

___ **plant**

___ **fire**

___ **seashell**

___ **water**

___ **pig(sample)**

___ **bird seed**

___ **log**

___ **bacteria**

___ **sand**

___ **cotton ball**

___ **plastic moving flower**

Warm Up

Complete the Checklist? Is it living?

___ **plant**

___ **fire**

___ **seashell**

___ **water**

___ **pig(sample)**

___ **bird seed**

___ **log**

___ **bacteria**

___ **sand**

___ **plastic moving flower**

Warm Up

Create a rule that supports your choices

**Today I am going to
learn about the
characteristics of Life.**

What Am I going to Learn Today?

What am I going to DO today

- Complete Cornell Notes
 - Review the questions from the "Alive or Not?" Lab
-

The Characteristics of Living Things

8 Characteristics of Living Things

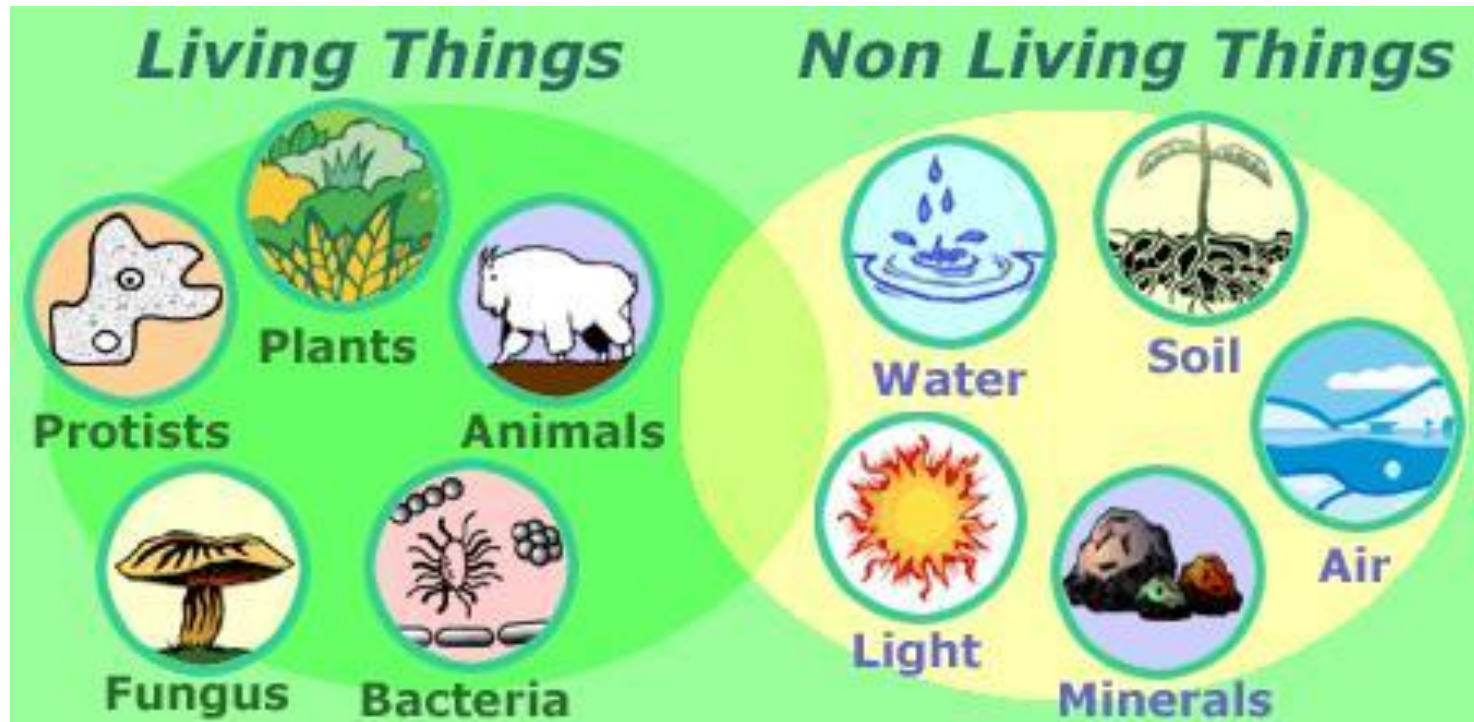
The left has characteristics of living things. On the right take notes about what each characteristics means and include examples.

