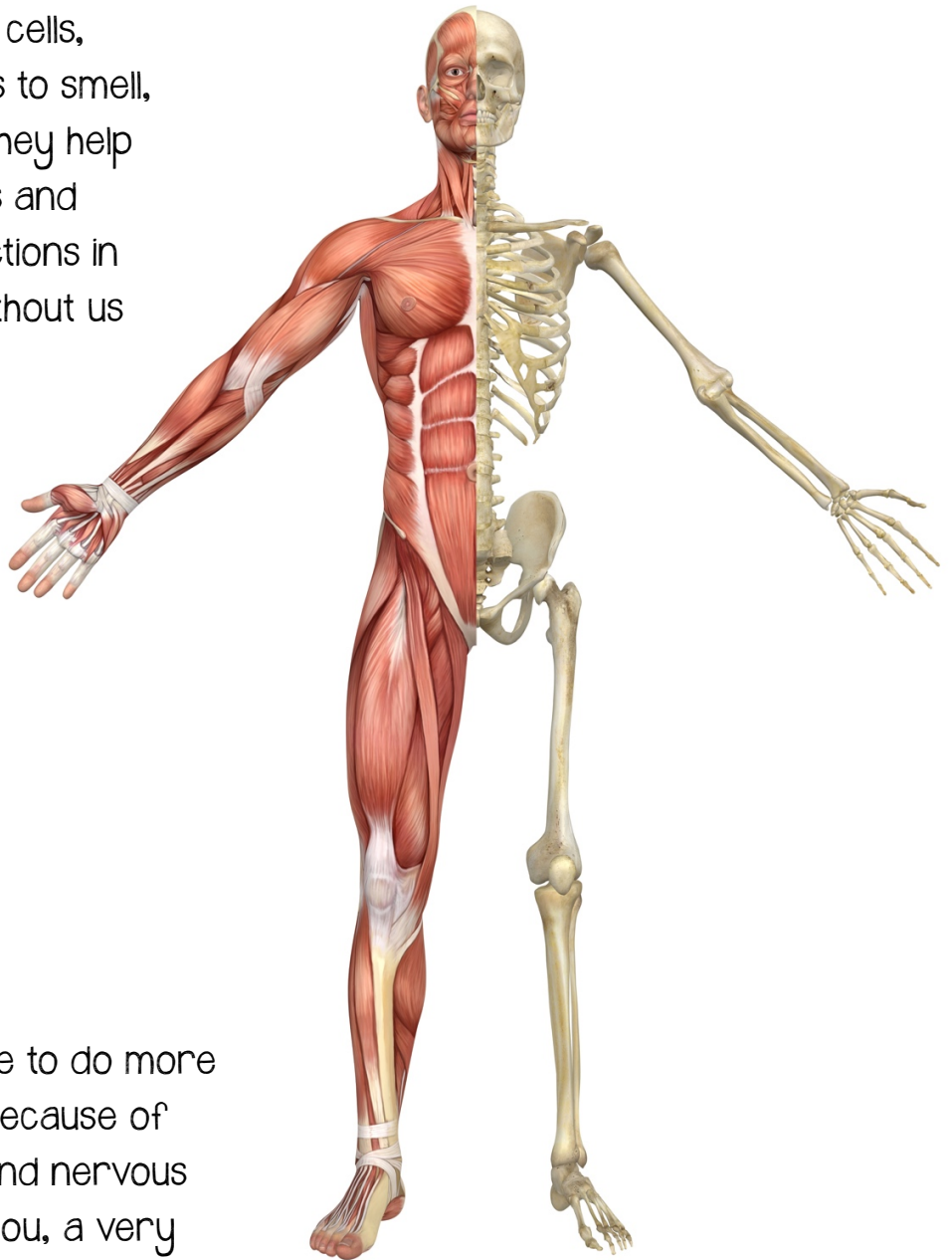
Our Amazing Bodies

The human body works in amazing ways. Everything you do, feel, learn, and remember throughout your life is made possible because of the incredible machine that is your body. Our bodies are made up of trillions of cells. These cells all work together in a giant network deep inside our bodies. They send messages back and forth throughout our body. They give us the ability to crawl, run, and kick a ball. They allow you to learn to read a book and write your name. They cause you to feel happy, lonely, and excited.

Because of these clusters of cells, you can use your five senses to smell, taste, touch, see, and hear. They help you remember funny stories and special memories. Many functions in our bodies are controlled without us even thinking about them.

Did you know that your heart is constantly beating all the time, day and night, totaling about 5,000 beats an hour? Take a guess at how many breaths you take everyday? The average person takes about 23,000 breaths a day. Our bodies are always working to keep us alive and healthy.

Humans are smarter and able to do more than any other living animal because of their highly developed brain and nervous system. That is what makes you, a very special you!



Name: _____

The Circulatory System

Your circulatory system is made up of many parts that work together to move your blood to every part of your body, from your head to your tippy toes. The word circulates means to move around. When you move or rotate to a new table during centers, you are circulating around the classroom. Deep inside your body, your blood is circulating all around your body. Your blood vessels located under the skin move the blood to and from your heart. Your heart pumps and keeps the blood flowing constantly.

Your heart beats about 60 to 80 times a minute. The heart is a powerful muscle that beats non-stop to move blood around your body. It is made of a special type of involuntary muscle that is called cardiac muscle. Involuntary muscle works without you thinking about it. It keeps your heart beating every minute of every day. Your heart has four chambers. The top two chambers are called the right and left atriums. The bottom two chambers are called the left and right ventricles.

Between each chamber are valves that open and close to let the blood in and out. A valve is like a gate when one closes it makes a loud sound. That loud sound is the sound of your heart beating. Valves stop the blood from going back the way it came and keep it moving forward.



What is the main job of your heart?

What is an involuntary muscle? Give an example of one.

Name: _____

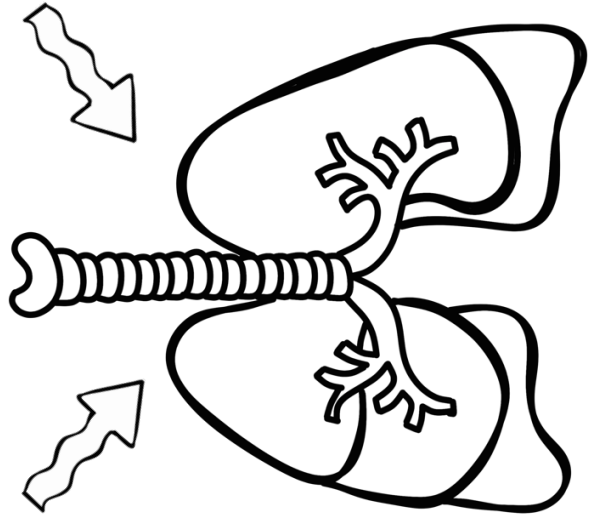
Name: _____

Tell why your lungs are an important part of the circulatory system.

Circulatory System

Explain what blood vessels do?

Color the lungs below.



How many times a minute does your heart beat?

How many chambers does your heart have in all?

Explain how valves inside the heart work:

Blood is the Fluid that Supports Life

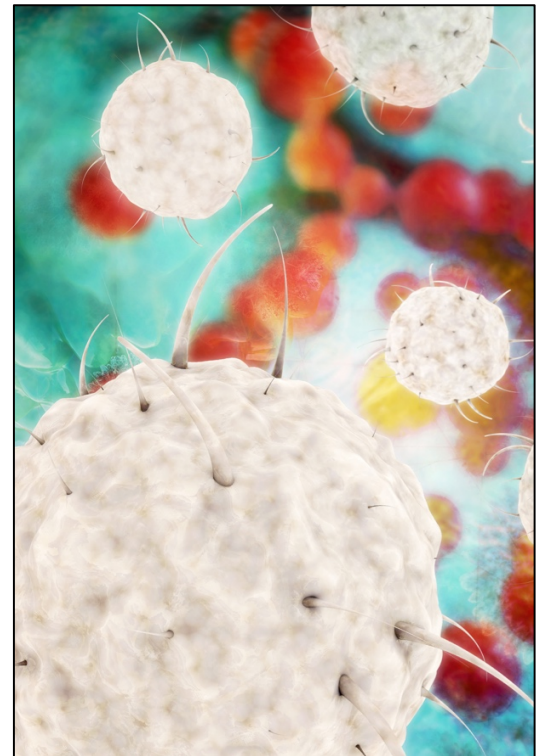
Did you know that blood cells are so tiny that one drop of blood holds millions of blood cells? Your body needs oxygen and nutrients to make them work. Where do they get these? From your blood! Oxygen is an invisible gas that your body needs to survive. Food is broken down by your digestive system to give your body energy. Your body then uses oxygen to get energy from the food you've eaten. Nutrients in your food such as glucose give you the energy to run, jump, read, and think. Glucose is a simple sugar that comes from the food you eat.

Your blood is a liquid that carries oxygen and nutrients around your body. Blood takes away waste products that your body does not need. Your blood is made up of many different types of cells carried in a liquid called plasma. Cells are tiny living parts that work together that make up your body. Blood is made up of plasma and blood cells. About one half of your blood is plasma. Plasma is made up of proteins and nutrients, but it's mostly water. There are three main types of blood cells. Each one has a very important job to do.

1. **Red blood cells** carry oxygen to all the parts of your body. These cells pick up oxygen in your lungs. Red blood cells contain a special protein called hemoglobin. Hemoglobin holds onto the oxygen.

2. **White blood cells** protect you from germs and illnesses. In other words, white blood cells keep you healthy. When you do get sick, your body makes more white blood cells. These cells look for the cells that make you sick so they.

3. **Platelets** are a unique kind of cell that cause your blood to clot. If you have a cut, platelets jump into action to surround the cut. They join into a thick layer to cover the cut and clot the blood. That is where you get a scab.



