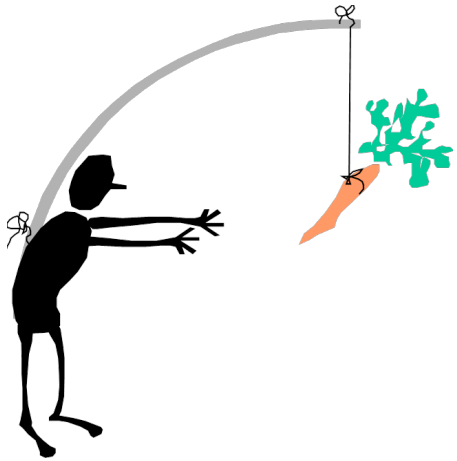
Characteristics of Living Things (Organisms)

Require energy

Respond to stimuli

Reproduce



Structure – cells, tissues, organs, organ systems

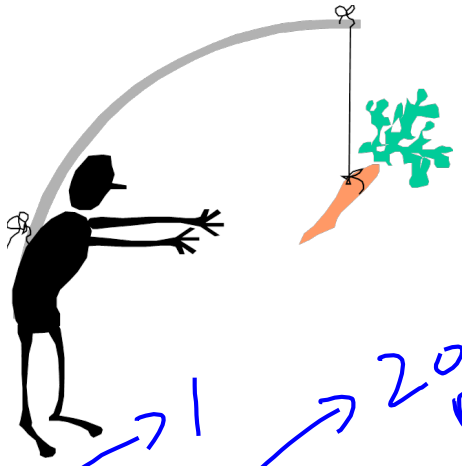
Unicellular or **multicellular**

Characteristics of Living Things (Organisms)

Require energy

Respond to stimuli

Reproduce



Structure – cells, tissues, organs, organ systems

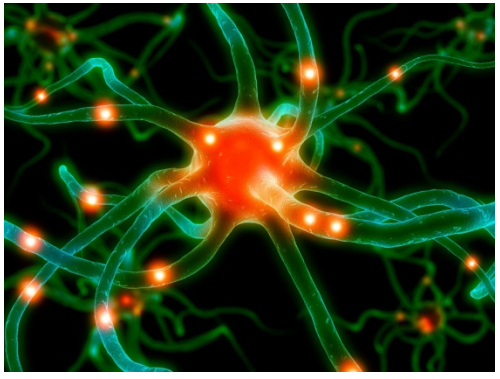
Unicellular or **multicellular**

1

2 or more

Characteristics of Living Things

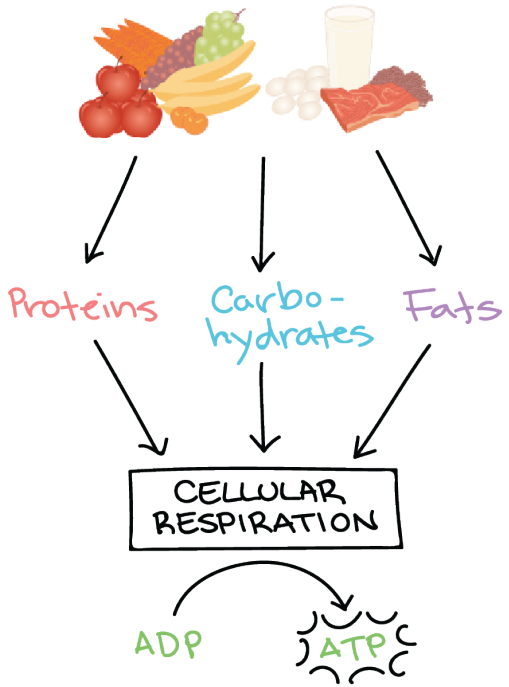
- **Homeostasis**: maintain a stable internal environment
- Obtain and use material for energy
- Made of **cells** (specialized, irreducible, and very complex: grow, develop, and reproduce)



Characteristics of Living Things

- ✓ **Matter and energy**. Life requires matter that provides raw material, **nutrients**, and **energy**. The combination of chemical reactions through which an organism builds up or breaks down materials is called **metabolism**.

↳ done by enzymes



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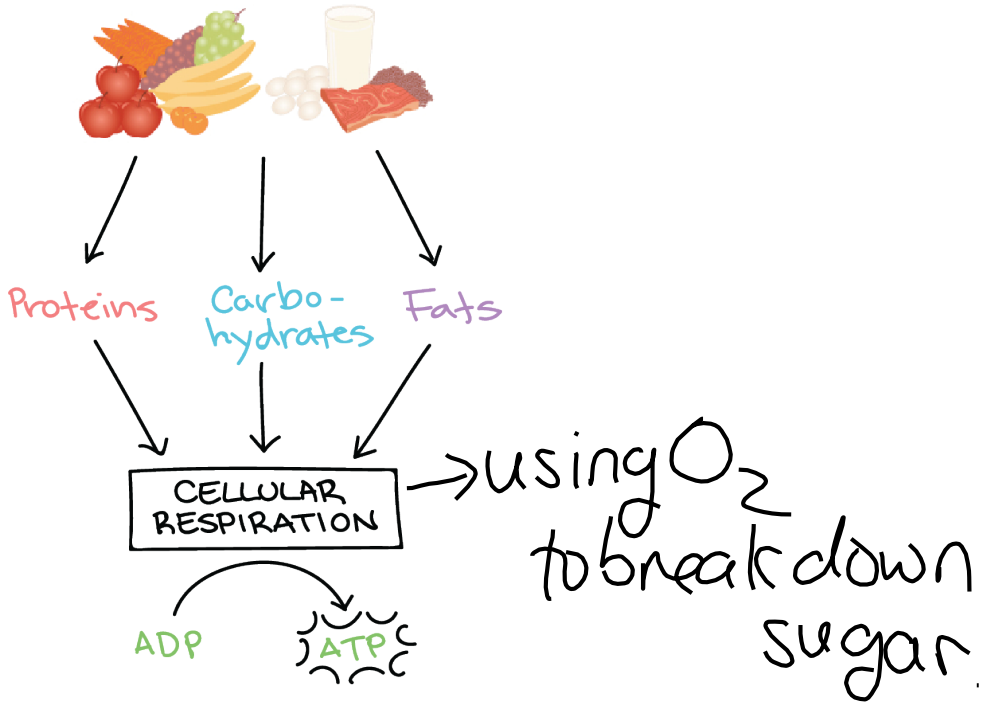
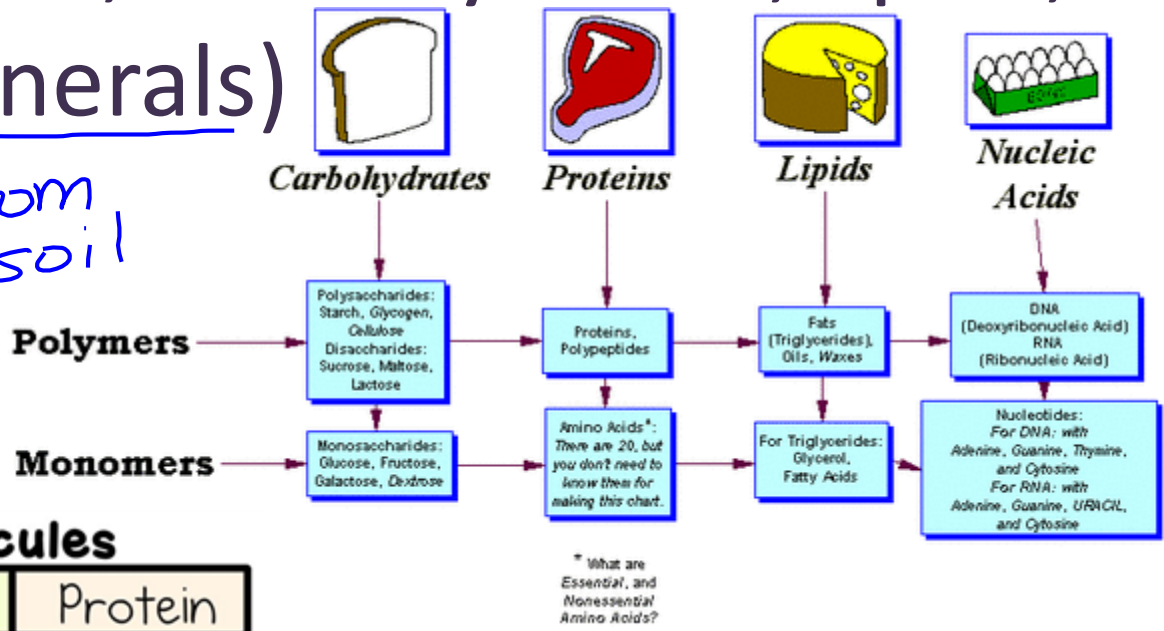
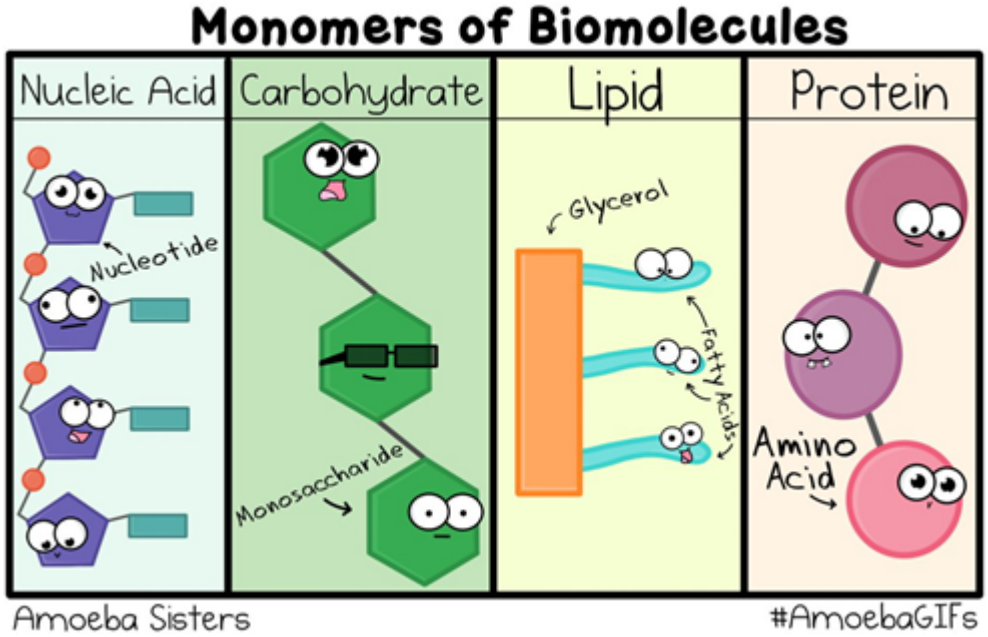