<p>Living things are based on a universal genetic code</p> <p>Living things are made of cells</p>	
---	--

Create Cornell Notes: Left side questions/topics; right side notes, diagrams and details.

Characteristics of Living Things

- What makes something living DIFFERENT from something non-living?

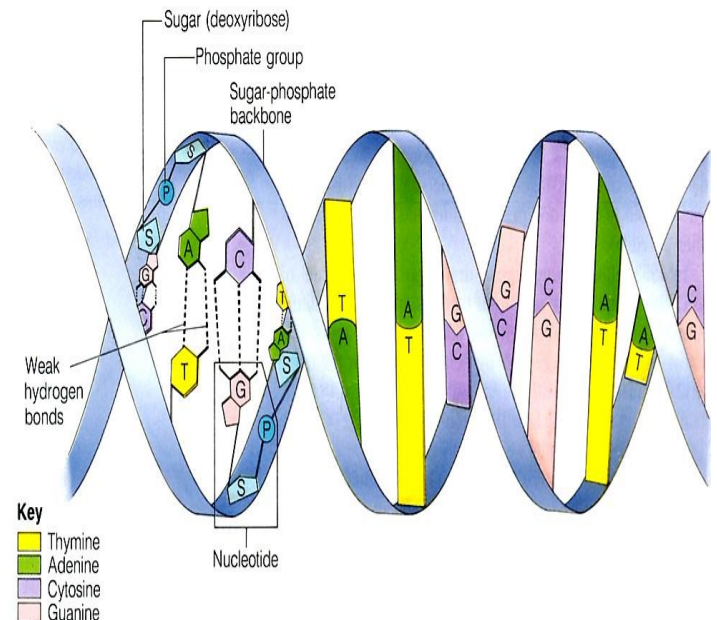


Characteristics of Living Things

- There are actually 8 characteristics that will tell you if something is alive.
 - We call them "**Characteristics of Living Things**"
 - Let's examine each of them...
-

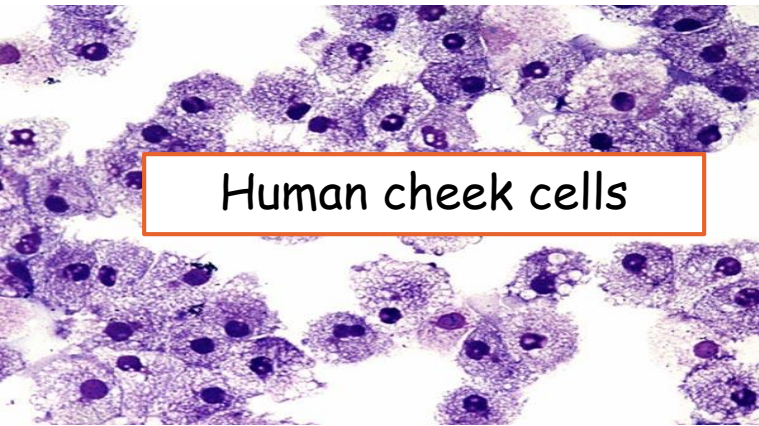
Characteristics of Living Things

1. Living things are based on a universal genetic code.
 - DNA controls the structure and function of cells.
 - All organisms store information they need to live, grow, and reproduce in a genetic code written in a molecule called DNA.
 - Characteristics of living things are passed on to the next generation.