Name the three main types of blood cells:

1. _____

2. _____

3. _____

Name: _____

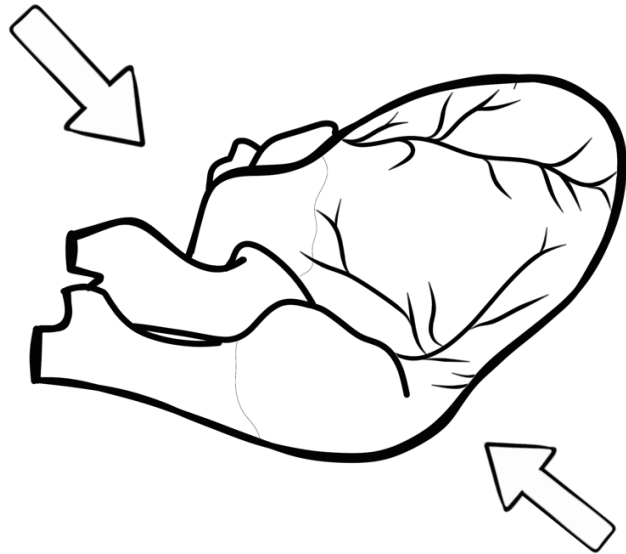
Name: _____

Explain the main job of each of the 3 main types of blood cells below:

Blood Cells

What is the main job of your blood vessels?

Color the heart below.



What is plasma?

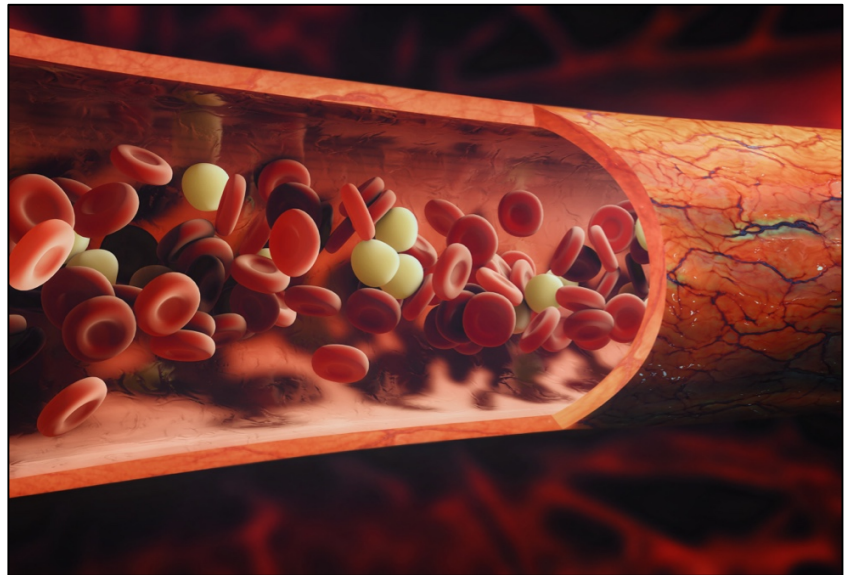
Why is oxygen important for our survival?

Our Bones are Alive!

Can you imagine what life would be like, if you had no skeleton? You wouldn't be able to move, stand, or play. In fact, you would probably just collapse and only be able to wiggle like a giant blob. Just like a house needs a framework to support it, so do our bodies. Instead of the wood and concrete that holds up our houses, it is our skeleton that supports and protects our bodies. Not only does your skeleton hold you up and give you shape, but it does so much more. It also serves as armor to protect delicate internal organs inside of you. For example, your rib cage is made up of 12 pairs of ribs that protect your heart and lungs underneath it. Think about your brain. What surrounds and protects it every day? That's right, your skull, which is made up of hard bones that fit around your brain like a helmet.

Bones are alive! They contain bone marrow. Bone marrow makes our blood cells. Red blood cells carry oxygen all over your body and fight off germs to keep you healthy. Bones can also store calcium and other minerals for times when you need it most.

Your bones are always changing. When you are first born you have about 270 bones in your body. As you grow and develop, some bones fuse, or join together. By the time you become an adult, you will have a total of 206 bones in your body.



Explain why bone marrow is so important.

Name: _____

Pumping it Out!

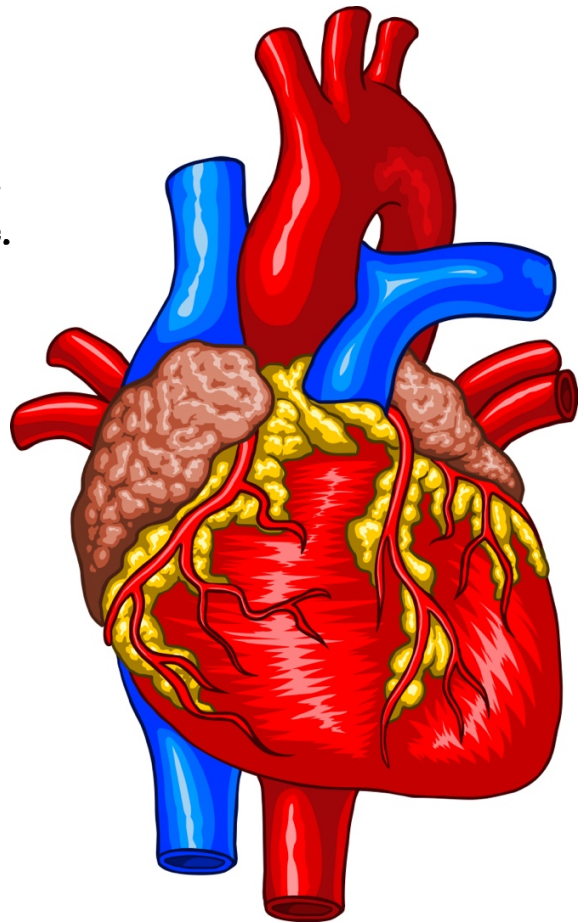
Your heart sits in the middle of your chest in between your lungs. Your heart has hollow tubes called blood vessels that carry the blood in and out of the heart. Your heart pumps blood out to the lungs to collect oxygen. Lungs fill the blood with oxygen and then send it back to the heart. Next, the blood is pumped into your arteries.

Arteries are blood vessels with thick walls. Arteries carry the oxygenated blood away from the heart to all parts of the body. As the blood travels away from the heart, the arteries get smaller and smaller. You can feel an artery in action by gently pushing on the pulse in your wrist. The beating you feel is blood being pushed through an artery.

Tiny blood vessels called capillaries join arteries and veins. Capillaries carry the blood from your arteries. Capillaries have thin walls to allow oxygen and nutrients to pass into other cells in your body. Your cells use the oxygen and nutrients to produce energy for you.

After cells use the oxygen, there is a waste gas called carbon dioxide left over. Carbon dioxide is passed back into the blood through the capillaries. Your body needs to get rid of the carbon dioxide. Your veins carry the blood with carbon dioxide gas back to your heart. As the blood travels closer to your heart, the veins get bigger and wider. Your heart sends the blood with the carbon dioxide to your lungs.

When you breathe out, the carbon dioxide is exhaled into the air. As you breathe in, oxygen from the air moves into your blood. Then the blood is pumped back to the heart and around your body again. Each blood cell completes its journey around the body in about 30 seconds. Then the process repeats over and over.



Name: _____

Pumping it Out!

Name: _____

Directions: put the following steps in the correct order.

After cells use the oxygen, there is a waste gas called carbon dioxide left over. Your body must get rid of this waste product.

Your veins carry the blood with carbon dioxide back to your heart. Your heart sends the blood to your lungs. When you breathe out, the carbon dioxide is exhaled in the air.

You cells use the oxygen and nutrients to produce energy for your body. You need energy for everything you do such as running, jumping, and thinking.

Your heart pumps blood out to the lungs to collect oxygen. Lungs fill the blood with oxygen and then send it back to the heart.

Arteries carry the oxygenated blood away from the heart to all parts of the body.

Capillaries carry the blood from your arteries. Capillaries have thin walls to allow oxygen and nutrients to pass into other cells in your body.

Name: _____

Tell 2 facts about the circulatory system below.

Pumping it out!

How are arteries and vein different?



What are capillaries?

What is a waste product?
Give an example of one.

What is Blood Pressure?

Have you ever had your blood pressure taken when you've gone to the doctor's office? The nurse places a cloth wrap around your upper arm that gets tighter and tighter for a few minutes. This is the process of taking your blood pressure. You have probably wondered, what they were doing?

Blood pressure is a measure of how easy or hard it is for your heart to pump the blood through your body. When the heart beats, the blood that is pumped puts pressure against the walls of the blood vessels. When your heart and blood vessels are healthy, they expand and contract easily. Sometimes, blood vessels become thinner or less flexible. This makes the heart work harder to push the blood through the blood vessels and in turn causes high blood pressure.

High blood pressure can damage your heart or brain. People with high blood pressure are more likely to have a heart attack or stroke than people with normal blood pressure. You can make healthy choices to help control your blood pressure. Eating a healthy diet and exercising can help keep your blood pressure normal.



Why can having high blood pressure be dangerous?

Name: _____

What Type are You?

Did you know that there are several different blood types? The list includes A, B, AB, and O. Some people have a special protein in their blood causing them to have a positive blood type. Others have blood without this protein, so their blood type is negative. What type of blood you have is set before you are born.

It is important to know your blood type just in case you ever need to have a blood transfusion. A blood transfusion is when blood from someone else is given to you through one of your blood vessels. Blood transfusions are often done to replace blood lost during surgery or due to a serious injury. Sometimes a blood transfusion may be done if your body cannot make blood correctly because of an illness. Remember to ask your parents what blood type you have.

Have you ever fallen and gotten a bruise on your knee? Chances are you have. A bruise is a pool of blood under your skin. When you fall or bang your knee, it breaks the blood vessels under your skin. This causes the dark color of a bruise to form. Slowly over time, the bruise get lighter and lighter until it heals. All because blood cells jumped into action to heal the bruise.

Why is it important to know what blood type you have?



