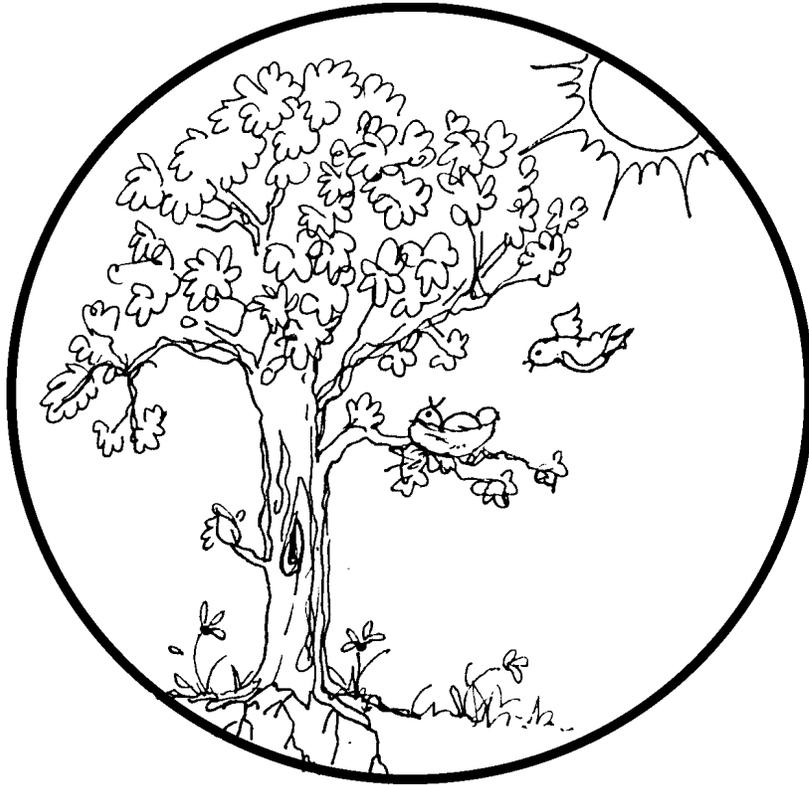




Life Cycle
Diversity in a Balance



SIXTH GRADE
HUMAN BIOLOGY



2 WEEKS
LESSON PLANS AND
ACTIVITIES

LIFE CYCLE OVERVIEW OF SIXTH GRADE

ORGANISMS

WEEK 1.

PRE: *Defining classification.*

LAB: *Exploring characteristics of the lower kingdoms.*

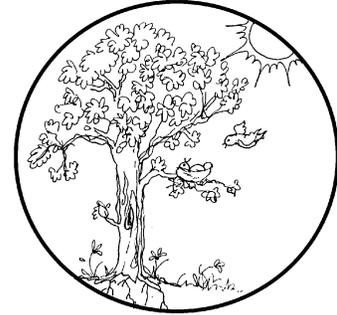
POST: *Comparing classification and taxonomy.*

WEEK 2.

PRE: *Exploring how food gets rotten.*

LAB: *Discovering why food rots.*

POST: *Defining the parameters of the kingdom system.*



HUMAN BIOLOGY

WEEK 3.

PRE: *Exploring the endocrine system.*

LAB: *Analyzing the different stages of human growth.*

POST: *Comparing mitosis and meiosis.*

WEEK 4.

PRE: *Distinguishing bacteria, protozoa, and viruses.*

LAB: *Distinguishing bacteria and viruses.*

POST: *Comparing genetic disorders with diseases.*

PLANT LIFE

WEEK 5.

PRE: *Distinguishing land from aquatic plants.*

LAB: *Comparing growth factors of plants.*

POST: *Exploring uses of auxins.*

WEEK 6.

PRE: *Exploring the history of genetics.*

LAB: *Testing heredity models.*

POST: *Developing a mutation theory.*

NATURAL ENVIRONMENT

WEEK 7.

PRE: *Exploring ecosystem requirements.*

LAB: *Comparing the pH of different soils.*

POST: *Interpreting the results of soil pH.*

WEEK 8.

PRE: *Adapting to the local environment.*

LAB: *Researching factors on adaptation.*

POST: *Comparing different theories on evolution.*

LIFE CYCLE - HUMAN BIOLOGY (6A)

PRE LAB

Students use a worksheet to learn about the endocrine system.

OBJECTIVES:

1. Describing the human body.
2. Exploring the endocrine system.

VOCABULARY:

endocrine system
gland
organ
pituitary gland
reproductive system
system



MATERIALS:

Human Anatomy Coloring Book by J. Ziemian (Dover)
worksheet

BACKGROUND:

The next two weeks will concentrate on the human biology, which includes the different organ systems in humans. Students should be familiar with the structure of the human body, as well as the different tissues that combine to make different organs such as the heart and lungs. In addition, students should know the organs that combine into systems such as the skeletal system or digestive system. Each student should be familiar with the interior of his or her own body.

Human bodies vary slightly from person to person, not only in the visible aspects of size and shape but also in the placement of internal organs. Human bodies, however, follow a general pattern and no part of the human body works in isolation. Each body part does its job, day and night, supported and aided by all the other organs. It is important for students to understand their bodies in order to take care of them. The sixth graders need to understand how their bodies grow. Students are at an age when many changes will be taking place. A factual presentation of their bodies' structure will help them not only understand but cope with the changes that they will experience.

Endocrine glands control many of the body's functions through chemical substances called hormones. Endocrine glands are ductless, pouring hormones directly into the bloodstream. Some organs, such as the pancreas, produce hormones. The hormones produced by the glands of the endocrine system signal the body to grow, sleep, eat, and provide changes needed for reproduction.

The glands of the endocrine system include the pituitary, thymus, thyroid, and adrenal. On the worksheet the students can locate these glands. The thymus gland controls activities of the spleen and the lymph glands which are important in the immune system. The thyroid gland produces a hormone that regulates the metabolic rate. Each of the adrenal glands provide hormones for emotions such as fright or anger. This reaction is responsible for the extraordinary feats of strength that people sometimes perform in emergencies.

The pituitary gland is important because it produces many growth hormones that are used throughout life. The hormones in the pituitary signal to the male and female reproductive parts to start developing the adult male and female characteristics. The hypothalamus gland regulates the output of the pituitary gland. It is the pituitary that signals the testes (male gland) to produce testosterone which tells a male body to grow hair, increase bone growth, have greater muscle strength, and a deeper voice. The hormones, estrogen and progesterone from the pituitary gland, regulate the work of the female's ovaries. Estrogens are important in the development of the adult female. Progesterone along with estrogen is needed to prepare a female body for pregnancy.

