

GRADE 6

TEACHER BACKGROUND INFORMATION

GROWTH AND DEVELOPMENT

THE EXCRETORY SYSTEM

The excretory system consists of the kidneys which form urine; the ureters which carry the urine from the kidneys to the bladder; and the urethra - the exit tube leading from the bladder through the penis in males and through an opening in the vulva in females.

The **kidneys** are two reddish-brown bean-shaped organs. They are located on each side of the backbone just below the diaphragm and in front of your floating ribs. Each kidney is covered by a thin transparent membrane called the **capsule**.

The kidney functions to maintain a chemical balance in your body fluid. The kidney must:

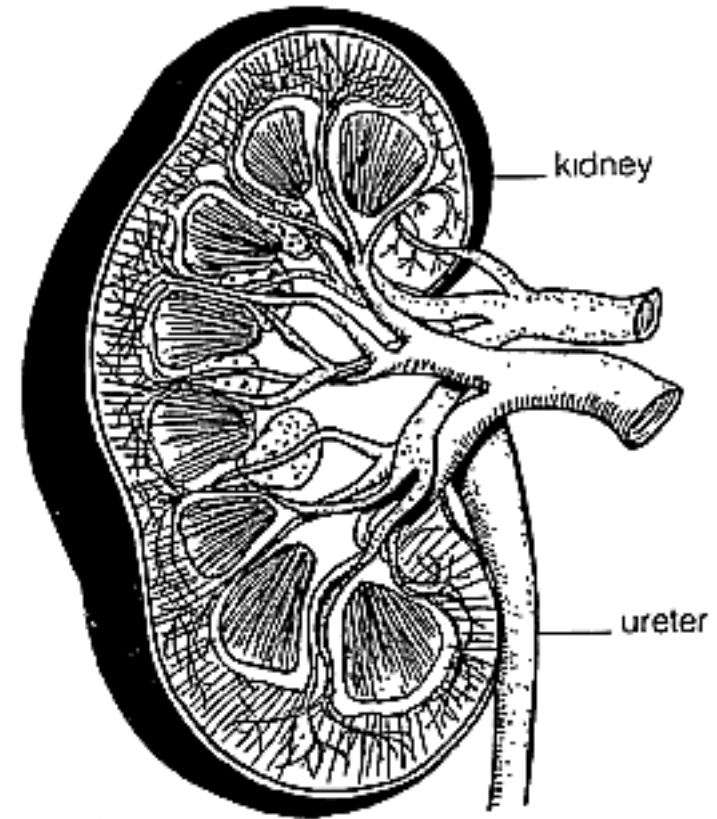
1. Filter excessive water from the blood.
2. Filter waste products (urea) from protein metabolism.
3. Filter excessive salts, sugars and other materials.
4. Maintain osmotic pressure of the blood.
5. Maintain the acid-base balance of the blood.

Basically, the job of the kidney is that of removing excess water, urea, salt and sugar from the blood. About one litre of blood passes through the two kidneys each minute.

The urine is collected within the kidney and passes into a muscular tube, the ureter, 25 cm in length, which conducts the urine to the bladder. In its final form the urine is composed mainly of water, urea and salt. The bladder which collects and stores urine, can hold about one litre of fluid. Urine is passed from the bladder outside the body via the urethra.

Adapted from: Harvey, D. and White, D., (ed.)
Body Systems and Physical Fitness.

Adult kidneys are approximately the size of a man's fist.



COMMON PROBLEM CONDITIONS OF THE EXCRETORY SYSTEM

Problems	Cause	Brief Description
bladder infection	<ul style="list-style-type: none">- bacteria enters bladder from urethra	<ul style="list-style-type: none">- signals frequent urination, burning, pus and/or blood may appear in the urine- medical care is required
kidney infection	<ul style="list-style-type: none">- bacteria or improper immune system response to infection	<ul style="list-style-type: none">- can cause impaired kidney function and lead to kidney failure- infections must be treated- medical care is required
kidney failure	<ul style="list-style-type: none">- infections- blockage- sudden drop in blood pressure- diseases e g , diabetessevere injury	<ul style="list-style-type: none">- a severe condition because body wastes are no longer removed from the body- hemodialysis and/or kidney transplant may be used in treatment
stones		

WAYS TO CARE FOR THE EXCRETORY SYSTEM

Positive health habits related to the excretory system include:

