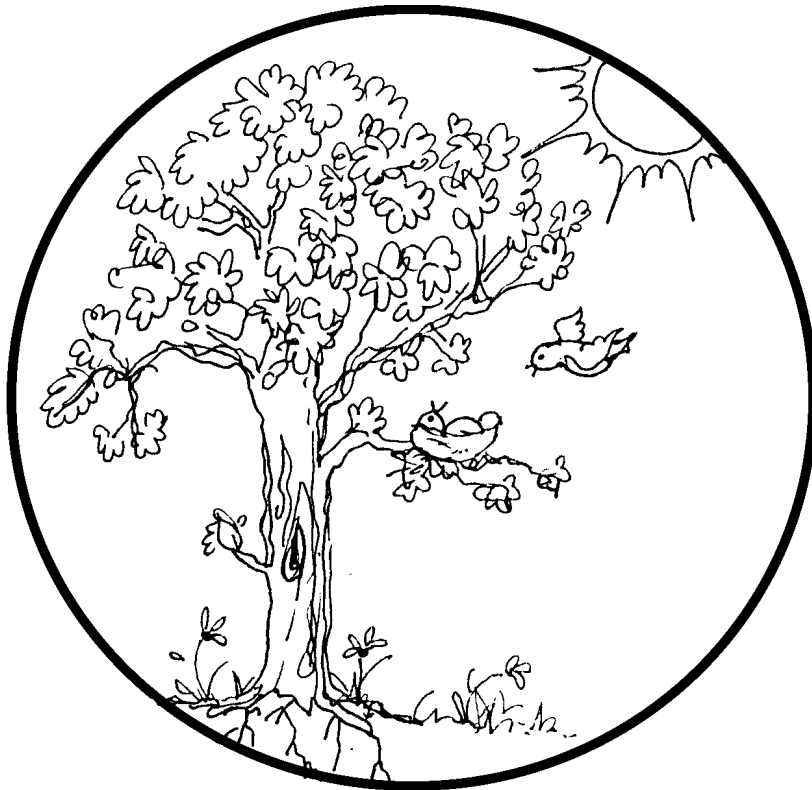




Life Cycle
Diversity in a Balance



FIRST GRADE
HUMAN BIOLOGY



2 WEEKS
LESSON PLANS AND
ACTIVITIES

LIFE CYCLE OVERVIEW OF FIRST GRADE

ORGANISMS

WEEK 1.

PRE: *Distinguishing non-living from living objects.*

LAB: *Discovering requirements of living objects.*

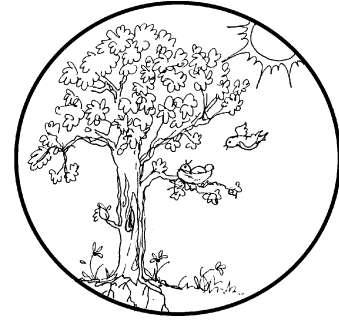
POST: *Comparing invertebrates and vertebrates.*

WEEK 2.

PRE: *Comparing animals with backbones.*

LAB: *Discovering characteristics of vertebrates.*

POST: *Exploring the uses of animals.*



HUMAN BIOLOGY

WEEK 3.

PRE: *Discovering the human senses.*

LAB: *Exploring involuntary and voluntary reactions.*

POST: *Exploring the central nervous system.*

WEEK 4.

PRE: *Comparing body systems.*

LAB: *Experimenting with blood circulation.*

POST: *Distinguishing between healthy and junk food.*

PLANT LIFE

WEEK 5.

PRE: *Comparing different types of seeds.*

LAB: *Examining a seed by finding the 3 basic parts.*

POST: *Distinguishing the parts of a flower.*

WEEK 6.

PRE: *Growing two kinds of plants from seeds.*

DURING: *Exploring stems and flowers.*

POST: *Analyzing if an item is made from a plant.*

NATURAL ENVIRONMENT

WEEK 7.

PRE: *Comparing land and water environments.*

LAB: *Distinguishing characteristics of land and water organisms.*

POST: *Discovering how organisms live.*

WEEK 8.