PROCEDURE:

1. If you feel the students lack an understanding, we suggest you do some of the exercises for the lower grades. You can also use *Human Anatomy Coloring Book* by J. Ziemian as a coloring/review of the human body.

2. Go over the worksheet with the student. See what parts they know already before showing them the location of each of the organ. Please note, that students at this age will "giggle," but if taught in a straight forward scientific way, the giggles will turn into curiosity.

3. Students will undoubtedly have questions. We suggest that you have available books on the human body. You may want students to do a research paper. It is so important for them to realize that their bodies are human machines with all parts working together to produce an effective and efficient product.

LIFE CYCLE - HUMAN BIOLOGY (6A) PRE

Draw a line to the correct location on the diagram of the following endocrine system organs.

Hypothalamus

Pineal Gland

Pituitary Gland

Thyroid Gland

Thymus Gland

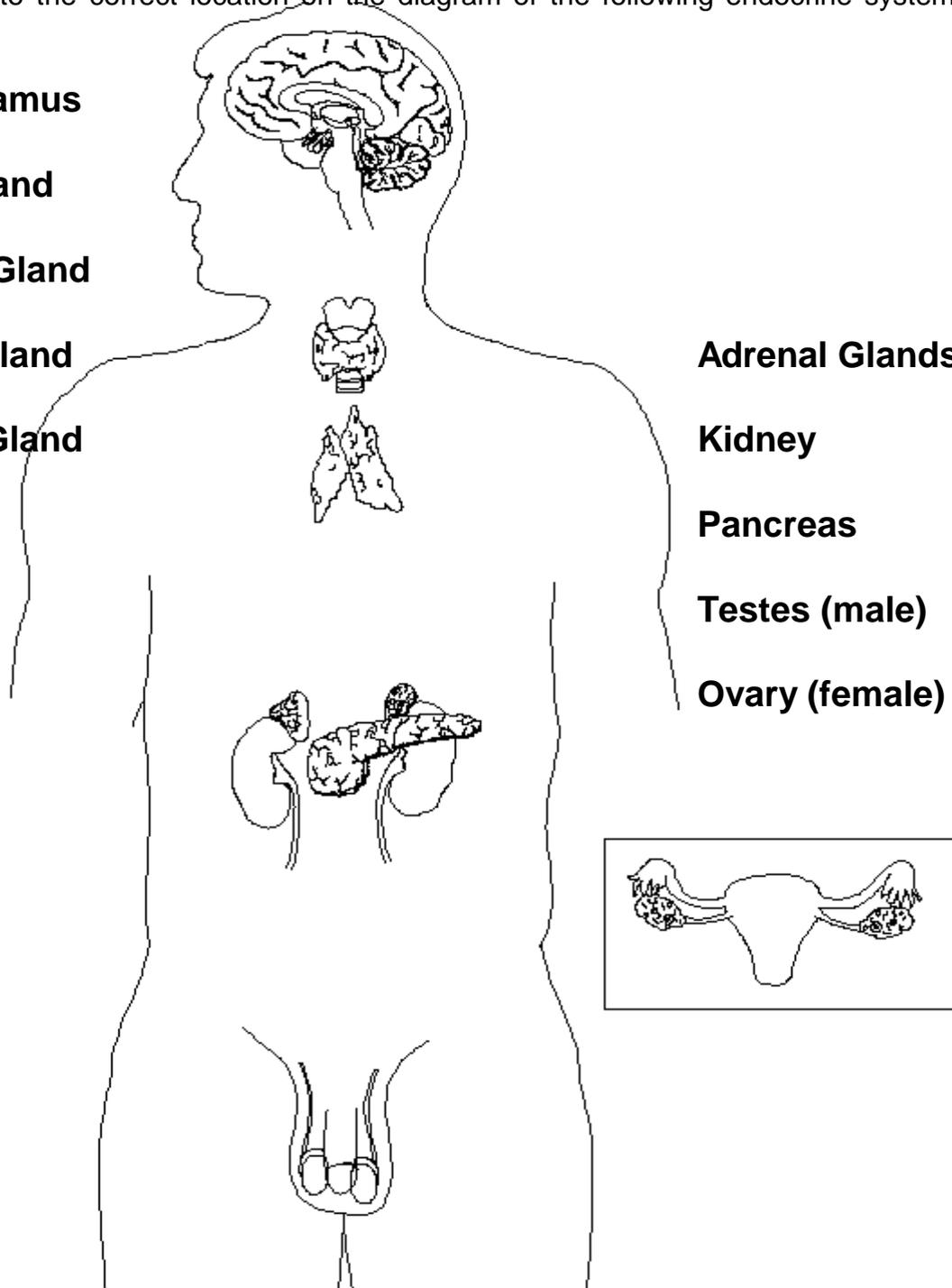
Adrenal Glands

Kidney

Pancreas

Testes (male)

Ovary (female)



LIFE CYCLE - HUMAN BIOLOGY (6A)

LAB

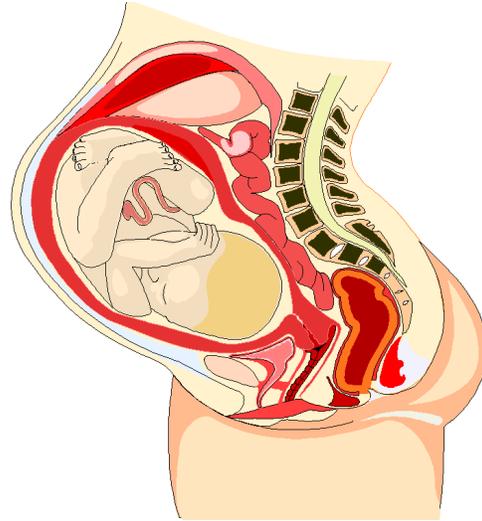
Students measure the stages of a growing fetus.

OBJECTIVES:

1. Plotting human growth during pregnancy.
2. Analyzing the different stages of human growth.

VOCABULARY:

chromosome
egg cell
fertilization
fetus
pregnancy
sperm cell



MATERIALS:

fetus growth chart
ruler
chart on organ development

BACKGROUND:

Babies grow within the womb of their mothers. The sperm of the father unites with the egg of the mother to start the creation of life. The medical profession divides all pregnancies into three trimesters - a period of three months. This division is useful because various events, signs, and developments tend to appear in different trimesters. From a length of three inches and a weight of one ounce, the fetus grows to some 14 inches and a weight of two and quarter pounds at the end of the second trimester. Movements of the fetus become noticeable at about 20 weeks or midway through the second trimester. The mother's weight gain is the most rapid during these three months, averaging close to a pound a week.