- careful toileting hygiene, females should wipe from front to back to avoid contaminating urethra and/or vagina
 - frequent showers, avoiding heavy use of bubblebaths
 - prompt changing of diapers
 - avoidance of tight fitting leans or slacks
 - use of cotton rather than nylon underwear
 - completing bladder emptying to avoid overdistention of the bladder
 - regular bladder habits (discourage the holding of urine and avoid overdistention of the bladder)
 - adequate fluid intake
 - normal exercise to improve blood circulation
 - avoidance of excessive amounts of highly spiced foods or beverages which may cause frequent urination or burning sensation
- avoidance of severe and prolonged chilling of the body
 - avoidance of self-medication for kidney ailments
 - use of protective pads and avoidance of blows on the back during contact sports
 - prompt treatment by doctors of infections (particularly streptococcal infection)
 - maintenance of normal blood pressure by following these lifestyle practices
 - regular checking of blood pressure
 - decrease in salt and alcohol intake
 - reduction of stress and smoking
 - maintenance of ideal weight for height and frame

THE NERVOUS SYSTEM

The nervous system consists of the brain, the spinal cord and the nerves.

The brain is the centre of the body's nervous system. The major parts of the brain are the cerebrum, the cerebellum and the brain stem.

The cerebrum is the largest part of the brain. It controls learning, thinking, creativity, memory, body movements and the senses. It is divided into two hemispheres.

The cerebellum is found below and to the back of the cerebrum. It controls balance, posture and muscle co-ordination.

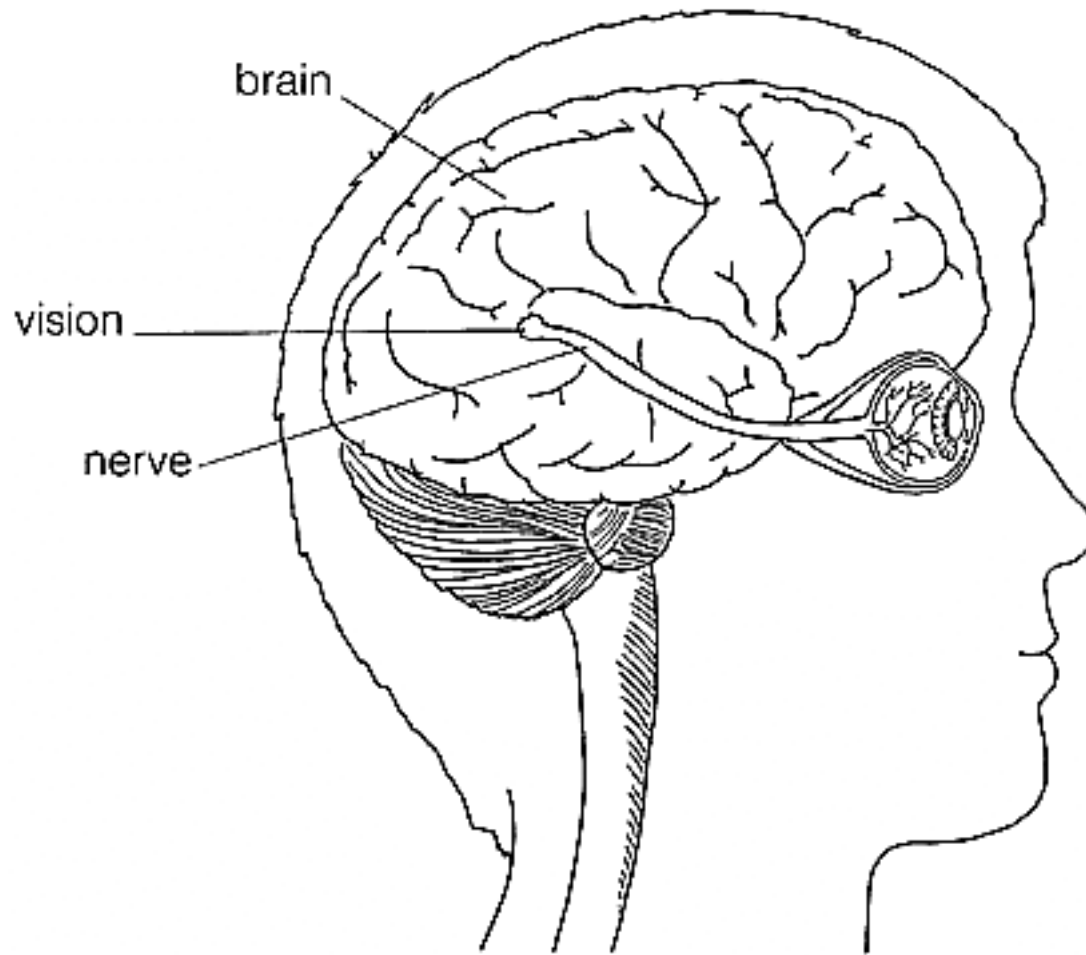
The brain stem connects the cerebrum with the spinal cord. This centre controls breathing, heart rate, swallowing, hunger, thirst, fear, anger, wakefulness and coughing.

