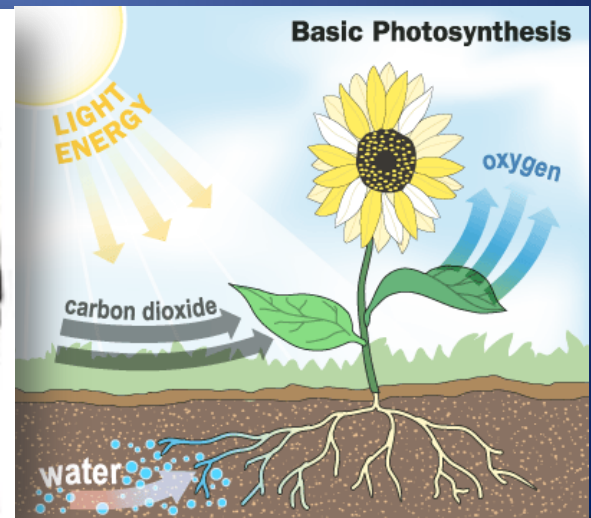
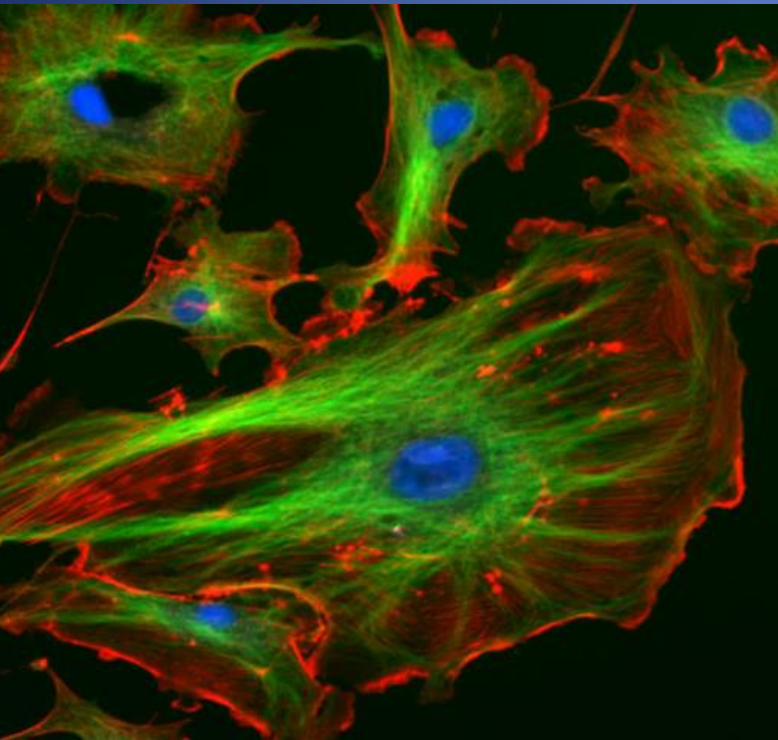


The Six Characteristics of Life



1. Living things have Cells

- A cell is the smallest unit of life
- Cells contain all of the materials necessary for life to exist



- Some organisms are...
 - **unicellular** (only one cell)
→ like **bacteria**
 - **multicellular** (many cells)
→ like **humans**
(**>100 trillion cells in fact**)
- ❖ Human cells have **different functions** – like for nerves or skin

2. Living Things Sense and Respond to Change

- Living things respond to a **stimulus**
- **A stimulus is...**
 - anything that causes a change or response
- A stimulus can include:
 - Smells (good or bad)
 - Tastes
 - Sounds
 - Heat (touching a hot stove)
 - Light or darkness (**plants respond**)
 - Gravity (what would you do if you were about to fall?)



2. Living Things Sense and Respond to Change

Homeostasis

When an organism responds to changes in order to keep its internal environment the same



**What happens when
our bodies get
too
cold or hot?**



3. Living Things Reproduce

Living things must reproduce to make sure their species survives



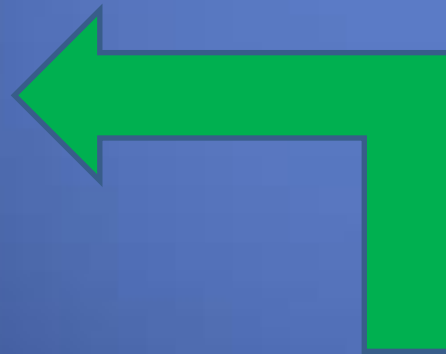
3 Types of Reproduction:

1. Sexual
2. **A**sexual
3. Binary Fission



Sexual VS Asexual Reproduction

- SEXUAL = **COMBO** of genetic material (DNA) from **two parents**



Asexual = an exact **COPY** of the genetic material (DNA) from **one parent**

(Example here is a budding Hydra)

Asexual Reproduction

(A= NOT)

Examples:

- Budding (Hydra)



- Spore Formation (fungi)



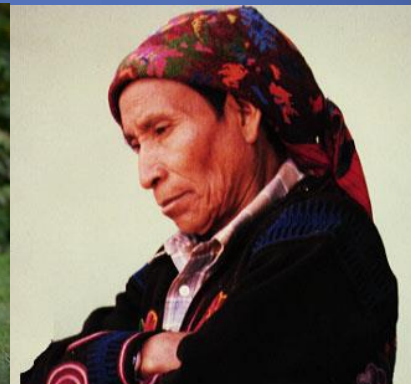
Sexual Reproduction

- Two parents combine their DNA to produce a new offspring
 - ❖ Sperm = male sex cell
 - ❖ Egg = female sex cell
- This mix of DNA creates an organism with the genetic characteristics of both parents



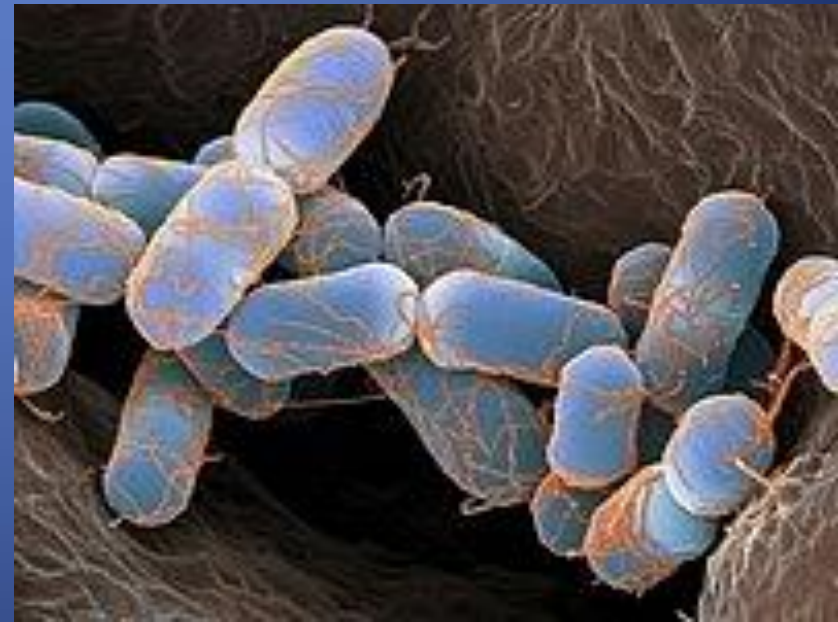
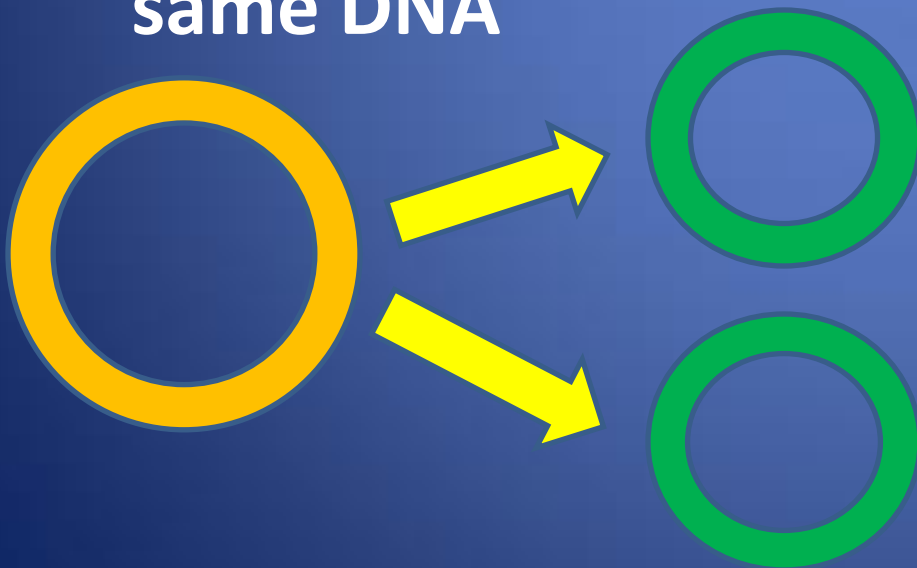
Sexual Reproduction

