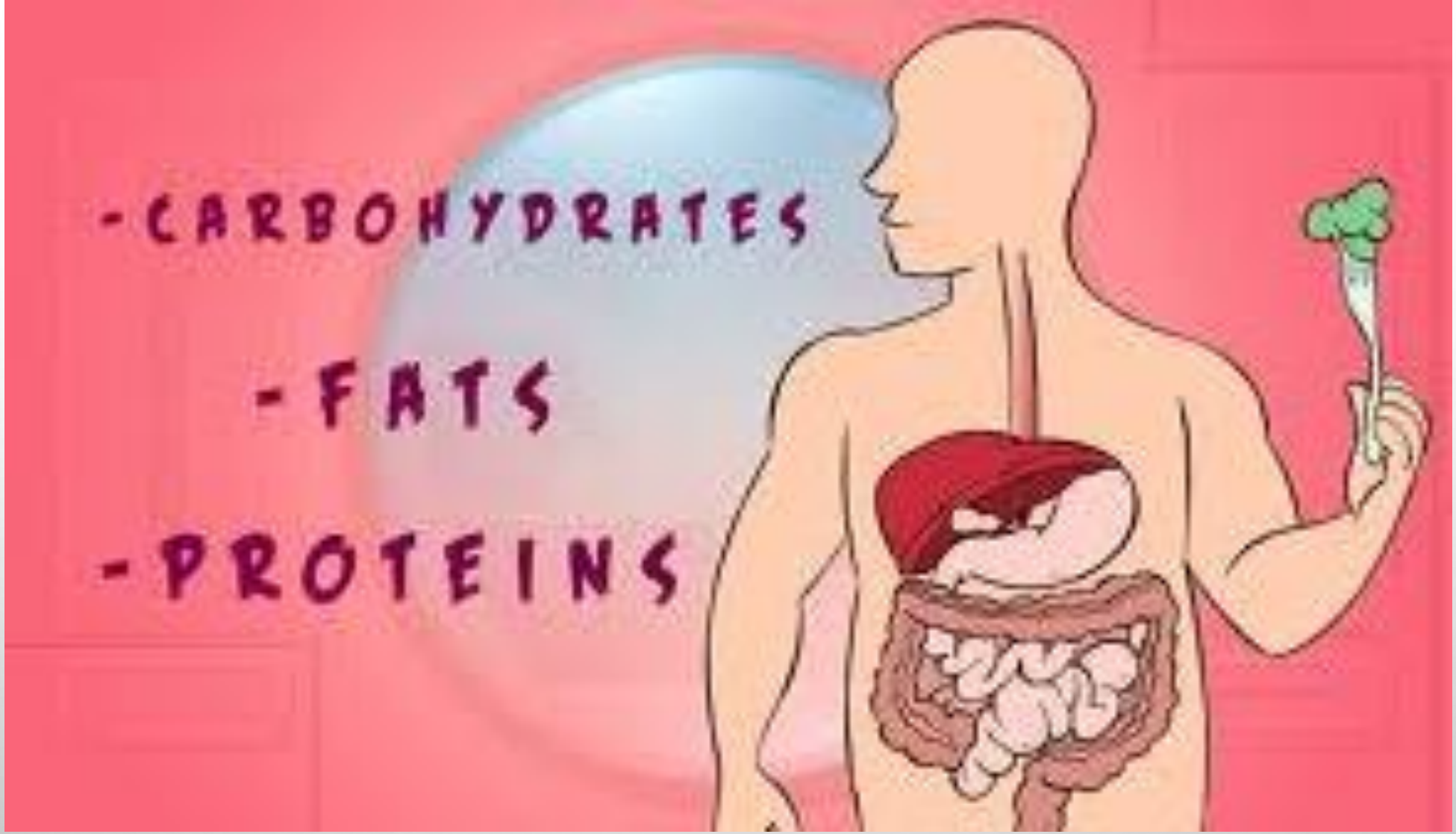
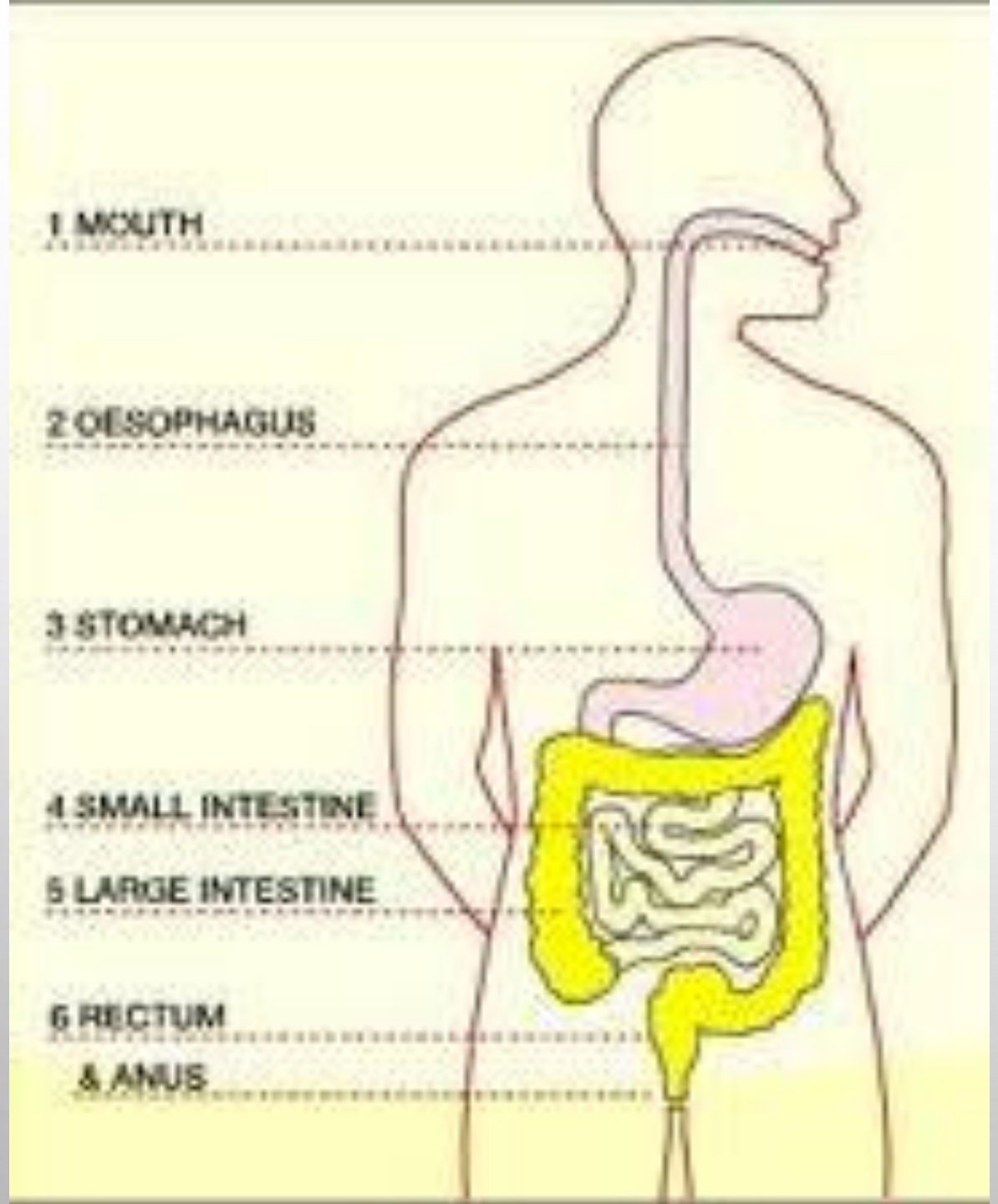
CHAPTER 7: BODY SYSTEMS



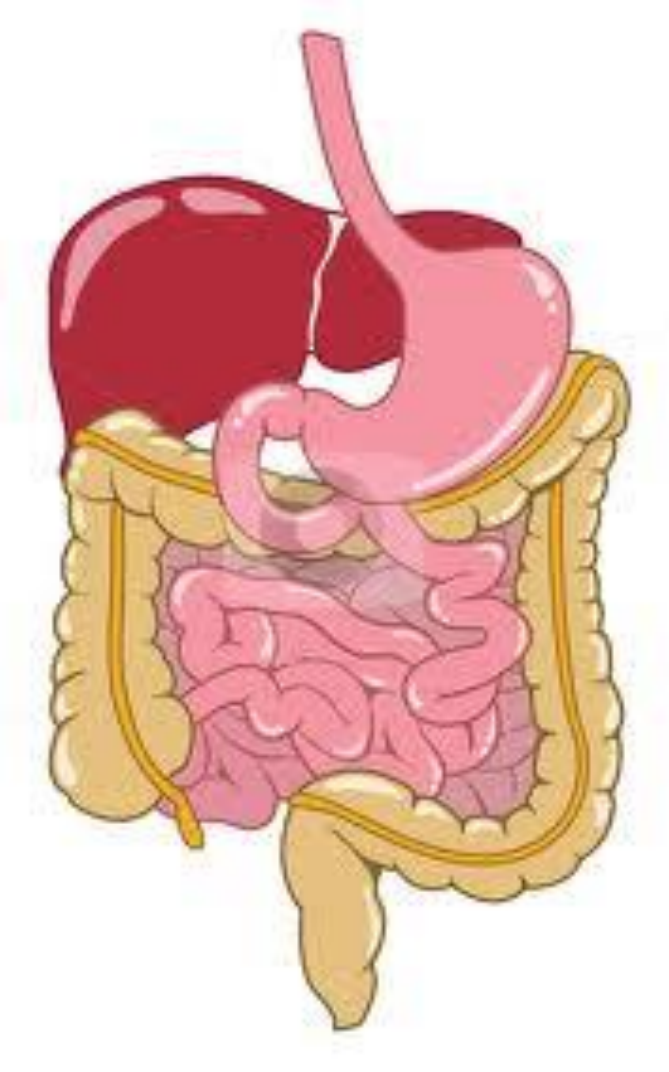
YOU'VE GOT GUTS



THE DIGESTIVE SYSTEM

WHAT DO PARTS OF THE DIGESTIVE SYSTEM DO?