The spinal cord runs from the brain through the spine and down the back. The nerves branch out from the spinal cord to all body parts. These nerves carry brain signals from the spinal cord to other body parts. The nerves also carry signals from the body to the spinal cord, which brings them to the brain.

Because the brain and spinal cord are so vital they have protective coverings. The bony skull (cranium) surrounds and protects the brain. The skull is tightly jointed with several protective membranes and fluid that protect the brain from shocks and sudden movements. The spinal cord is enclosed by a bony, vertebral column known as the spinal column.

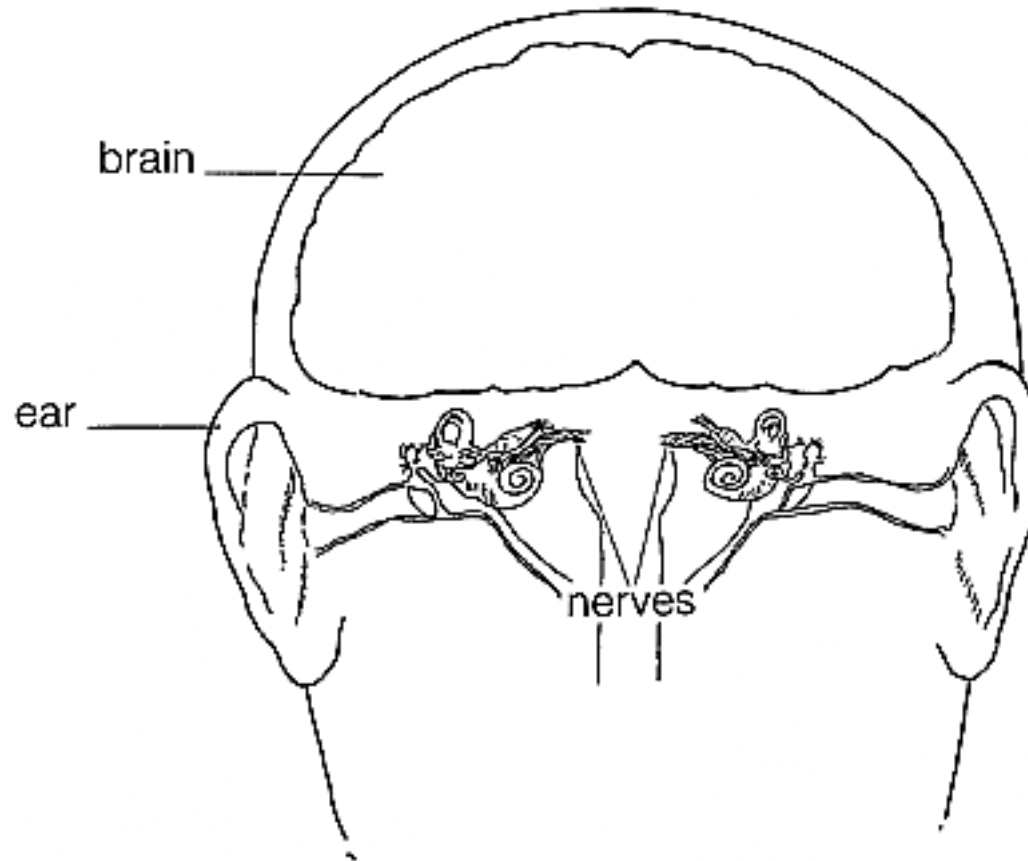
HOW WE SEE

A nerve at the back of the eye goes to the brain carrying sight messages. The brain tells you what you see.