PRE: *Discovering how birds eat.*

LAB: *Comparing different birds.*

POST: *Exploring habitats of birds.*

LIFE CYCLE - HUMAN BIOLOGY (1A)

PRE LAB

Students use a worksheet to explore their senses.

OBJECTIVES:

1. Exploring the human body.
2. Discovering the human senses.

VOCABULARY:

nervous system
organ
senses



MATERIALS:

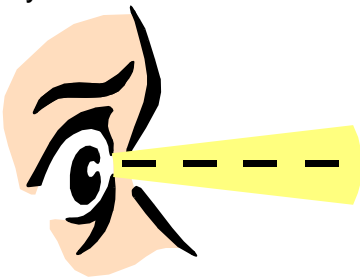
worksheet
crayons
My Five Senses by Aiki

BACKGROUND:

The human body is a beautifully engineered structure. The body has a general plan. We all have arms, legs, a head, ears, and eyes on the outside of our bodies. We also have similar parts on the inside of our bodies. We all have one heart, two lungs, one brain, two kidneys, and one stomach.

Understanding and learning about the human body is a complicated subject. If you just take an organ or system and emphasize its function, you must tell students how the system fits into the rest of the body's functions.

You can introduce the parts of the body, both internal and external, by using the organs that allow humans to operate their senses. The nervous system controls the actions and sensations of all the parts of your body by using a complex network of nerves, which carry electrical signals to and from the brain. The brain and spinal cord compose the central nervous system, acting as the central clearing house. One part of your nervous system controls your body's relationship to the external environment (somatic) and another part controls your body's internal organs (autonomic). The human body has five major senses which operate to gather information from the world around us, sight, hearing, smell, taste, and touch. Any stimulus to one of the sense areas is detected by sensory nerves and is sent to the brain for



interpretation.

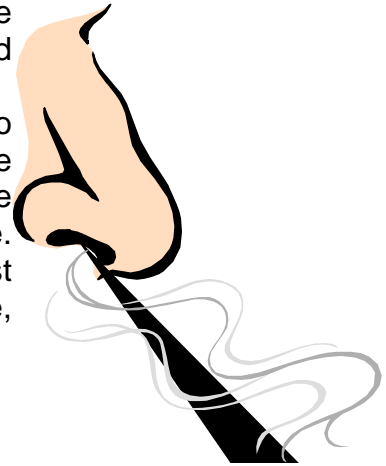
The eye (an organ) acts like a camera. Human vision is stereoscopic, which means seeing in three dimensions. When we look at objects two slightly different images are transmitted to the brain, and are merged so the brain can interpret the image that we see. This allows us to see objects which stand away from the background, not flat like you see in a photograph.

The ear (an organ) is specially made to receive sound waves that are sent out by vibrating objects and converts them into sensations we call sound.

The nose contains the nostrils and organs of smell. The stimulus that excites smell is chemical, for example onion and garlic give off different chemical sensations.

The tongue is the organ that controls taste. Taste is also a chemical stimulus. Things to be tasted must touch the tongue, sometimes, taste become combined with smell because of the connection between the mouth and the back of the nose.

Touch is created by stimulating the skin (the largest organ of the body) through the sensations of touch, pressure, pain, heat and cold.



PROCEDURE:

1. Read or have children read aloud *My Five Senses* by Ailiki. If you reading to the children have them fill in the parts of the story as you read to them.