Name: _____

Name: _____

Circulatory System

	True	False
<p>Directions: read the statements below. If it is true, put an X under True. If it is false, rewrite it to make it correct.</p>		
<p>After cells use the oxygen, there is a waste gas called carbon dioxide left over.</p>		
<p>Blood dissolves waste products that your body does not need.</p>		
<p>Your blood is a liquid that carries oxygen and nutrients around your body.</p>		
<p>Your heart is made of a special type of involuntary muscle that is called skeletal muscle.</p>		
<p>Blood pressure is a measure of how easy or hard it is for your heart to pump the blood through your body.</p>		
<p>Arteries carry the oxygenated blood toward the heart to all parts of the body.</p>		
<p>High blood pressure can damage your heart or brain.</p>		

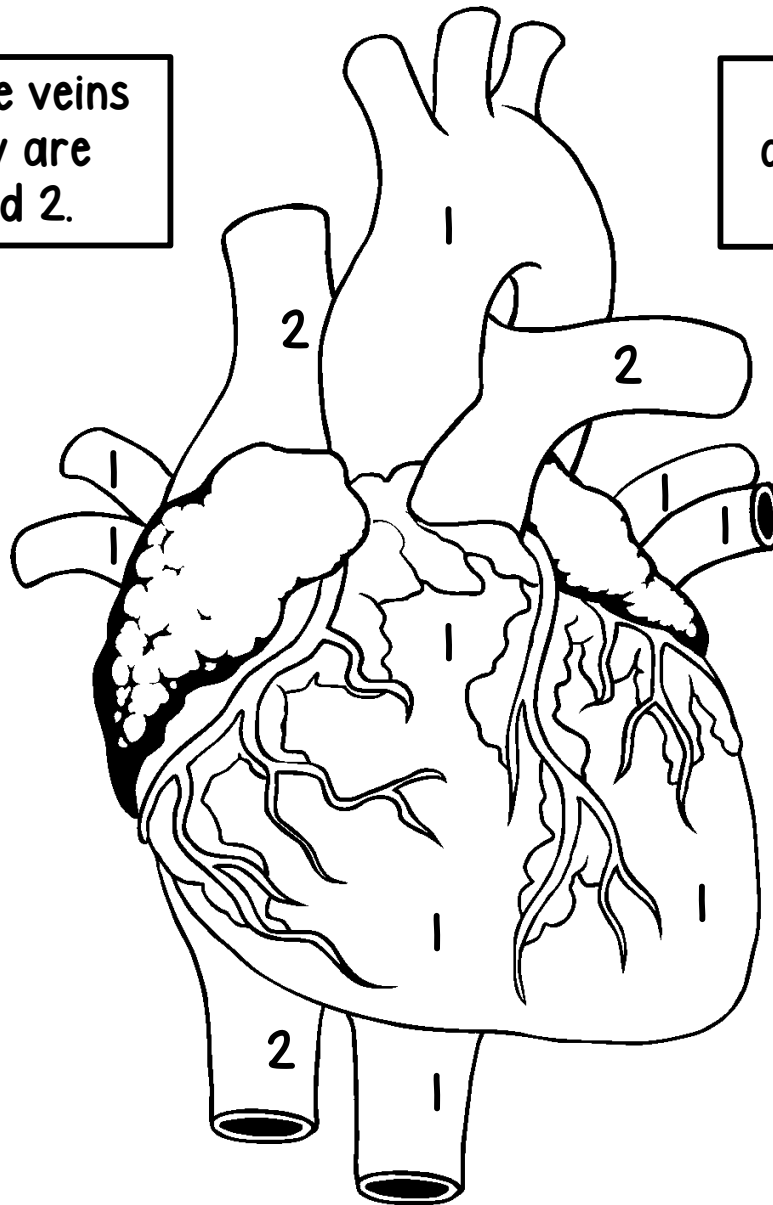
The Heart

Name: _____

Your heart has hollow tubes called blood vessels that carry the blood in and out of the heart and all over the body. There are two main types of blood vessels: arteries and veins. Arteries carry the blood away from the heart to all parts of the body. Your veins carry the blood back to your heart.

Color all the veins blue. They are numbered 2.

Color all the arteries red. They are numbered 1.



Why do you think the veins are always shown as blue?

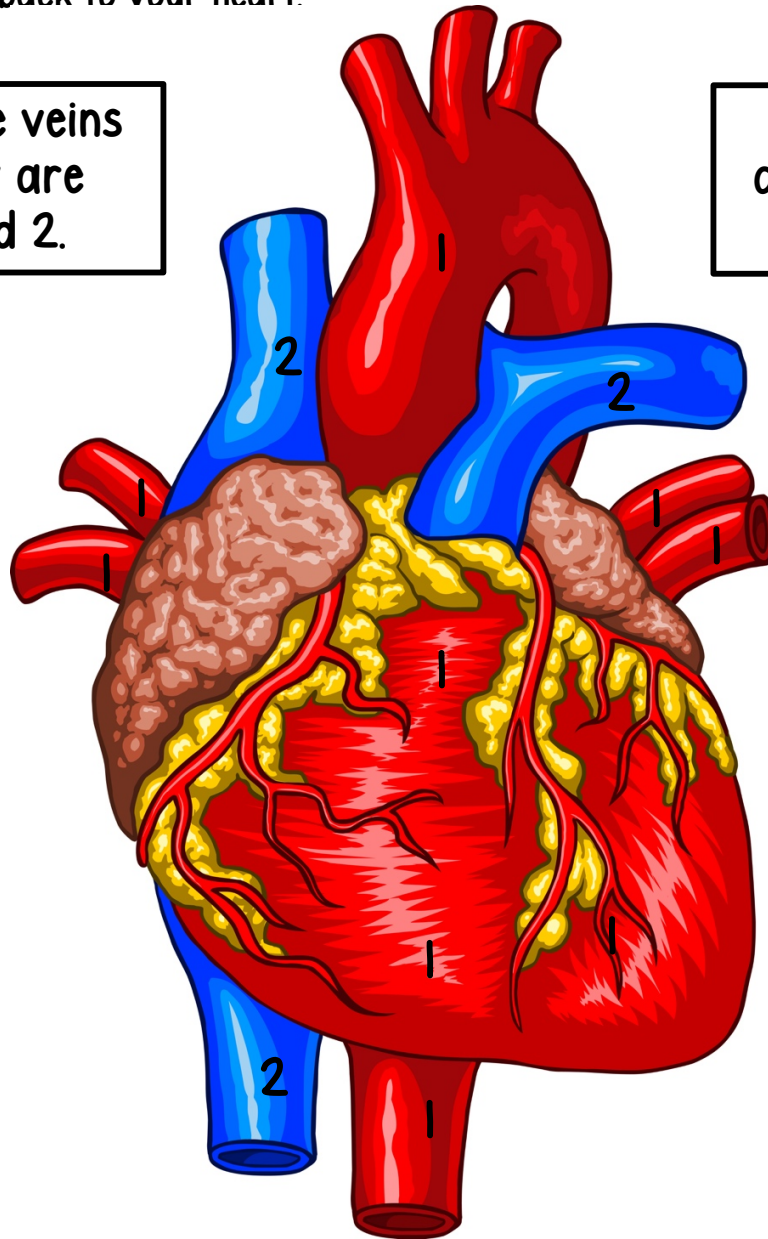
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Color all the arteries red. They are numbered 1.



Why do you think the veins are always shown as blue?

Name: _____ Circulatory System

Directions: Read the articles about the circulatory system. Answer the questions below in complete sentences.

1. What is our blood made of?

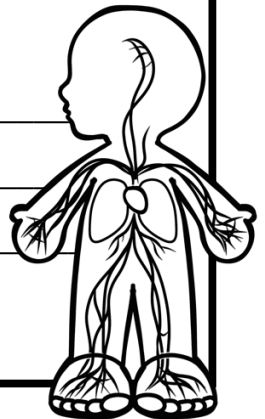
2. Our heart has many functions. Give an example of one.

3. How does our body get rid of carbon dioxide?

4. The lungs help the circulatory system work correctly. How?

5. Explain how platelets help protect you?

6. What is glucose? Why does our body need glucose?



Name: _____ Circulatory System Cloze

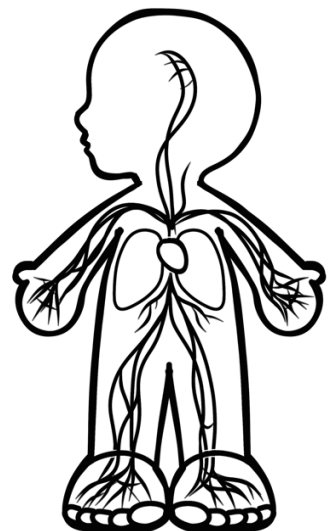
Your circulatory system is made up of many parts that work together to move your _____ to every part of your _____.

The word circulates means to _____ around. Deep inside your body, your blood is _____ all around your body. Your blood vessels move the blood to and from your _____. Your heart beats about _____ to 80 times a _____.

The heart is a powerful _____ that beats non-stop to move blood around your body. It is made of a special type of _____ muscle that is called cardiac muscle. Involuntary muscle works _____ you thinking about it. It keeps your heart _____ every minute of every day. Your heart pumps blood out to the lungs to collect _____. Then your _____ fill the blood with oxygen and then send it back to the heart. Next, the blood is pumped into your blood _____. Arteries carry the blood _____ from the heart to all parts of the body. Your veins carry the blood _____ to your heart.