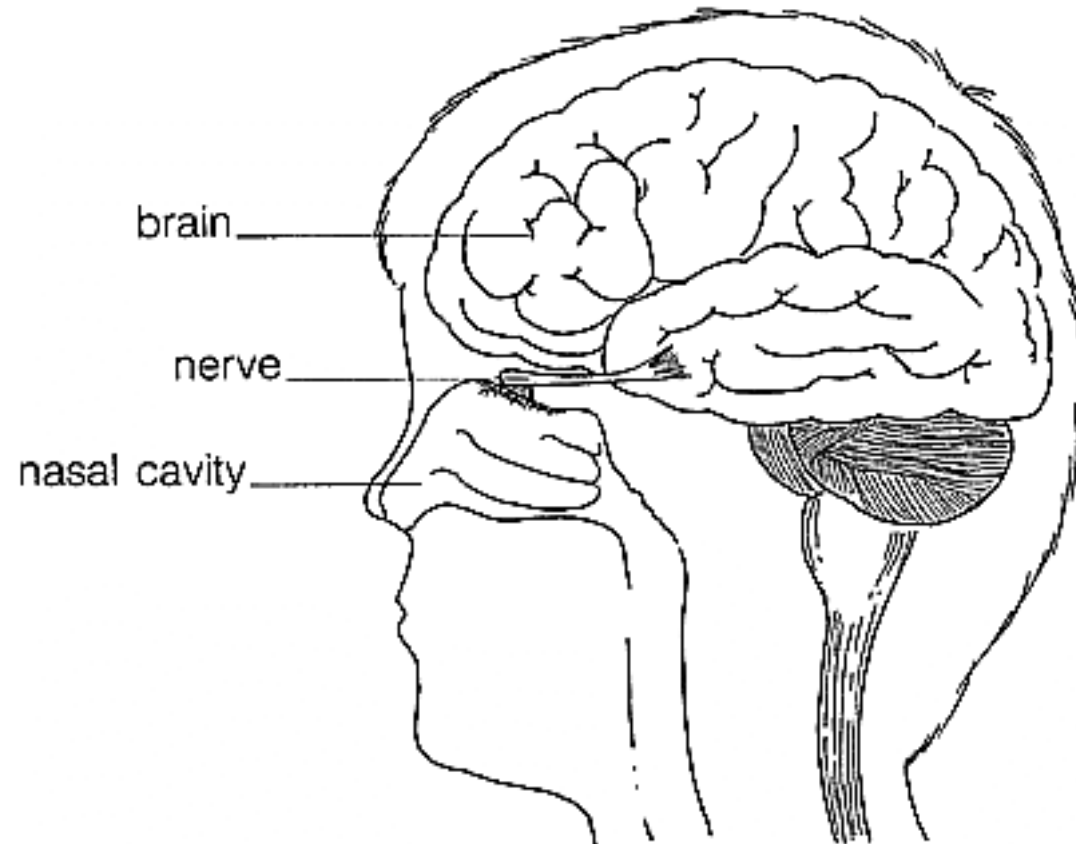
HOW WE HEAR

A nerve at the back of the ear (inside the head) runs to the brain carrying sound messages. The brain tells you what you hear.