Within the first week, three layers of cells form which will later be the start of all organs. The outer layer produces the nervous system, skin, nails, hair, and tooth enamel. The middle layer produces the bones, muscles, kidneys, and circulatory system. The inner layer produces the respiratory and digestive system and the glands.

The genetic material directs the number of cells at a given time in the growing baby. Two cells (the original egg and sperm) divide into the 6 trillion cells of a newborn baby. In this lab we want the students to look at the development of the fetus. All children are curious about what is going on within a woman who is pregnant, it is something obvious, natural, and all of us have gone through it ourselves. Questions from children are natural

and remember that this is not a morality issue, it is a fact of life. Describing and explaining pregnancy in a factual method, will make these students confident of what is going on.

PROCEDURE:

1.This lab looks at the development of the baby in the mother's womb. Students need to measure the fetus during selected periods of growth. On the lab sheet graph, students need to obtain the following information: number of weeks of growth; the size of the fetus at that time; the difference between the last growth and the new growth; the rate of growth (growth/time); and the percent of growth.

2. We suggest that you use a calculator and measure in centimeters because it makes the math much easier. The answers are below. Please note that the precision of the fetus growth is simplified.

	# Weeks	Size cm	Growth cm	Growth Rate	% Growth
5th week	5	.1	.1	.02	2%
8th week	3	.8	.7	.23	23%
12th week	4	2	1.2	.3	30%
18th week	6	3.6	1.6	.26	26%
22nd week	4	5	2.4	.60	60%
26th week	4	6	1	.25	25%
30th week	4	7	1	.25	25%
34th week	4	7.3	.3	.075	7.5%
36th week	4	7.4	.1	.025	2.5%

The rate of growth is greatest between the 18th and 22nd week (4th-5th months). The baby turns around because its head must come out first. The baby turns until it gets into that position.

1. 4th week
2. 5th week
3. 7th month, 5th month
4. 6th month
5. 7th month

3. Students may ask about abortion, but just refrain from your views and tell students that is a moral issue, and not part of this science lesson.

LIFE CYCLE - HUMAN BIOLOGY (6A)

PROBLEM: Does a fetus grow at a constant rate?

PREDICTION: _____

MATERIALS: ruler, fetus growth chart, timetable of fetal development, calculator

PROCEDURE: Measure the fetus in the chart as it grows through time. Record the information below and try to find the period during the pregnancy when the growth is at its highest rate. To figure this you must count the weeks between the measured period. This baby will be 20 inches long after its born. The growth rate can be calculated by dividing the growth by the number of weeks.

	# Weeks	Size cm	Growth cm	Growth Rate	% Growth
5th week					
8th week					
12th week					
18th week					
22nd week					
26th week					
30th week					
34th week					
36th week					

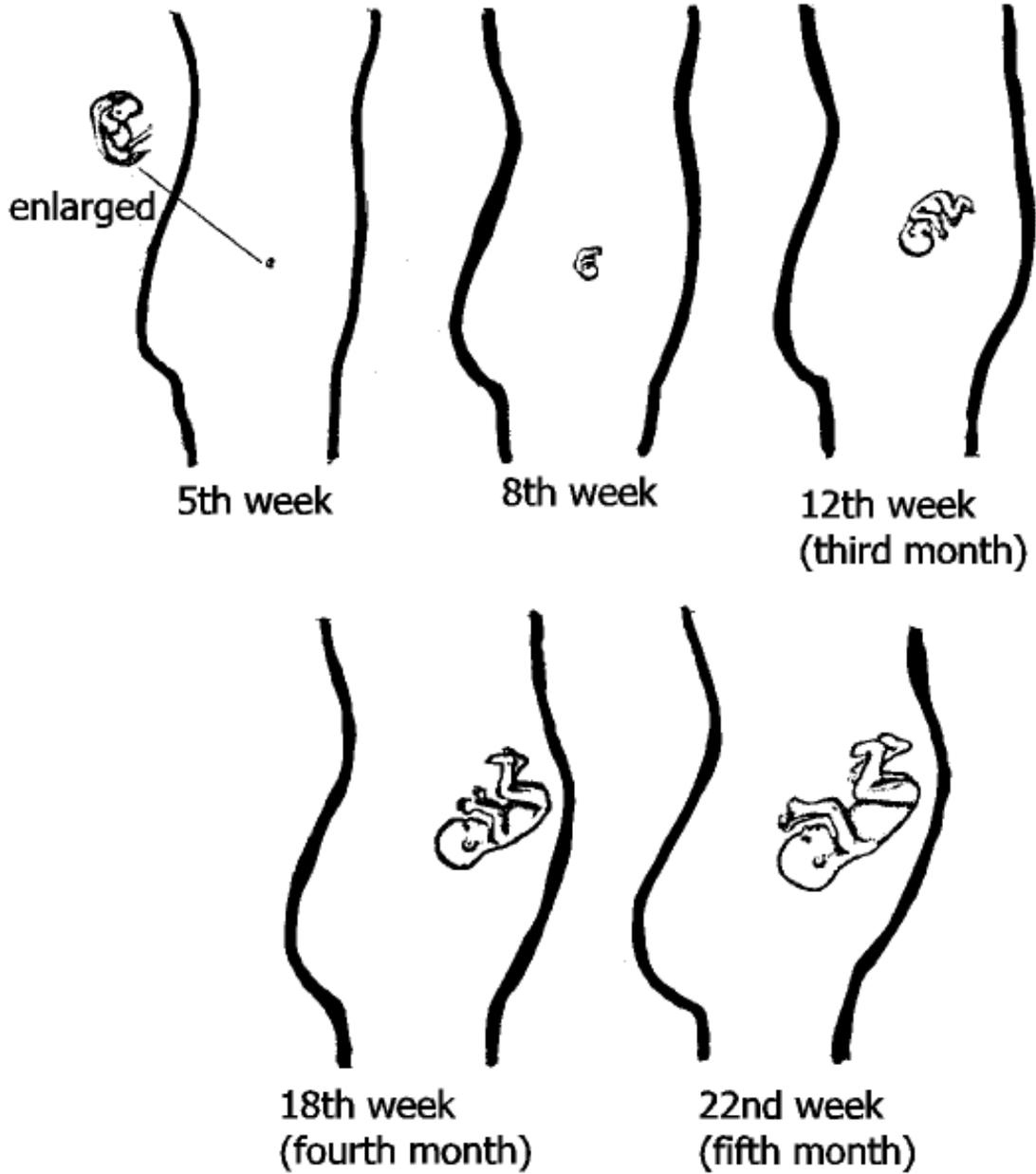
Why is the baby turning around in the womb? _____

Look at the "Timetable of Fetal Development."