Living things use material and energy, **nutrients** (proteins, carbohydrates, lipids, vitamins, and minerals)

made in the body of something

come from the soil





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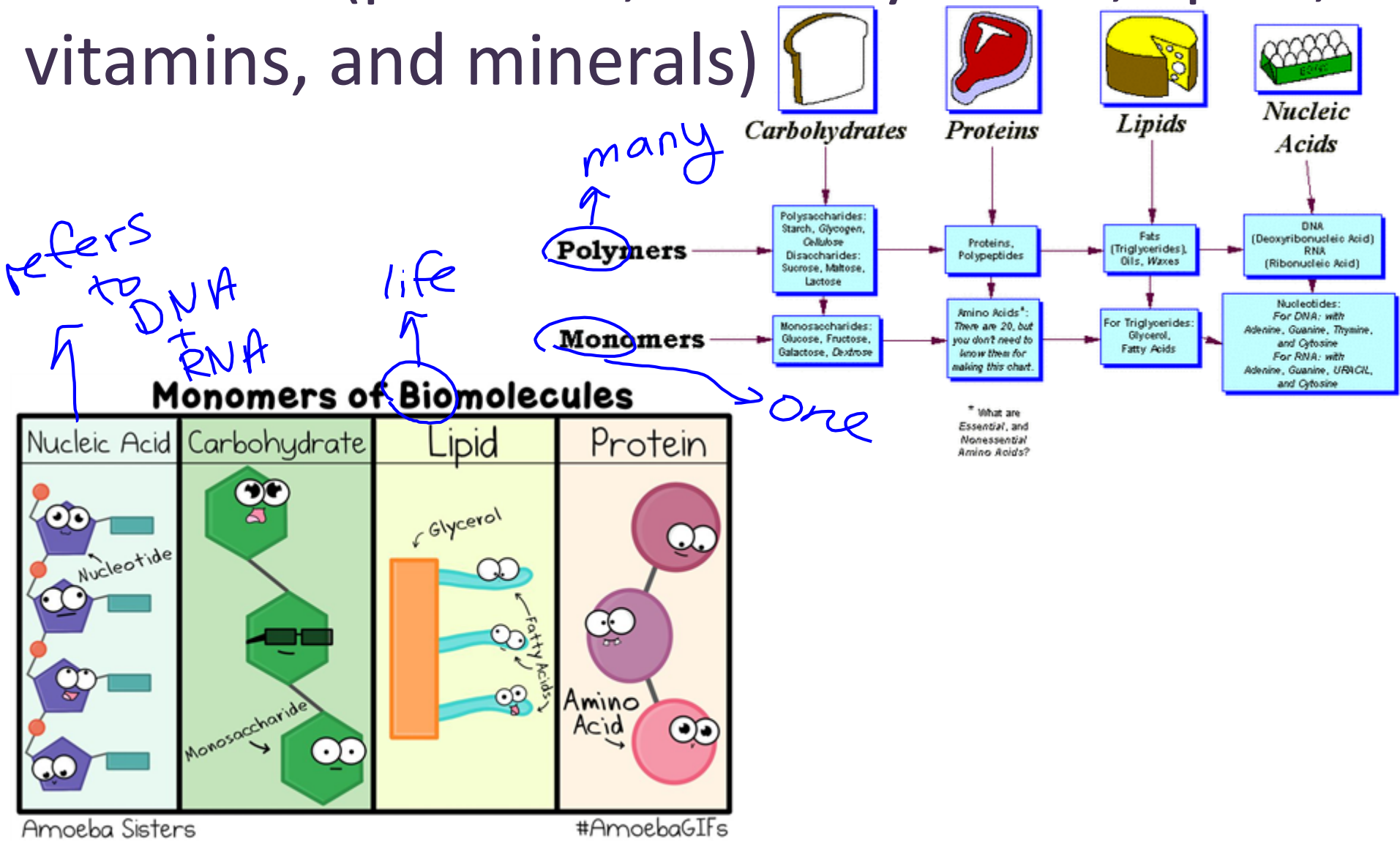
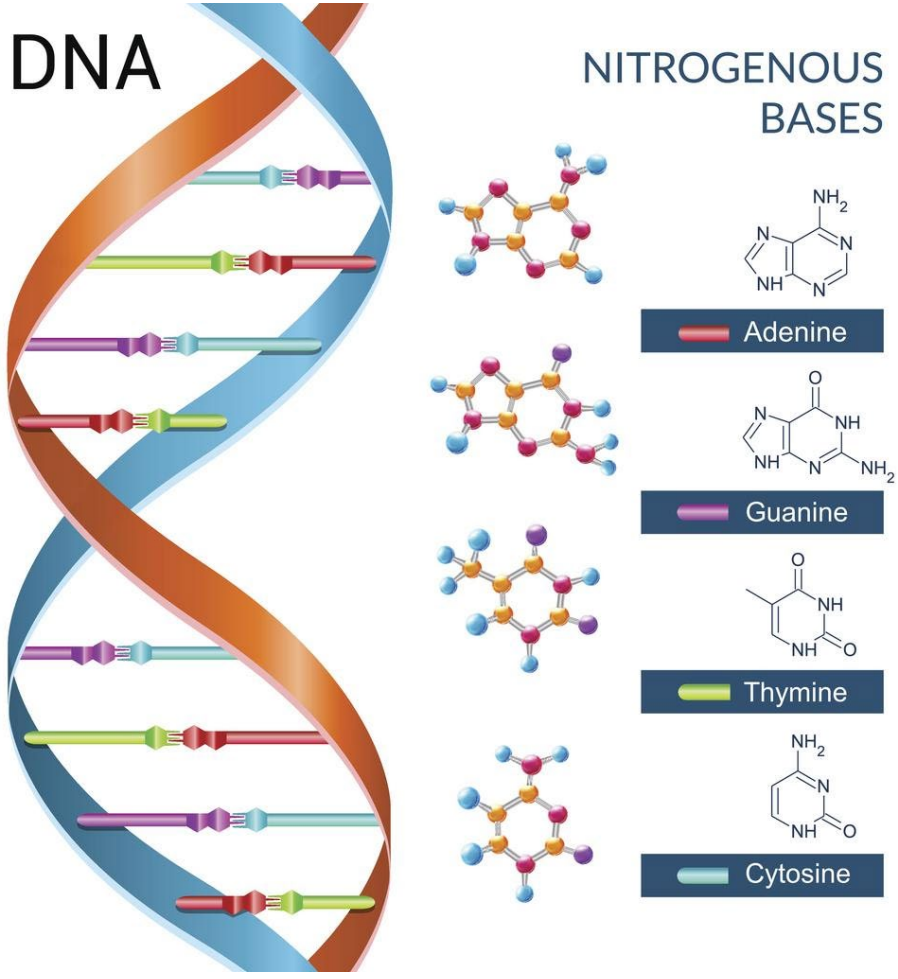


Characteristics of Living Things

- ✓ **Information and heredity.** Living things are based on a universal genetic code written in a molecule called **Deoxyribonucleic Acid**



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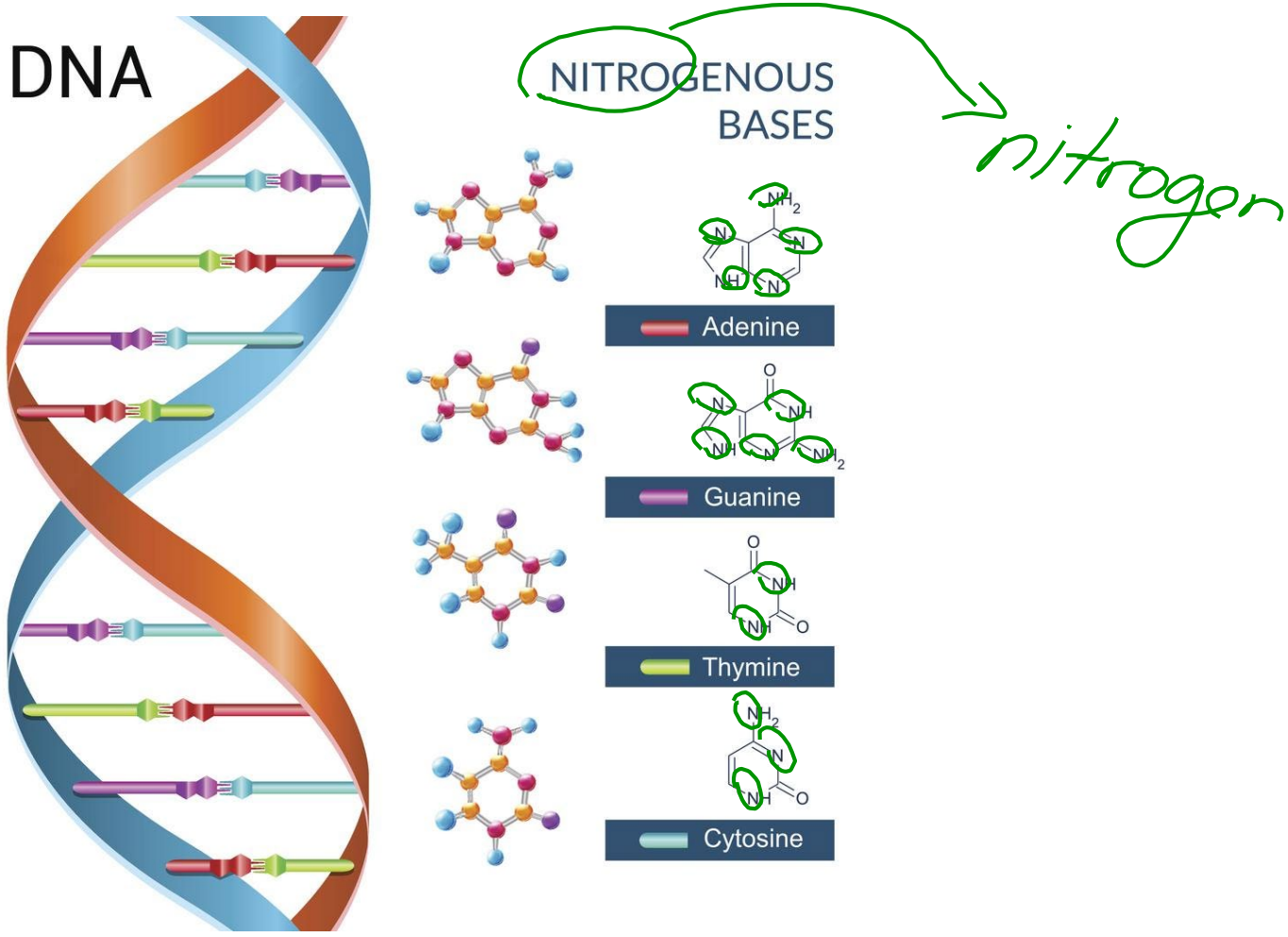
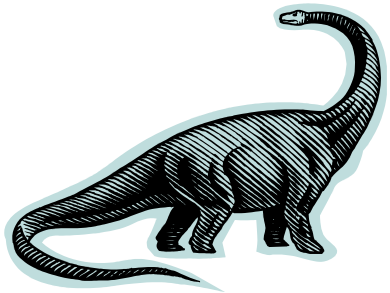


Characteristics of Living Things

Change over time: **adaptations** based on the genetic code with in **kinds** and **species** – leads to **variations** and **speciation**



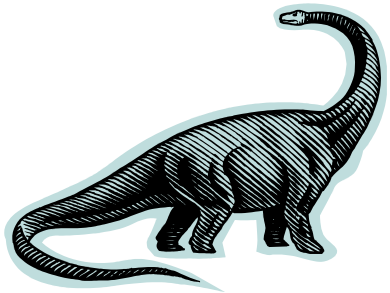
Characteristics of Living Things

Change over time: **adaptations** → behavior, physical trait

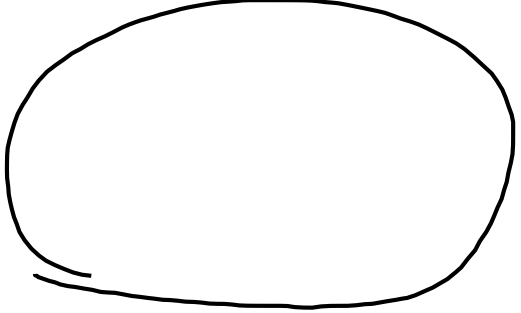
based on the genetic code with in **kinds** and **species** – leads to **variations** and **speciation**

kinds → general type

species → specific type



https://www.youtube.com/watch?v=ezHxi2DEHOE



1. 3 characteristics of life (living things)

2. Homeostasis?

3. Purpose of DNA?

4. Why important for your body to maintain a consistent temperature?

What's a Stimulus?