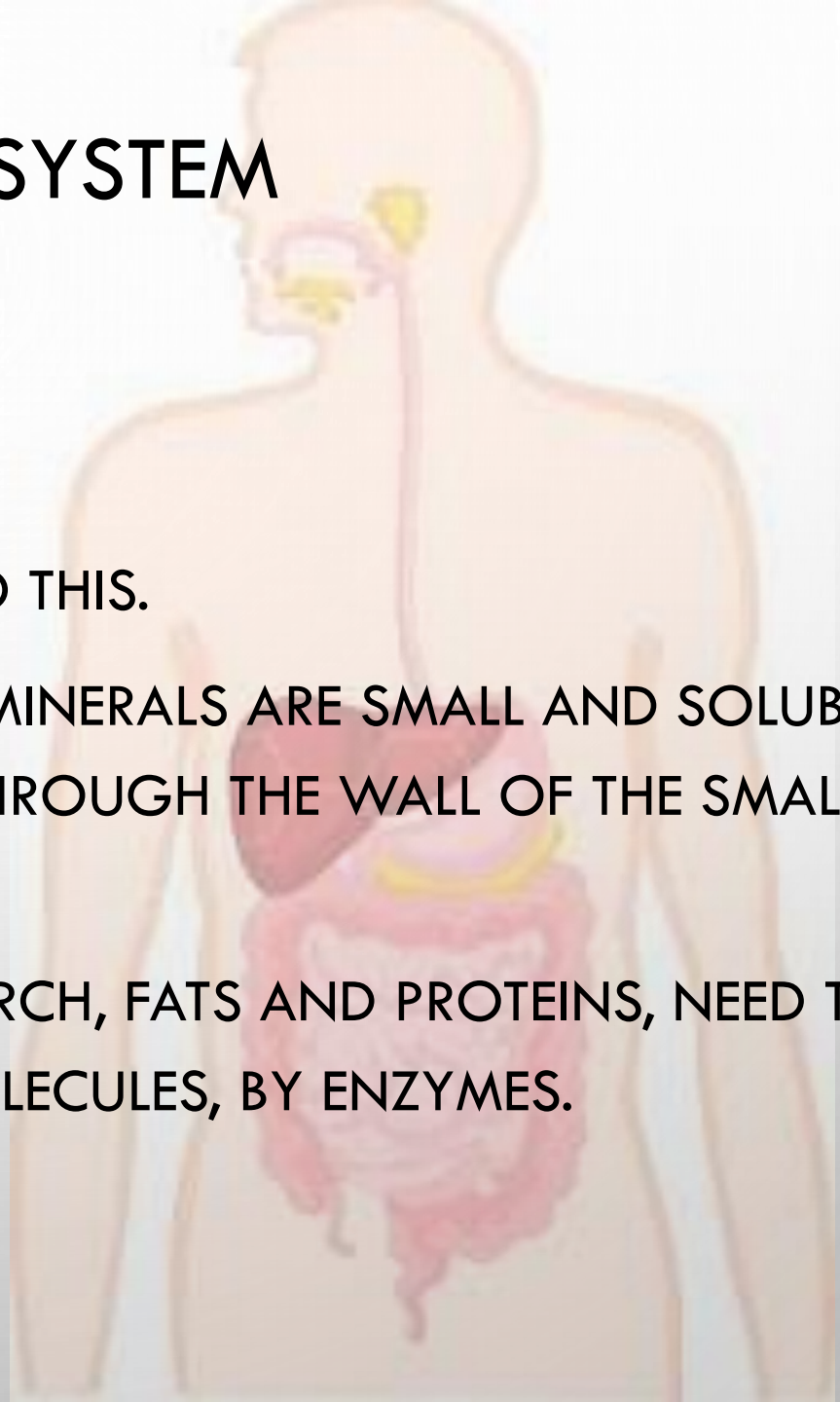
- A PROCESS CALLED DIGESTION TURNS FOOD INTO A FORM THAT YOUR BODY CAN USE.
- IT HAPPENS AS FOOD PASSES DOWN A TUBE MADE UP OF DIFFERENT ORGANS, CALLED THE GUT.
- OTHER ORGANS, LIKE THE LIVER, ALSO HELP WITH DIGESTION.
- THE GUT AND THESE OTHER ORGANS MAKE UP THE DIGESTIVE SYSTEM.



THE DIGESTIVE SYSTEM

- THE GUT IS ABOUT 8M LONG. THE INTESTINES ARE COILED UP SO THAT THEY CAN FIT INSIDE THE BODY.
- IT NORMALLY TAKES BETWEEN 24 AND 48 HOURS FOR FOOD TO GO THROUGH THE GUT.
- FIBRE IN YOUR DIET HELPS THIS TO HAPPEN.
- MOST OF THE FOOD WE EAT IS INSOLUBLE (IT WON'T DISSOLVE). TO MAKE THE MOST OF OUR FOOD, MOST OF IT NEEDS TO BE BROKEN DOWN INTO SMALLER, SOLUBLE SUBSTANCES.
- THIS IS WHAT HAPPENS IN DIGESTION.

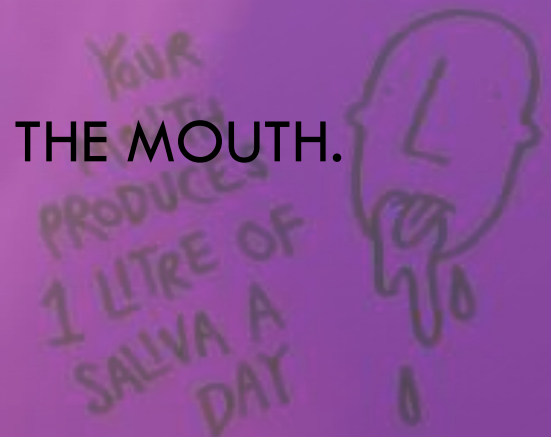
THE DIGESTIVE SYSTEM



- SPECIAL CHEMICALS CALLED ENZYMES DO THIS.
- SUGARS (EX: GLUCOSE), VITAMINS AND MINERALS ARE SMALL AND SOLUBLE IN WATER AND AS A RESULT CAN PASS THROUGH THE WALL OF THE SMALL INTESTINE.
- LARGER INSOLUBLE MOLECULES, LIKE STARCH, FATS AND PROTEINS, NEED TO BE BROKEN UP INTO SMALL, SOLUBLE MOLECULES, BY ENZYMES.

INGESTION

- PUTTING FOOD IN YOUR MOUTH IS CALLED INGESTION.
- YOUR TEETH GRIND YOUR FOOD INTO SMALLER PIECES.
- THE SALIVARY GLANDS PRODUCE A LIQUID CALLED SALIVA.
- SALVIA MAKES THE FOOD MOIST SO THAT IT'S EASY TO SWALLOW.
- CARBOHYDRATE DIGESTION STARTS IN THE MOUTH.

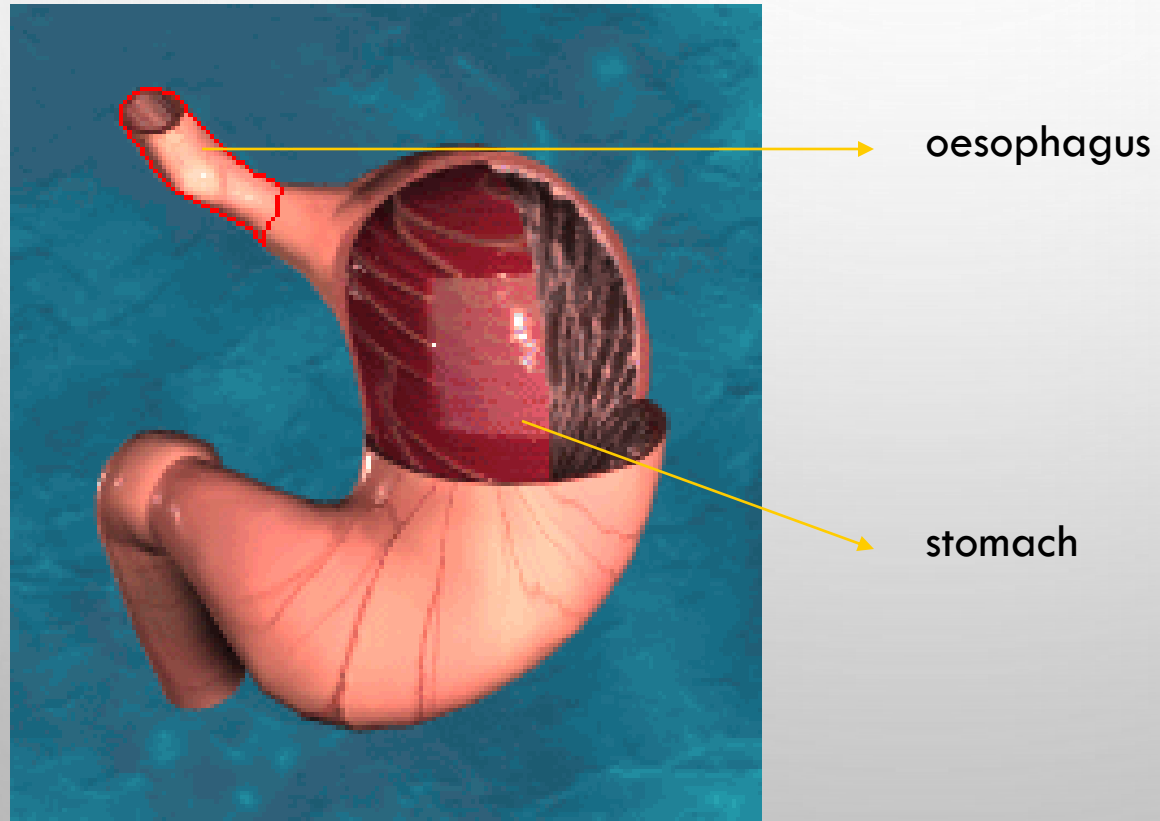


THE GULLET

- WHEN YOU SWALLOW, THE WINDPIPE IS SHUT OFF AND FOOD GOES INTO THE GULLET.
- MUSCLES IN THE WALL OF THE GULLET CONTRACT (GET SMALLER) TO NARROW THE TUBE ABOVE THE FOOD. THIS IS CALLED PERISTALSIS.
- THIS PUSHES FOOD DOWN TO THE STOMACH.