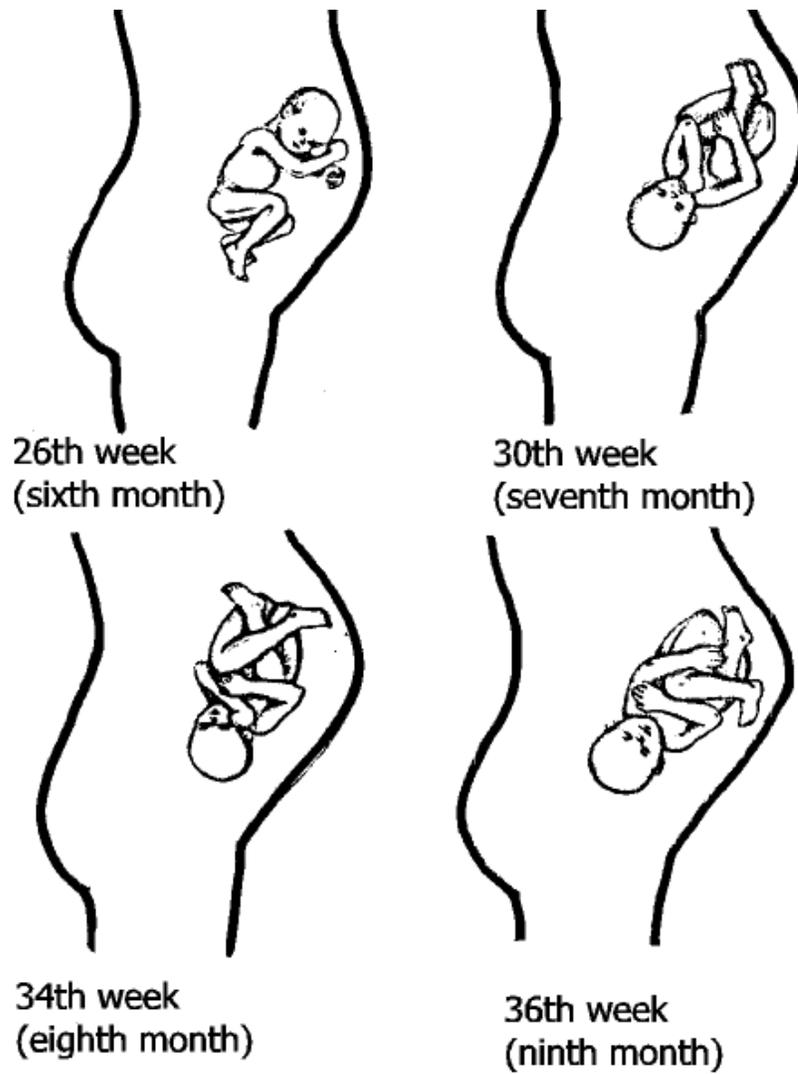
1. When do the gallbladder and liver form? _____
2. Primitive blood vessels form when? _____
3. Eyes open _____ Eye lens form _____
4. Fetus has downy hair over its body _____
5. When does a baby become plump? _____

CONCLUSIONS: When does the greatest growth rate occur?

LIFE CYCLE - HUMAN BIOLOGY (6A) DURING



LIFE CYCLE - HUMAN BIOLOGY (6A)



redrawn from *The Human Body* by R. and B. Bruun

LIFE CYCLE - HUMAN BIOLOGY (6A) LAB

GROWTH OF A FETUS

5-9 days - Remains free in uterine cavity.

10-11 days - Attaches to and begins to become imbedded in the prepared lining of the uterus. The different tissue layers are developing.

14 days - Irregular, blob-like oval body with a longitudinal depression from which cells are pushed into an enlarging body.

18-21 days - Thickening of the neural plate, which is the first sign of the central nervous system. The primitive heart is a simple tube. There are primitive lung buds. Two faint depressions are the sites of eyes. The embryo begins to curve head-to-tail to fit its environment.

4th week - Beginning of gallbladder and liver tubules. Parts of brain begin differentiation. Local dilations indicates beginning of stomach. Heart tube becomes slightly bend. Nose parts suggested. Tiny liver and belly stalk. Primitive head parts, mouth, brain, eyes, ears, are forming. Opening from mouth to gut breaks through; a little later, the anus. Primitive thyroid cells. Windpipe and larynx beginning. The heart is under the chin. First heartbeat occurs. Blood corpuscles form, circulation begins.

5th week - Nasal pit, buds that will be arms and legs, cells that will develop into pancreas gland, tiny thickening that will be tongue appear. The gut elongates. Primitive blood vessels function. Beginnings of eye lens, cranial nerves, retinal layer.

6th week - Arm and leg buds lengthen, faint grooves suggest toes and fingers. Brain recognizable. Lung buds bifurcate. Primitive kidney established. Eyes far to either side of head. Epithelium and primitive ear parts begin to form. Nasal pits recognizable as nostrils. Stomach suggests adult form. Salivary glands identifiable. Skeleton system begins.

7th week - Distinct beginnings of fingers, toes, eyelids, delicate fibrils that will be muscles, autonomic nervous system. Nasal opening break through, optic nerve fibers extend, gallbladder elongates.

8th week - Centers of bone growth established. Thumb and big toe begin to diverge. Local buds destined to be teeth. Rapid growth of nose and upper jaw. Ears are very low on head. Recognizable human form.

3rd month - Eyelids meet and fuse, eyes remain closed until seventh month. Bony parts of skull develop from base of skull upward. Inner ear structure almost complete. Hair

follicles appear. External genitals evidenced by swellings; sex not obvious.

4th month - Brain a recognizable miniature of adult brain; large bulge of forebrain distinguishable from cerebellum and brain stem. Sweat glands appear. Outer skin thickens into distinctive layer.

5th month - Structures of testes and windpipe are well established. Branching structures will become kidney tubules.

6th month - Eyebrows, eyelashes are visible. Fetus is coated with downy hair. Skin ridges form on palms and soles, the lifelong basis of fingerprints and sole prints. The bronchial tree branches out actively, continues to do so after birth.

7th month - Eyelids unfuse, Testes begin to descent. Fat begins to be deposited under translucent skin layers and fetus becomes plumper.

