Close Notes: Species Change over Time:

* Evolution:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_- occur following a \_\_\_\_\_\_\_\_\_\_\_\_\_ drastic change in the environment

 If organisms don’t \_\_\_\_\_\_\_\_\_\_\_\_ quickly enough to survive, they die

The extinction of a species can affect an \_\_\_\_\_\_\_\_\_\_ ecosystem

* + \_\_\_\_\_\_\_\_\_\_ that relied on the \_\_\_\_\_\_\_\_\_\_\_ species for food may die
	+ Species that once \_\_\_\_\_\_\_\_\_\_\_ for food with the extinct species may thrive

Extinction is a \_\_\_\_\_\_\_\_\_\_\_\_ part of evolution

Scientist s estimate that about \_\_\_\_\_\_\_\_\_\_ of all species that ever lived on Earth have become \_\_\_\_\_\_\_\_\_\_

On average a species will \_\_\_\_\_\_\_\_\_\_\_ on Earth 2 to \_\_\_\_\_\_ million years

* Natural Events that cause Extinctions: \_\_\_\_\_\_\_\_\_\_\_\_, rainfall, volcanic eruption, \_\_\_\_\_\_\_\_\_\_, flooding or drought, \_\_\_\_\_\_\_\_land masses or seas, a \_\_\_\_\_\_\_\_\_\_ in food supply, a new \_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_

Mass Extinctions:

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Extinction**

* \_\_\_\_\_\_\_\_ million years ago species living in the ocean and on land became extinct because \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_ moved together which \_\_\_\_\_\_\_\_ the \_\_\_\_\_\_\_\_\_ of Earth

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Extinction**

* \_\_\_\_\_\_million years ago \_\_\_\_\_\_\_\_\_ disappeared on Earth
* \_\_\_\_\_\_\_\_\_\_\_Theory- at the rock layer between the Cretaceous and Tertiary periods evidence of an asteroid can be found

Human Threats for extinction:

|  |  |  |
| --- | --- | --- |
| Threat | Description | Remedy |
| Habitat |  | Reduce human encroachment –land management |
| Invaders | Non - native species introduced to new locations |  |
|  | Contaminated land, air, water |  |
| OvergrazingForest burning |  | Land use management |
| Overharvesting | Species taken for food, energy, medicine |  |
|  | Ozone depletion, greenhouse effect |  |
| Poaching, overhunting,overfishing |  | Reduce demand, laws  |

Answer the following questions from the video. Isn’t Evolution just a Theory?

* What is a theory?
* What is an inference?
* What was Charles Darwin’s theory?

**Natural Selection:**

Charles Darwin (1809-1882) Sailed around the world 1831-1836

What did \_\_\_\_\_\_\_\_\_\_ Travels reveal?

* The \_\_\_\_\_\_\_\_\_\_\_\_ of living species was far \_\_\_\_\_\_\_\_\_\_\_than anyone had previously known!!
* These observations led him to develop the \_\_\_\_\_\_\_\_\_ of \_\_\_\_\_\_\_\_\_\_\_\_!!
* Based in part his evolutionary theory on observations of \_\_\_\_\_\_\_\_\_ species on the Galapagos Islands.
* \_\_\_\_\_\_\_\_\_\_\_ species of finch had developed \_\_\_\_\_\_\_\_\_\_\_ beak \_\_\_\_\_\_\_\_\_for the types of food that was available on the different islands
* Suggested that the \_\_\_\_\_\_\_\_\_\_\_ species of finch had \_\_\_\_\_\_\_\_\_\_ from the original species in response to \_\_\_\_\_\_\_\_\_\_\_ environmental conditions

How did tortoises and birds differ among the islands of the Galapagos?

* Each \_\_\_\_\_\_\_\_\_ had its \_\_\_\_\_\_\_\_ type of tortoises and birds that were clearly \_\_\_\_\_\_\_\_\_ from other islands

Artificial Selection:

* \_\_\_\_\_\_\_\_\_\_\_\_ provides variations, \_\_\_\_\_\_\_\_\_\_\_ select variations that are useful.