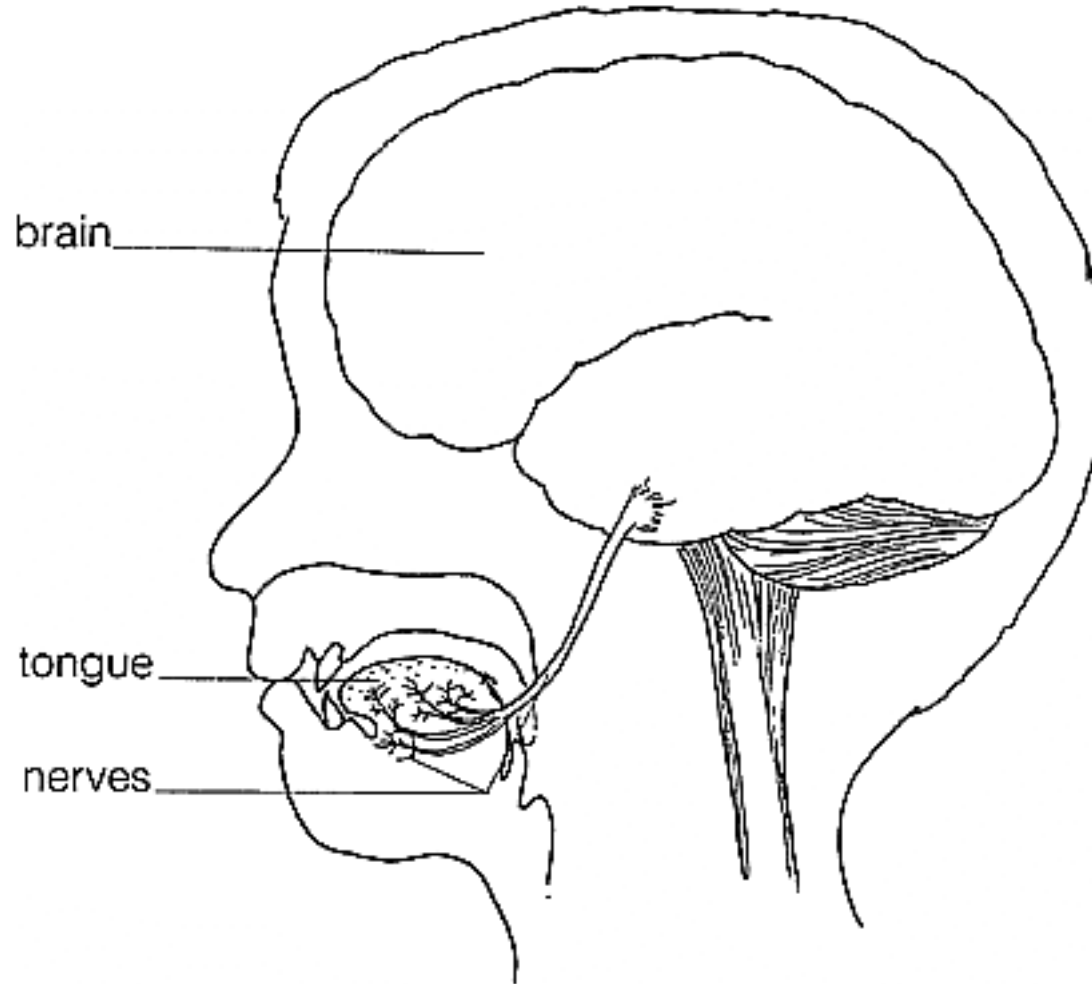
HOW WE SMELL

A nerve, with many branches in the nose, carries odour messages to the brain. The brain tells you what you smell.



HOW WE TASTE

Inside the tongue are small nerves which join a large nerve running to the brain. The tongue nerve carries a taste message to the brain. The brain tells you what you taste.



COMMON PROBLEM CONDITIONS OF THE NERVOUS SYSTEM

Problems	Cause	Brief Description
headaches	- stress, eyestrain, colds, infected sinuses, allergies, tumor, disease	- common pains in forehead, back of head and neck, behind eyes
concussion (head injuries)	- severe blow to head	- possible loss of consciousness, severe headache, blurred vision
hearing impairment	- infection (i.e. measles), damage (i.e. noise), obstruction	- gradual loss of hearing or distortion of hearing
meningitis	- germs (bacteria or virus)	- inflammation of membranes around the brain and spinal cord, contagious, stiff neck, fever, headache, nausea, vomiting
spinal cord injury	- accidents e.g., motor vehicles, falls	- loss of ability to move a part of the body due to nerve or muscle damage (paralysis)
snow blindness	- not wearing proper eye protection in bright sunlight	- sore eyes, vision impairment
epilepsy	- sudden surge of brain impulses	- convulsions - violent body shaking and loss of consciousness, small convulsions, clouded consciousness
intoxication, mood alterations	- alcohol and other drugs	- depresses or speeds up brain function which can cause lessening of self control, muscle co-ordination change, speech and vision impairment, memory and intelligence damage, coma - kidney damage - mental retardation in unborn babies caused by pregnant woman's drinking

WAYS TO CARE FOR THE NERVOUS SYSTEM

Positive health habits related to the nervous system include:

- using a helmet when riding all terrain vehicles
- driving slowly and carefully when riding all terrain vehicles
- avoiding drugs, caffeine, alcohol, tobacco, inhalants (glues, gasoline)
- playing in safe places to avoid falls, suffocation, drowning, electrical shock
- using proper sports equipment in contact sports
- following safety rules around water, motor vehicles, play equipment, medicines and chemicals
- taking care of sensory organs
- using seat belts when in motor vehicles
- choosing smoke-free places to work and play whenever possible
- eating nutritious foods
- finding time to rest, sleep and relax

DISEASES

Every day, people are exposed to many microbes (germs). Some people's health is affected by these microbes, while other people's health is not.

Germs are tiny, living things that are invisible to the human eye, but can be seen with a microscope. There are two main types of microbes.

bacteria: one cell, most common form of life, grow in water, soil, air and other living things

viruses: smaller than bacteria, grow within other living cells.

Whether a person develops a disease is related to:

- the number of germs s/he is exposed to;
- the kind of germ (some are more infectious and harmful than others);
- how healthy s/he is.

