

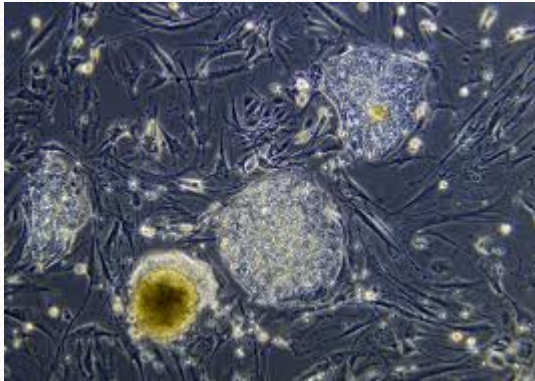
Living vs. Non Living



Characteristics of Living Things

ANIMATION

1. Are made of one or more cells

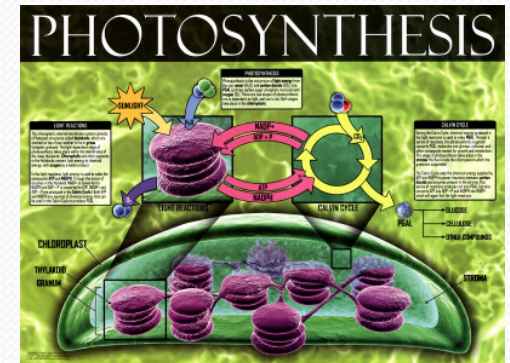
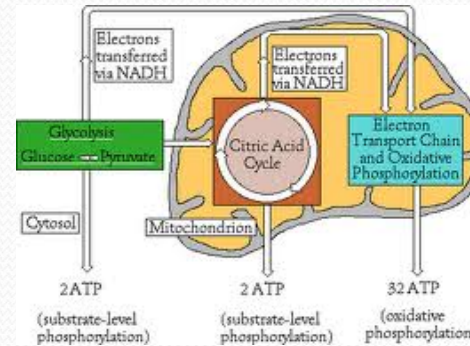
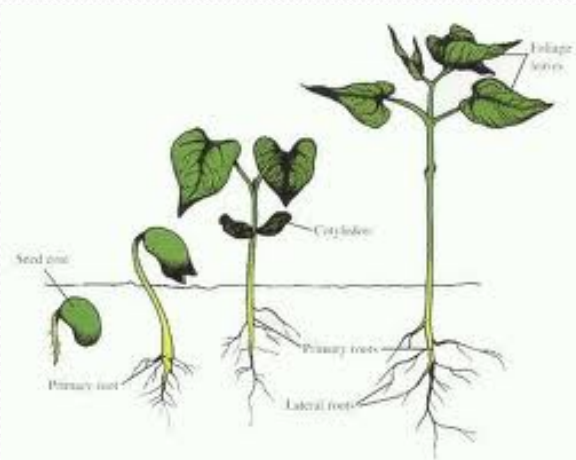


2. Reproduce



3. Grow and develop

4. Obtain and use energy



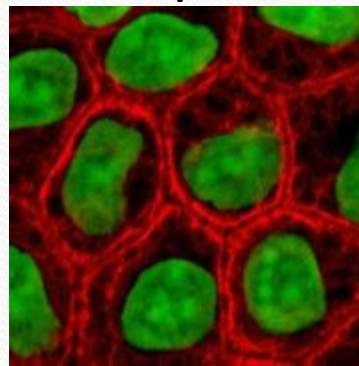
5. Respond to their environment

- Motile bacteria can respond by swimming toward or away from a chemical gradient



Living things are made up of Cells

- Cell: a collection of living matter enclosed by a barrier that separates the cell from its surroundings
- Unicellular: organisms of only one cell
- Multicellular: organisms made up of many cells... hundreds to trillions



Living Things Reproduce

- Reproduction is necessary because all individuals die eventually
 - Sexual reproduction: two cells from different organisms unite to form the first cell of a new organism



- Asexual reproduction: when a single organisms reproduces alone (eg: unicellular organism dividing in two)



Living Things Grow and Develop

- All organisms are capable of growth at one stage or another in their lives
- Development (def'n): cycle of change
 - Eg. The development process by which humans change from children to adults is puberty

Living Things Obtain and Use Energy

- Living things obtain energy from their environment for:
 - Growth
 - Development
 - Reproduction
- Anabolism: process of synthesizing complex substances from simpler ones (eg. photosynthesis)
- Catabolism: breakdown of complex substances to simpler ones. Usually the purpose is to release energy (eg. digestion and cellular respiration)
- Metabolism: the balance (sum total) of these processes

Living things respond to their environment

- Stimulus: anything in the environment that causes an organism to respond
 - Examples include: light, temperature, odor, sound, gravity, heat, water, pressure

ANIMATION

- Homeostasis is a process by which organisms respond to stimuli in ways to keep bad conditions suitable for life
 - Example (humans): our “thermostat” which regulates the body temperature – too hot we sweat and cool down.

Biology: The Study of Life

- To translate the term biology:
 - Bio = “life”
 - Logy= “study of”
- Biology: a science that seeks to understand / explain / control the living world
- Biologist: a person who uses the scientific method to study living things

Branches of Biology

- Complete the table using the text examples given:

Level of question/focus	Type of Biologist	Might study:
Questions at the molecular level:		
Questions at the cellular level:		
Questions at the multicellular level:		
Questions at the population level:		
Questions at the global level:		

- What “goal” do all biologists have in common?