Natural Selection and Species Fitness:

* Over time, \_\_\_\_\_\_\_\_\_ selection results in changes in the \_\_\_\_\_\_\_\_\_\_\_ characteristics of a population.
* These changes \_\_\_\_\_\_\_\_\_ a species fitness (survival rate)
* The traits that help an organism survive in a particular environment are “\_\_\_\_\_\_\_\_\_\_\_\_” in natural selection

Natural Selection:

Summary of Darwin’s Theory

|  |
| --- |
| 1. |
| 2. |
| 3. |
| 4. |
| 5. |

Theory of Natural Selection

* Darwin knew from personal experience that dog breeders can produce new species over time by selective breeding techniques. Breeding dogs with desired traits produces a new breed of dog. This process is called artificial selection.
* He thought this process might be \_\_\_\_\_\_\_\_\_\_\_\_\_\_ occurring in nature and termed it natural selection

Key Principles of Natural Selection

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - most organisms produce more offspring than can survive
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - visual differences among individuals result from differences in genetic material this process of changing base pairs in the DNA is called a mutation.

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ -** A trait that improves an organism’s chance for survival and reproduction.

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**- The individuals that have the adaptation increase in numbers and are able to adapt to the environment over the individuals who do not have the adaptation

Homologous Body structures

Structures that have \_\_\_\_\_\_\_\_\_\_\_mature forms but develop from the same embryonic tissues

*e.g. wing of bat, human arm, whale flipper, leg of cat*



**Analogous Structures** ­­­­­\_\_\_\_\_\_\_ different but essentially perform the \_\_\_\_\_\_\_\_ function for each organism



**Vestigial organs**- are \_\_\_\_\_\_\_\_\_\_ structures that were \_\_\_\_\_\_\_\_ developed and functional in an \_\_\_\_\_\_\_\_\_ group of organisms but are \_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_in later species.



**Evidence of Evolution**

Geographic Distribution of Living Things

\_\_\_\_\_\_\_\_\_\_\_ animals in different l\_\_\_\_\_\_\_\_\_\_were the product of \_\_\_\_\_\_\_\_\_\_ lines of descent

Fossil Record

Fossil Record provides \_\_\_\_\_\_\_\_\_\_\_ that living things have \_\_\_\_\_\_\_\_\_\_\_

Fossils show the \_\_\_\_\_\_\_\_\_\_\_ of \_\_\_\_\_\_\_\_ on earth and how \_\_\_\_\_\_\_\_\_\_\_\_ groups of organisms have changed over time



Similarities in Embryology

In their \_\_\_\_\_\_\_\_ stages of development, chickens, turtles and rats \_\_\_\_\_\_\_ similar, providing evidence that they \_\_\_\_\_\_\_\_\_ a common ancestry.



**Traces of homologous organs in other species**

**\_\_\_\_\_\_\_\_\_ that serves \_\_\_\_\_\_ useful function**

***Example: Appendix***

**Evolution and Speciation**

* \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ – Common group of \_\_\_\_\_\_\_ genes present in a population.
* \_\_\_\_\_\_\_\_\_\_\_\_ genetic info. of \_\_\_\_\_\_\_\_\_ members
* Allele frequency is # of times alleles occur



**Variation in Populations**:

2 processes can lead to this:

* \_\_\_\_\_\_\_\_\_\_\_ -change in DNA sequence
* \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_ – from sexual reproduction

**Evolution of populations**: Occurs when there is a \_\_\_\_\_\_\_\_\_\_ in relative frequency of alleles

**Speciation**: The Formation of a \_\_\_\_\_\_\_ Species

* As new species evolve, \_\_\_\_\_\_\_\_\_\_\_ become reproductively isolated.
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_ – members of 2 populations cannot interbreed and produce fertile offspring**.**

**Speciation in Darwin’s Finches**:

* Speciation of the Galapagos Finches occurred by:

 - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 - Geographic Isolation which led to – Reproductive isolation and

 - Changes in the new population’s gene pool due to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