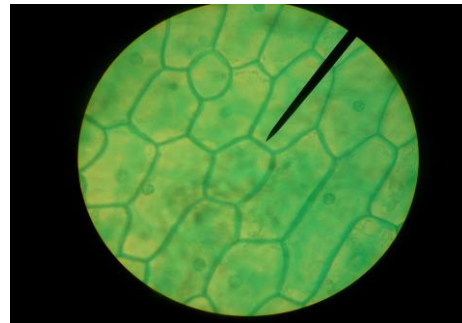


Characteristics of Living Things

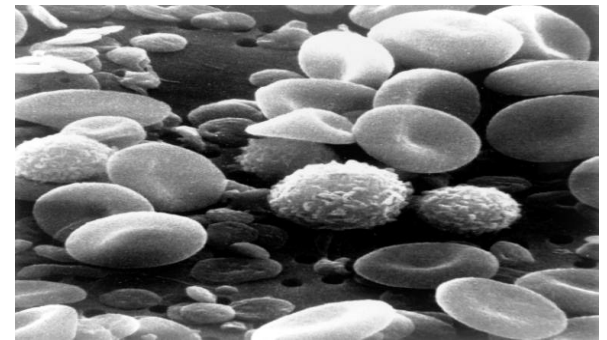
2. Living things are made up of cells.
- Basic unit of life.
 - All things composed of one or more cells.
 - Cells are the smallest living things.
 - Cells are complex and very organized.



Human cheek cells



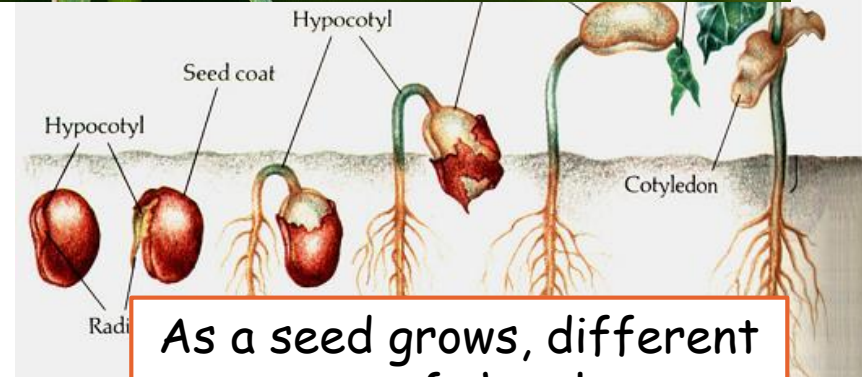
Plant leaf cells



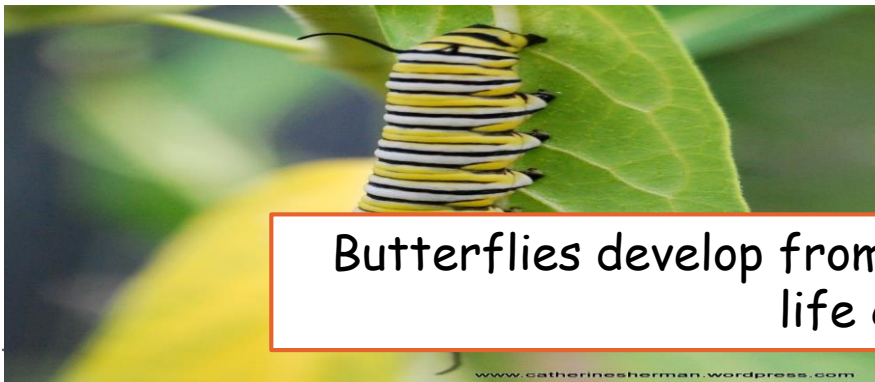
Blood cells

Characteristics of Living Things

3. Living things grow and develop.
- Living things may change as they grow.
 - Every organism develops at a different rate.
 - During development a single cell divides again and again.
 - Increase in size.
 - Mature over time.
 - Has a lifespan (live and die).



As a seed grows, different parts of the plant develops.



Butterflies develop from caterpillars during their life cycle.