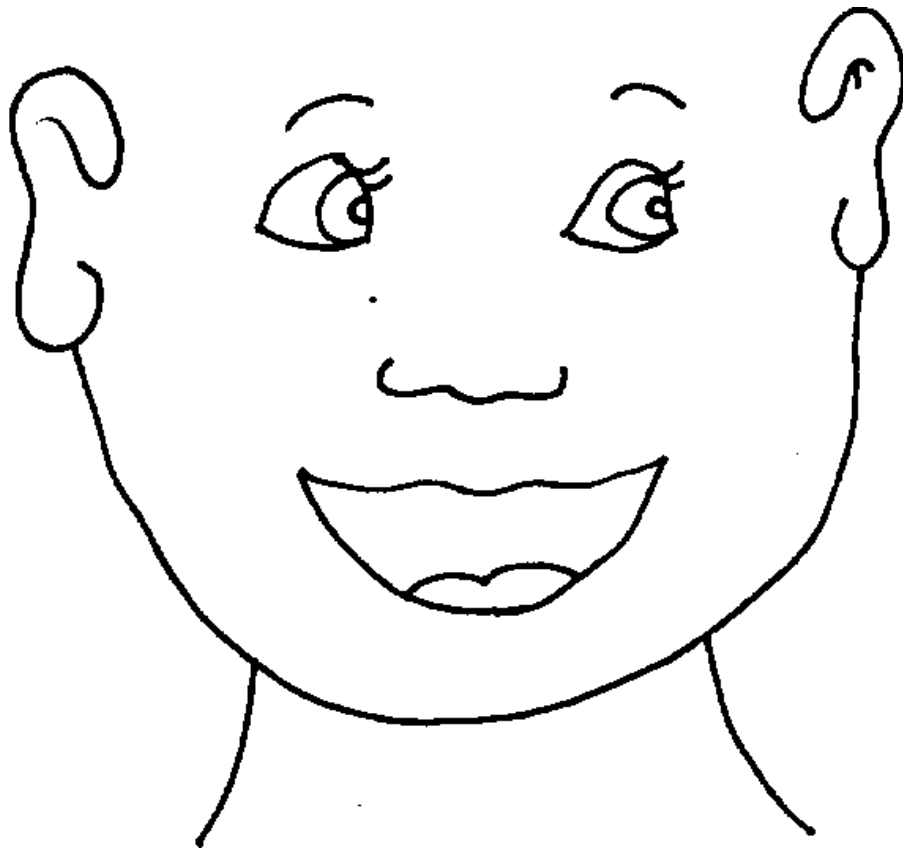


2. Hand out the worksheet and have the students draw themselves and then label their sense organs on their face. You may have to show students how to draw curly or straight hair or other modifications that can transform this picture into a picture of themselves.

LIFE CYCLE - HUMAN BIOLOGY (1A)

PRE

DRAW YOURSELF. LABEL THE EARS, EYES, TONGUE, NOSE, AND SKIN.



LIFE CYCLE - HUMAN BIOLOGY (1A)

LAB

Students find sensitive parts of their bodies.

OBJECTIVES:

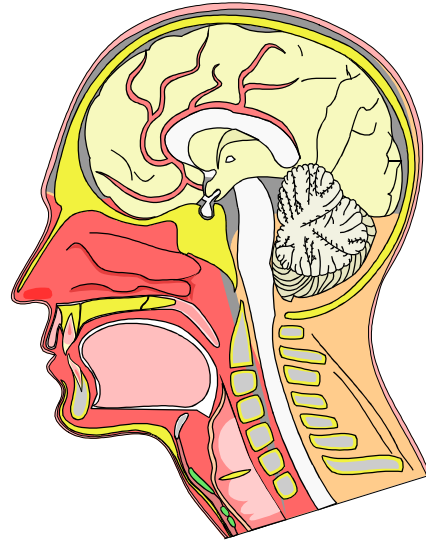
1. Discovering the human nervous system.
2. Exploring involuntary and voluntary reactions.

VOCABULARY:

brain
nervous system
reflex
senses

MATERIALS:

ice cubes
towels
flashlight
large white shirts (optional)



BACKGROUND:

The organs of your body are composed of tissues that are composed of many cells. Cells can be specialized to perform a particular function such as contraction (muscle) or sensation (nervous). Nerve cells or neurons conduct nerve impulses to and from the body of the cell. They transmit impulses all around your body. Touching something hot causes impulses to move through the neurons and relay the message to the brain. It is like a train track of nerve cells that brings the message to your brain. Nerve cells are very delicate and cannot be regenerated. The nervous system controls all other functions in the body. It accomplishes this by two mechanisms which we will group into voluntary actions and involuntary actions. The nervous system simulates movement, digestion, circulation, and the direction of all other body parts. The somatic nerves control the voluntary cells which are under conscious control. If you want to raise your hand, and do so, this is a voluntary motion. The autonomic nerves control the involuntary motions of your body. These nerves keep check of your body continuously by maintaining temperature, composition of blood, heart beat, digestion, and excretion. These are activities that you do not even think about. Even stress when your blood pressure, pulse rate, and blood sugar become elevated, is controlled by the autonomic nerves. The somatic and autonomic systems work together. Skin exposed to cold air becomes "blue," this is autonomic. At the same time impulses are sent to the brain for sensations of cold, this is somatic.