Word Bank:

move	beating	body	back
without	involuntary	60	vessels
circulating	minute	lungs	muscle
oxygen	heart	away	blood



Meet Willem Kolff

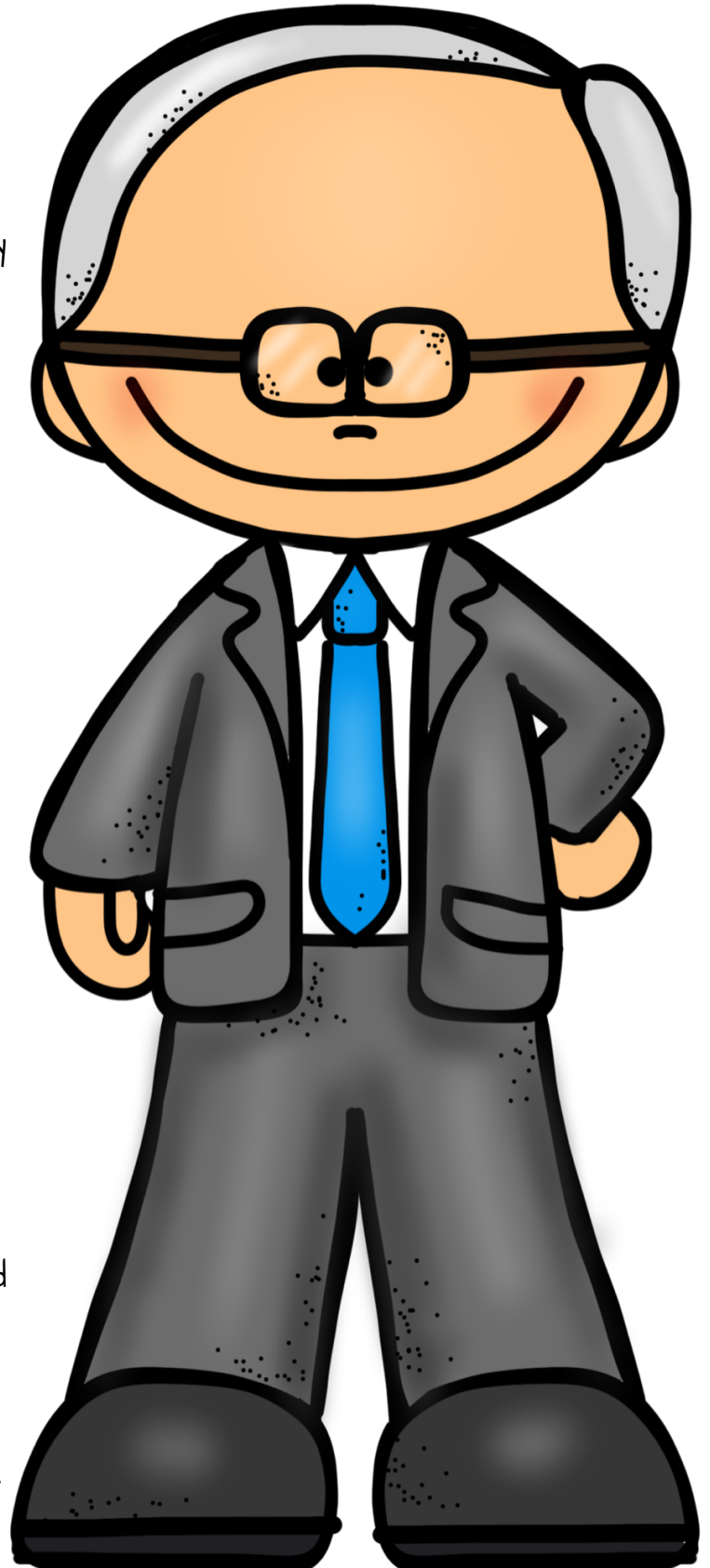
Willem Kolff was born on February 14, 1911, in the Netherlands. At a young age, Willem decided to become a doctor just like his father.

Dr. Kolff wanted to create a machine that would work like our kidneys to remove toxins (poisons) from the blood. In 1943 Dr. Kolff developed the first artificial kidney. Artificial is something made by people rather than occurring naturally. Working with wooden drums, plastic tubing, and laundry tubs, Kolff built a machine that drew in the patient's blood, cleaned it, and pumped it back into the patient. The first 15 patients who used it only lived a few days afterward, but Dr. Kolff didn't give up! His goal was to help people with kidney diseases live longer.

Next, he started working on an artificial heart. In 1957, he implanted an artificial heart into a dog, but it only survived for 90 minutes. Dr. Kolff knew he was on the right track!

A few years later, with the help of a team of doctors, Dr. Kolff developed the first artificial working heart. It was placed in a calf, which survived for 268 days with its new heart. Since the procedure was such a success, Dr. Kolff was ready to use the artificial heart in a human. On December 2, 1982, a team of surgeons implanted the first artificial heart into a 61-year-old man. The artificial heart worked perfectly! Dr. Kolff and his team became famous after this life-changing surgery.

Today, he is remembered for creating the first artificial heart and kidney. Thanks to his hard work and dedication, Dr. Kolff's medical machines have saved hundreds of people around the world.



Meet Willem Kolff

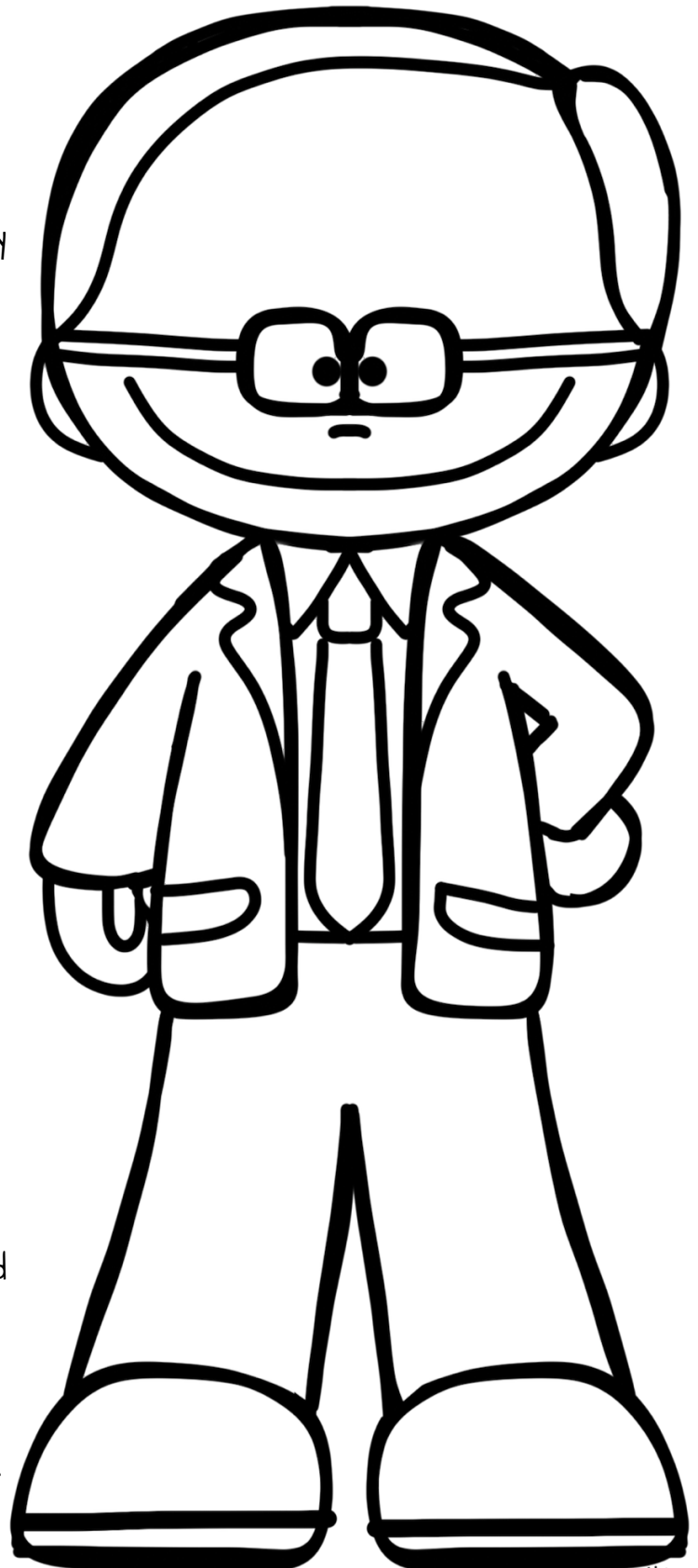
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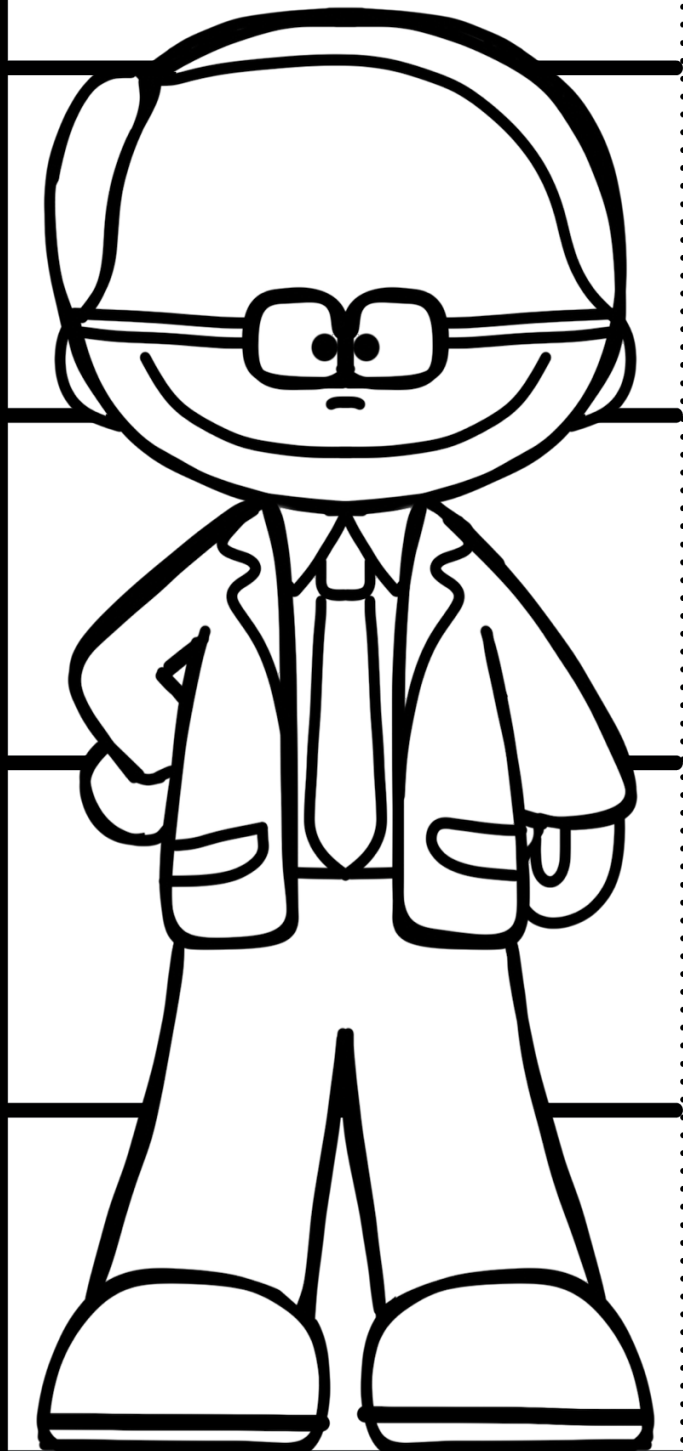
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Dr. Kolff



Write 3 facts about Dr. Kolff
in the boxes below.