**An icicle can grow, but
why isn't it alive?**

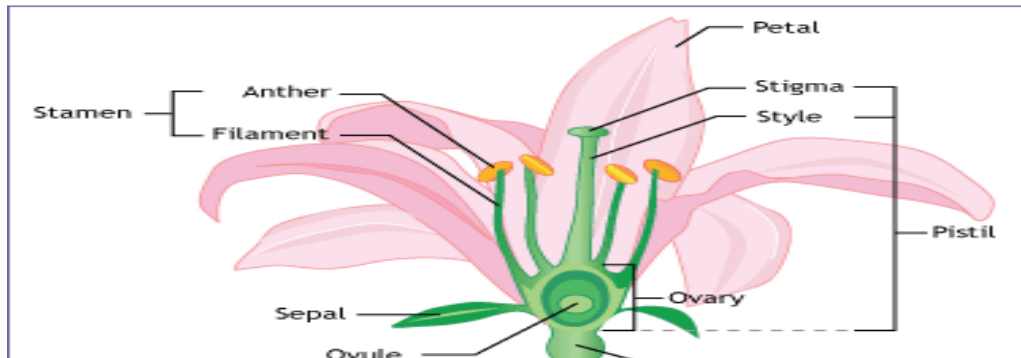
Characteristics of Living Things

4. Living things reproduce.

- Organisms make other organisms similar to themselves.
- Organisms produce offspring
- Sexual reproduction (2 parents)
- Asexual reproduction (1 parent)



Birds have two parents, so these chicks were produced through sexual reproduction



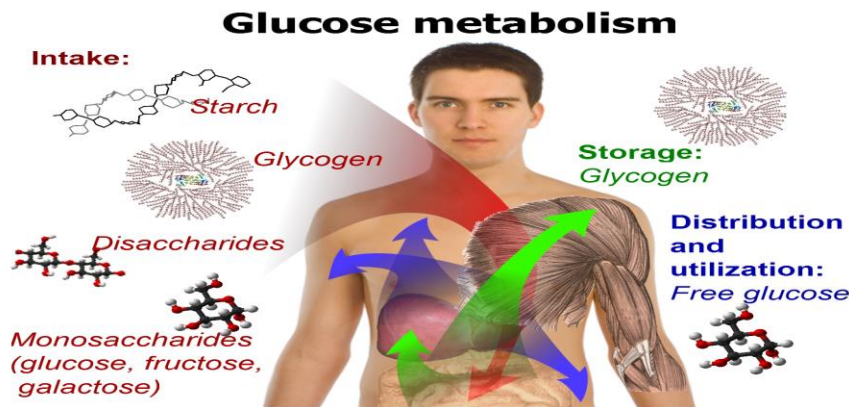
This flower has male and female sex cells, so it is using sexual reproduction



This fern has produced spores by dividing its own leaf cells. A fern uses asexual reproduction

Characteristics of Living Things

5. Living things obtain and use material and energy.
- Organisms either make their own food, eat other things, or break down dead material.
 - All organisms must take in materials and energy to grow, develop, and reproduce.
 - Chemical reactions breaks down materials in what is called metabolism.



Characteristics of Living Things

6. Living things respond to their environment.
- A stimulus is an external change.
 - All living things respond to external changes or stimuli.
 - Organisms detect and respond to signals from their environment.
 - Sensitive and can react rapidly to surroundings.



For example, plants respond to light by growing



Mammals respond to cold temperature by growing thicker fur.

Characteristics of Living Things

7. Living things maintain a stable internal environment.
- All organisms need to keep their internal environment relatively stable, even when external conditions change dramatically.
 - This is called **HOMEOSTASIS**