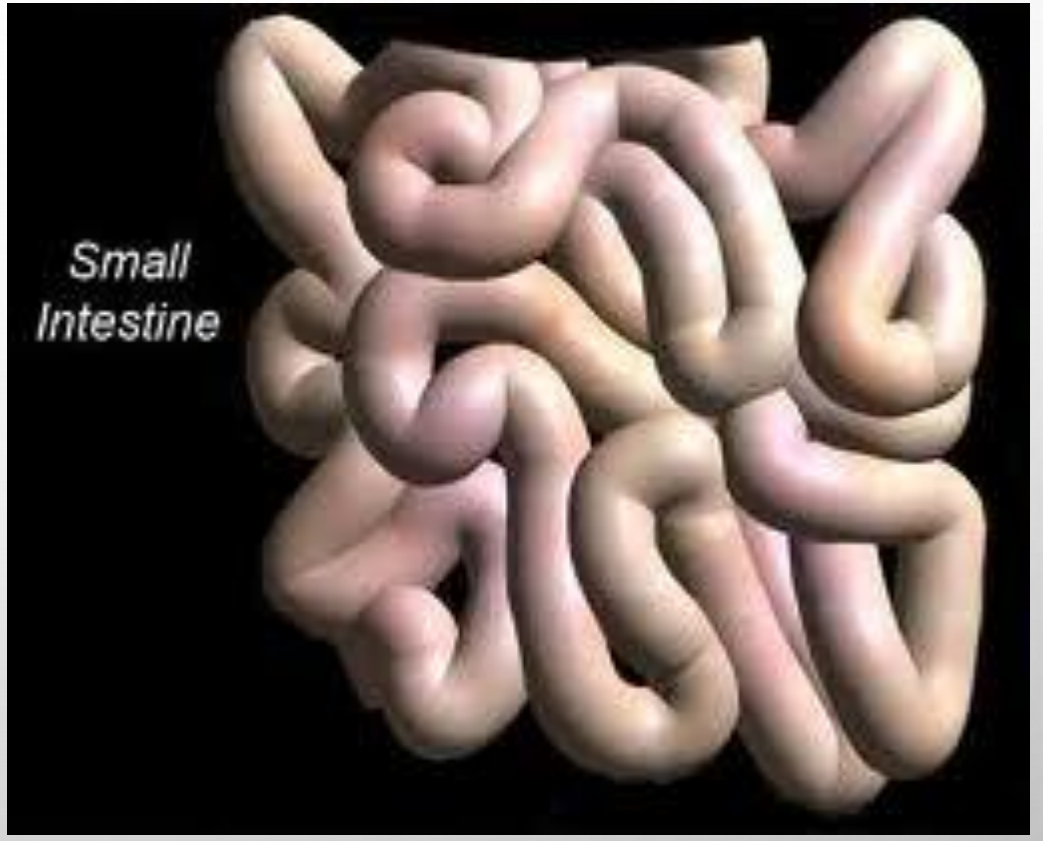
THE STOMACH

- PROTEIN DIGESTION STARTS IN THE STOMACH, BY THE ENZYME PEPSIN.
- IN THE STOMACH, FOOD IS CHURNED UP WITH A STRONG ACID (HYDROCHLORIC ACID, PH 1-2). THE ACID IS NEEDED TO ACTIVATE THE ENZYMES AND TO KILL ANY BACTERIA.



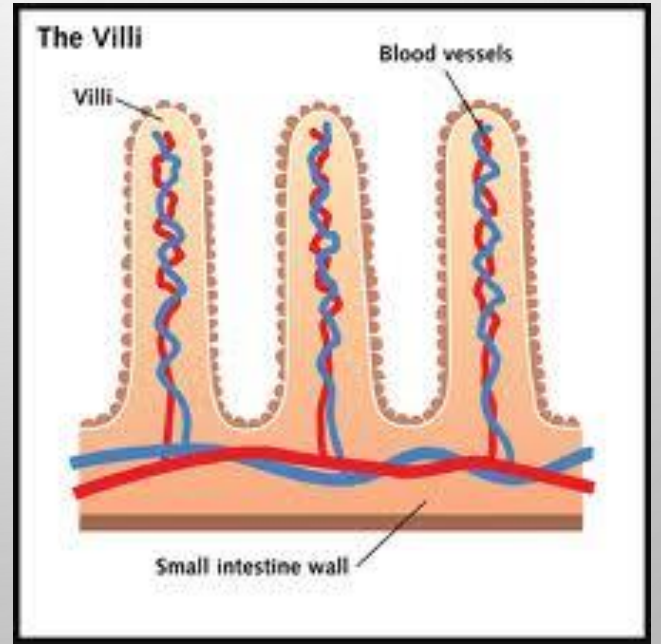
THE SMALL INTESTINE

- THE PARTICLES THAT MAKE UP FOOD ARE CALLED MOLECULES.
- SMALL MOLECULES ARE ABSORBED (TAKEN INTO THE BODY) THROUGH THE WALL OF THE SMALL INTESTINE.
- STARCH, PROTEINS AND FATS ARE BROKEN DOWN IN THE SMALL INTESTINE.
- THE SMALL INTESTINE IS HIGHLY FOLDED TO INCREASE THE SURFACE AREA FOR ABSORPTION.



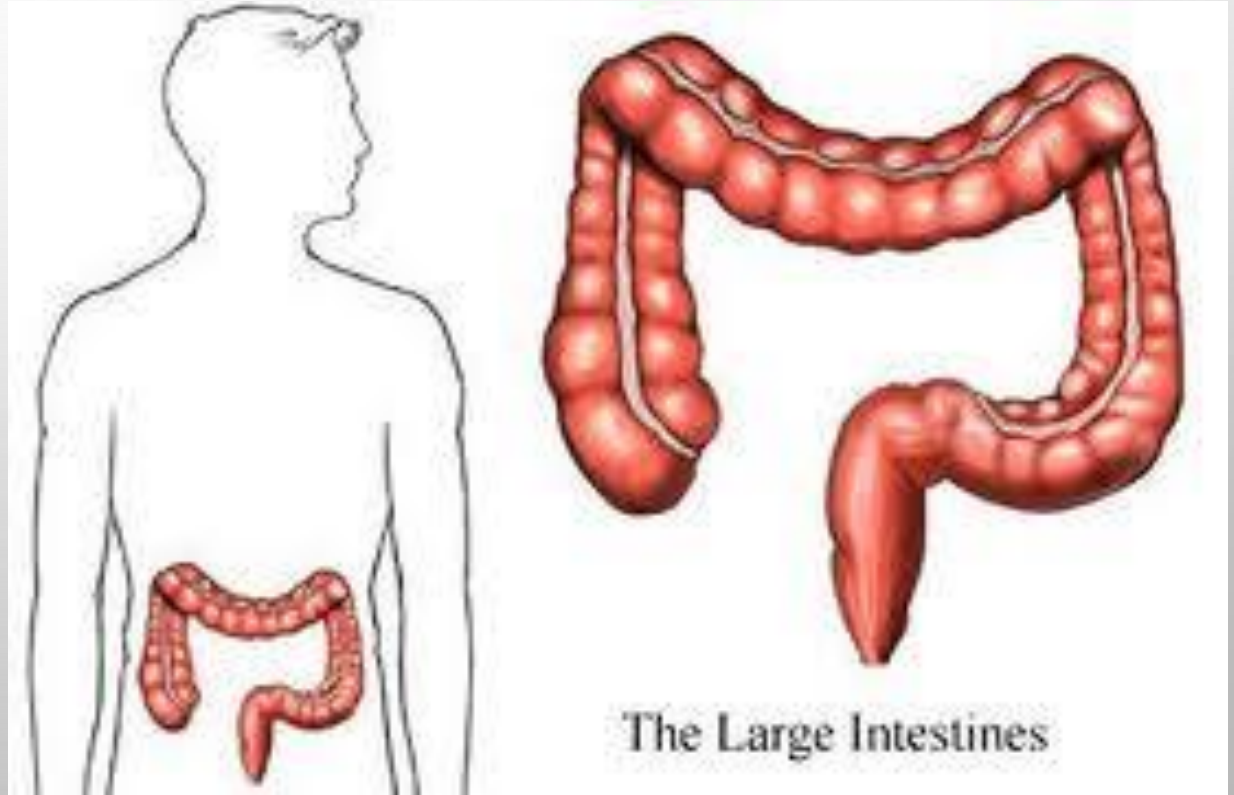
THE SMALL INTESTINE – VILLI

- THE SMALL INTESTINE IS COMPLETELY LINED WITH VILLI.
- THESE ARE NEEDED TO INCREASE THE SURFACE AREA FOR ABSORPTION OF NUTRIENTS.
- THE LARGER THE SURFACE AREA, THE MORE NUTRIENTS CAN BE ABSORBED.