Was quoted saying:

Three words that describe him:



Dr. Willem Kolff

One obstacle he overcame to achieve success was:

What I admire most about him is:

Birthdate:

Birthplace:

What is he famous for?



Three facts I learned about him:

1.

2.

3.

Explain how he made the world a better place:

One thing I would ask him is:

Name:

Page 2

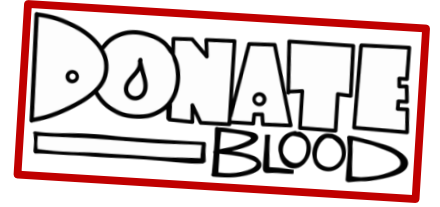
Meet Charles Drew

Charles Drew was born in 1904 in Washington D.C. When Charles was young, his sister became sick and died from tuberculosis. Tuberculosis (TB) is a disease caused by bacteria. The bacteria attack the lungs and can damage other parts of the body. During that time, there was not any known treatment for this disease. Watching his sister's illness developed led him to dream of becoming a doctor.

At this time, blacks and whites went to separate schools and colleges. Charles Drew was an African-American, so he knew he had little chance of going to college to become a doctor. Charles didn't let that stop him! He worked hard at school and was a star athlete. Luckily, he was given the opportunity to go to medical school in Canada. It was here that he became very interested in studying blood. Doctors knew that when someone lost a lot of blood, he could be given new blood with a blood transfusion. The only problem was it wasn't easy to get a blood transfusion because there was no way to keep the blood fresh.

Charles discovered that if he removed the solid cells in blood and kept only the liquid part, or plasma, blood could keep for a longer time. After this important discovery, Charles set up the first blood bank in New York City. During World War II, many soldiers were wounded and needed blood transfusions. Charles knew that sending plasma instead of whole blood could save thousands of lives. He worked day and night separating the plasma and sending it safely overseas for injured soldiers and war victims. When the war ended, Charles Drew became the head of the blood bank at the Red Cross. The Red Cross was instructed by the US Army to keep "black" blood and "white" blood separate. Charles Drew made it clear that there is no such thing as "black" or "white" blood. Blood is blood! Sadly, people wouldn't listen to him, so Charles left his job at the Red Cross.

Today, Charles Drew is remembered for his important discovery that blood could be separated, so it stays fresh for a longer time. His dedication to medicine and the study of blood saved thousands of lives. Charles Drew proved that it's how you live your life, not the color of your skin, that truly matters.



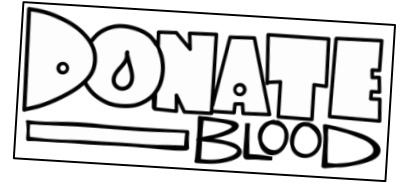
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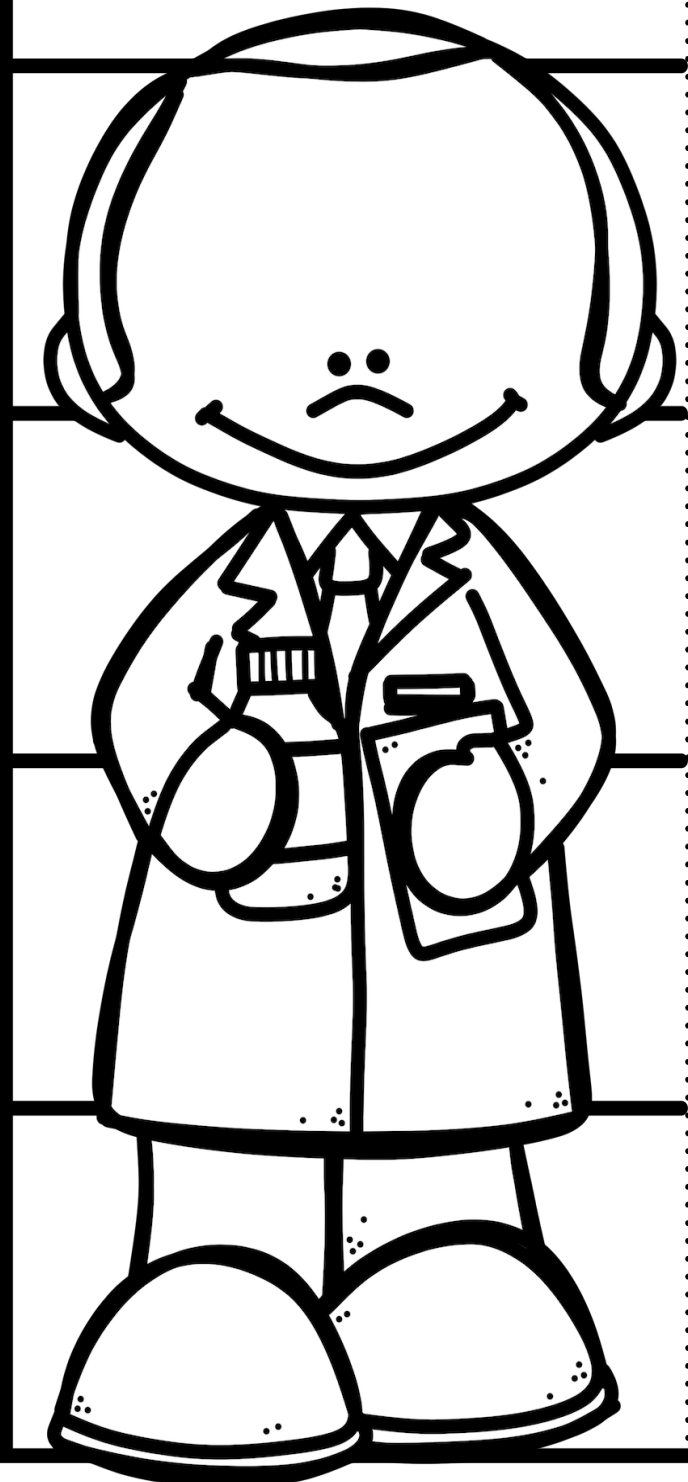
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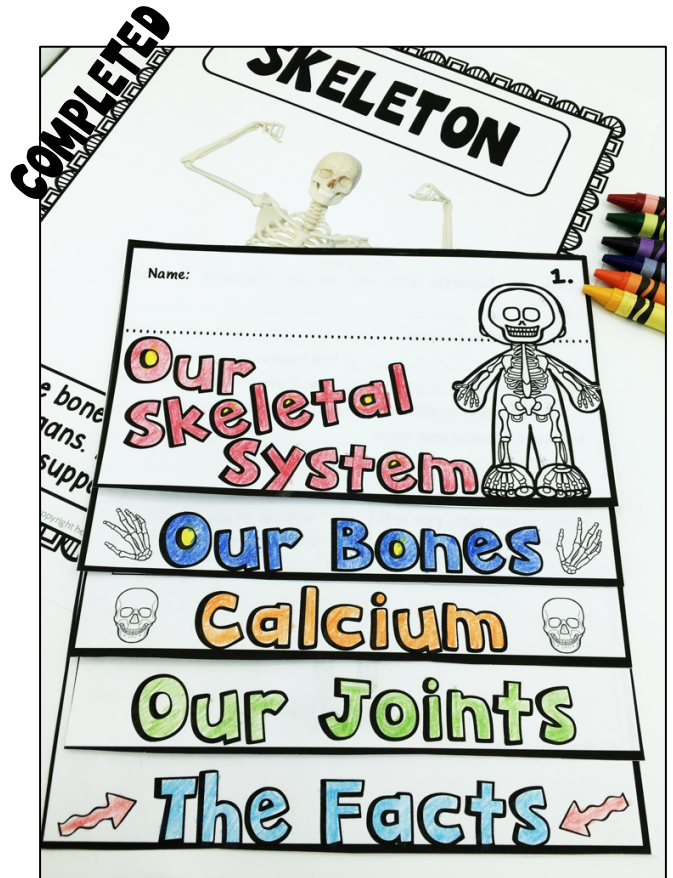
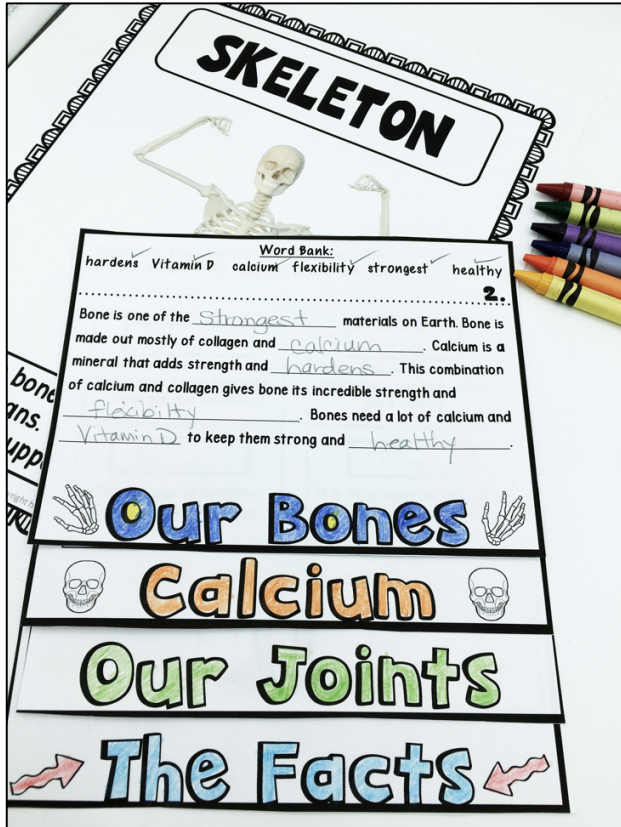
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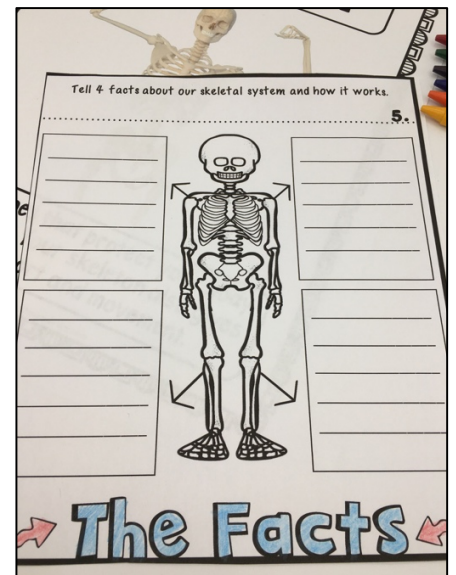
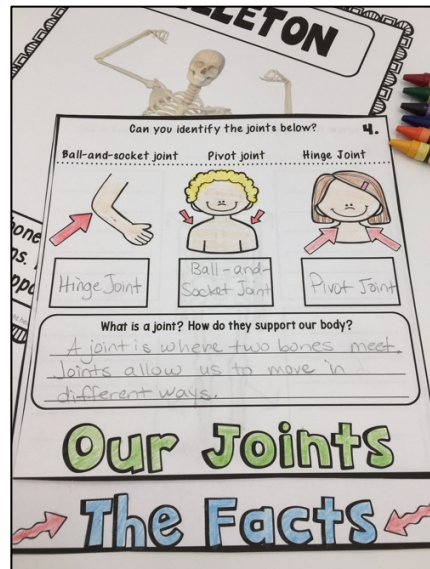
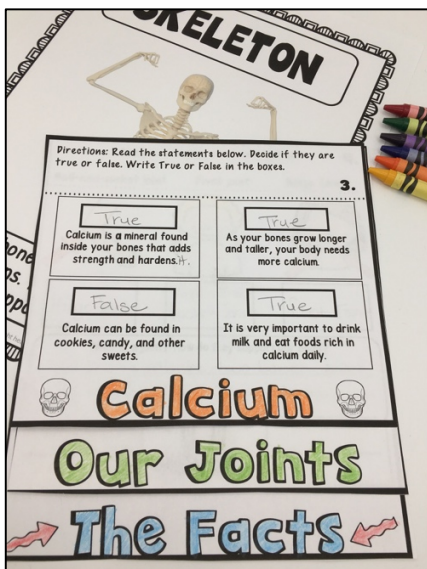
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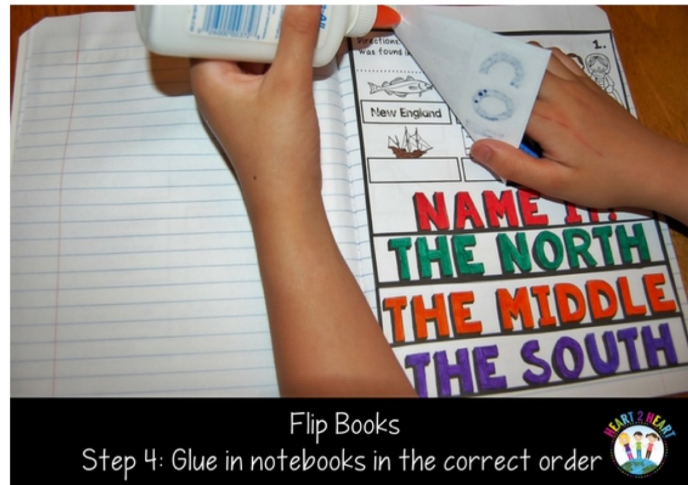
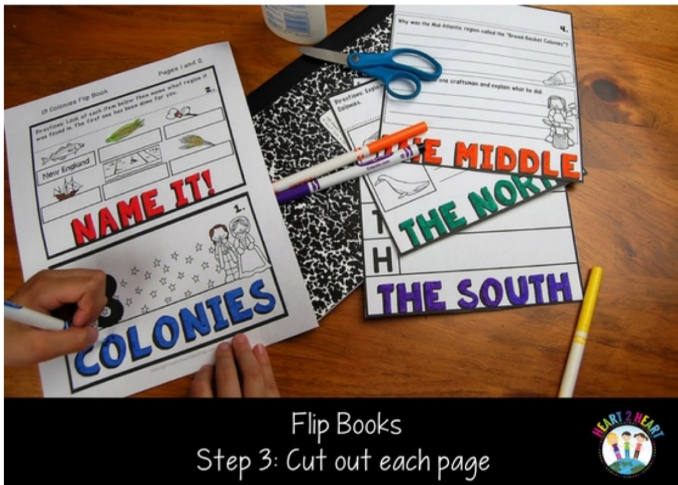
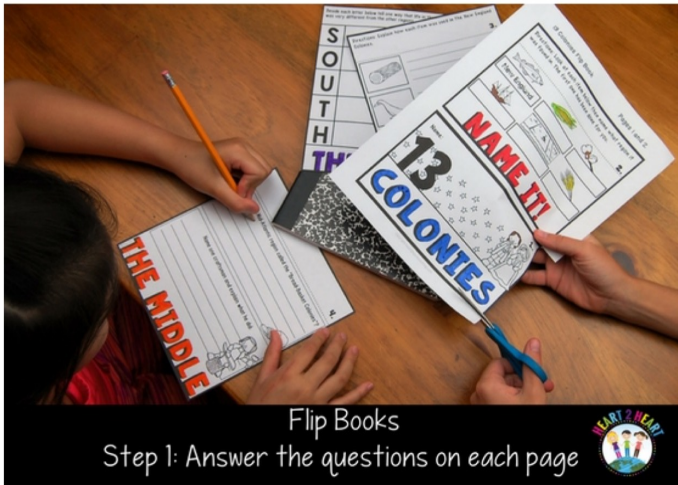
SAMPLE FLIP BOOK PICS