LIFE CYCLE - HUMAN BIOLOGY (6A)

POST LAB

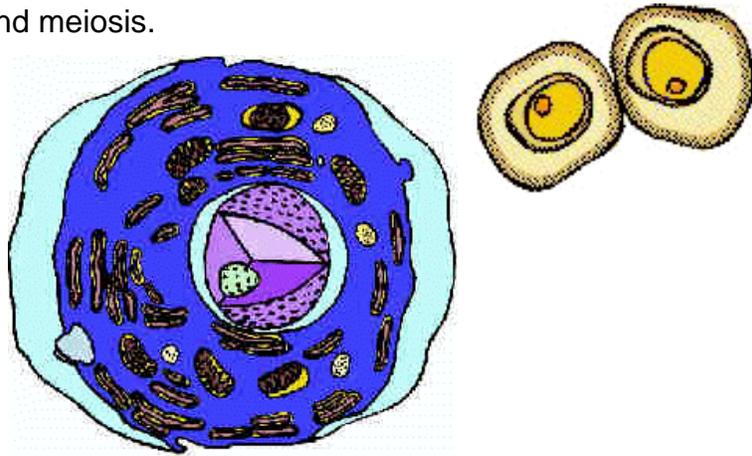
Students use a worksheet to compare meiosis and mitosis.

OBJECTIVES:

1. Exploring how a cell divides.
2. Comparing mitosis and meiosis.

VOCABULARY:

centriole
chromatin
chromosome
meiosis
mitosis



MATERIALS:

worksheet
coloring pencils
Internet

BACKGROUND:

Students need to discover why all cells cannot produce babies. Mitosis is the process whereby cells exactly duplicate themselves. Both old and new human cells contain 46 chromosomes. During meiosis, which involves the sperm and egg cells, each cell has 23 chromosomes. When the sperm and egg unite, the fertilized egg will have the normal number of 46 chromosomes, half from the mother and half from the father.

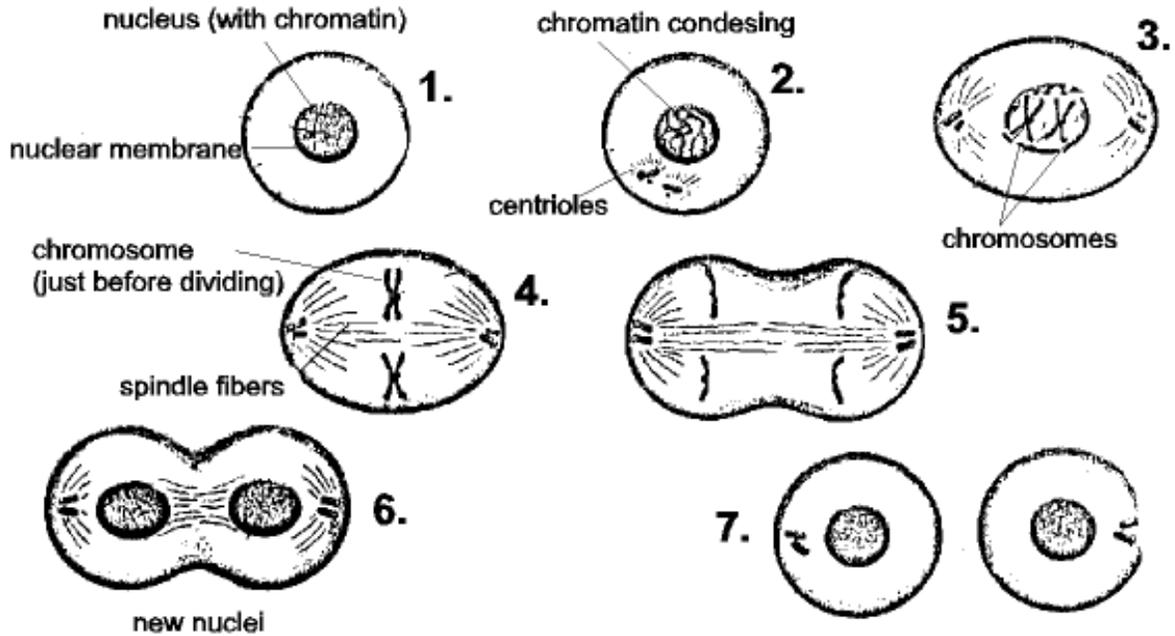
In the worksheet we have the students trace the stages of mitosis and meiosis. Before mitosis begins, the nucleus contains chromatin (protein + DNA). As the cell begins to divide, the chromatin begins to condense into 23 pairs of x-shaped structures called chromosomes. The centrioles (whose function is not fully defined) move and spindle fibers begin to develop around them. Each of the chromosomes become a pair of identical chromosomes. The centrioles are at opposite sides. The spindle fibers stretch from one side of the cell to the other. The chromosomes pair across the center of the spindle. The two halves of each chromosome pair separate and move to opposite sides of the cell. Two new nuclear membranes develop. The cell begins to break. The two new cells are complete.

During meiosis the story is a little different. There are different avenues for the female and male sex cells. Meiosis is the process that produces 23 chromosomes (haploid) from 46 chromosomes (diploid). Meiosis is long and complicated and frequently takes days to complete instead of hours or minutes as does mitosis.

PROCEDURE:

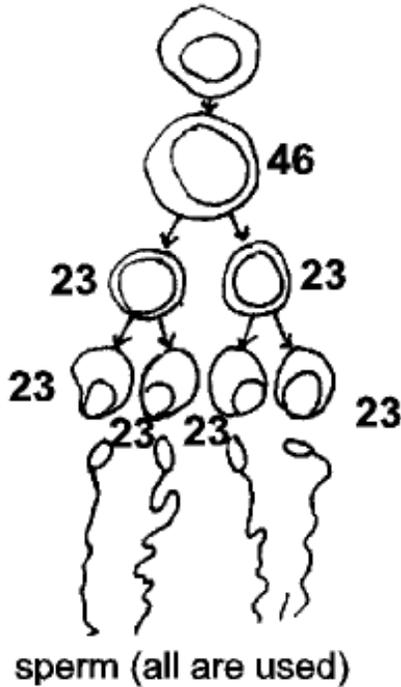
1. Go over the information on the worksheet emphasizing mitosis and meiosis. Mitosis is just the dividing of a cell into equal parts. The two types of meiosis one involving the sperm and one involving the egg. Meiosis is characterized by going through two phases of cell division. The first phase closely resembles mitosis. One sex cell produces two sex cells in the first phase. The two sex cells will then divide again to produce 4 sex cells. In females, however, only one egg is produced (the remaining 3 cells are called "polar bodies" and their function is not positively known.) The resulting sex cell will have one half of the normal number of chromosomes (23). Meiosis only occurs in sex cells, not in other cells.
2. Instruct students to using coloring pencils to make the worksheet more readable.
3. Use the Internet if students are unfamiliar with cell structure. Search under "cells" or "genes" to look for information.