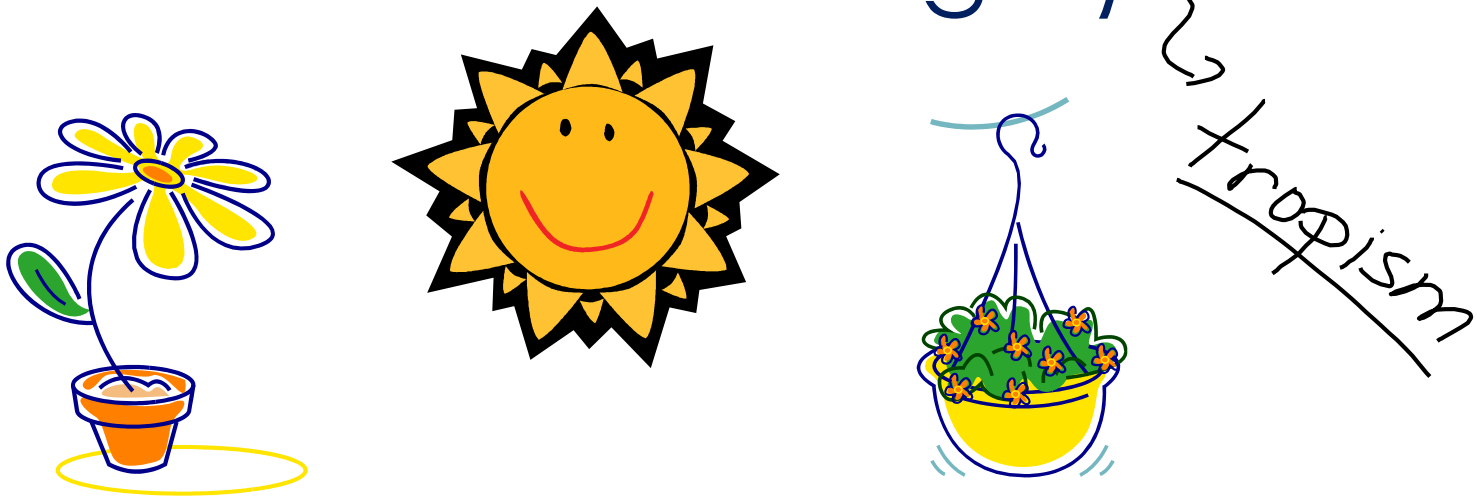
Stimulus – something that causes an internal or external reaction or response

- Fever as a **response** to an infection, the immune system is fighting the "invader"
- Increased heart rate from physical exercise

What's a Stimulus?

Stimulus – something that causes an internal or external reaction or response

- Plants growing toward a window (direction of the sunlight)



Carnivorous Plants

- Carn - flesh
- Vore - eater

Bladderwort

- autotroph - makes its own food (sugar -> glucose) (photosynthesis)
- heterotroph - feeds on something else (insects)

* adaptation due to nutrient poor soils

Carnivorous Plants

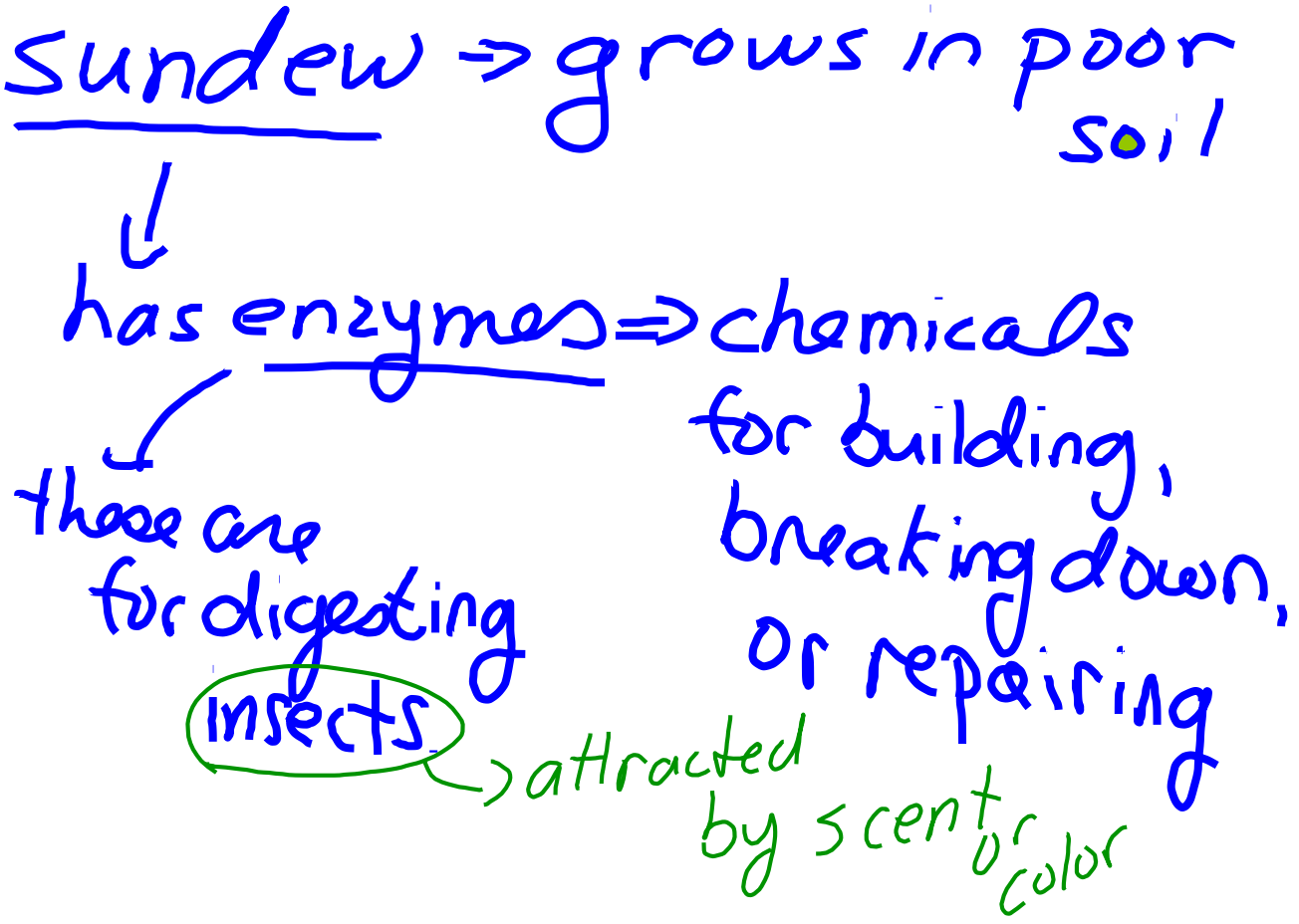
- Carn - flesh
- Vore - eater

Bladderwort

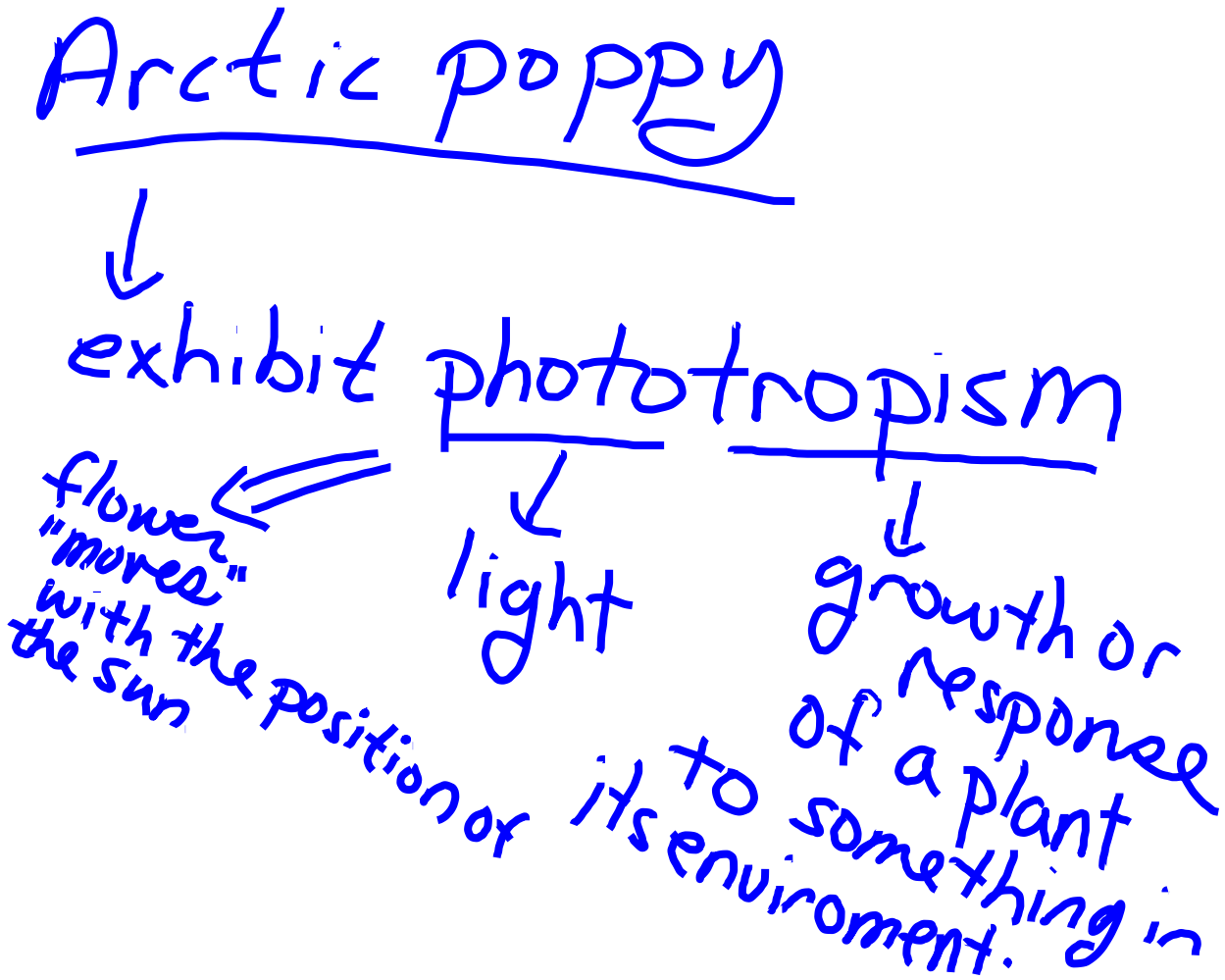
- autotroph - makes its own food (sugar -> glucose)
  - photosynthesis
  - producer
- heterotroph - feeds on something else (insects)
  - consumer

Limiting factor: low/little nitrogen

* adaptation due to nutrient poor soils


sundew ⇒ grows in poor soil
has enzymes ⇒ chemicals for building, breaking down, or repairing
these are for digesting
insects
attracted by scent or color

- homeostasis
- enzyme
- autotroph (producer)
- heterotroph (consumer)
- vitamin/mineral


Arctic poppy
exhibit phototropism
flower "moves" with the position or the sun
light
growth or response of a plant to something in its enviroment.