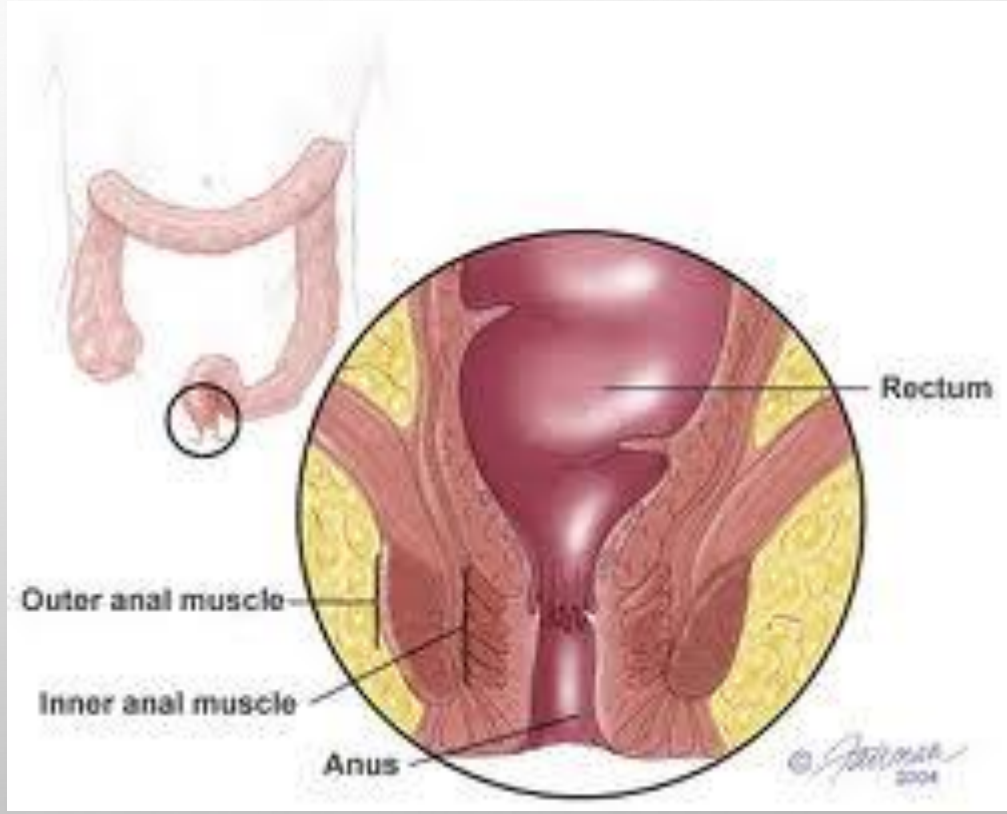
THE LARGE INTESTINE

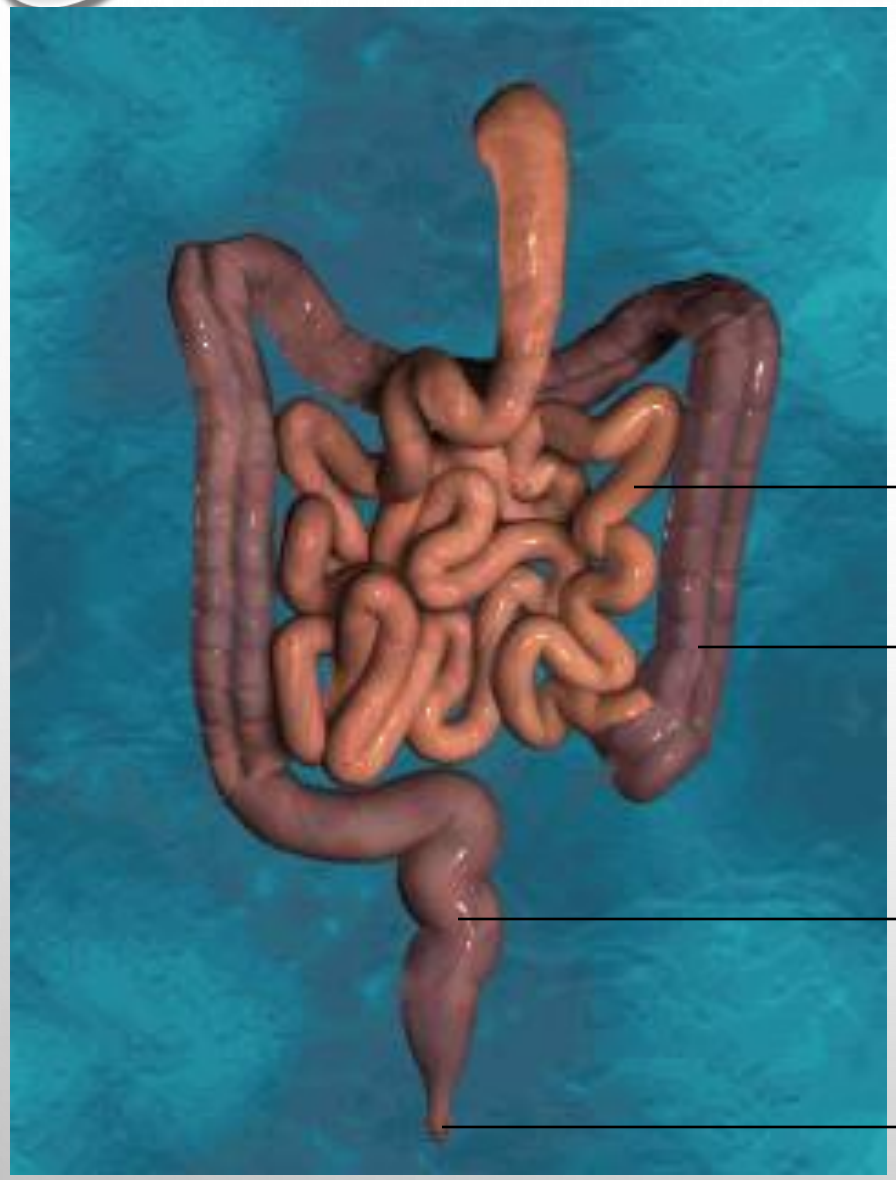
- FOOD THAT WE CANNOT DIGEST, (EX: FIBRE) GOES INTO THE LARGE INTESTINE, WHERE WATER IS REMOVED.
- THIS FORMS A MORE SOLID MATERIAL CALLED FAECES.



RECTUM AND ANUS

- FAECES ARE STORED IN THE RECTUM.
- THEY ARE EVENTUALLY PUSHED OUT OF THE ANUS IN A PROCESS CALLED EGESTION.





Small intestine

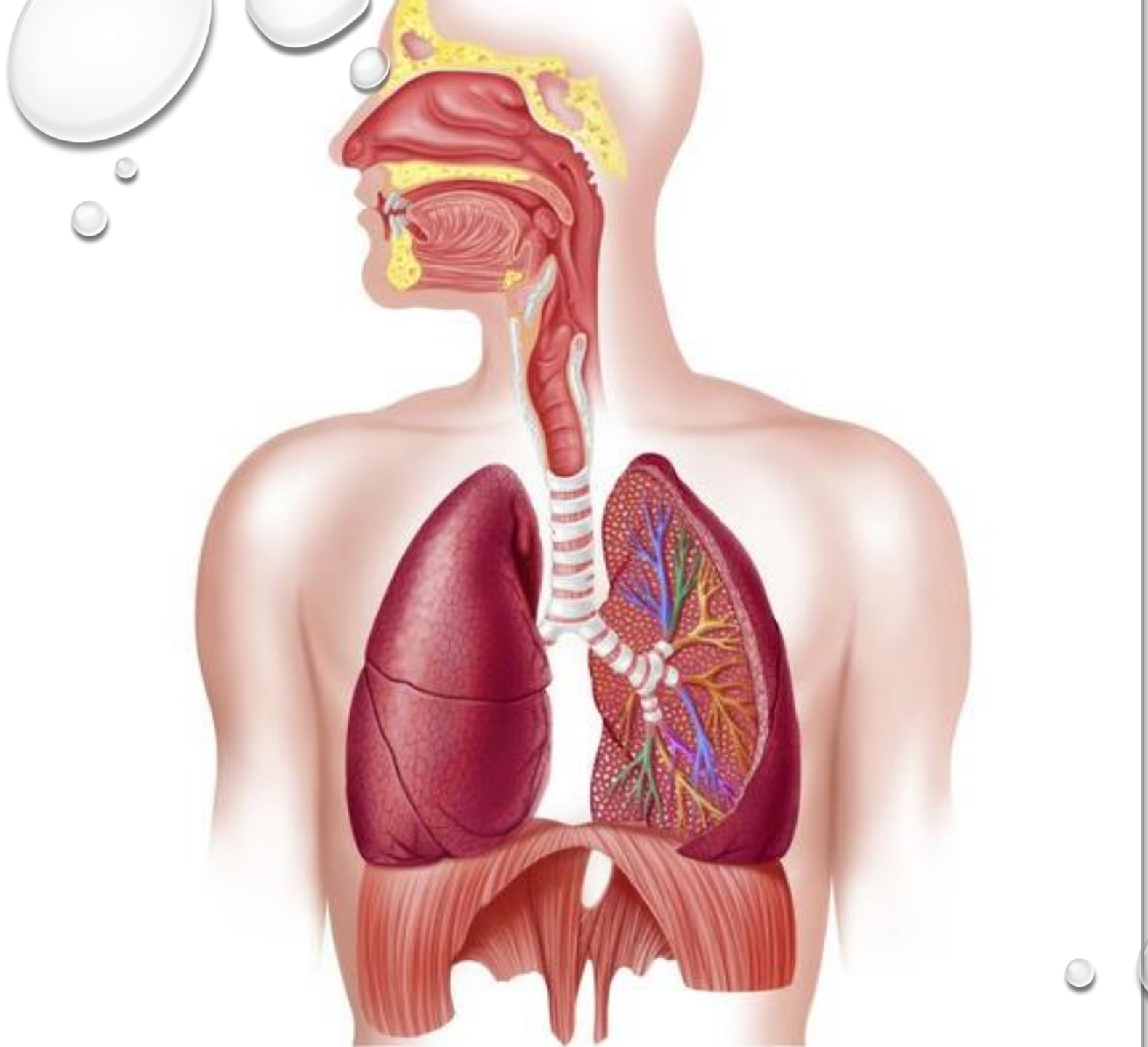
Large intestine

Rectum

Anus

SUMMARY

- FOOD IS CHEWED TO MAKE DIGESTION EASIER.
- THE STOMACH STARTS TO DIGEST THE FOOD AND MAKES IT INTO A LIQUID.
- THE SMALL INTESTINE FINISHES DIGESTING THE FOOD AND THE TINY DISSOLVED FOOD PARTICLES MOVE INTO THE BLOOD.
- UNDIGESTED FOOD PASSES OUT THROUGH THE LARGE INTESTINE.