Sexual
reproduction
helps make one
specie look very
different
(compare to **A**sexual)



Binary Fission

- The simplest form of reproduction which occurs in prokaryotes (aka – **bacteria**)
- Binary fission involves copying a circle of DNA and dividing into **two copies with exactly the same DNA**



4. Living things have DNA

- Living things need **DNA** (Deoxyribonucleic acid) because it **controls all the characteristics and activities of an organism**
- **DNA is a special molecule** that contains the instructions for making proteins-a macromolecule



Copies of DNA are passed down from the parent to the next generation.

Adopting a parent's features is called...

Heredity

5. Living things Use Energy



ENERGY

- Living things use energy to:
 - ✓ Make and Break down food
 - ✓ Breathe
 - ✓ Move things in and out of the cell
 - ✓ And move, grow, reproduce and other things
- All of these activities involve **chemical reactions**
- **Metabolism** is the combined chemical activities in an organism

5. Living things Use Energy

Producers are plants or bacteria that can make (produce) their own food using the sun's energy in a process called **photosynthesis**

Any other organism is either a

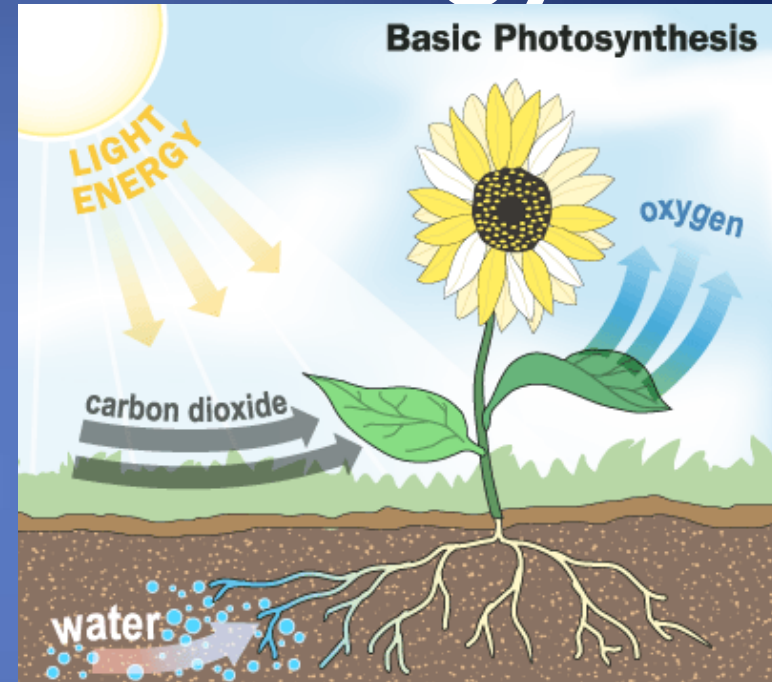
consumer

(like a wolf)

or a

decomposer

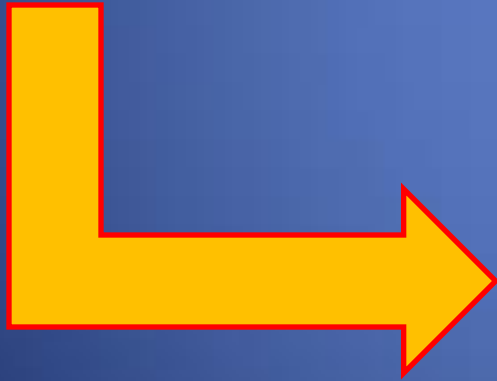
(like mushroom)



6. Living Things Grow and Develop

Development = living things change and mature as they grow over time

Organisms pass through different **stages** as they grow



Single celled organisms = grow larger

Multi-celled organisms = grow in **number of cells**

6. Living Things Grow and Develop

Metamorphosis is when organisms have a **complete change of body shape**

Examples: - Tadpole → Frog
- Caterpillar → Butterfly