Uni or Multi – Cellular?

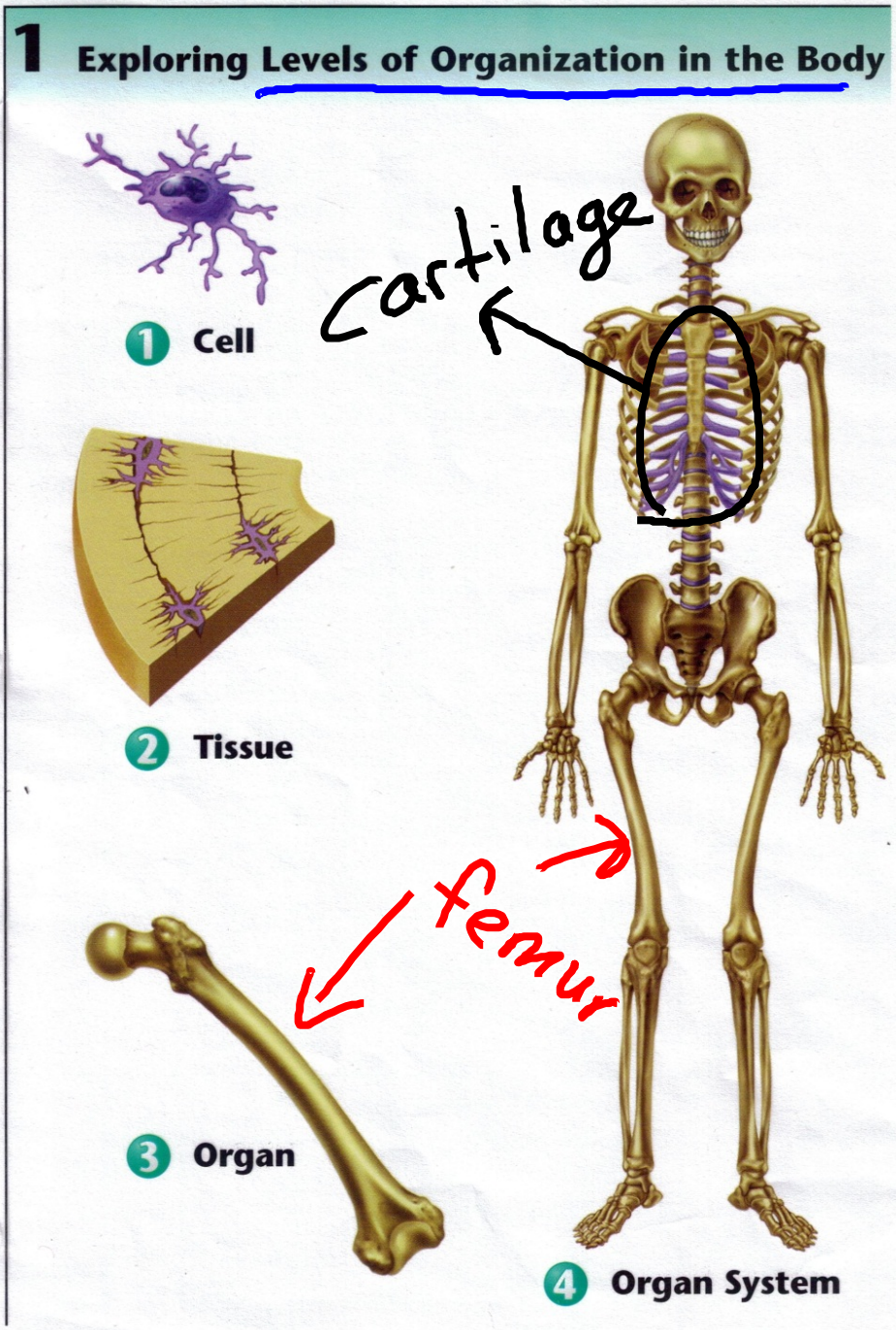
Uni: one **Multi**: many

Unicellular:

made of one cell

Multicellular:

made of many cells



cell -> smallest living part of the body.

tissue - "layer" of the same kind of cell.

organ = part of the body

Recap

1. Plants exhibit tropisms – such as **phototropism** and **gravitropism**. What is a **tropism**?
2. What is the difference between a **vitamin** and **mineral**?
3. Name 3 **bio(macro)molecules**.
4. Explain the difference between **kinds** and **species**.

Characteristics of Life

https://www.youtube.com/watch?v=0NnFhY_STFQ

Characteristics of Life

https://www.youtube.com/watch?v=0NnFhY_STFQ

In your notebook, write down:

1. **The 7 characteristics of life:**
   (explained in this video)
2. **The tiny "parts" that make up the tree: _____**
3. **DNA is found in: _____**
4. **The creek is considered non-living:**
   Why?

Characteristics of Life

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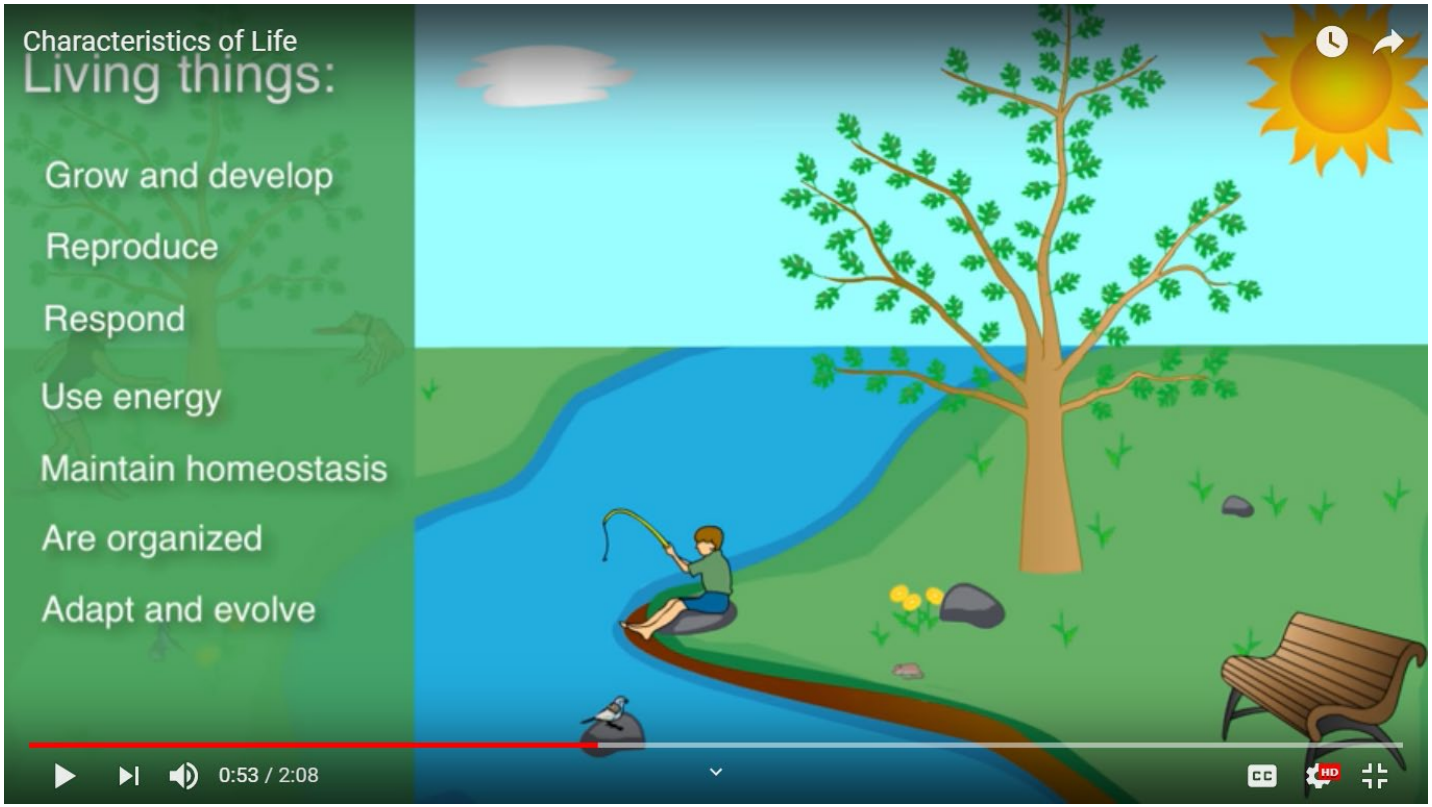

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   (explained in this video)
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3. **DNA is found in:** nucleus
4. **The creek is considered non-living:**
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Characteristics of Life