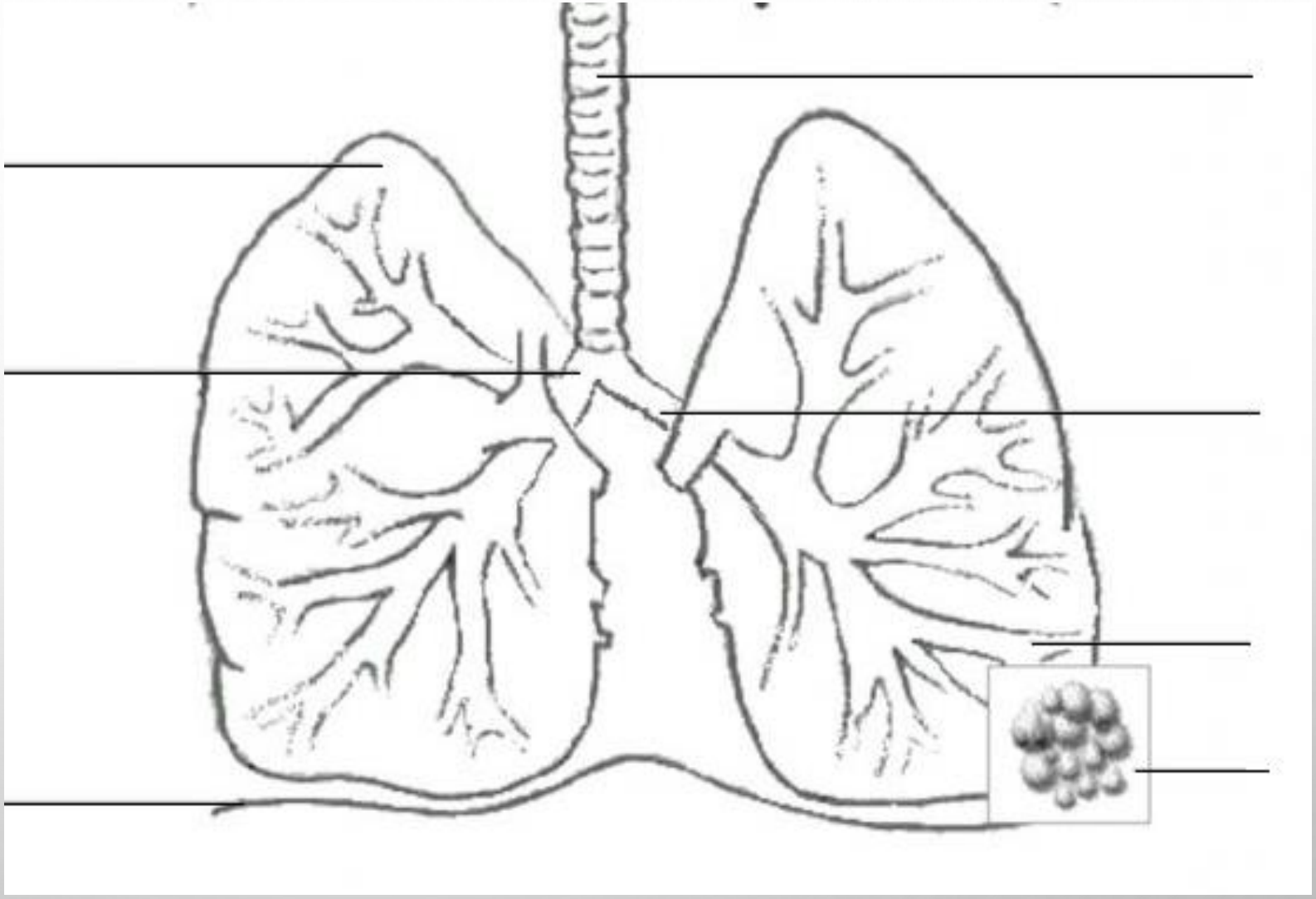
RESPIRATION

- RESPIRATION IS THE PROCESS BY WHICH FOOD IS TRANSFORMED INTO ENERGY
- THERE ARE TWO TYPES OF RESPIRATION
  - AEROBIC (WITH OXYGEN)
  - ANAEROBIC (WITHOUT OXYGEN)

THE HUMAN LUNGS

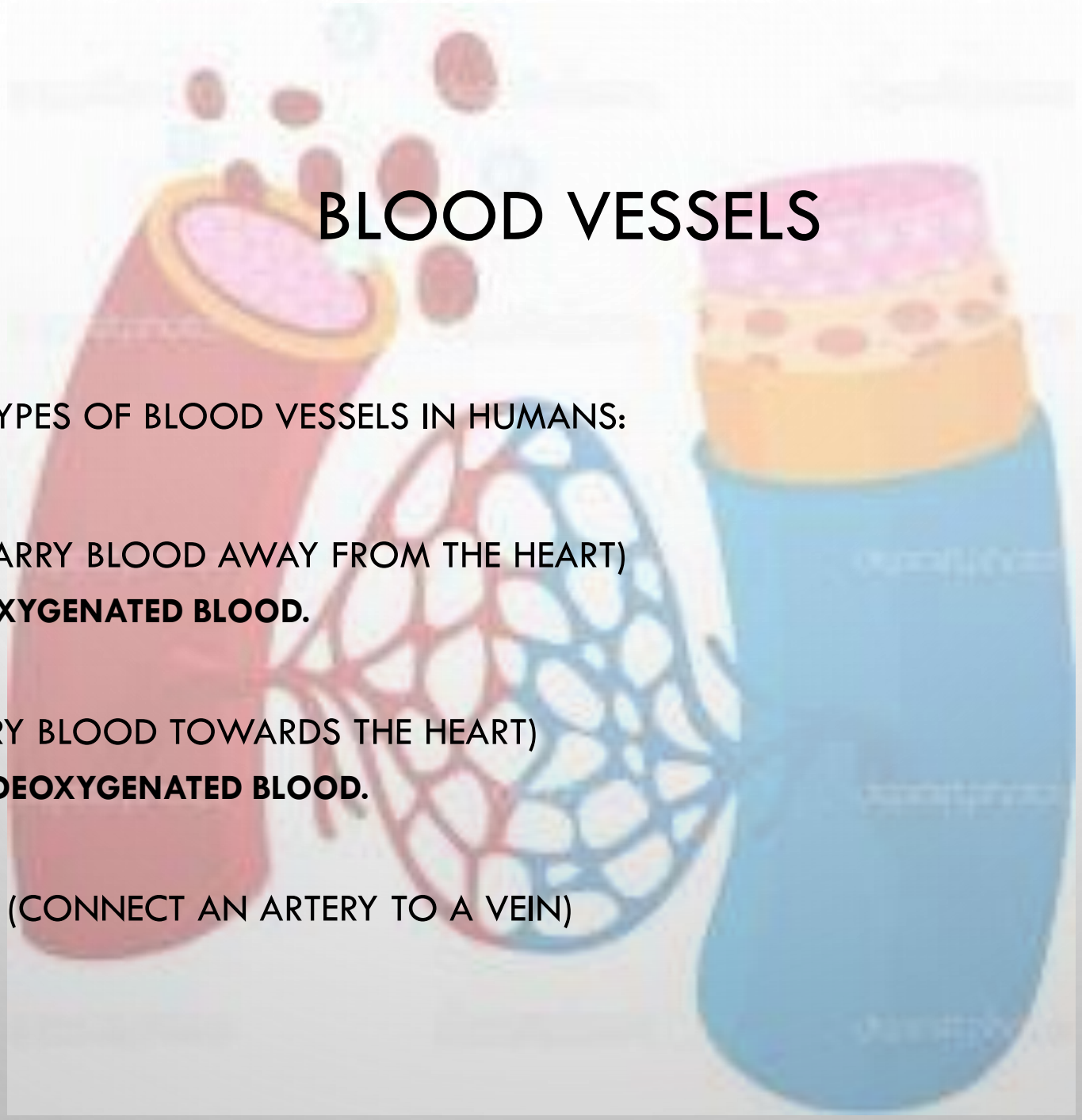
<u>WHERE DO THESE BELONG?</u>

- DIAPHRAGM
- RIGHT BRONCHI
- LEFT BRONCHI
- LUNGS
- TRACHEA
- BRONCHIOLE
- ALVEOLI



CIRCULATION

BLOOD VESSELS



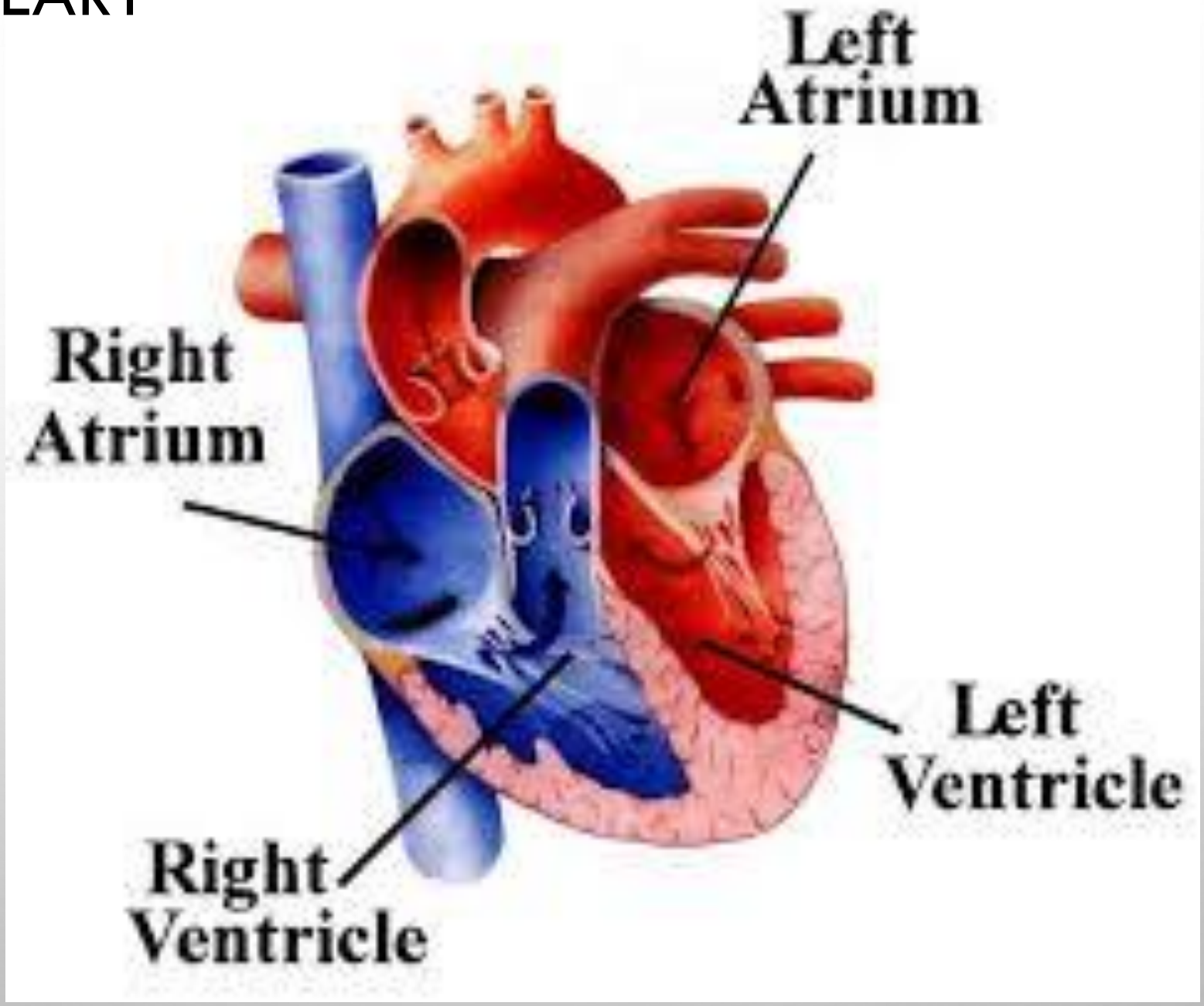
- THERE ARE 3 TYPES OF BLOOD VESSELS IN HUMANS:

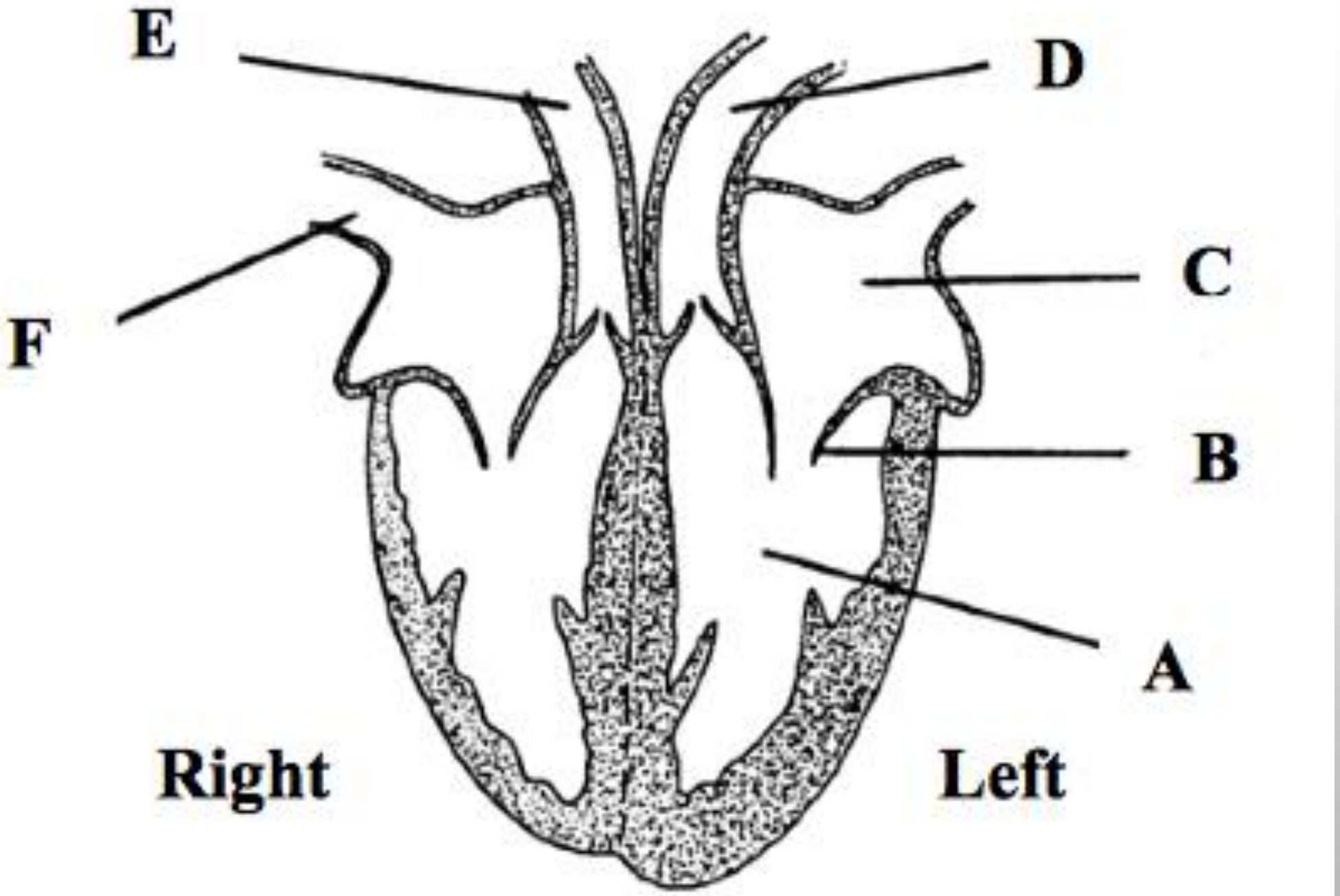
1) ARTERIES (CARRY BLOOD AWAY FROM THE HEART)
   - **CARRY OXYGENATED BLOOD.**

2) VEINS (CARRY BLOOD TOWARDS THE HEART)
   - **CARRY DEOXYGENATED BLOOD.**

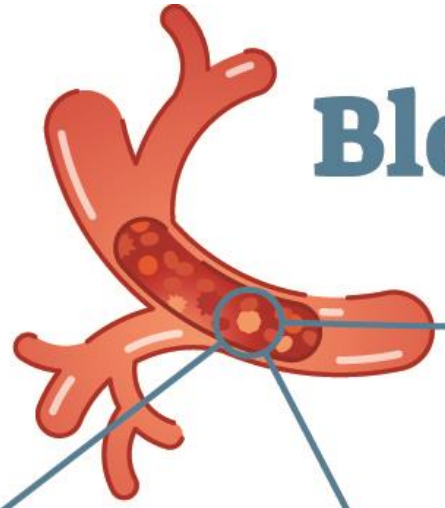
3) CAPILLARIES (CONNECT AN ARTERY TO A VEIN)

THE HEART

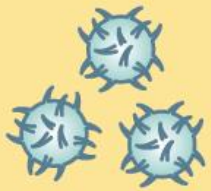



E
D
F
C
B
A
Right
Left

Blood Cells



Platelets



Thrombocytes

Red Blood Cells

Erythrocytes

White Blood Cells

Basophil

Neutrophil

Eosinophil

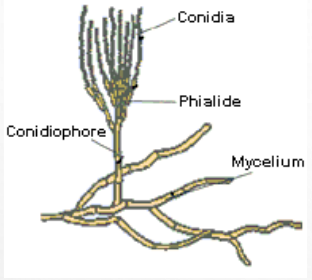
Monocyte

Lymphocytes

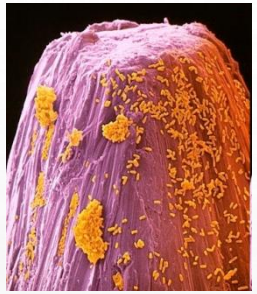
Microorganisms are Very Small

Biggest → Smallest

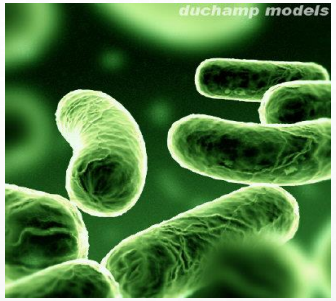
FUNGI



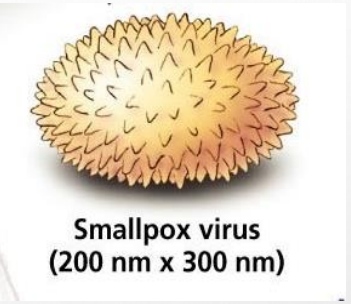
BACTERIA



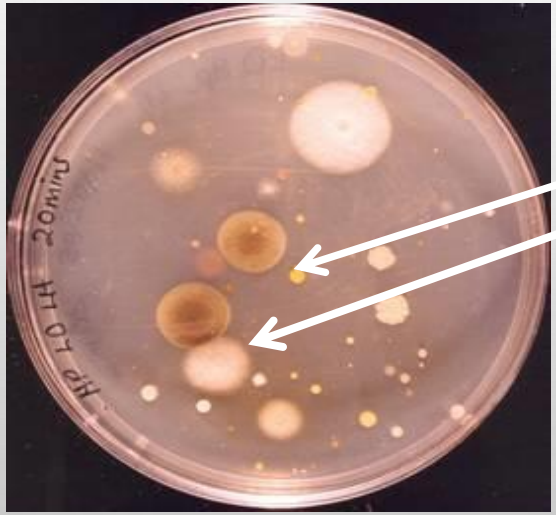
(On a needle)



VIRUSES



When millions of them grow in one place then you can see them

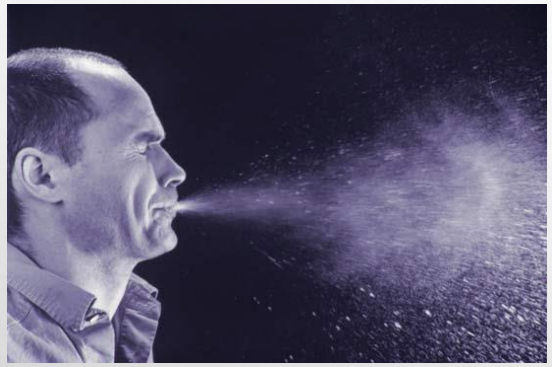


Colonies of Bacteria and Fungi growing in an agar plate.