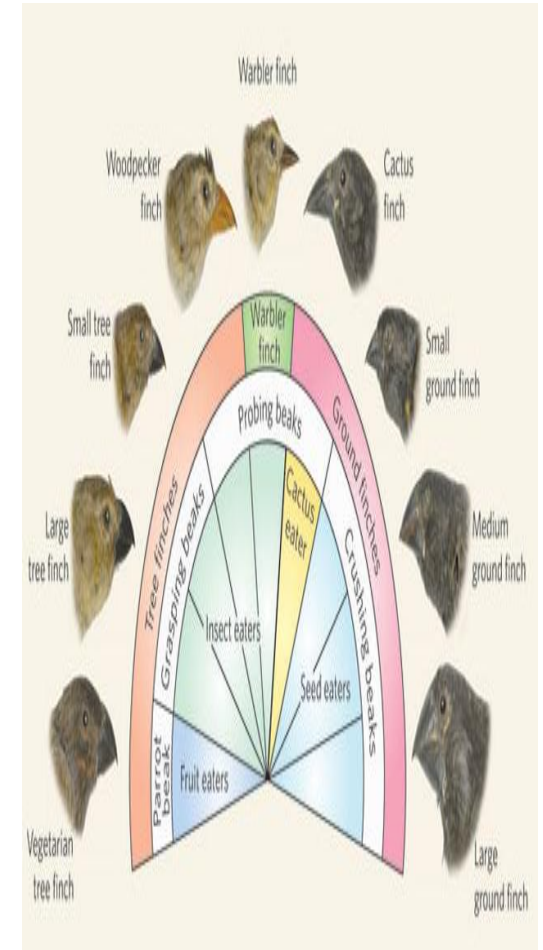
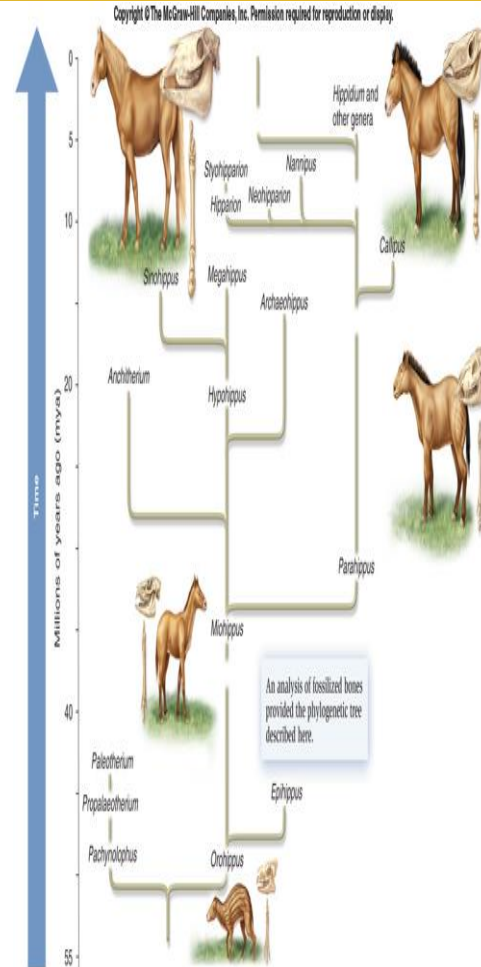


Thermal images show that even though the temperature outside the body is cool, inside there is warm and stable environment.

Characteristics of Living Things

8. Living things adapt to their environment through evolution

- Evolution is change over a long period of time to better survive in an environment.
- Species will change not an individual organism.
- Due to variation, organisms with advantageous traits will survive and be able to reproduce.



**You can take any living
organism and apply all
eight characteristics...**

Example: Pigmy Seahorse

1. Living things are based on a universal genetic code (DNA):

The Pigmy seahorse has 48 chromosomes



Example: Dugmy Seahorse

2. Living things are made up of cells:

Seahorses have fewer cells than other ocean-dwelling animals.

All of the cells of the species *Hippocampus trimacutus* can fit inside it's 3 cm length body.



Example: Dugmy Seahorse

3. Living things grow and develop:

Most seahorses reach the age of reproduction at about 100 days old.



Example: Dugmy Seahorse

4. Living things reproduce:

Mature seahorses can reproduce 10-12 times each year. Female seahorses will release several hundred eggs at a time.



Example: Dugmy Seahorse



5. Living things obtain and use material and energy

Seahorses eat the larvae of small crustaceans.

This food provides the energy for seahorses to live.

Example: Dugmy Seahorse



6. Living things respond to their environment:

Seahorses can adapt to a variety of water temperatures.

They can only reproduce when the water is 20-28 degrees C.

When light intensity is too bright or too dim birth defects can occur in the babies.