MITOSIS

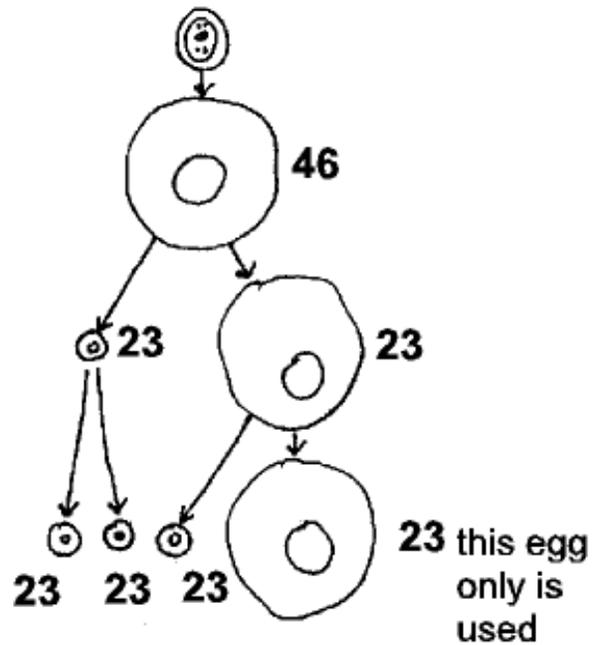


MEIOSIS

MALE SEX CELL



FEMALE SEX CELL



LIFE CYCLE - HUMAN BIOLOGY (6B)

PRE LAB

Students uses a worksheet to compare bacteria, virus, and protozoa.

OBJECTIVES:

1. Distinguishing bacteria, viruses, and protozoa.
2. Understanding an infection.

VOCABULARY:

bacteria
disease
genetic
pathogen
virus



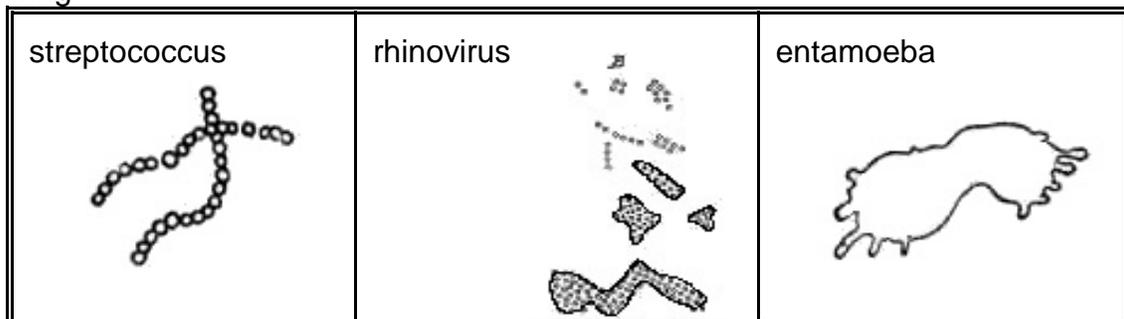
MATERIALS:

worksheet
culture demonstration (optional)

BACKGROUND:

A disease is the abnormal functioning of the body that prevents the body organs or processes from functioning as they should. There are many causes of disease. Disease can be caused by fungi (i.e. athlete's foot), bacteria (i.e. tuberculosis), viruses (i.e. common cold) and protozoa (amoebic dysentery). Not all types of fungi, bacteria, viruses and protozoa are disease-causing agents. The causes of disease are sometimes referred to as germs. The definition of the term germ is sometimes ambiguous. Germs can be carried through food, water, air, animals, and people. "Bad" germs are pathogenic or disease causing organisms and are the ones that make people sick.

Bacteria, viruses, and protozoa cause different infections. The worksheet is just a way for students to look at these "germs" without a microscope. They should look like the following:



Bacteria are extremely small organisms. They are so small that you cannot see them with your naked eye, and need at least 400 times magnification with your microscope to begin seeing them. Identifying bacteria is very difficult since they are very small. Many times scientists have to make a culture of a suspect bacteria to find out what problem the suspect bacteria may have caused. This culture is allowed to grow in a petri dish and the colony of bacteria is then observed. Bacterial diseases include pneumonia, strep throat, trench mouth, boils, blood poisoning, gonorrhea, chancre sores, bubonic plague, cholera, and syphilis.

Viruses are composed of a protein overcoat enclosing a core of either DNA or RNA. Once a virus is attached to a susceptible cell it dissolves a hole through the membrane and uses the cell's processes to reproduce. Diseases that are caused by viruses include the common cold, influenza, herpes, yellow fever, shingles, rabies, polio, and mononucleosis.

Protozoa are single celled organisms. Most protozoa do not cause infections, but a few do. Malaria, dysentery, African sleeping sickness are caused by different species of protozoa.

PROCEDURE:

1. You may want to prepare agar solutions and grow bacteria cultures to show your students. We do not recommend that the students do this, the germs could get out of control! It is necessary to stress that probably all of the bacteria grown will be harmless, but that the students shouldn't touch the cultures with their hands. Make sure that they wash their hands if they touch the cultures

2. Below are materials and instructions that can be used to make your own cultures. You can also purchase ready-made agar petri dishes. You can also use a thin layer of pectin (usually in the grocery store with "Canning" supplies.)

MATERIALS: agar, water, glassware, hot plates, petri dishes, tape, marking pens

- a. Make sure that all the glass and petri dishes that you use are clean. If not, wash with soap and water and let stand to dry upside down. Do not dry with a cloth or paper towel.
- b. Weigh about 2.5 grams of agar from the bottle labeled NUTRIENT AGAR.
- c. Fill a beaker with 100 ml of water and add agar to water.
- d. Boil the solution and be sure to stir frequently. Keep your eyes and face away from the top of the beaker.
- e. Let the solution stand at 100 degrees centigrade for 15-20 minutes.
- f. Pour the solutions into the clean petri dishes and tape the dish around the edges where the two tops meet.
- g. Label the dishes and store them until the next lab period.

****NOTE: THE INSTRUCTIONS ABOVE MAKE ENOUGH MATERIAL FOR ONE PERSON. YOU WILL HAVE TO ADJUST THE AMOUNT OF AGAR AND**

WATER DEPENDING ON YOUR CLASS SIZE.

