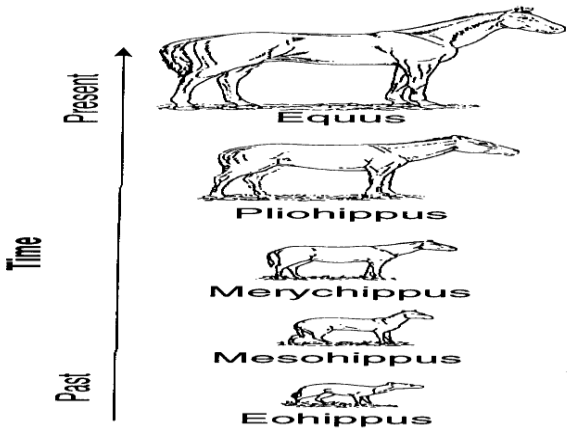
Key Idea 3/Standard 4 Evolution Living Environment

Changes in species over geologic time is called _____.



List three sources of genetic variability in living things.

a.) crossing over -- exchange of chromosome pieces making gametes in meiosis

b.) recombination -- mixing of parental DNA at fertilization

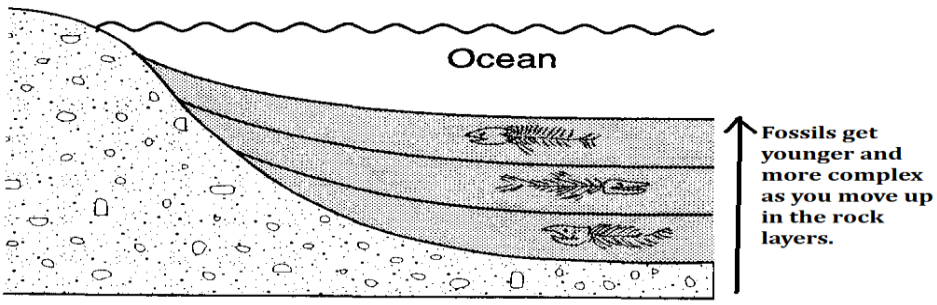
c.) mutation -- a change in DNA

List factors which can increase the incidence of gene mutations.

Radiation including X-rays and chemicals

Only mutations in __**gametes**_____ are passed on to the offspring.

Many places in the _**fossil**_____ record show a gradual transition between species in the rock layers. The fossils get _____**younger**_____ and more ___**complex**_____ as one moves up the sedimentary rock layers.



Explain the evolution of longer necks in the giraffe using the terms overproduction, finite resources, variation, and natural selection.

overproduction___ **too many giraffes for the available resources**_____

variation_____**long necked and short necked giraffes** _____

finite resources_____**not enough food for all the giraffes** _____

survival of the fittest _____**long necked giraffes reach food and live while short necked giraffes can not and die … long necked giraffes pass on their genes to their offspring**

List three sources of genetic variability:

a.) ___**mutation**_____ is a change in the DNA of an organism

b.) ___**crossing over**___ is the exchange of pieces of chromosomes in meiosis which ensures that all gametes made by a sexually reproducing organism will be different

c.) __**recombination**____ is the mixing of genes in the offspring by the combination of traits from the Mother and the Father.

__**favorable**___ variations tend to survive changes in the environment while

__**unfavorable**_____ variations tend to become extinct over time.

Increased ___**variation** _____means more individuals within a species will be able to survive changed environmental conditions.

Give an example of the above situation. ___**The Florida panther only has a few individuals remaining with limited genetic variation and any disease could wipe it out** _____

_____

Give two different adaptations used by organisms to ensure reproductive success.

_____**plumage displays in birds, mating calls in birds**_____

_____

Give an example of a behavior used by humans to enhance reproductive success.

Relatives are more likely to help each other making it more likely their genes are passed on.

Small changes over generation that would accumulate over time would need to be __**favorable** _ adaptations which better suit an organism for _**survival** _____.

What is a niche? **The role an organism plays in the environment.**

Unicellular organisms first appeared about __**3**___ billion years ago.

Multicellular organisms first appeared about __**1**___ billion years ago.

Why would some organisms change little over millions of years?

These organisms are well adapted to their environment.

Why would some organisms die out over time?

These organisms were not well adapted to changes in their environment.

___**Extinction**_____ of a species occurs when the environment changes and the adaptive characteristics of a species are insufficient to allow its survival.

Fossils indicate that many organisms that lived long ago are ___**extinct** _____.

What is biodiversity? **Differences within or differences in species**

What is adaptation?

A variation in an organism which better suits it for survival

How do favorable and unfavorable adaptations in a species influence the evolution of those variations?

Favorable variations are passed on/unfavorable variations die out

Do insects and bacteria mutate because a pesticide or antibiotic is added to their environment?

NO … the pesticide or antibiotic kill the nonresistant variety while the resistant variation lives.

What do we mean by a selecting agent and how does it influence evolution?

Selecting agent -- factor which selects against one variation and for another

Why have insects and bacteria been able to evolve so rapidly?

They make many offspring with variations and have short generation times

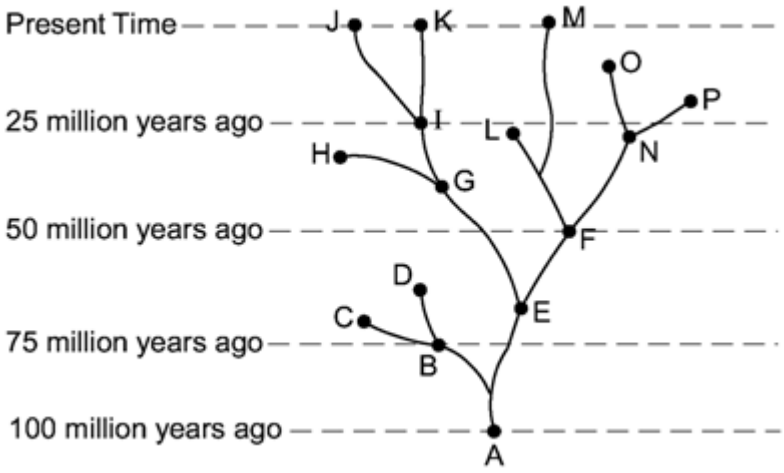
___**physical**_____ similarities are a weaker basis for classifying organisms than **biochemical** similarities like similarities in DNA, enzymes, hormones, or proteins.

The more similar the __**DNA** ____, the more similar the __**RNA** _____, the more similar the _**proteins**_____ making up the organisms and the more ___**closely** _____ they are related.

Organisms are classified based on their ___**evolutionary**_____ relationships.

A __**species** _____ is able to successfully reproduce amongst its members.

Branching tree diagrams (cladograms) are often used to show __**evolutionary** __ relationships.



In the diagram above identify the following:

1. What is the common ancestor of all these organisms? _____ **A** _____

2. Is J and K or J and M more closely related? Justify your answer.

_____**J and K have a more recent common ancestor in L than J and M with E** ____

3. What is the common ancestor of K and M? _____ **E** _____

4. Which organisms in this cladogram have become extinct? _____

_____ **all but J,K, and M** _____