PROCEDURE:

1. This lab is to get students to realize that their nervous systems are very complicated. Use large white shirts as doctor uniforms. Select students that will be the doctor, and who will administer the activity. Put the suit on the students and give that student a piece of ice. If you have enough parent volunteers, you may want a parent to take the role of the doctor.

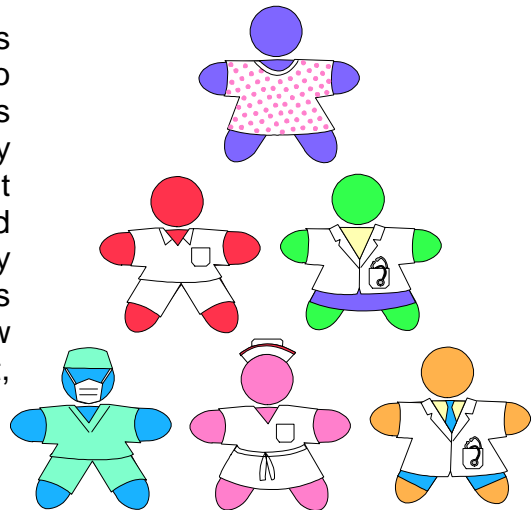
2. Break the class into groups or patients in front of each doctor. The doctor will put the ice cube on several areas of the patient's body. The purpose of this is so students can find where the ice feels the "coldest." The doctor should place the ice on the backarm, forearm, palm, hand, and fingertips. The patients are supposed to figure out where the ice feels coldest on their bodies. They should all feel that the fingertips sense the cold with the greatest sensitivity.

3. You may want the doctors to also use the "needle" to find the most sensitive part of the arm or leg. However, you must select those students who will not try to really "stick" it to their fellow students. The needle can be the back of a pen or tongue depressor. This part should be done with adult supervision.

4. Another activity that illustrates the fact that nerves control motion is for students to find their knee reflex. A reflex is an action in response to a stimulus, occurring without conscious effort or thought. Have the patient cross his knee and the doctor uses the reflex hammer to find the spot where the knee will jerk. This will need supervision, because finding that spot takes a little skill.

5. The doctor can also perform an examination of the eyes to see if the nerves of the eye react to light. Have one student shine a small flashlight into another student's eye to observe what the pupil of the eye will do. It will move, which is an autonomic response to the light. Only do this lab if an adult guides the students.

You may want to see if any of your student's parents are doctors or nurses. They may be able to add to the realism in the classroom. This lab is for students to realize that their bodies move in very planned motions. There are motions that we don't have to think about such as involuntary motions, and there are some that we control such as, voluntary motions. The nervous system controls this movement. The parts of our bodies are somehow connected and work in unison, for if they did not, they would not work.



LIFE CYCLE - HUMAN BIOLOGY (1A)

POST LAB

Students make a yarn diagram of the nervous system.

OBJECTIVES:

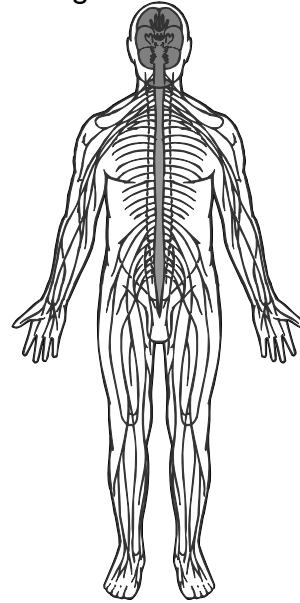
1. Exploring the central nervous system.
2. Discovering how the nervous system sends messages to the brain.