2. You can then prepare your bacteria colonies by inoculating the agar. Remove the tape from the petri dish and take the top cover off. With a clean toothpick make two lines so that there are 4 sections in the dish. With a clean toothpick scrape the inside of your mouth. Do not poke your skin, just scrape your inside of the cheek. Rub the toothpick on the agar, very gently. DO NOT poke or scratch the agar, just rub it. On the other section, place a piece of hair, spit, scab, or anything else to see if bacteria will grow.

3. After you have inoculated all 4 sections tape the petri dish. Store in a place that is warm (not hot). After you see growth, we recommend that you use a Microbiology book if you want to identify your colony of bacteria. Discard the germs with care under sanitary conditions.

4. Use the worksheet and have the students create a picture of each of the different types of diseases. You may also want to do an Internet search to find out more information on diseases.

LIFE CYCLE - HUMAN BIOLOGY (6B) PRE

WHAT CAUSES DISEASES?

Certain bacteria, viruses, and protozoa are responsible for many diseases that affect humans. Below is a brief description of one disease-causing agent from each of the three groups and the name of a disease each agent causes. Using the characteristics given, draw the disease-causing agent in the space provided.

<p>BACTERIA</p> <p>(STREPTOCOCCUS)</p> <p>CAUSES STREP THROAT</p> <p>small spherical bodies, lined-upside-by-side, forming "s"-shaped chains</p>	
<p>VIRUS</p> <p>(RHINOVIRUS)</p> <p>CAUSES COMMON COLD</p> <p>spherical bodies with smaller, randomly arranged spherical bodies within them</p>	
<p>PROTOZOA</p> <p>(ENTAMOEBA)</p> <p>CAUSES DYSENTERY</p> <p>shapeless blobs with cell walls that keep them held together</p>	

LIFE CYCLE - HUMAN BIOLOGY (6B)

LAB

Students sort bacteria and viruses.

OBJECTIVES:

1. Distinguishing viruses and bacteria.
2. Distinguishing inherited characteristics.

VOCABULARY:

bacteria
vaccine
virus

MATERIALS:

worksheet on viruses/bacteria



BACKGROUND:

Bacteria come in three different shapes: (1) coccus or sphere shaped; (2) bacillus or rod shaped; (3) spirillum or spiral, corkscrew shape. Bacteria have a tough outer coating which gives them a cell-like shape.

Viruses are non-living and cannot reproduce without using the mechanisms of a host cell. Once a virus enters a host it can cause great damage. Viruses come in different shapes. Viruses are smaller than bacteria, have no nucleus, no cytoplasm, and no surrounding cell membrane. There are, however, some viruses, that produce a "fake" cell membrane that is used in tricking the immune system. Actually, a virus can almost be considered a chemical crystal.

Bacteria and viruses that cause disease are called pathogens. Pathogens can enter a body through the air, water, or through contact with an infected body. Diseases caused by bacteria can usually be cured with medication. Viral diseases on the other hand cannot be cured because there is no medication that will stop viruses. The immune system of the human body has to fight the viruses, sometimes the body wins but many times it loses. Vaccines can help prevent the virus in the first place. Viruses are very difficult to study.

PROCEDURE:

1. Go over the characteristics of bacteria and viruses using the student's lab sheet.
2. Instruct the students to cut out the viruses and bacteria and try and sort them into their respective groups. Tell students to write their answer on the back site of each picture with the reason for the student putting it in its group. This is not an easy lab, because the

weird shapes that both bacteria and viruses take.

3. The bacteria and viruses on the chart are: 1. phage, a virus that invades the cells of bacteria; 2. Influenza virus, causes influenza; 3. generalized mycoplasma (bacteria); 4. tobacco mosaic virus, results in disease of tobacco plants; 5. smaller tobacco mosaic virus; 6. micrococcus radiodurans (bacteria); 7. spirillum bacteria; 8. crystal of adenovirus particles within the nucleus of a human cell; 9. polio virus; 10. bacillus bacteria; 11. tumor virus; 12. pseudomonad bacteria; 13. prochloron bacteria; 14. spirillum bacteria; 15. cell invaded by bacillus bacteria; 16. influenza virus.

LIFE CYCLE - HUMAN BIOLOGY (6B)

PROBLEM: What is the difference between a bacterium and a virus?

PREDICTION: _____

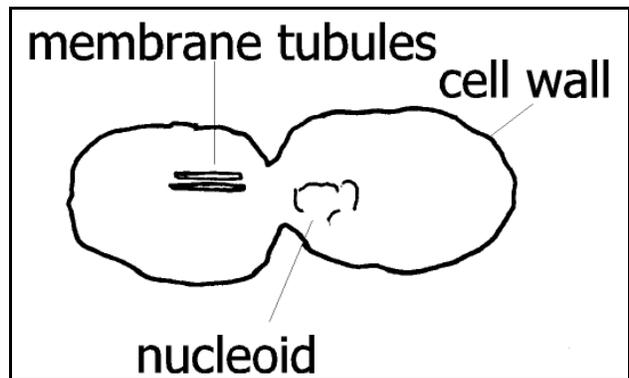
MATERIALS: bacteria and virus sheet, glue, construction paper

PROCEDURE:

1. Go over the characteristics of a bacteria and virus using the diagrams below.
2. Cut the bacteria and virus sheet and group them into bacteria and viruses.
3. Glue the pieces on 2 separate sheets of construction paper and label bacteria and viruses.

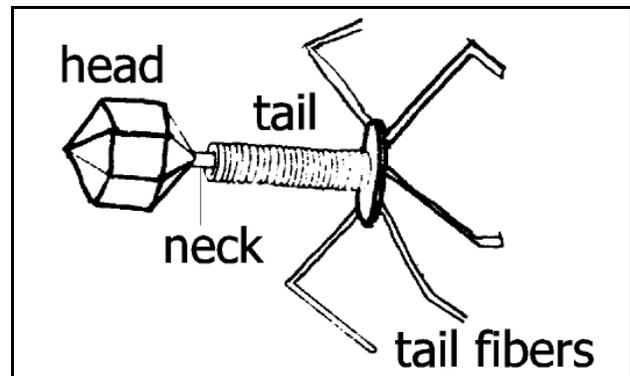
BACTERIA

1. 3 basic shapes: bacillus, coccus, and spirillum
2. have a tough outer covering called the non-cellulosic cell wall