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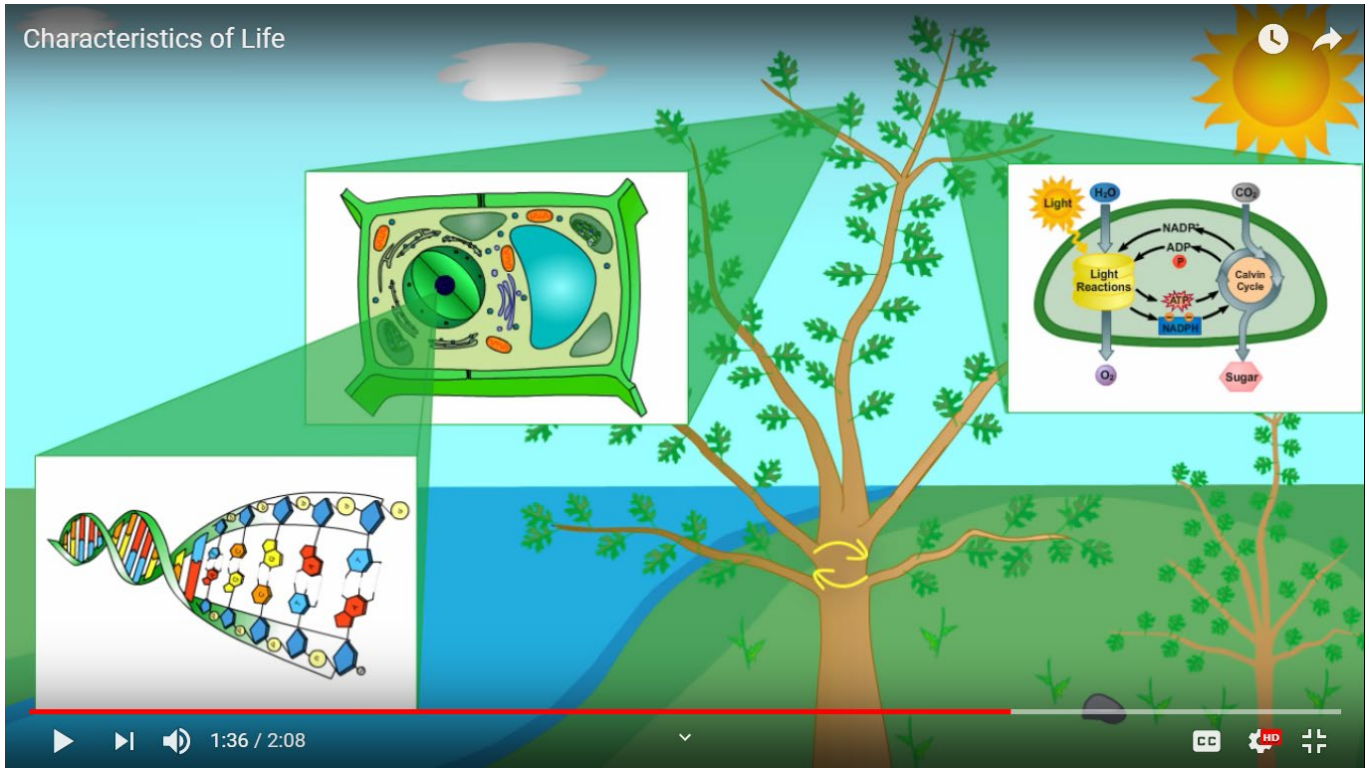

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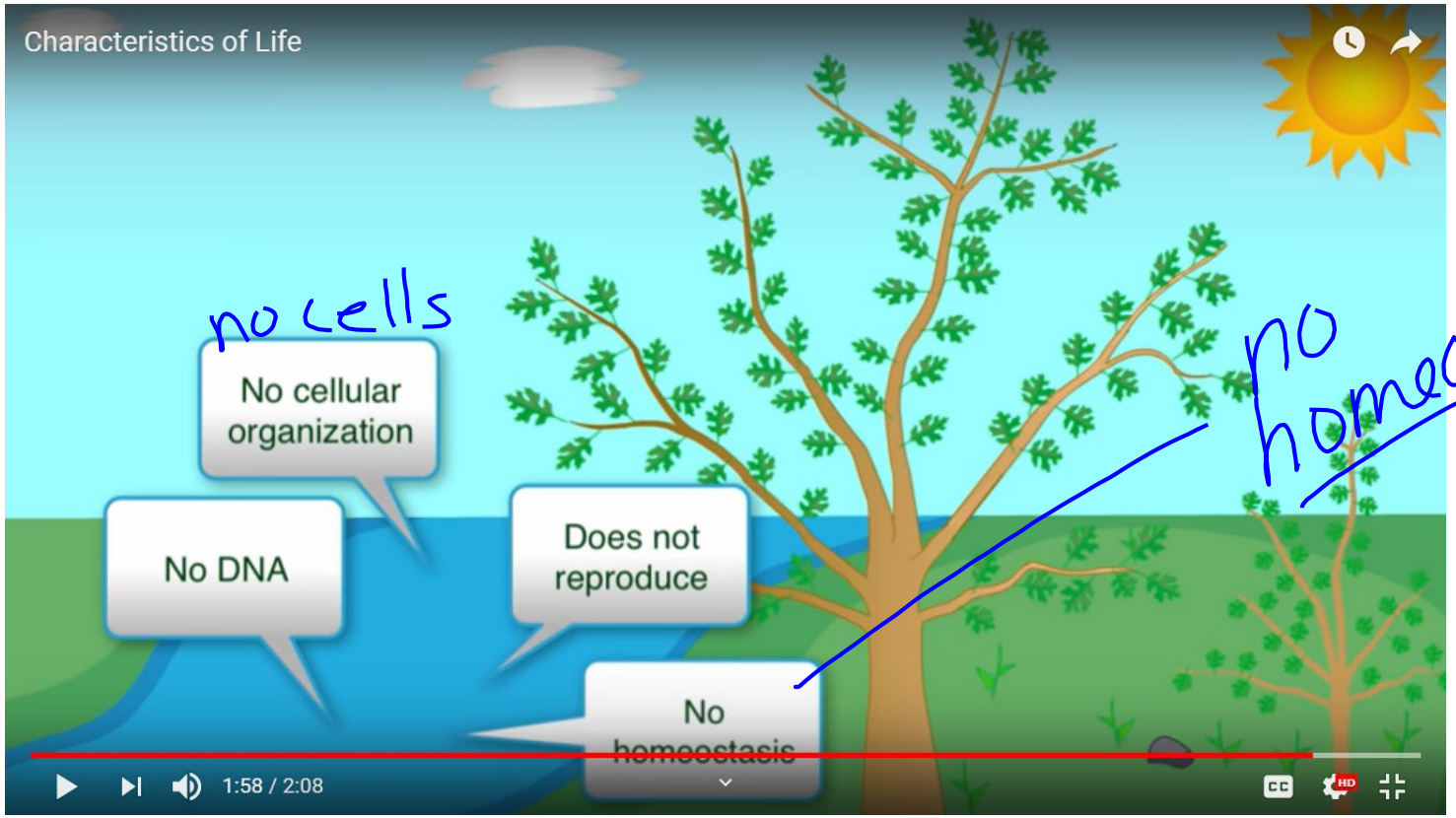


Organisms are Organized

System: group of "parts" that work together for a common **function**. Each "part" has its own unique job

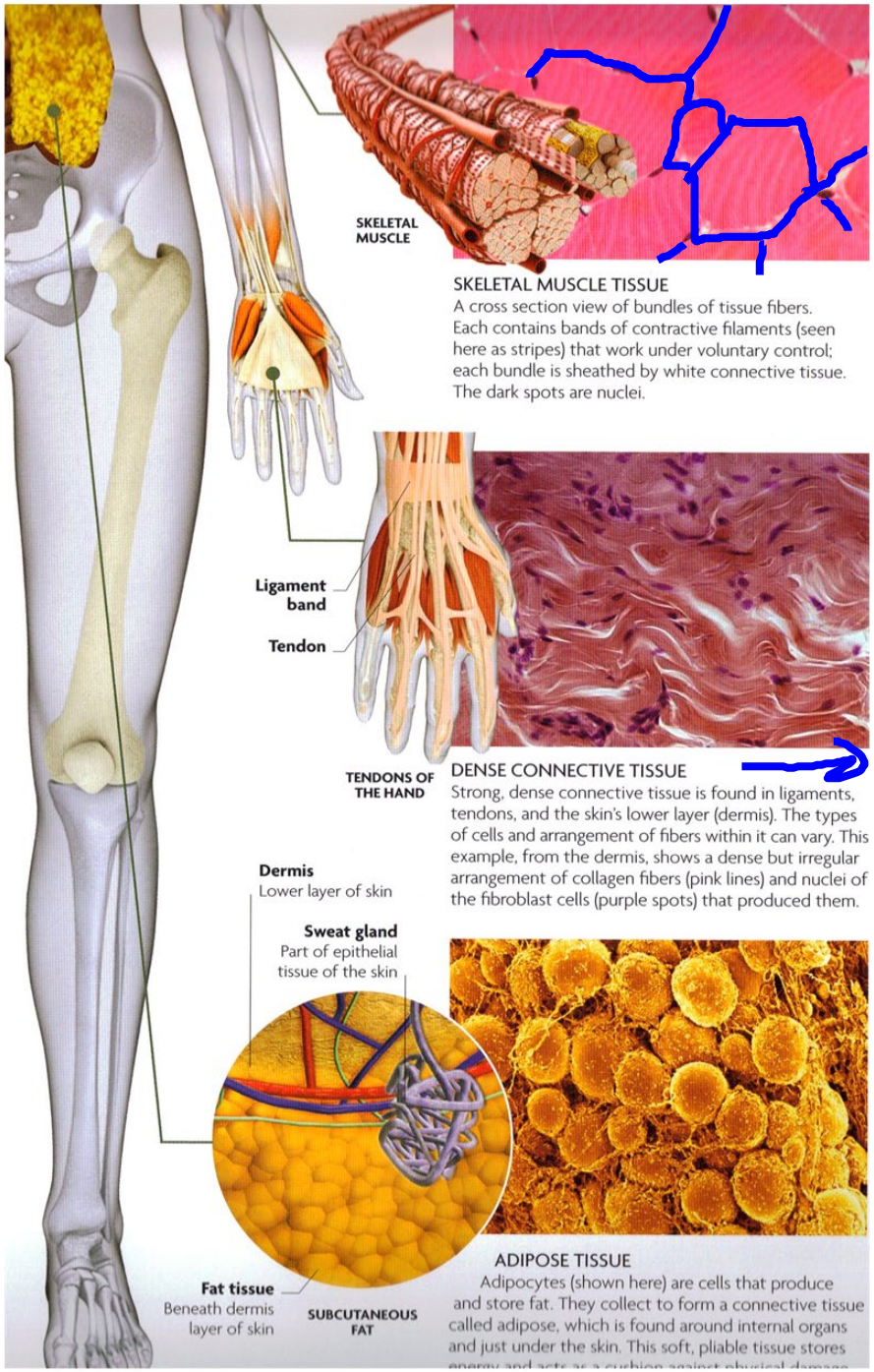
Organ: part of the body, made of layers of **tissues**