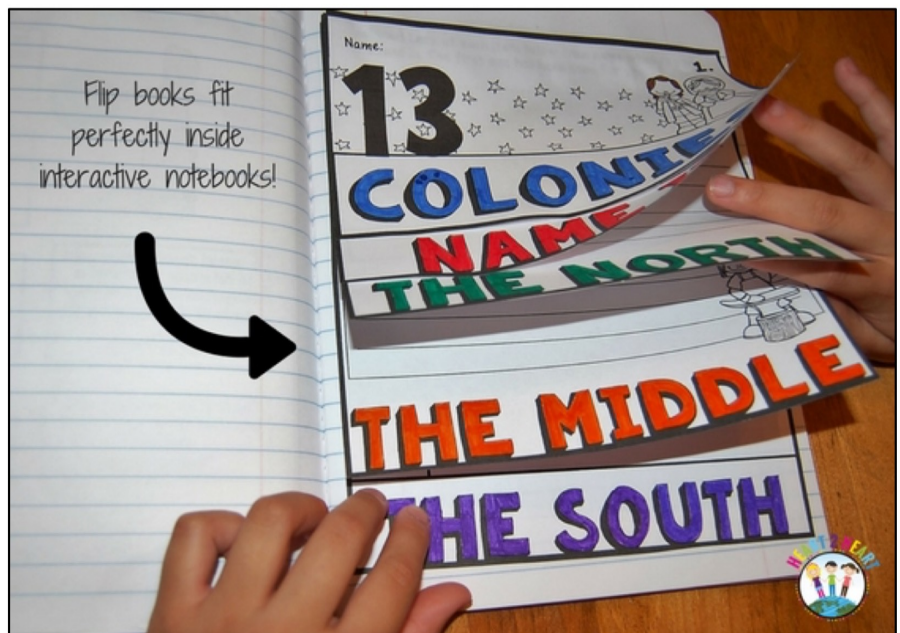
Students read the articles, answer the questions, color, cut, and assemble the flip-up book. Pages can be done one at a time in different stations and fit perfectly inside their interactive notebooks too!



Directions for Flip Booklet

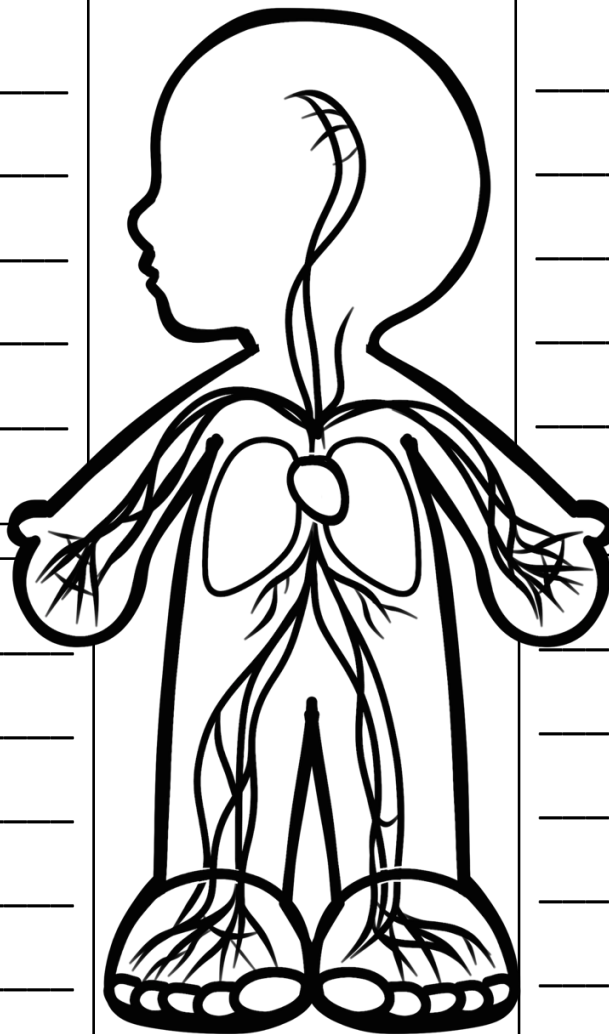


Students flip for flip books!
They work great as a fun activity or as a tool to review at the end of a unit.