Agar jelly is their food.

- Athletes foot → Fungal
- Flu, HIV → Viral
- Tuberculosis, Cholera → Bacterial

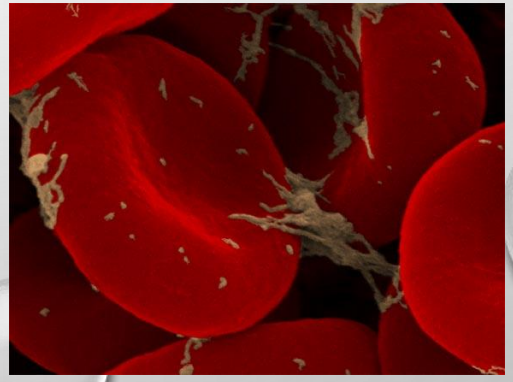
If you are infected with one of these you will show <u>symptoms</u>: E.g. runny nose, high temp, spots, sneezing etc.



Patient's leg covered in smallpox

Some diseases are caused by the things we do:
Over eating, cigarettes, alcohol, drugs
These are called <u>LIFESTYLE</u> diseases:
Obesity, Heart disease, lung cancer.
Remember: <u>YOU</u> can change your lifestyle

HOW DO MICROBES SPREAD?



HOW DO MICROBES SPREAD?

STARTER:

MATCH THE DISEASE TO THE MICROBE WHICH CAUSES IT:

Athlete's foot	HIV virus
Flu	Bacteria
Common cold	Fungus
Aids	Not caused by a microbe
Food poisoning	Virus
Cancer	Virus

DISEASES CAN SPREAD BY...

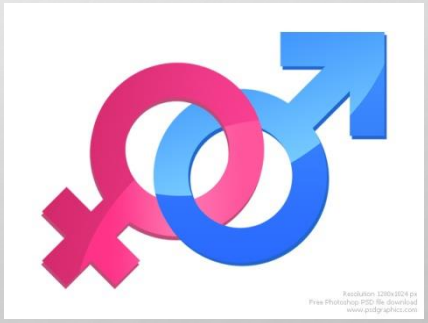
Coughs/Sneezing (Air)

Water

Food

Touch

Animals



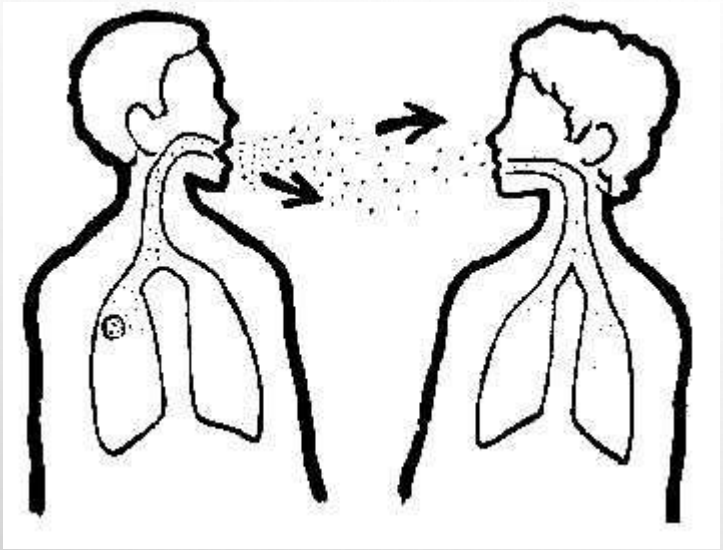
Sexual contact

DISEASES

SOME HARMFUL MICROBES CAUSE DISEASES. BACTERIA AND VIRUSES ARE THE MOST COMMON CAUSES OF DISEASES.

THE SPREAD OF DISEASES IS KNOWN AS TRANSMISSION

AIR



DROPLETS CONTAINING MICROBES FLY INTO THE AIR WHEN PEOPLE SNEEZE OR COUGH. THE MICROBES THEY CONTAIN GET INTO OTHER PEOPLE IF BREATHED IN.

EG. CHICKEN POX, COLDS, MEASLES

ANIMALS

ANIMALS MAY CARRY HARMFUL MICROBES. THE MICROBES CAN GET INTO A PERSON WHO IS SCRATCHED OR BITTEN BY SUCH AN ANIMAL

EG. MALARIA SPREAD BY MOSQUITOES

FOOD

FOOD CAN HAVE HARMFUL MICROBES IN AND ON IT. THE MICROBES GET INTO THE BODY WHEN THE FOOD IS EATEN, CAUSING FOOD POISONING.

TOUCH

MICROBES CAN BE PASSED FROM ONE PERSON TO ANOTHER WHEN PEOPLE TOUCH EACH OTHER, OR WHEN THEY TOUCH SOMETHING AN INFECTED PERSON HAS HANDLED.

EX: ATHLETES FOOT

WATER

WATER CAN HAVE HARMFUL MICROBES IN IT. THE MICROBES GET INTO THE BODY WHEN THE WATER IS SWALLOWED.

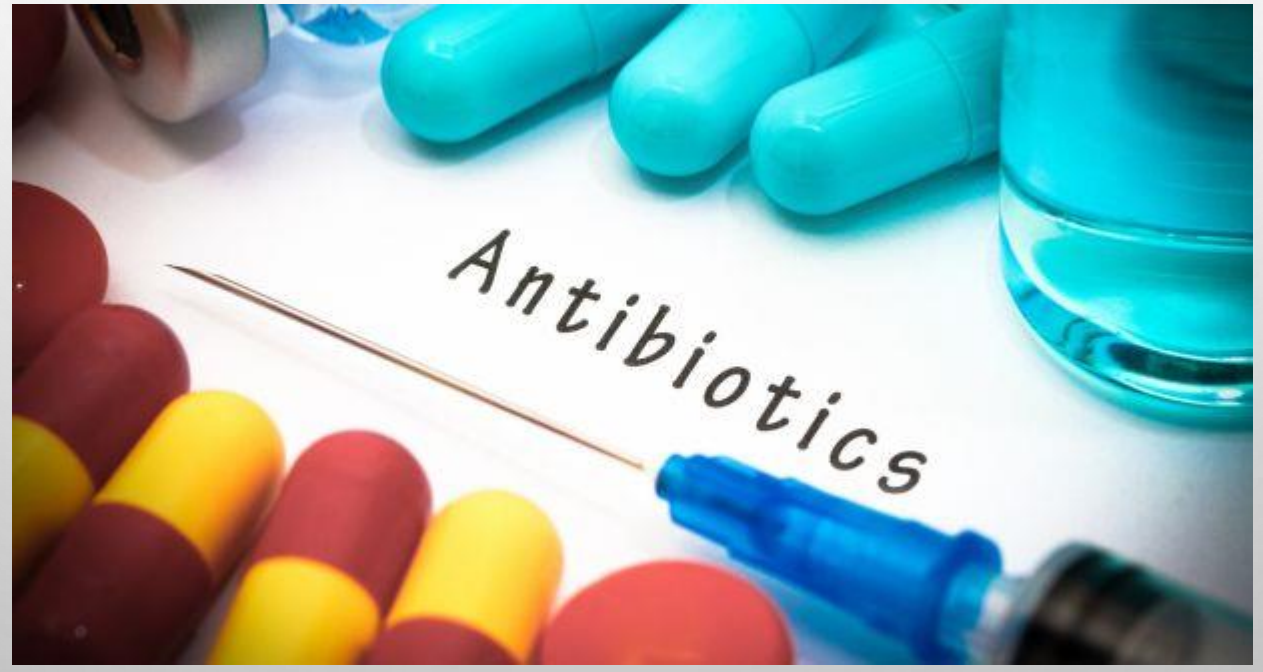
EG. CHOLERA

VACCINATION

VACCINES ARE ‘INJECTIONS’ THAT WE TAKE TO PREVENT MORE SERIOUS DISEASES. THE VACCINE CONSISTS OF THE DEAD MICROBE.

ANTIBIOTICS

ANTIBIOTICS ARE TYPES OF MEDICINE WHICH WE TAKE WHEN WE ARE SICK. THEY PRIMARILY FIGHT BACTERIA



DISINFECTANTS

- **DISINFECTANTS** ARE SUBSTANCES THAT ARE APPLIED TO NON-LIVING OBJECTS TO DESTROY MICROORGANISMS.

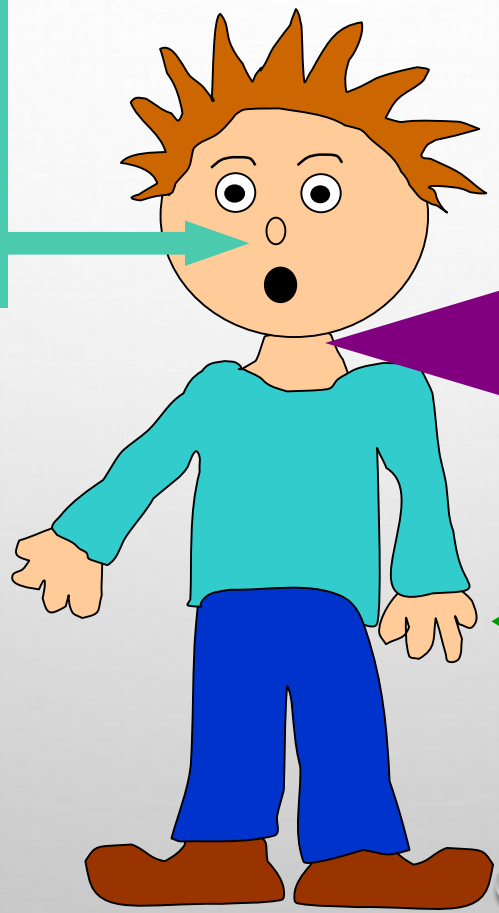
ANTISEPTICS

ANTIMICROBIAL SUBSTANCES THAT ARE APPLIED TO LIVING TISSUE/SKIN TO REDUCE THE POSSIBILITY OF INFECTION

How do microbes make us ill?