Organisms are Organized

Tissue: "layer" of the same type of **cell**

Cell: – smallest "living" part of the body that carries out the basic functions of life

soft tissue

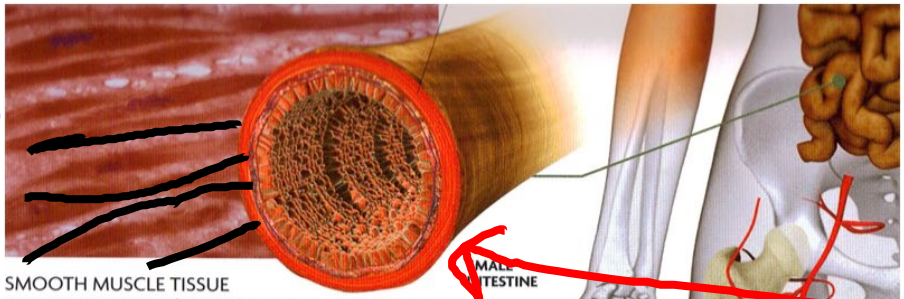


ligaments
tendons
cartiliage

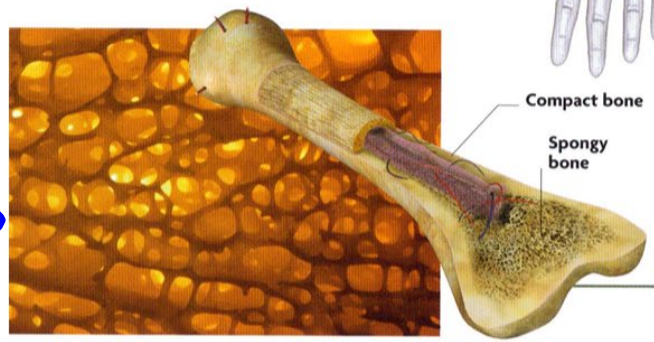
digestive organs

hard tissue

soft tissue



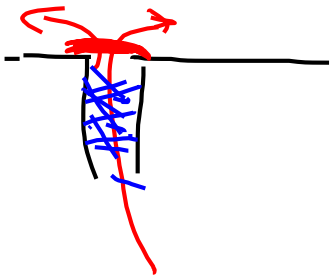
SMOOTH MUSCLE TISSUE
A microscope image showing long, slim muscle fibers in smooth muscle tissue. These contract involuntarily and are found with varying fiber orientations in multiple layers within the walls of many tubular internal parts, such as the airways, blood vessels, and intestines.



SPONGY BONE TISSUE
Most bones contain spongy (cancellous) bone encased in a dense "shell" of compact (cortical) bone. Spongy bone has a lightweight honeycomb-like structure composed of "bars" and "cross-spikes" of tissue) that accommodates bone marrow in its large open spaces.

STRUCTURE OF A LONG BONE

BLOOD
Blood is a formless, fluid connective tissue. Its main component is liquid plasma, which carries three major cell types. Red cells (shown in this micrograph) transport oxygen; white cells fight disease; and platelets, which are cell fragments, help with blood clotting.



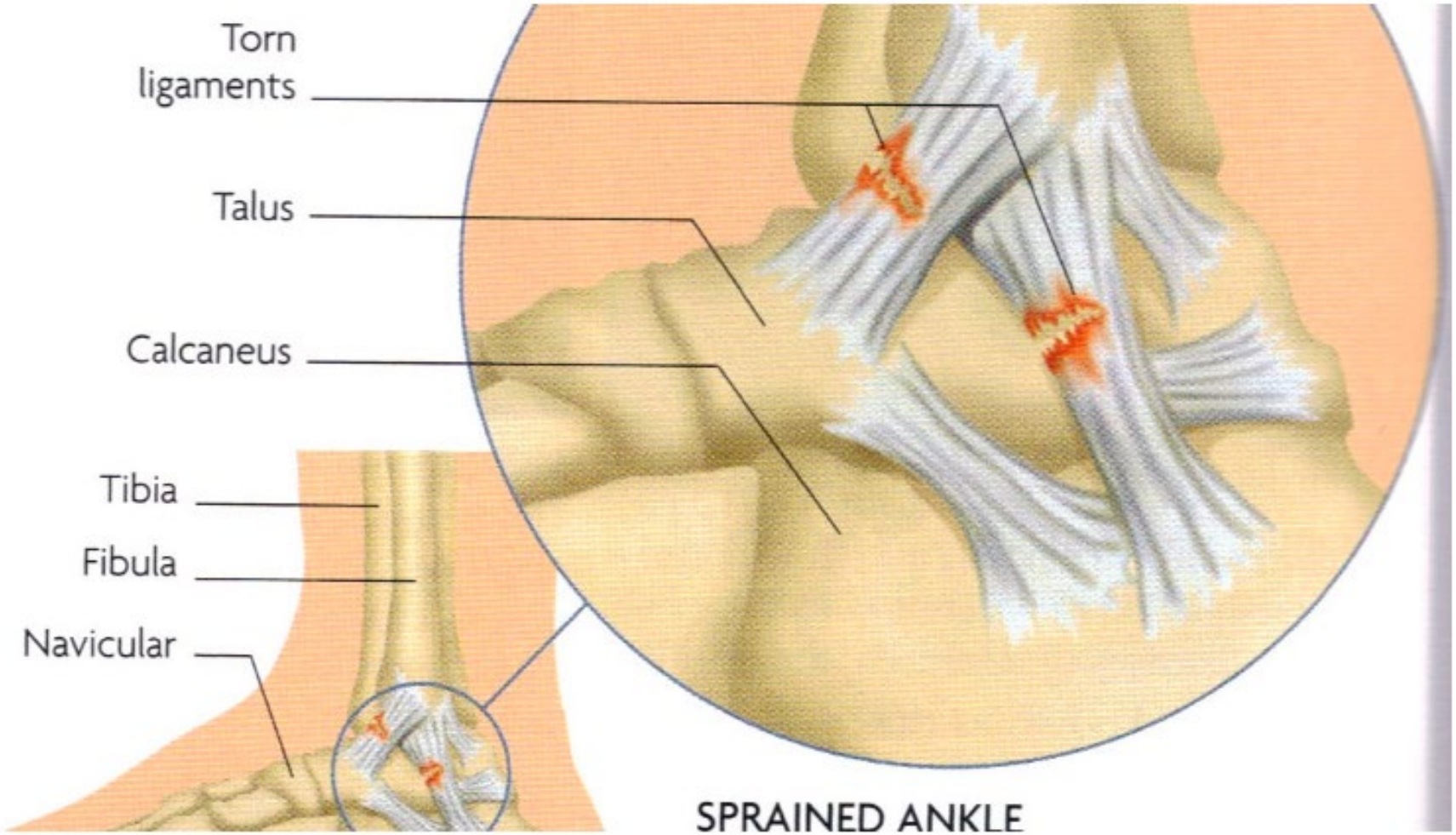
Tissues - "layers" of cells

cells → tissues → organs →

(muscle cells) (skeletal muscle) (bicep muscle)

organ system → organism

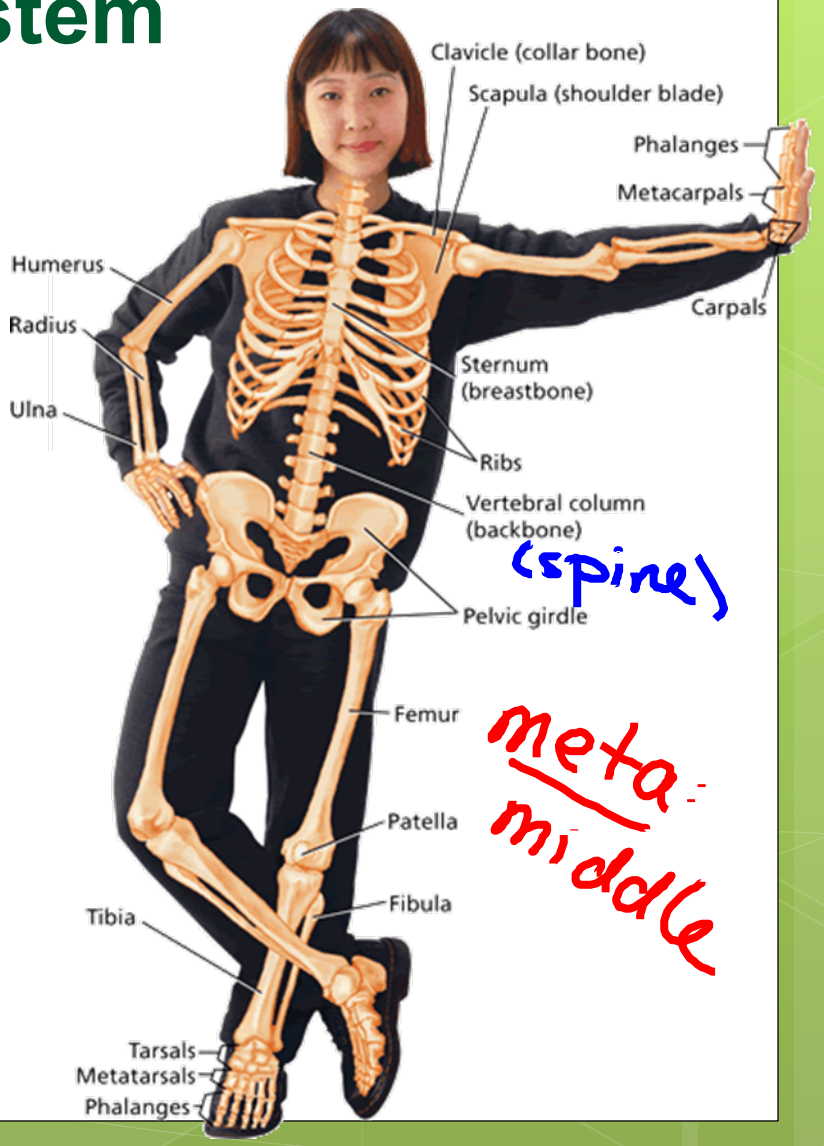
(musculoskeletal system) → (you)