Tell 4 facts about our circulatory system and how it works.

5.



THE FACTS

4.

Name the 3 main types of blood cells:



What is the main job of your circulatory system?

→ **BLOOD** ←

Directions: Read the statements below. Decide if they are true or false. Write True or False in the boxes.

3.

Arteries carry the oxygenated blood away from the heart to all parts of the body.

Capillaries have thin walls to allow oxygen and nutrients to pass into other cells.

After cells use the carbon dioxide, there is a waste gas called oxygen left over.

Your veins carry the blood with carbon dioxide gas back to your heart.

VESSELS

Word Bank:

muscle back waste oxygen pumps vessels arteries

2.

Your heart is a powerful _____ that pumps blood all around your body. Hollow tubes called blood _____ that carry the blood in and out of the heart. Your heart _____ blood out to the lungs to collect _____. After cells use the oxygen, there is a _____ gas called carbon dioxide left over. Your _____ carry the blood with carbon dioxide _____ to your heart.



HEART

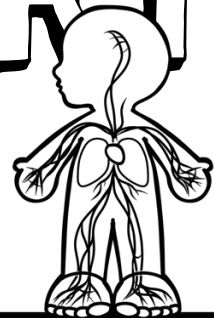


Name: _____

1.



CIRCULATORY SYSTEM



The circulatory system

Plasma

Platelets

Blood Vessel

Arteries

Veins

Capillaries

The circulatory system

Nutrients

Clot

Glucose

Valves

Bone Marrow

Artificial

Vocabulary Match Up

Name: _____

Directions: match the vocabulary words to their definitions.

The clear liquid part of the blood.

Hollow tubes that carry blood all around your body.

Tiny blood cells that make your blood thicker to stop you from bleeding too much.

Tubes that carry blood away from the heart to other parts of your body.

Tubes that carry blood back to the heart from other parts of the body.

Tiny blood vessels that branch out to join arteries and veins.

Word Bank:

blood vessel

platelets

arteries

veins

capillaries

plasma

Vocabulary Match Up

Name: _____

Directions: match the vocabulary words to their definitions.

A simple sugar that comes from the food you eat.

A soft substance inside bones that is used to make blood cells.

When platelets join together to form a thick layer over an injury to stop you from bleeding.

These close to stop the blood from going back the way it came and keep it moving forward.

Something made by people rather than occurring naturally.

Substances your body needs to grow, develop, and live.

Word Bank:

bone marrow

valves

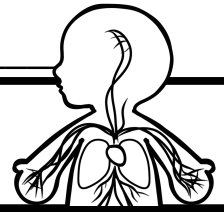
glucose

artificial

nutrients

clot

Name: _____



Spotlight on Vocabulary

Plasma:

Illustrate it here!

Platelets:

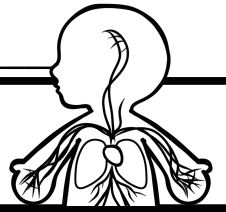
Blood Vessels:

Arteries:

Veins:

Capillaries:

Name: _____



Spotlight on Vocabulary

Nutrients:

Illustrate it here!

Clot:

Glucose:

Valve:

Bone Marrow:

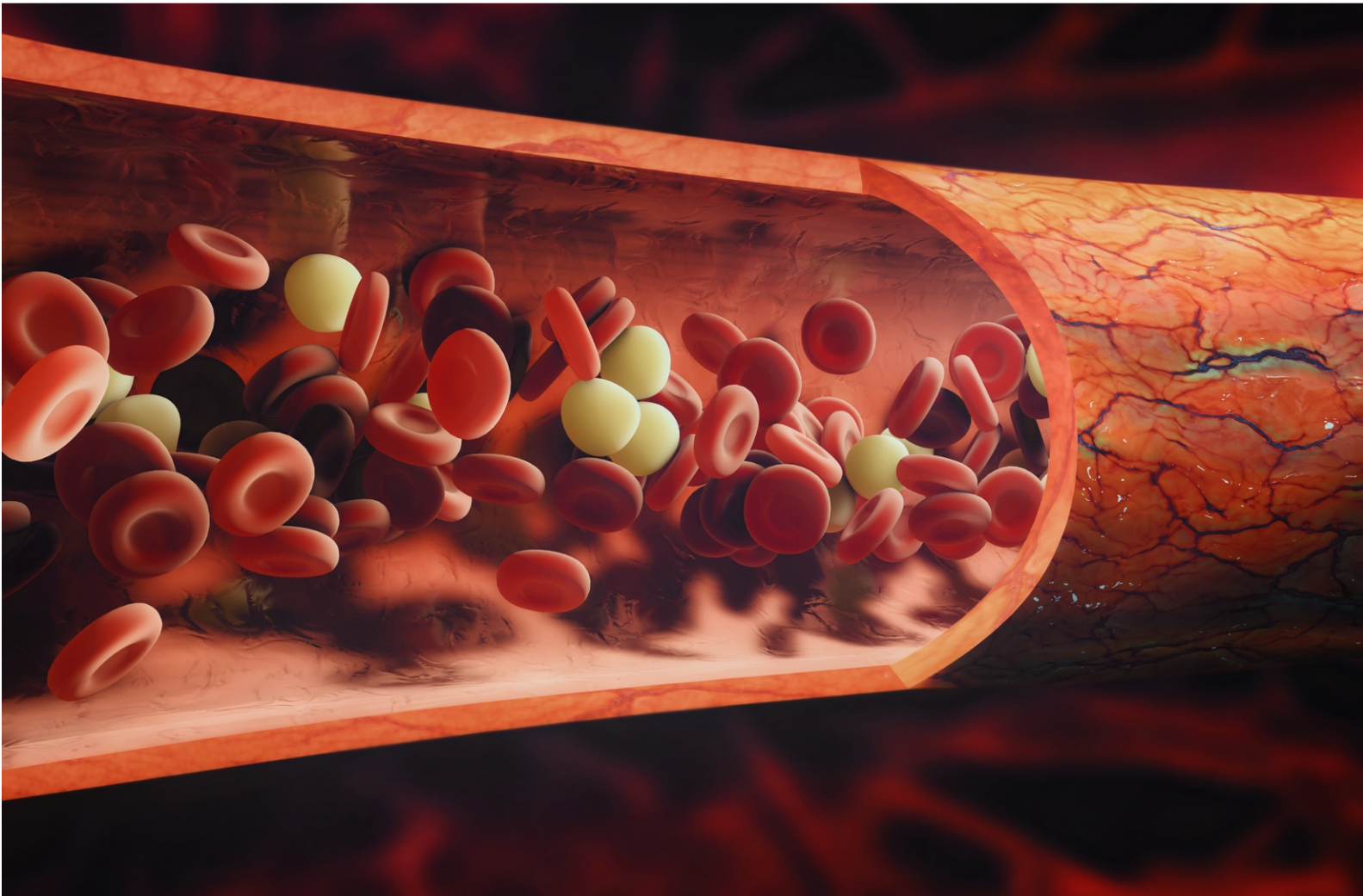
Artificial:

Plasma



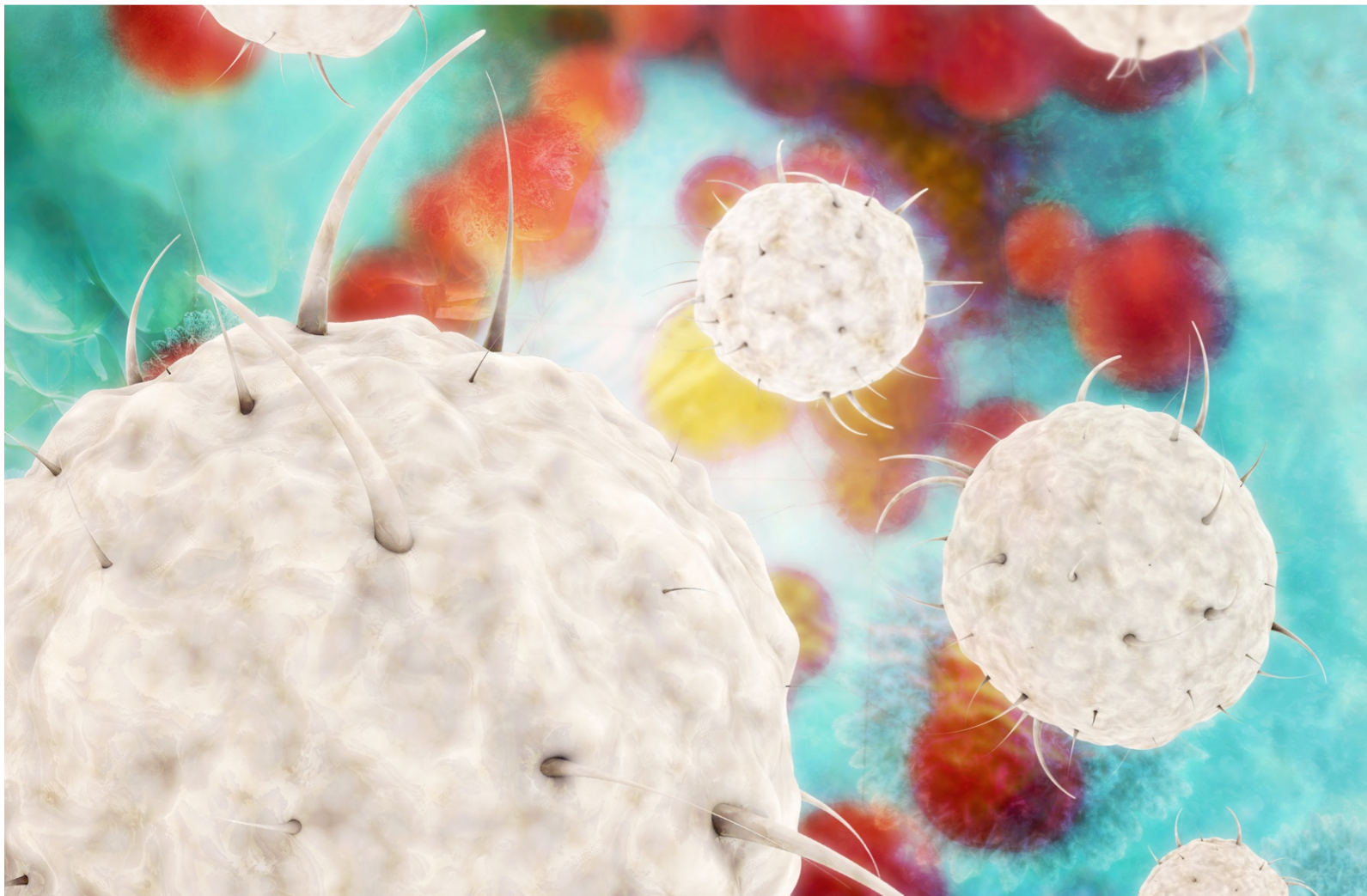
The clear liquid part of the blood. A crucial part of blood that can be donated.