VOCABULARY:

brain
nerve
spinal cord

MATERIALS:

yarn
worksheet
glue
brain mold (optional)



BACKGROUND:

The central nervous system is controlled by the brain. The central nervous system includes the spinal cord, the brain, and an entire network of nerve fibers that run throughout the body. Unlike the circulatory system which forms a closed loop, the nervous system has "endings." This exercise will help students to visualize the pathways of these nerves. The brain is an incredibly complex organ that is the center of thought and all involuntary motions. The brain maintains the body in working order by overseeing the functions of all organs and body systems. The spinal cord is a soft, fluted column of nerve tissue continuous with the lower part of the brain and is enclosed by the bony vertebral column. This nerve tissue lies within the vertebral column; the bone is there to protect the tissue. There are 31 pairs of spinal nerves which emanate from the spinal cord. These nerves provide pathways for impulses to flow throughout the body and to the brain.

PROCEDURE:

1. In this exercise the students will use the worksheet to see how the central nervous system is connected with the brain. Students should cut and paste yarn over the system. The darker lines illustrate the 31 pairs of spinal nerves that begin at the spinal cord..
2. Instruct the students to count the number of spinal nerves first, and then direct

them to trace the major ones with the yarn. Make sure that the nerve paths end and are not looped.

3. You may want to prepare a jello "brain mold" for students to look at. Since the brain is considered the "nerve" center of the body, this activity emphasizes the brain's importance.

Ingredients for brain: two 6 ounce boxes of gelatin mix (any flavor but peach or watermelon give a more realistic color)

1 $\frac{3}{4}$ cups boiling water

1 cup cold water

9 ounces fat free evaporated milk - don't use any kind but fat free or it will curdle

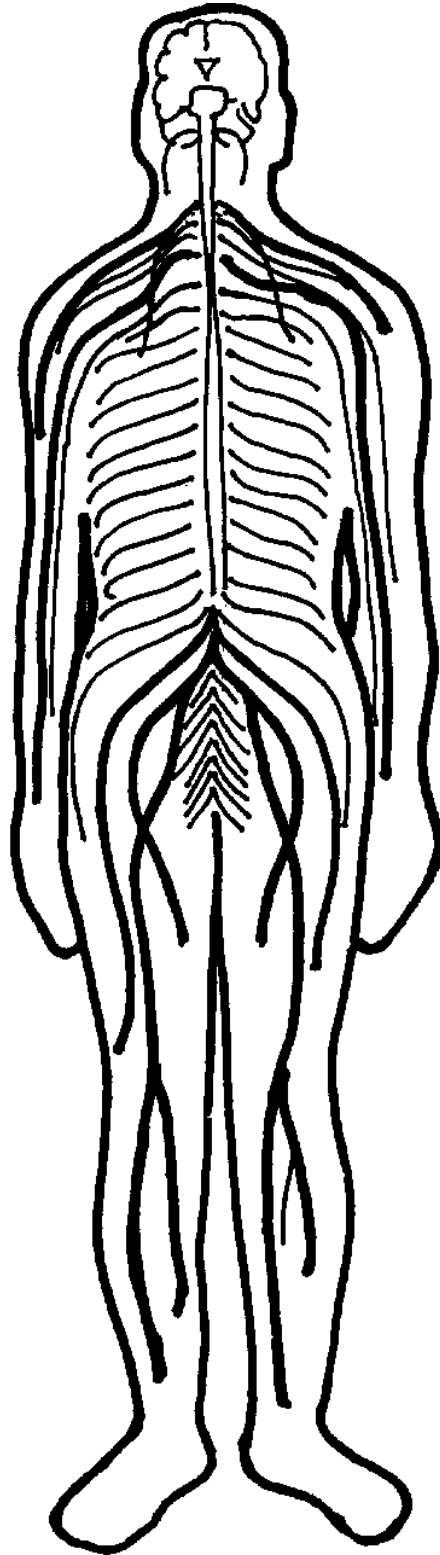
food coloring: about 15 drops each of red, green, and blue with make a gray brain, but any colors will work

Directions:

1. Before each use, wash the brain mold with warm soapy water.
2. Spray or smear the inside of the brain mold with a small amount of vegetable oil.
3. Put the gelatin mix in a large bowl and add the boiling water. Stir about 2 minutes until the mixture is dissolved.
4. Stir in 1 cup of cold water.
5. Add the evaporated milk and food coloring and stir well. Adjust the color to your liking.
6. Pour the mixture into the brain mold, stopping about $\frac{1}{4}$ inch from the top.
7. Place the brain mold in a shallow bowl so it will sit level, and refrigerate overnight or until firm.
8. To remove your brain, shake the mold until the gelatin loosens. Place a flat plate upside down over the open side of the mold, then flip the mold and plate together. Lift the mold off, leaving the brain on the plate.

LIFE CYCLE - HUMAN BIOLOGY (1A)

POST



LIFE CYCLE - HUMAN BIOLOGY (1B)

PRE LAB

Students discuss the function of each body system.

OBJECTIVES:

1. Comparing body systems.
2. Learning about the circulatory system.

VOCABULARY:

circulation

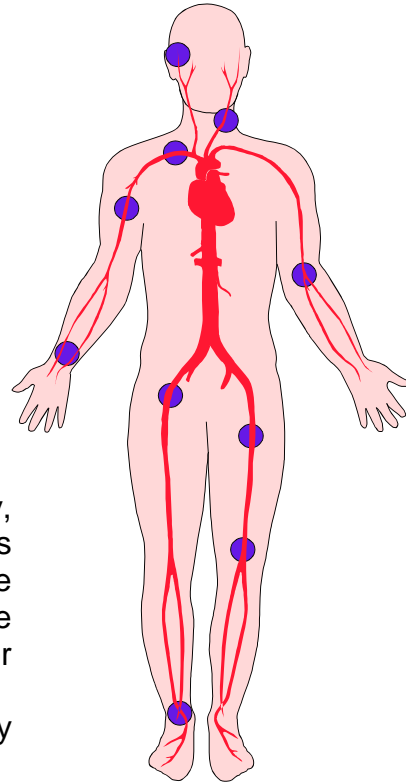
MATERIALS:

Human Body Placemats

BACKGROUND:

There are many systems in the human body, and each has a different function. Different authors separate the body systems into varying groups, so use your judgement on how you wish to present the material. The table below summarizes the major systems that we recommend for small children.

In lab students will investigate their circulatory systems.



SYSTEM	FUNCTION/PARTS
skeletal-muscular (bones and muscles)	protects organs, enables movement, skeleton, muscles
circulatory (blood)	moves fluids in our bodies through veins and arteries, heart, capillaries
renal or excretory (urea and fecal matter)	controls water balance; bladder, urinary tract
endocrine (hormones)	regulates most of body functions using glands

digestive (food)	converts food to energy, stomach, mouth
nervous (nerves)	gathers information, controls most body activities
respiratory (lungs)	breathing, lungs

PROCEDURE:

1. Go over some of these systems with students so they can become familiar with their various functions. Use the table above to help students determine the function of the various systems in the body.

2. Students should use the Human Body Placemats to find the major parts of the system. The important part is for students to hear and say the terms. Do not have students memorize each system.

LIFE CYCLE - HUMAN BIOLOGY (1B)

LAB

Students watch blood move.

OBJECTIVES:

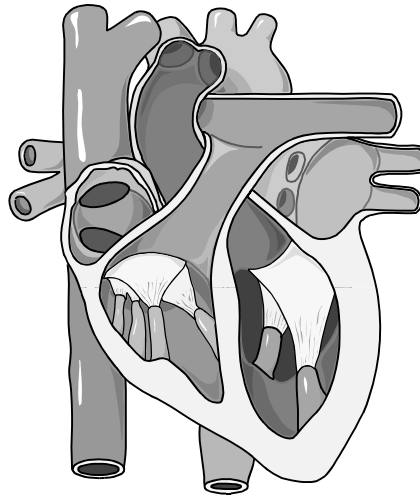
1. Experimenting with blood circulation.
2. Tracing the pattern of blood flow.