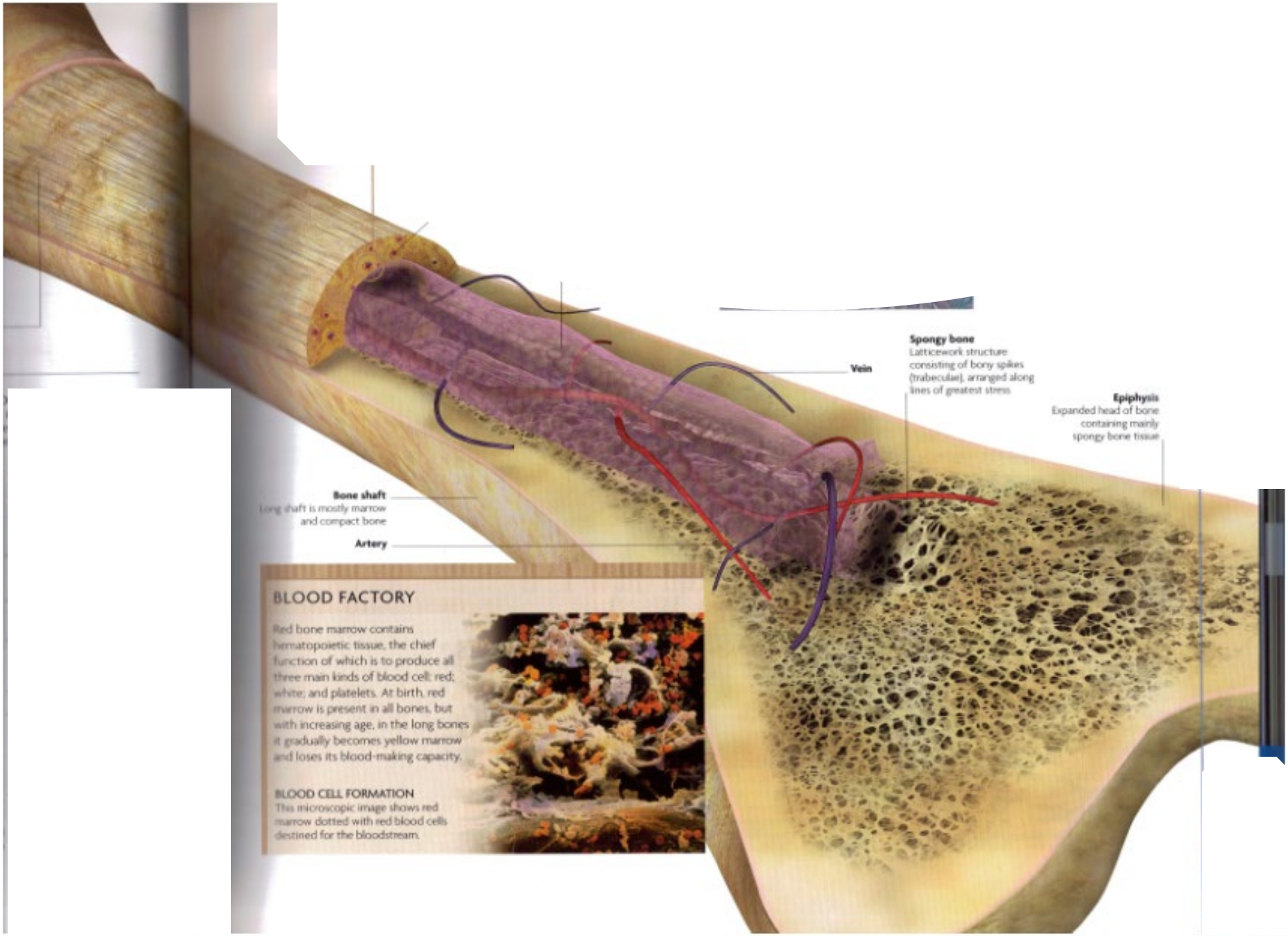

Torn ligaments
Talus
Calcaneus
Tibia
Fibula
Navicular
SPRAINED ANKLE

Skeletal System

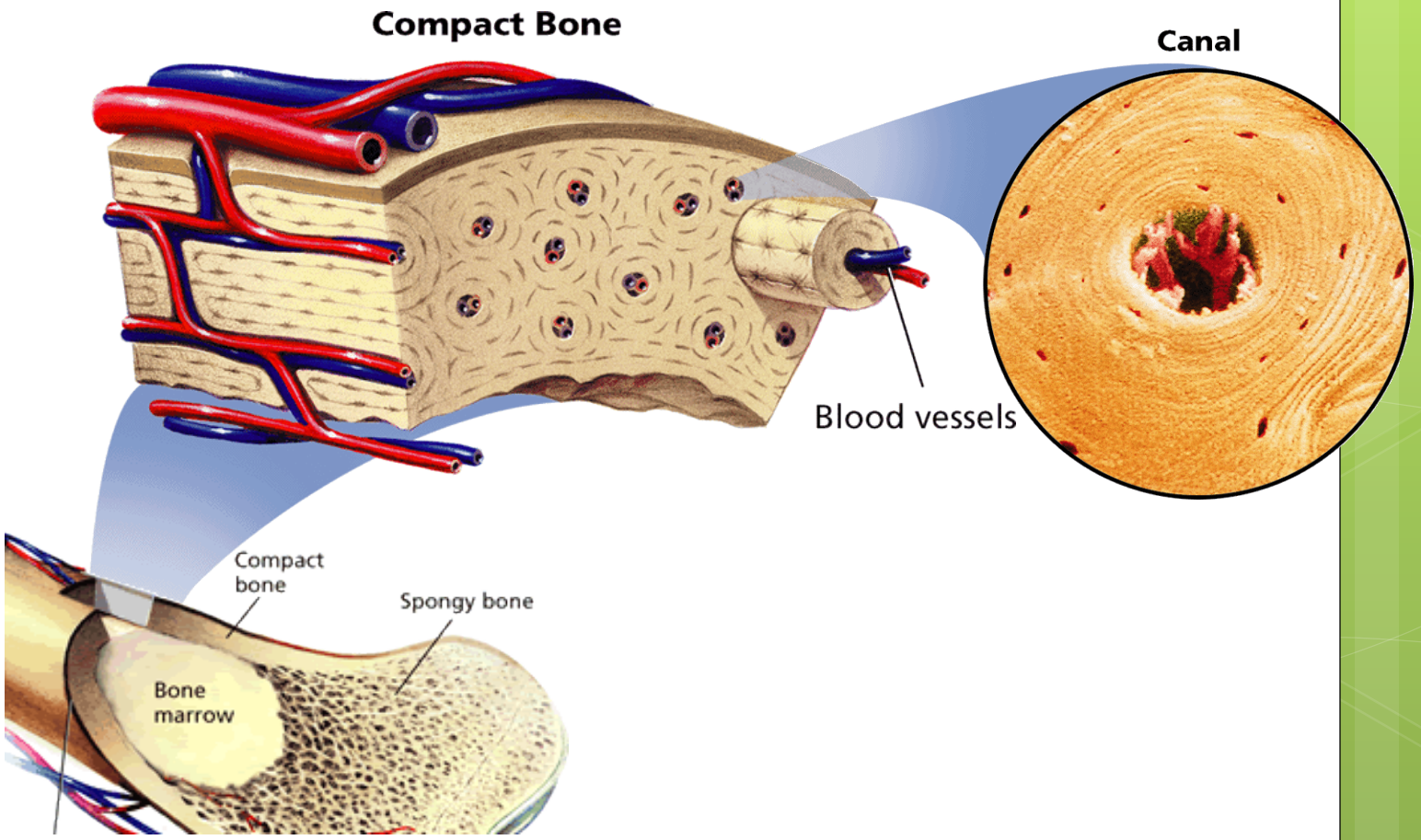
5 major functions

- **provides shape and support**
- **enables you to move**
- **protects your organs**
- **produces blood cells**
- **stores minerals**

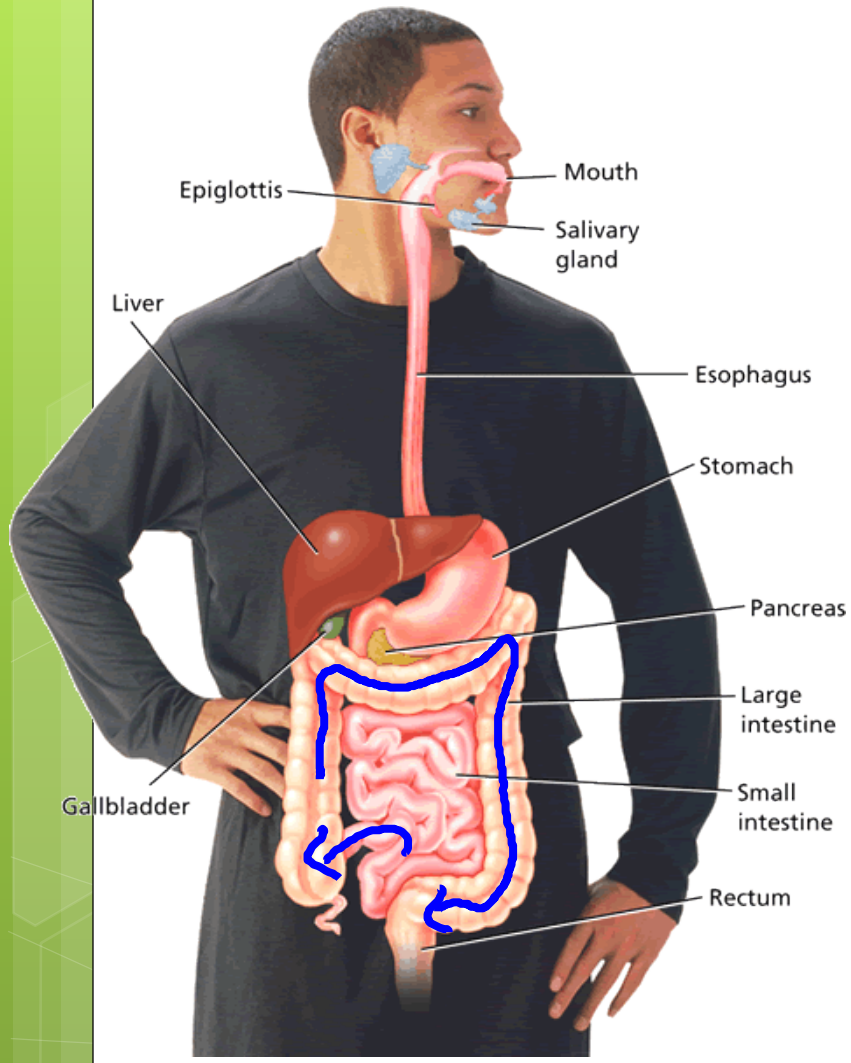



Spongy bone
Latticework structure consisting of bony spikes (trabeculae), arranged along lines of greatest stress
Vein
Epiphysis
Expanded head of bone containing mainly spongy bone tissue
Bone shaft
Long shaft is mostly marrow and compact bone
Artery
BLOOD FACTORY
Red bone marrow contains hematopoietic tissue, the chief function of which is to produce all three main kinds of blood cell: red; white; and platelets. At birth, red marrow is present in all bones, but with increasing age, in the long bones it gradually becomes yellow marrow and loses its blood-making capacity.
BLOOD CELL FORMATION
This microscopic image shows red marrow dotted with red blood cells destined for the bloodstream.