Example: Dugmy Seahorse



7. Living things maintain a stable internal environment:

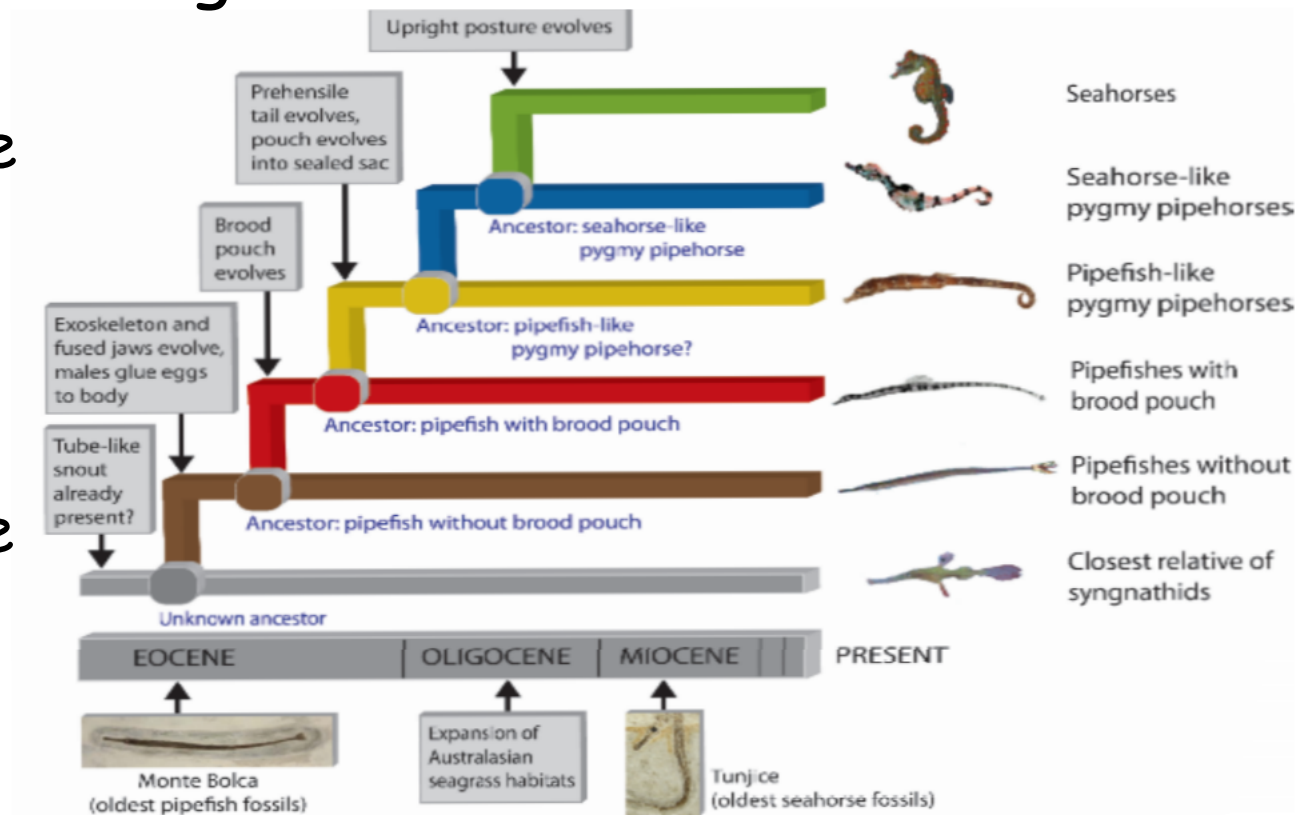
Seahorses are cold blooded, so their internal environment depends on the temperature of the water they are in.

They survive best in water that is 28 °C on average.

Example: Pigmy Seahorse

8. Living things adapt to their environment through evolution:

Seahorses have evolved over millions of years. Their ancestors did not have a tube like snout or swim upright.



How will I show what I have learned

- Cornell Notes Summary
 - Review the questions from the "Alive or Not?" Lab
 - Would you change any of your answers? Why?
-

Characteristics of Living Things

- Let's Summarize:

- Living things...

- Grow and Develop

- Are based on a universal genetic code

- Respond to their environment

- Are made of cells

- Reproduce

- Maintain a stable internal environment

- Obtain and use material and energy

- Adapt and evolve over time

Reference:

- <http://www.fao.org/docrep/field/003/AB736E/AB736E01.htm>
-

What is LIFE?

- Scientists that study living things are called biologists.
- Bio=life and -ology=study of
- We study Life Science Or Biology
 - All living things:
 1. are made up of cells
 2. reproduce
 3. have DNA
 4. grow and develop
 5. obtain and use materials and energy (metabolize)
 6. respond to their environment
 7. maintain homeostasis (stability)
 8. evolve