VOCABULARY:

blood
circulation

MATERIALS:

red food coloring
mechanical heart
plastic tubing
beakers or jars
worksheet



BACKGROUND:

The circulatory system is responsible for the transport of body fluids such as blood and lymph and for the temperature regulation. The heart pumps blood through a network of arteries and veins spread throughout the body. For your own knowledge, the lymphatic circulatory system is structurally and functionally related to the blood circulatory system. Lymph vessels are widely distributed throughout the body, but they are concerned with the transport of lymph which is concerned with immuno-defenses.

Blood is a mixture of solid material and liquid. The liquid portion, or plasma, provides a medium in which the solid portion can be transported. Within the plasma are many substances, including water, inorganic salts, proteins, nitrogen bearing substances (urea), fats, cholesterol, sugars, hormones, and dissolved gases. (Note: do not confuse plasma, a state of matter with this meaning.) The cellular solid portion includes red blood cells and variety of white blood cells and platelets.

This lab emphasizes how blood moves in our body. Students will learn about the heart rate and how body position affects the heart rate.

The heart is a mechanical device whose function is to pump blood through the body to replenish oxygen lacking blood cells with oxygen. The importance of constant circulation of blood throughout the body cannot be overemphasized. Without blood, life would not exist. If blood does not reach the brain for just five seconds an individual loses consciousness; after 15-20 seconds the body begins to convulse (shake uncontrollably); and if nine minutes pass, irreparable damage to the brain results.

The strong contraction of the heart muscle forces blood into the arteries in two ways: the first expands the muscular walls of the arteries and the second pushes the blood through the arteries to regions of the body away from the heart. This rhythm makes the arteries expand and produce a pulse. In the wrist, the pulse is detected by a throbbing sensation near the surface. The heart is composed of four chambers, two upper chambers, the right and left atria, and two lower ones, the right and left ventricles.

PROCEDURE:

1. There are three parts to this lab. Use the worksheet to show students the pattern of the circulatory system. Make sure they note that it is a closed network.

2. The second part of the lab has students mixing some "blood" by filling half a glass of water with a few drops of red food coloring. Ask students how this blood moves through the body. Many students may not be aware that blood moves through a network of tubes (arteries and veins). Note that a child thinks that blood is just moving around in their bodies. It is conceptually difficult to understand veins, arteries and capillaries in our bodies. Capillaries are a net work of "roads" that allow communication between arteries and veins. When a tube is cut, we bleed. Give students an empty cup and a little less than a meter of (3 feet) plastic tubing (approximately 1 cm (½ inch) thick). The problem is to get the liquid from the head (top) to the toes (bottom).

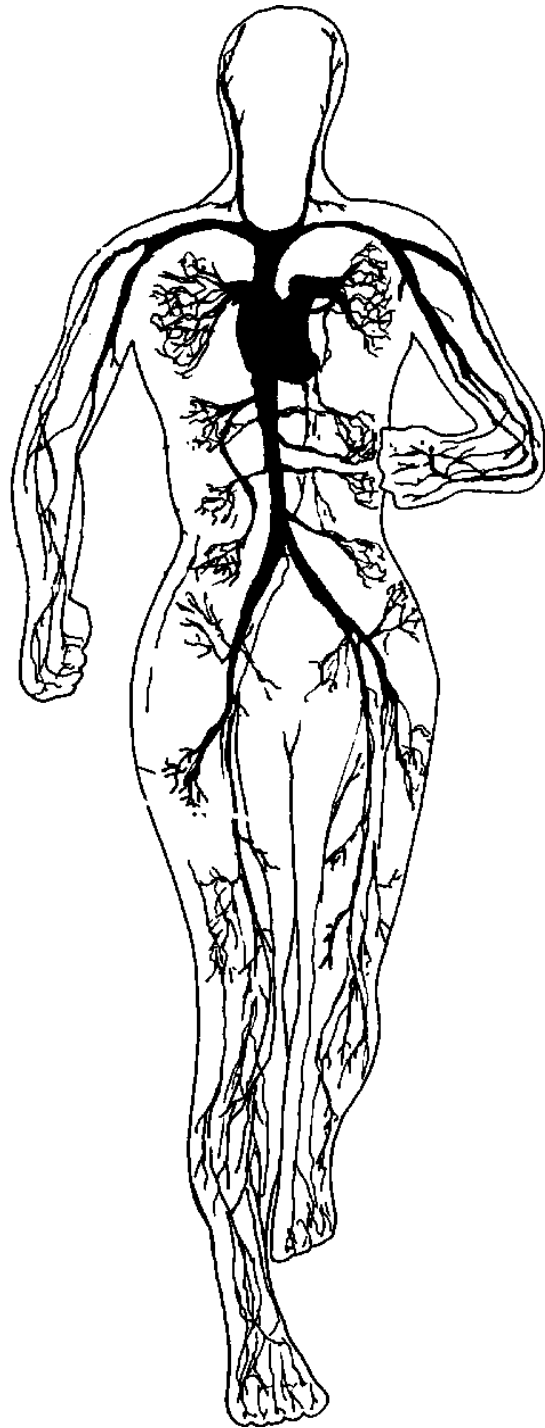
Place the cup with the liquid about 1-3 feet higher than the empty cup. Have the students siphon the tube so the liquid begins to flow to the bottom cup. Many students have never seen a siphon, so demonstrate and guide them. When you suck at one end you are forcing the liquid to flow. Gravity then continues the flow until no more liquid can flow or no more liquid is left. Although the tube is open compared to a closed blood network, it does show the students how blood moves. Students love to "siphon."