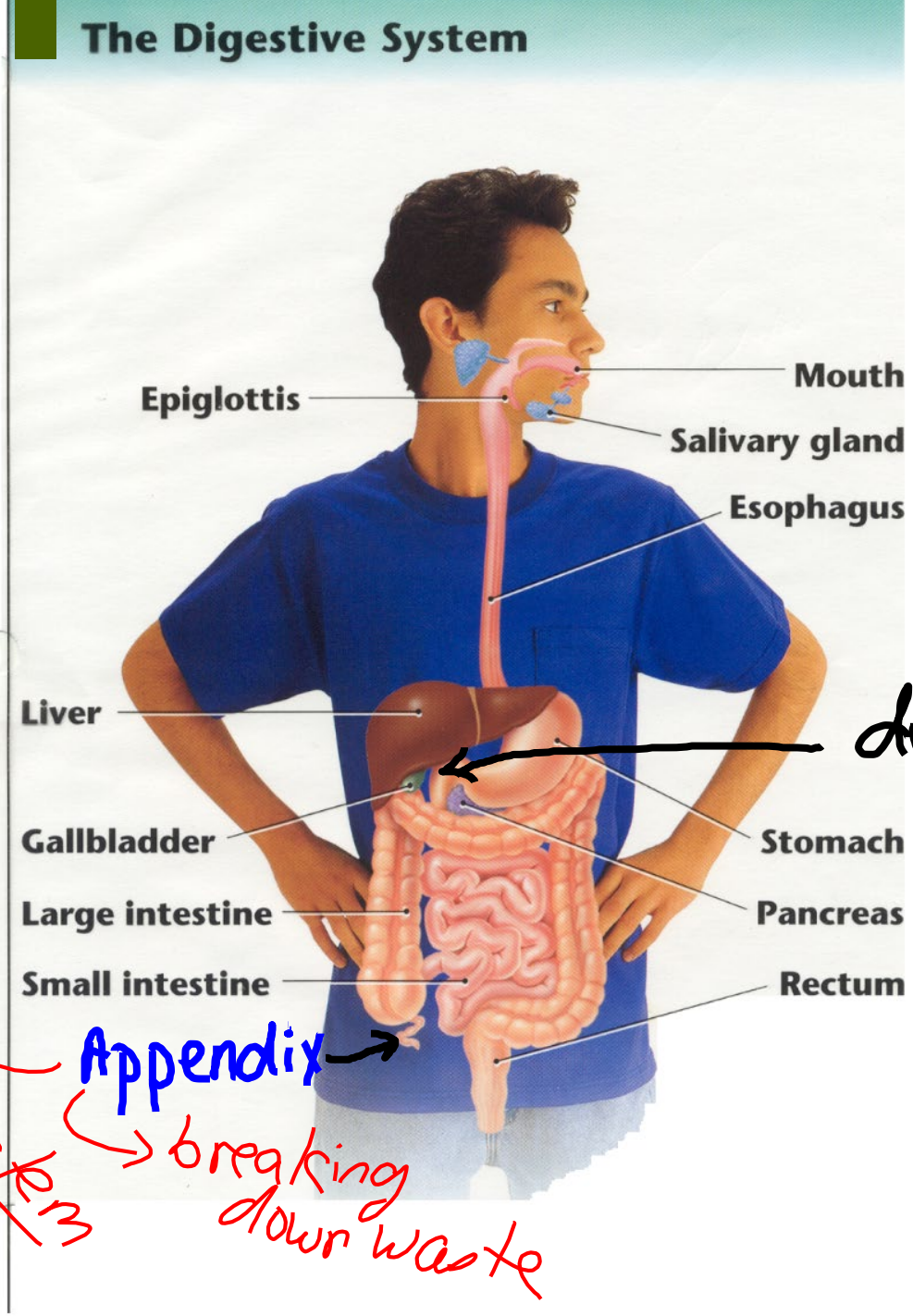
- Bones are complex living structures that undergo growth and development.

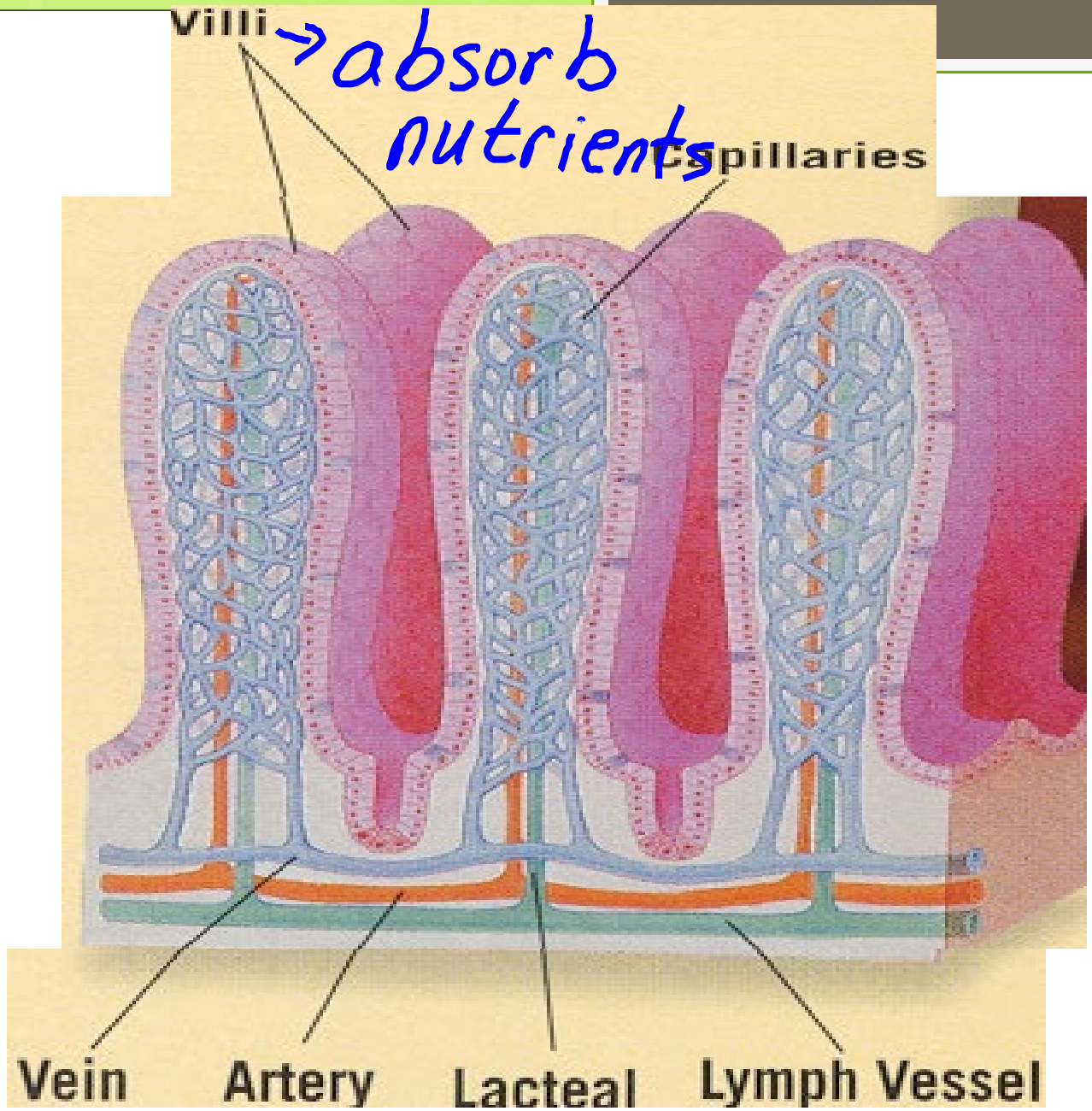


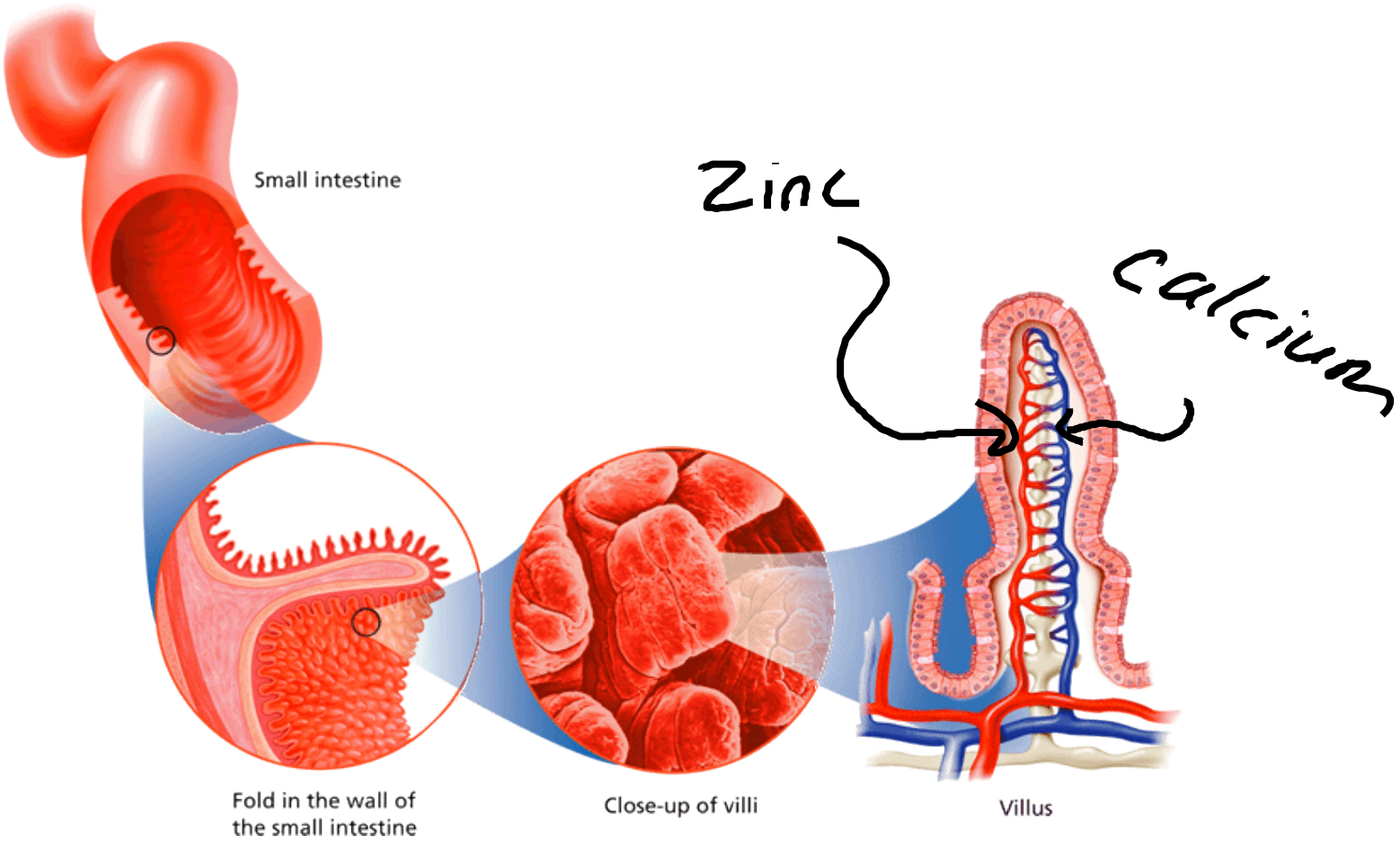
Digestive System



- **Digestive System Processes:**
- **Ingestion:** taking in the food
- **Digestion:** break down food into nutrient molecules
- **absorption:** of nutrients into the blood stream
- **elimination:** of waste


The Digestive System
Epiglottis
Mouth
Salivary gland
Esophagus
Liver
duodenum
Gallbladder
Stomach
Large intestine
Pancreas
Small intestine
Rectum
Appendix
immune system
breaking down waste


Villi
→ absorb nutrients
Capillaries
Vein
Artery
Lacteal
Lymph Vessel


Small intestine
Zinc
calcium
Fold in the wall of the small intestine
Close-up of villi
Villus

system → group of "parts" that work together for a specific purpose.

model → represents, looks like, mimics, or explains something

8 Characteristics of Life

List the 8 characteristics of life explained in this video.

8 Characteristics of Life

- https://www.youtube.com/watch?v=nhAR9MTWEd8