Germs enter the body by a number of different routes:

- through the air (e.g. sneezing);
- through untreated drinking water;
- through food which has been improperly prepared or stored;
- by insects;
- through cuts;
- through body orifices e.g. eyes, mouth, ears etc.

The body has a number of ways of protecting itself from disease:

- first line of defence e.g. skin, mucous membranes, hair (cilia), body secretions, reflexes
- second line of defence e.g. white blood cells which surround and dissolve germs
- third line of defence e.g. production of antibodies. (Antibodies are produced in the blood to fight germs that enter the body. Each antibody fights a different germ.)

Once a person's body has developed antibodies against a specific disease, that person is immune to the disease.

DISEASE PREVENTION

Positive health habits related to the prevention of disease include:

- covering nose or mouth when sneezing or coughing,
- covering/refrigerating food,
- properly washing and cooking food,
- protecting oneself from insect bites,
- not sharing dishes, combs, etc ,
- washing hands with soap and water before eating and after going to the bathroom,
- properly caring for cuts,
- staying away from other people if one is sick

OTHER DISEASES WITH WHICH STUDENTS MAY BE FAMILIAR

Problem	Communicable	Cause	Brief Description
AIDS	Yes	<ul style="list-style-type: none"> - virus - spread from person to person usually by sexual contact 	<ul style="list-style-type: none"> - break down of the body's immune system which makes the person susceptible to many different diseases
arthritis	No	<ul style="list-style-type: none"> - Unknown 	<ul style="list-style-type: none"> - swelling and inflammation of a joint or joints causing pain and stiffness
bronchitis	No/Yes	<ul style="list-style-type: none"> - irritants - spread from person to person by direct contact 	<ul style="list-style-type: none"> - an inflammation of the mucous membrane of the bronchi with fluid and thick mucus accumulation; - signals cold, hoarseness, coughing
cancer	No	<ul style="list-style-type: none"> - environmental, hereditary, biological factors 	<ul style="list-style-type: none"> - normal body cells become malignant
chicken pox	Yes	<ul style="list-style-type: none"> - spread from person to person by direct contact, virus 	<ul style="list-style-type: none"> - slight fever, headache, backache, loss of appetite, small red spots on the back or chest, spots enlarge and a vesicle of clear fluid appears, itchy
common cold	Yes	<ul style="list-style-type: none"> - spread from person to person by direct contact, virus 	<ul style="list-style-type: none"> - upper respiratory infection, especially of nose and throat, - signals headache, runny/stuffed nose, watery eyes, fever, cough
diabetes mellitus	No	<ul style="list-style-type: none"> - genetic and/or environmental predisposition, possible virus 	<ul style="list-style-type: none"> - inability to make or utilize insulin to break down blood sugar - a controlled diet and/or insulin injections may be necessary
ear infection	Yes	<ul style="list-style-type: none"> - environmental predisposition, virus, bacteria, spread from person to person by direct contact 	<ul style="list-style-type: none"> - severe pain, fever, draining of the ear
emphysema	No	<ul style="list-style-type: none"> - smoking, pollution 	<ul style="list-style-type: none"> - lung disorder in which the bronchioles become plugged with mucus, onset - 40-80 years old
German Measles (Rubella)	Yes	<ul style="list-style-type: none"> - spread from person to person by direct contact, bacteria 	<ul style="list-style-type: none"> - slight cold, some fever, sore throat, lymph nodes swell, rash on face and scalp, then to body and arms, spots do not run together - rash fades in 2-3 days

OTHER DISEASES WITH WHICH STUDENTS MAY BE FAMILIAR (CONTINUED)