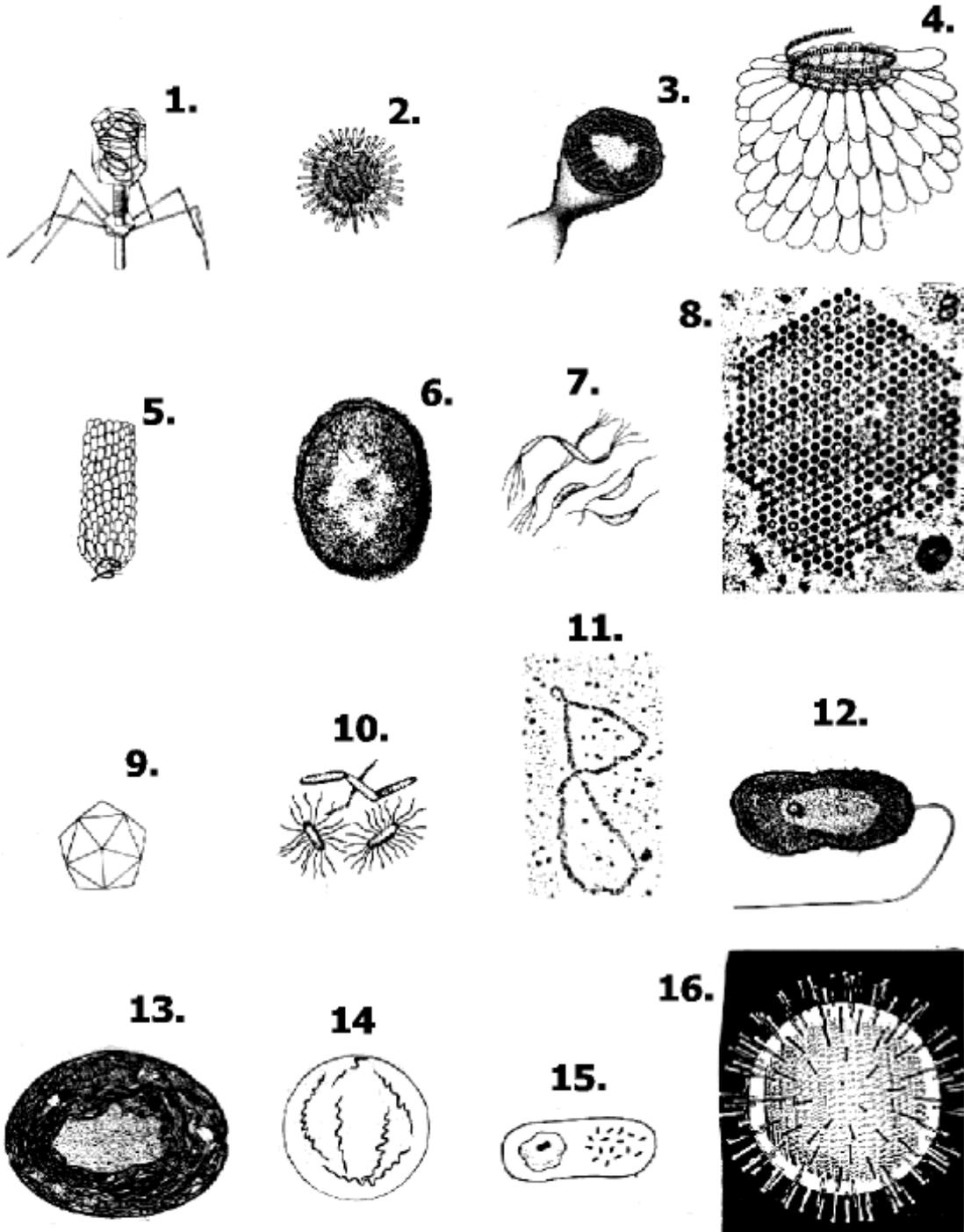
VIRUS

1. non living, needs a host to reproduce
2. composed of nucleic acid enclosed in a coat of protein



CONCLUSION: How can you tell the difference between a bacterium and a virus?

LIFE CYCLE - HUMAN BIOLOGY (6B)



LIFE CYCLE - HUMAN BIOLOGY (6B)

POST LAB

Students discuss genetic disorder versus other diseases.

OBJECTIVES:

1. Distinguishing illnesses.
2. Comparing genetic disorders with diseases.

VOCABULARY:

bacteria
disease
disorder
genes
inherited
virus



MATERIALS:

Germs Make me Sick! by Melvin Berger (optional)

BACKGROUND:

Many students cannot distinguish the difference between a genetic disorder and a disease. Cavities, earaches, and skin boils are caused by bacteria. The common cold, AIDS, measles, and cancer are all caused by viruses. Sickle cell anemia and hemophilia are genetic disorders. If students are not clear or unaware of what heredity and genetics are, you may want to discuss that certain characteristics of humans are genetic, or carried on from one family generation to another generation.

How do you determine which characteristics are genetic? Ask the students to look at their neighbor's ear lobe and observe if the ear is attached to his face or if it is free. This is a genetic trait within families. If you can roll your tongue, if your thumb bends back, your eye color, and your hairline type are all genetic traits that are inherited. The direction of your hair growth, or hair whorl is also genetic. These are characteristics that do not adversely affect the human body, but some genetic traits can cause severe damage to a human body. The chances of getting a genetically impairing trait are statistically linked to recessive and dominant gene pools.

PROCEDURE:

1. To illustrate this to your students, get a piece of 8 1/2" x 11 paper and randomly place one or two colored lines on the paper (short direction). This represents a "genetically transmitted" trait that will result in a disorder. Cut out 4 paper dolls, by folding the paper

in half. (This represents how many children were born by parents with the trait.) Some genetic mishaps are not inherited, but represent a departure from the average human genetic make up. In other words, not all the children will have the disorder.

2. Ask the students if they can determine whether an illness is bacterial, viral, or genetic. You may want to make a list as they bring each disease up.

BACTERIAL	VIRAL	GENETIC *NOT INHERITED
tuberculosis acne strep throat pneumonia boils gonorrhea bubonic plague cholera syphilis chancre sore	polio mumps measles AIDS common cold yellow fever influenza mononucleosis	sickle cell anemia mongolism * cystic fibrosis color blindness Huntington's disease baldness hemophilia

3. You can use the recommended book, *Germs Make me Sick* and see if students can critique the book for correctness. For instance, is the term "germ" appropriate. "Germ" is not a scientific name, but yet the book makes it appear that it is. There are also other mistakes like there should be a picture of a virus when it really is a bacterium. Students should critique whether the students who read the book would really understand the difference of germs.