Blood Vessel



Hollow tubes that carry blood all around your body.

Platelets



Tiny blood cells that make your blood thicker to stop you from bleeding too much.

Arteries



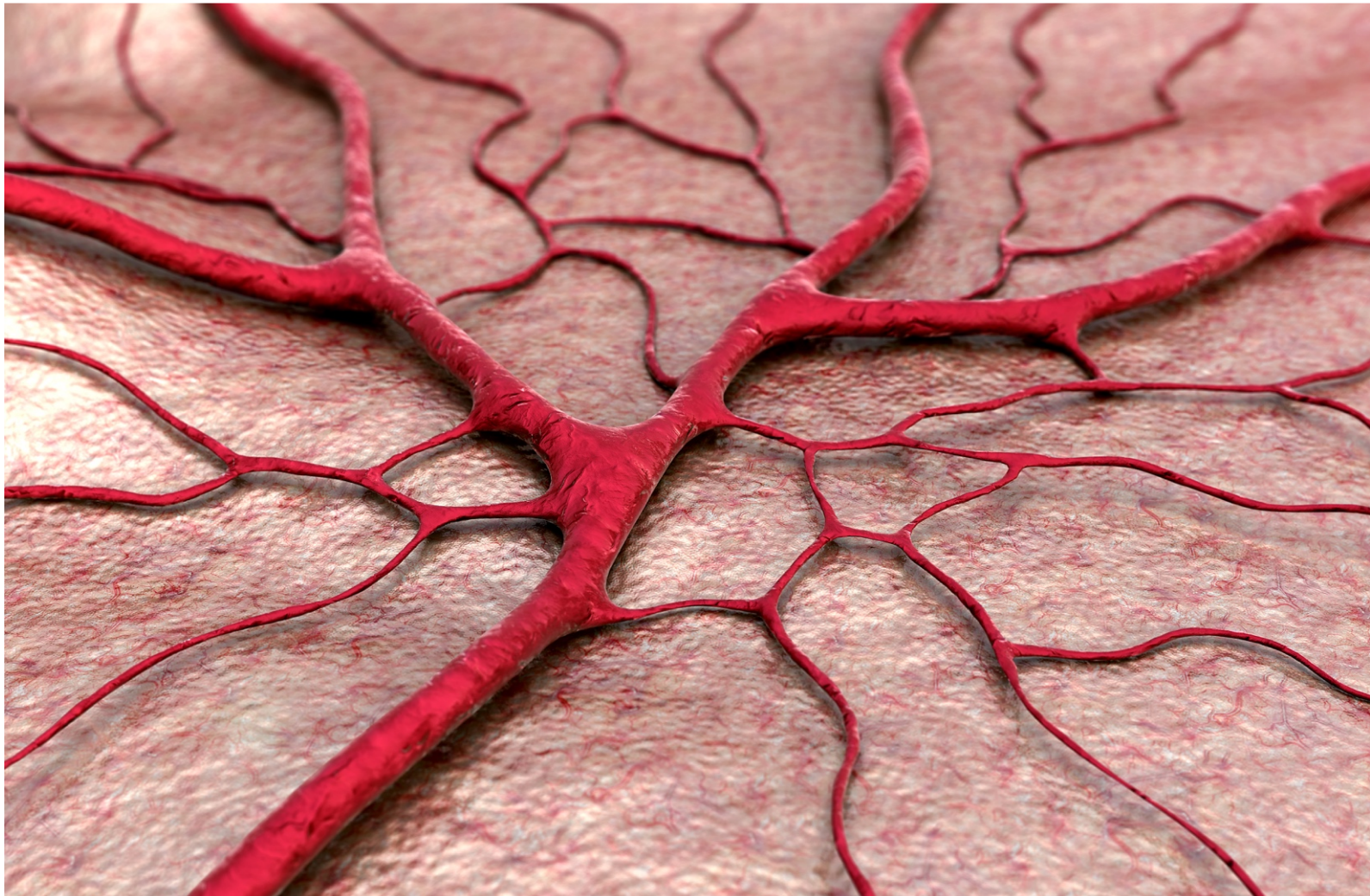
Tubes that carry oxygenated blood away from the heart to other parts of the body.

Veins



Tubes that carry blood back to the heart from other parts of the body.

Capillaries



Tiny blood vessels that have thin walls to allow oxygen and nutrients to pass into other cells.

Nutrients



Substances your body needs to grow, develop, and live.

Clot



When platelets join together to form a thick layer over an injury to stop you from bleeding.

Glucose



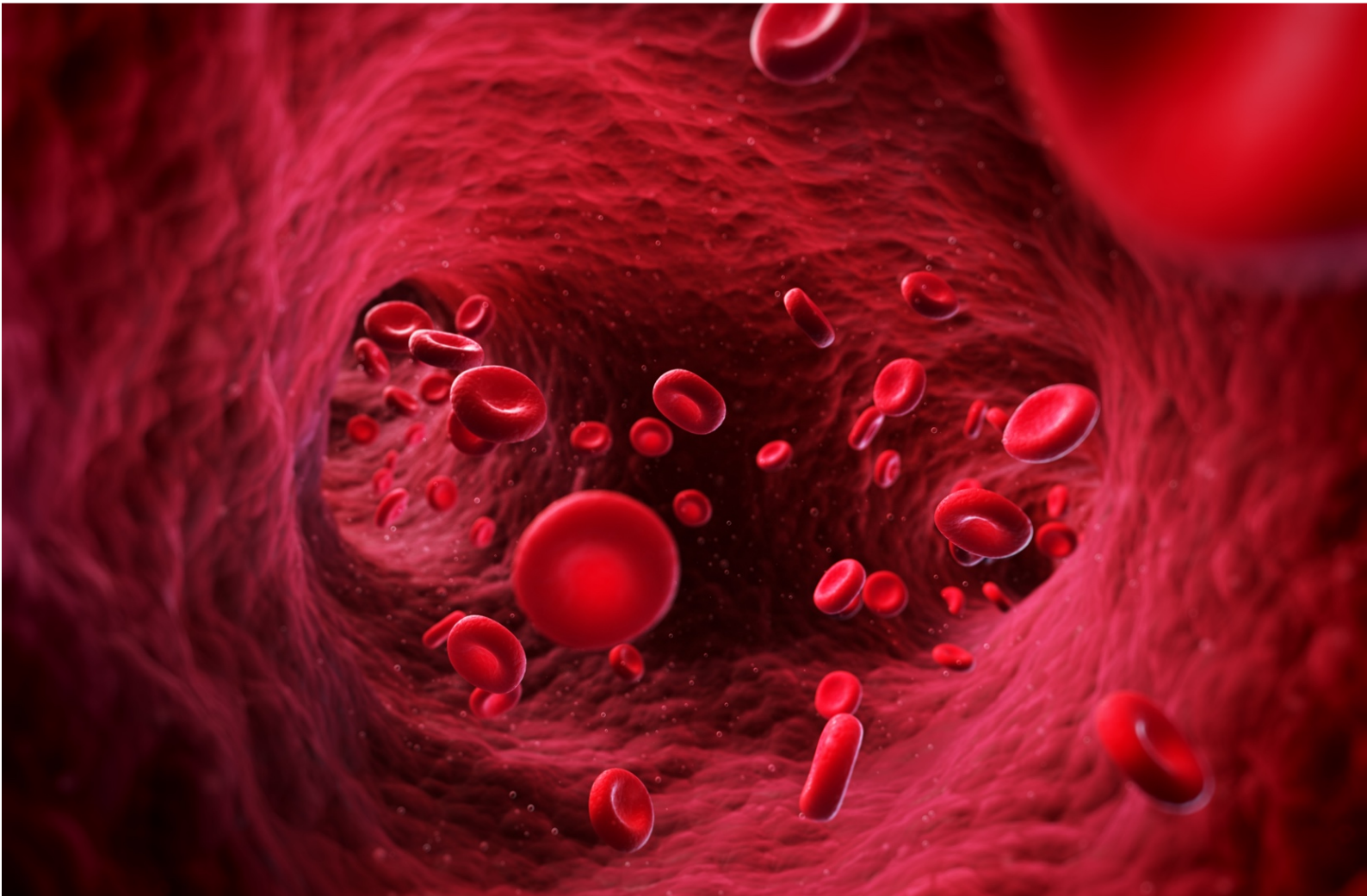
A simple sugar that comes from the food you eat. Your body uses glucose as energy.

Valve



A valve is like a gate. It stops the blood from going back the way it came and keeps it moving forward.

Bone Marrow



A soft substance inside bones that is used to make blood cells.

Artificial



**Something made by people
rather than occurring naturally.**