

What Does it Mean to Be Alive?



The Characteristics of Life

Life!!!

All living things share some basic properties.

- } Cellular Organization
- } Reproduction
- } Metabolism (Obtain and Use Energy)
- } Homeostasis
- } Heredity
- } Responsiveness
- } Growth and Development
- } Adapt Through Evolution

All Living Things are Made Up of Cells

Smallest unit capable of all life functions

Unicellular Organisms

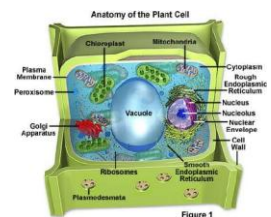
- } Entire organism is made up of one single cell
- } Bacteria and protists



Multicellular Organisms

The organism is made up of many cells

Cells have specialized functions within the organism



All Living Things Reproduce

Reproduction is the process of producing new organisms of the same type

Asexual Reproduction

- } A single parent organism reproducing by itself



Sexual Reproduction

- } Two different parent organisms contribute genetic information
- } Involves the combination of male and female sex cells



All Living Things Obtain and Use Energy

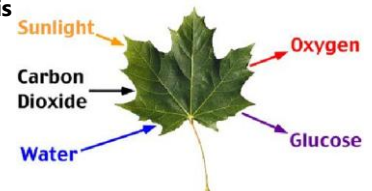
Living organisms need energy to grow, develop, repair damage, and reproduce



Anabolism

The process of building up complex substances from simpler substances

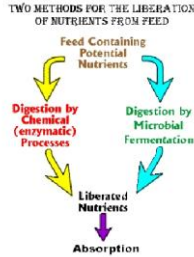
- } Building up cells and cellular components
- } Photosynthesis



Catabolism

The process of breaking down complex substances into simpler substances to release energy

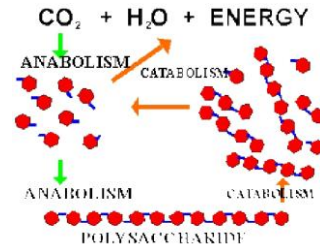
- } Digestion
- } Cellular Respiration



Metabolism

The total of all chemical reactions in an organism

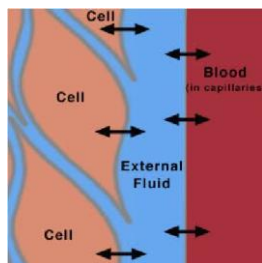
} Anabolism + Catabolism = Metabolism



All Organisms Maintain Homeostasis

A stable state of conditions in the body that are necessary for life

- } Body temperature
- } Blood volume
- } pH balance
- } Water balance



All Organisms Pass Along Hereditary Traits

Genes carry hereditary information

Genes are composed of DNA

Heredity is the reason children resemble their parent:



Mutations change DNA code and can be passed from generation to generation

All Living Things Respond to Their Environment

Organisms react to stimuli:

- } Light
- } Temperature
- } Odor
- } Sound
- } Gravity
- } Heat
- } Water
- } Pressure

An example is a plant's leaves and stems growing toward light



All Living Things Grow

Growth means to get bigger in size



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All Living Things Develop

Development involves a change in the physical form or physiological make-up of an organism



All Living Things Adapt to Their Environment Through Evolution

Adaptation

- } A process that enables organisms to become better suited to their environment
- } Species obtain adaptations through evolution over great periods of time

Era	Period	Epoch	MYA
CENOZOIC	Quaternary	Holocene	0.01
		Pleistocene	1.6
	Tertiary	Miocene	5
		Oligocene	24
		Eocene	54
MESOZOIC	Cretaceous	65	
		145	
	Jurassic	145	
		206	
	Triassic	250	
PALEOZOIC	Permian	290	
		323	
	Pennsylvanian	323	
		362	
	Devonian	362	
Silurian	408		
	439		
	439		
Cambrian	510		
	570		
PRECAMBRIAN		570	

An Example of Adaptation



Desert plants have succulent waxy leaves and stems to store water and reduce water loss