Problem	Communicable	Cause	Brief Description
impetigo	Yes	- spread from person to person by direct contact, bacteria	- thin walled vesicle which ruptures and is covered by a honey-yellow crust, spreads in circles on exposed parts of the body
influenza (flu)	Yes	- spread from person to person by direct contact, virus	- fever, chills, headache, sore throat, cough, intestinal disorders, muscular pain
lice (pediculosis) (head lice)	Yes	- spread from person to person by direct contact	- visible white specks in the hairs of the back of the head, glands behind ears and back of the neck are enlarged, itching
meningitis	Yes	- spread from person to person by direct contact	- headache, vomiting, nausea, stiff neck, chills, fever, irritability, confusion and later convulsions
mumps	Yes	- spread from person to person by direct contact	- swelling of glands in the neck, pain, tenderness, fever, loss of appetite, back pains, headache
red measles	Yes	- spread from person to person by direct contact	- tired and uncomfortable, running nose, fever, pains in back and head, small white dots on the gums, rash at the hairline spreading down the body, spots may run together to form blotches
pneumonia	Yes	- virus, bacteria	- an infection of the lung tissue often accompanied by fluid, - signals breathing difficulty, fever and coughing
scabies	Yes	- spread from person to person by direct contact	- intense itching, more often at night, usually one month after initial infection
strep throat	Yes	- spread from person to person by direct contact, bacteria	- sore throat, headache, red pharynx, enlarged tonsils, flushed face
tuberculosis (TB)	Yes	- spread from person to person by direct contact	- mainly a disease of the lungs with development of lesions, - signals fever, weight loss, cough, sputum, blood, pain, difficult to breathe
tonsillitis	Yes	- spread from person to person by direct contact	- tonsils act as a defence against respiratory infections, signals include sore throat, enlarged tonsils, difficulty in swallowing

AIDS INFORMATION (January, 1988)

What is AIDS?

AIDS is an acronym which stands for Acquired Immune Deficiency Syndrome.

AIDS is a new and frightening disease which is caused by a virus known as HIV...Human Immunodeficiency Virus (also LAV, HTLV, ARV). The virus attacks the t-helper cells, a group of white blood cells that are an important part of the human immune system. Once they have been destroyed, the person is susceptible to a variety of opportunistic infections which are normally extremely rare, but are common in people with this disease (e.g. Kaposi's Sarcoma, Pneumocystis Carinii Pneumonia, etc.). Researchers have recently identified a second virus (HIVII) which also causes AIDS, but is less widespread than the original virus.

One of the reasons why AIDS is so frightening is that there is no cure and no vaccine. There are some new drugs, including one called AZT, that help prolong the life of an AIDS patient but they are still in the trial stage and they do not stop the progression of the disease. There is a tremendous amount of research being done but it is unlikely that there will be a vaccine for a number of years. About half the people who have developed AIDS have died.

Where did AIDS come from??

The disease probably started in Africa. The first documented case in Africa was in the mid-70's in a species of monkey, called the green monkey. It was probably transmitted to humans through a bite since it is common for people to have these monkeys as pets. The disease is not fatal to monkeys, but in humans it is deadly. The disease spread through the population in Central Africa (e.g., Zaire) and slowly spread across to Haiti via migrant workers.

It most likely reached the U.S. in 1979. The first case of the disease in the States was in 1981. It probably reached Canada sometime in 1981, since the first case in Canada was identified in 1982.

What are the present AIDS statistics in Canada?

There are currently about 59,832 people with AIDS in the world, 41,770 in the U.S. and about 1303 in Canada (as of Oct 5, 1987).

Canada

SEX	ALIVE	DEAD	TOTAL
Adult male	588	624	1212
Adult female	29	36	65
Infant male	3	10	13
Infant female	5	8	13
Totals	625	678	1303

International

North America	43,657
Europe	6,249
Asia	175
Oceania	628
Africa	5,126
South and Central America	3,997
Total	59,832

For each person with the disease AIDS, scientists estimate that there are from 50 to 100 people who are infected with the virus.

Normally when the body is invaded or exposed to a virus such as a cold virus, the body's immune system comes into play, producing antibodies against the virus which help to combat the invader. In the case of HIV, the virus which causes AIDS, it invades the body, and after a period of time, antibodies to the virus are produced. The difference is that these antibodies are not effective in controlling the virus. Instead, they serve as an indicator that the person has been infected with the HIV virus. Although there is a lag time after exposure, before antibodies can be detected, the infected person can still pass the virus on to others at this time. Some people never produce antibodies but are carriers of the virus.

Who can get AIDS?

AIDS can affect anyone. In Africa, 50% of people with the disease are women. When AIDS first reached North America, and started to affect homosexuals, it became known as "The Gay Plague". However, the incidence of AIDS among the heterosexual population is increasing rapidly.

High risk groups

The majority of the people with AIDS in North America are still homosexual or bisexual men. Although intravenous drug abuse is not as big a problem in Canada as it is in the U.S., people who share drug needles are at high risk of contracting the AIDS virus. People who received massive blood transfusions between 1979 and 1985 represent another high risk group. Sexual partners of any of these people are also at risk. Most of the children who have the disease have contracted it from infected parents, either prenatally or during birth itself. These are the "High Risk Groups".

How do people get AIDS?