3. The third part of the lab is for students to see the mechanical heart. Ask them what the "beating" is all about in their chest. The heart is the pump that will bring the blood back up so it can circulate through the body. The mechanical heart is an example of the beating.

This lab is just to expose students to how blood moves through their body. Just learning the words "artery" and "vein" will help students to begin to understand circulation.

LIFE CYCLE - HUMAN BIOLOGY (1B)

LAB



LIFE CYCLE - HUMAN BIOLOGY (1B)

POST LAB

Students make a collage of different foods.

OBJECTIVES:

1. Comparing different types of food.
2. Distinguishing between healthy and junk food.

VOCABULARY:

bread
cereal
fruit
meat
milk
nutrition
vegetable



MATERIALS:

pictures of food
butcher paper

BACKGROUND:

Proper nutrition and maintenance of the body should be emphasized every year. The well being of an organism is important to his overall wellness. Nutrients are available from digested food and moves through an organism's body by via the circulatory system.

Nutritious foods can be divided into four groups, meat, milk, bread and cereal, and vegetable and fruit. In addition, it is often useful to talk about an "extra" or "junk" food group, since so many foods we eat fit into that category. Junk foods are those which "fill us up," but do not provide very many nutrients for our bodies. Some foods may start as worthwhile foods, but so much salt, fat, or sugar has been added that the nutritional value drops. For example, popcorn is a good high fiber snack, until it is doused with butter and salt. Yogurt and granola are fairly nutritious, until excess sugar is added.

Foods that provide the same kinds of nutrients are grouped together. Nutrients are things that our bodies need to grow and be healthy, such as proteins, carbohydrates, fats, vitamins, and minerals. Our bodies have no requirement for table sugar or honey in any amount, and it is not necessary for energy during, before, or after exercise. Other nutrients can fill that need more effectively. The traditional food groups can be divided in the following ways:

MEAT GROUP- meats, eggs, peanut butter, nuts, beans

MILK - milk, cheese, yogurt, ice cream, pudding (not butter, since it is mostly fat)

BREAD-CEREAL - bread, crackers, cereal, muffins, pasta, tortillas

FRUIT-VEGETABLE - fruits, vegetables (except dried peas, beans, and nuts) juices

"JUNK" - food with little value to the human body

PROCEDURE:

1. Discuss with students why we divide foods into different groups. Go over all five of the groups, including "Junk" as another category.

2. Instruct the children to bring 4-5 pictures of food from home. They should be simple foods, not casseroles or whole dinners. Some may be junk, but most hopefully will be nutritious. You will have to use your judgement of what constitutes junk. Be consistent in your grouping.

3. Go over the pictures with the rest of the class and have them identify the group for each food.

4. Let them paste their pictures onto the butcher paper to make a class collage of the different food groups.