Microbes are micro organisms that are too small to be seen. A pathogen is a microbe that can cause diseases if it enters the body:

They can be breathed in through the mouth or nose



They can be ingested (eaten) through the mouth

They can enter through cuts or bites in the skin or just by touching something

…or other natural openings…

CHICKEN POX

Spread by:

Direct contact – eg touching or hugging someone with it

In the air – you can breathe in the microbes

Symptoms:

-Rash

- Coughing

-Sneezing

MALARIA

Symptoms

-Headache

-Vomiting

-Diarrhoea

SPREAD BY: **MOSQUITOES**.

- A MOSQUITO BITES AN INFECTED PERSON AND DRINKS THEIR BLOOD
- IF THE MOSQUITO BITES SOMEONE ELSE – THEY PASS THE MICROBES ON IN THE BLOOD

COMMON COLD

Spread by:

Direct contact – ex: touching or hugging someone with it

Sneezing – you release viruses into the air

Symptoms:

-Coughing

-Sneezing

-Sore throat

-Headache/tummy ache

CHOLERA

Spread by:

Water

If an infected person goes to the toilet, the bacteria enters the water.

If someone else drinks the water they will become infected

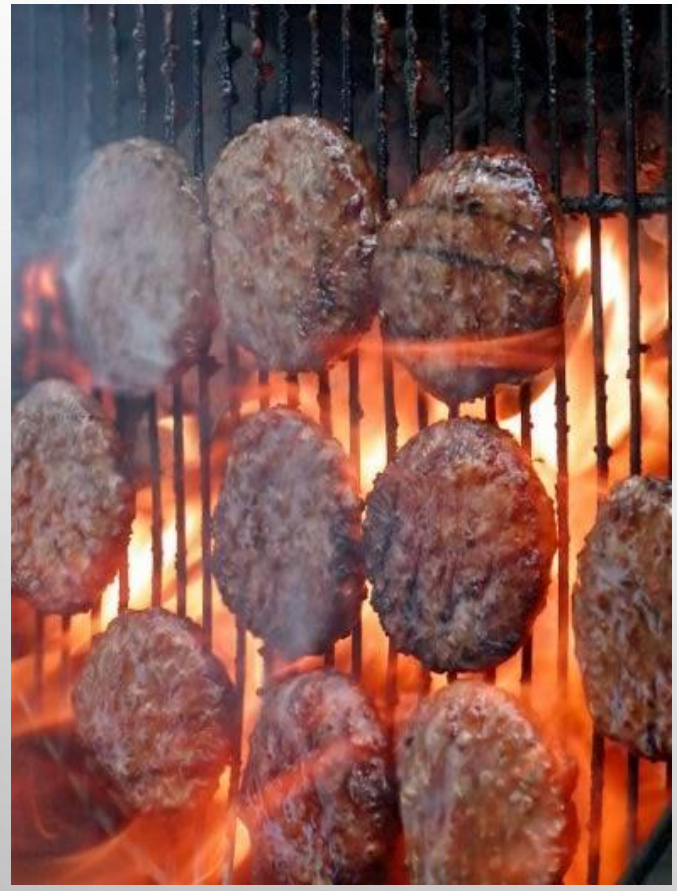
Symptoms:

- Vomiting

-Diarrhoea

-Muscle cramps

FOOD POISONING



How is it spread?

• Food poisoning is caused by bacteria in food.

• Certain foods like meat contain bacteria that could make you ill.

• When you cook food it kills the bacteria

•If your food is not cooked all the way through the bacteria are not killed. If the food is eaten the bacteria are able enter you body.

Symptoms:

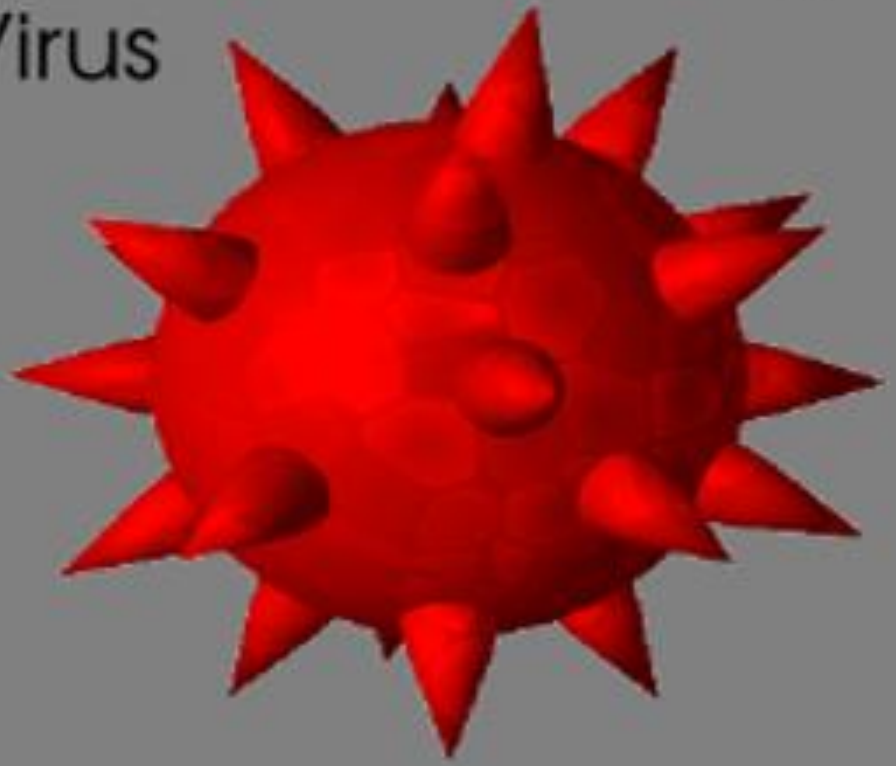
•Vomiting
•Diarrhoea
•Muscle cramps

ATHLETES FOOT

- SPREAD BY:
- ATHLETES FOOT IS CAUSED BY A SPECIFIC TYPE OF FUNGUS.
- IT IS MAINLY TRANSMITTED THROUGH PUBLIC SHOWERS.

- SYMPTOMS:
- PEELING, CRACKING, AND SCALING OF THE FEET.
- REDNESS, BLISTERS, OR SOFTENING AND BREAKING DOWN OF THE SKIN.
- ITCHING, BURNING, OR BOTH

HIV: Human Immunodeficiency Virus

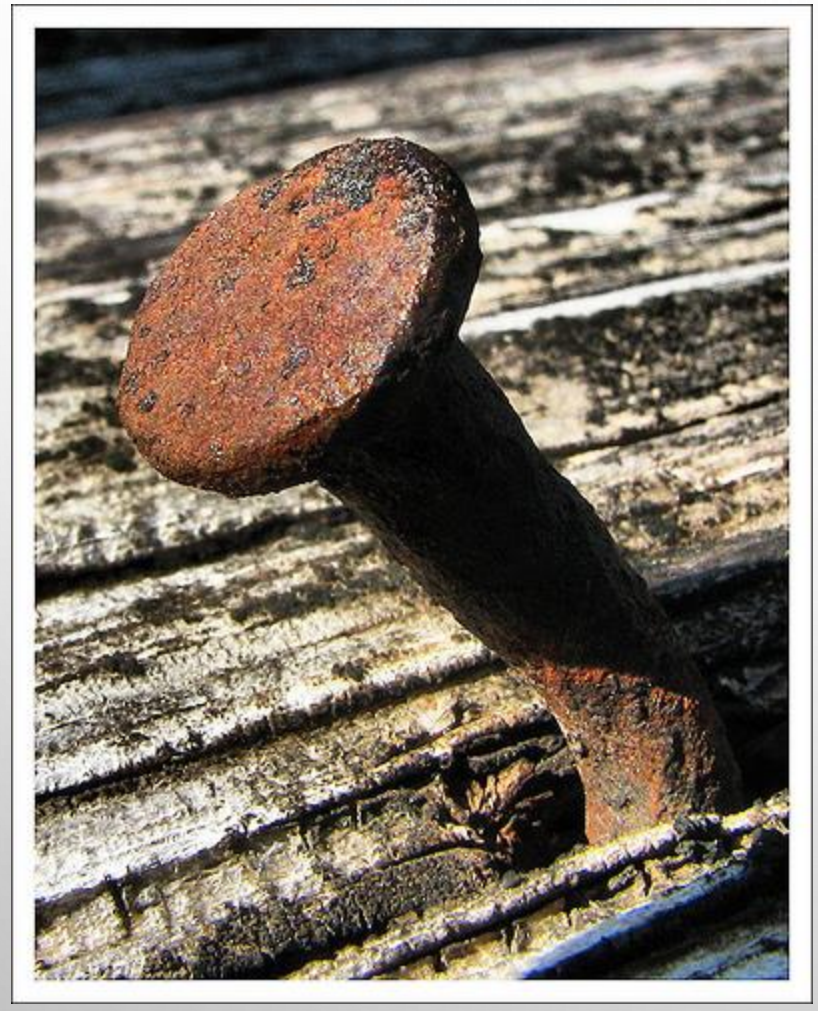


HIV is a virus which attacks immune system in humans.

AIDS: Acquired Immune Deficiency Syndrome

AIDS is a medical condition (immune system is too weak to fight infections).

Mode of transmission: **Through cuts or breaks in the skin.**



Example: **Tetanus**

How is it spread?

•Tetanus is caused by a bacteria

•The bacteria lives on dirty objects such as rusty nails

•If you have an open cut that touches something with the bacteria on it the bacteria will pass through the cut into you body.

•If something with the tetanus bacteria on it pierces your skin the bacteria will also be able to pass into your blood.

Symptoms:

• Lockjaw

• Spasms

Mode of transmission: **Bitten by an infected animal**

Example: **Rabies**

How is it spread?

If an animal infected with the rabies virus bites you the virus enters your body through the cut when you are bitten.

Symptoms:

- Flu like symptoms
- Hallucinations
- Brain damage / death

THE IMMUNE SYSTEM

The purpose of the immune system is to keep pathogens, such as certain bacteria, viruses, and fungi, out of the body, and to destroy any infectious microorganisms that do invade the body.

The immune system is made up of a complex and vital network of cells and organs that protect the body from infection.

The following are some of the organs that make up the immune system: appendix, tonsils, and spleen. Thus these organs help to fight off infections.