Most people are not in danger of becoming infected with the AIDS virus. AIDS is hard to get. It is not nearly so infectious as the flu, colds or measles.

It is not spread by casual contact such as touching, coughing, sneezing, handling food, sharing work or living space or from toilets. It is not spread from donating blood.

AIDS is spread from an infected person to an uninfected person through the exchange of blood, semen and vaginal fluid. This is usually through sexual intercourse. The virus gets into the blood through small cuts or damage to the lining of the vagina, penis or rectum. The rectum is especially liable to be damaged during intercourse.

It can also be spread when IV drug abusers share needles.

Although there have been a few case studies suggesting that the AIDS virus is transmitted through breastmilk, these are *not* scientifically documented.

How do people protect themselves against AIDS?

People who have been in a monogamous relationship for at least the past six years and who don't inject illegal drugs, are not at risk, as long as they continue to have sex only with each other.

If the AIDS virus is present, some sexual practices are more likely than others to allow transmission of the virus. Some activities are completely safe, others are extremely risky, others have some risk associated...

- i) **completely safe**: dry kissing, hugging, massage, mutual masturbation, and other activity that does not allow blood, semen, or vaginal fluid to enter the body are completely safe.
- ii) **low risk**: French kissing - although small amounts of the virus have been found in saliva in laboratory situations, there are no known cases of people who have been infected this way.
- iii) **moderate risk**: oral sex - there is some risk of the virus being transmitted from vaginal fluid or seminal fluid to cuts in the mouth.
- iv) **very high risk**: anal sex - the lining of the rectum is quite delicate and easily torn. This usually happens during anal intercourse, even though the individual may not be aware of it. The virus is passed from the semen of the infected person to the blood of the uninfected person through these tiny cuts.

Vaginal intercourse is not as dangerous but the virus can pass from woman to man and vice versa.

People can protect themselves from infection by practising behaviours which help prevent or reduce the spread of AIDS.

- i) **abstinence**: Since AIDS is transmitted usually through sexual intercourse, people who abstain from sexual activity are at low risk of contracting the disease. This method is effective and is recommended by health professionals for young people.

If people are sexually active

- ii) ***knowing their sexual partner:*** Abstaining from casual sex - knowing the person well and being able to communicate openly about past sexual practices will not ensure safety, but will reduce the risks.

- iii) ***limiting the number of sexual partners:*** The more sexual partners a person has, the less they are likely to know whether or not their partner is infected.

- iv) ***using a condom and spermicide properly:*** If people engage in sexual activities which could involve the exchange of bodily fluids, e.g., vaginal, anal or oral sex, condoms and spermicide should be used. Condoms are not foolproof. Each year one in ten couples who use condoms as a means of birth control have a pregnancy. However, condoms, when used properly do reduce the risk of transmitting the virus. Latex condoms, (not those made from animal membrane), used in conjunction with a spermicide which contains Nonoxynol-9, is effective in killing the virus, and are recommended by health professionals.

Is there a test for AIDS?

Several types of tests have been developed to detect the HIV antibody. These tests will indicate if a person's body has developed the antibody to the AIDS virus. When a positive test is found, the test is repeated, and then followed with a different test procedure. (If the result is consistently positive, the person is considered positive for the antibodies to HIV.)

The test is highly accurate when used on a high risk population. It is not at all accurate when used on the general population. In a group of low risk people, the test procedure produces a high percentage of what are called "false positive" results, i.e., the test indicates that people have the disease, when, in fact, they do not have it. The consequences of this may be extremely harmful. Therefore, testing is recommended for people in high risk groups.

Resources for AIDS education

Further information on AIDS can be obtained from the following agencies:

N.W.T. AIDS Program
Dept. of Health
Govt. of the N.W.T.
P.O. Box 1320
Yellowknife, N.W.T.
X1A 2R3
Phone: (403) 873-7017

National AIDS Centre
Health and Welfare Canada
LCDC Building
Tunney's Pasture
Holland Ave.
Ottawa, Ont.
K1A 0L2
Phone: (613) 957-1774

Otto Schaefer Health Library and Resource Centre
Dept. of Health
Govt. of the N.W.T.
P.O. Box 1320
Yellowknife, N.W.T.
X1A 2L9
Phone: (403) 873-7713

Family Life Educators
Dept. of Health
Govt. of the N.W.T.
P.O. Box 1320
Yellowknife, N.W.T.
X1A 2L9
Phone: (403) 920-7711

Your local Nursing Station/Health Centre/Hospital