

Identifying, Naming and Classifying Species

SB13U

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Identifying and Naming Species

Over the centuries, scientists have had difficulty agreeing on a single definition for a species.

Scientists tend to categorise species based on broad characteristics. Eventually scientists begin looking at distinguishing characteristics that helps narrow down their classification.

Remember....

Species:

Identifying and Naming Species

Even though not all scientists can agree on ways in which to classify organisms, there are three main concepts used that have helped scientists categorize species that we know today.

- 1) Morphological species concept
- 2) Biological species concept
- 3) Phylogenetic species concept

1. Morphological Species Concept

Morphology includes the structural features like body shape, size, and colour. Scientists compare measurements and descriptions of similar organisms over time



What are some advantages and disadvantages to this concept?

2. Biological Species Concept

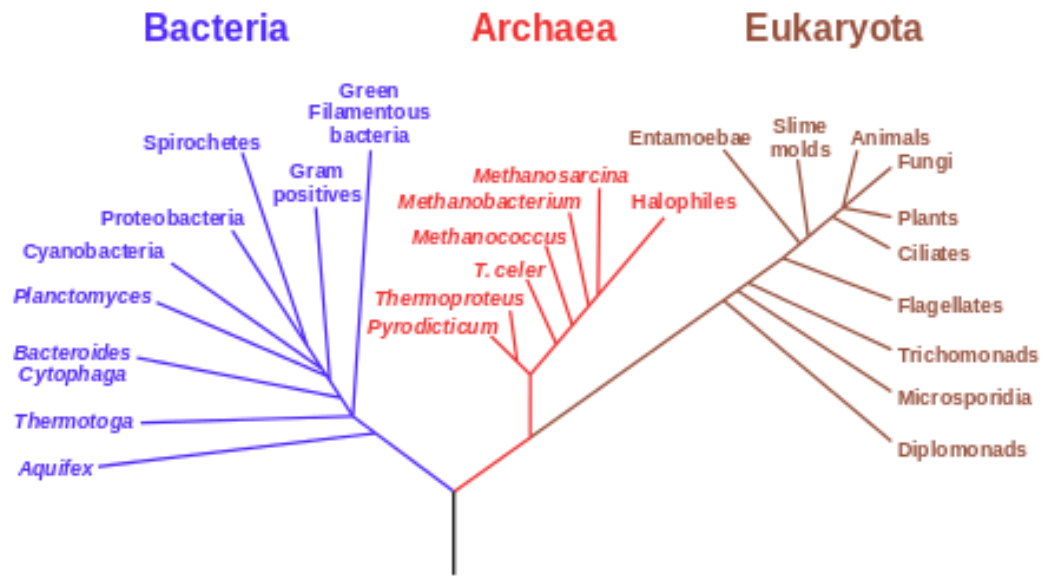
Biological species concept focuses on the ability to interbreed to produce viable, fertile offspring.



What are some advantages and disadvantages to this concept?

3. Phylogenetic Species Concept

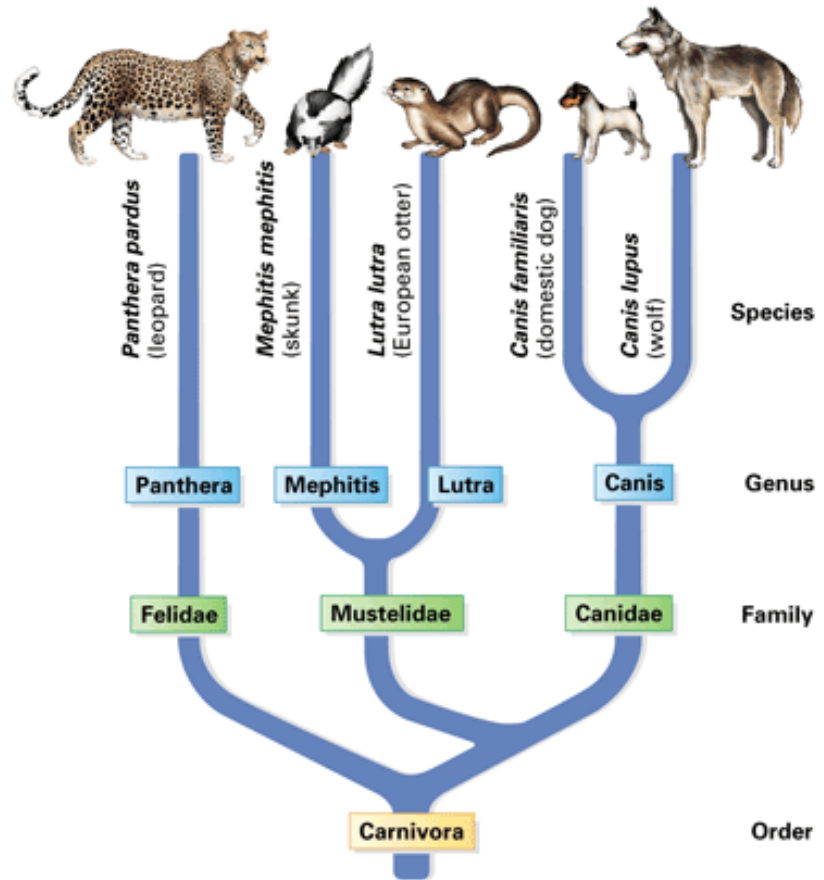
Phylogenetic focuses on the evolutionary relationships among organisms. Species are a cluster of organisms distinct from other clusters



Pattern of relationship among organisms can be created and DNA analysis can be used

3. Phylogenetic Species Concept

What are some advantages and disadvantages to this concept?



Naming Species

Taxonomy: identifies, names, and classifies species based on natural features



Carolus Linnaeus was known as the '*Father of Taxonomy*' and developed the system of **binomial nomenclature**.

Naming Species



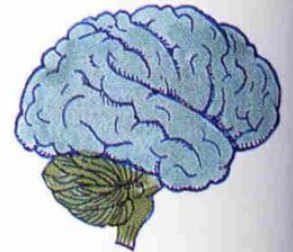
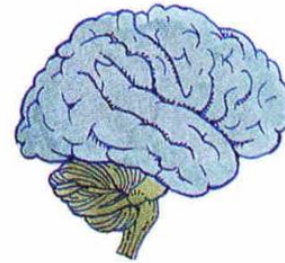
First part of name is called **genus** (closely related)

- (capitalized + italicized)

Second part of name is the specific **species**

- (lower case + italicized)

The Genus Homo



Australopithecus robustus

Homo habilis

Homo erectus

Homo sapiens neanderthalensis

Homo sapiens sapiens

Checking for Understanding

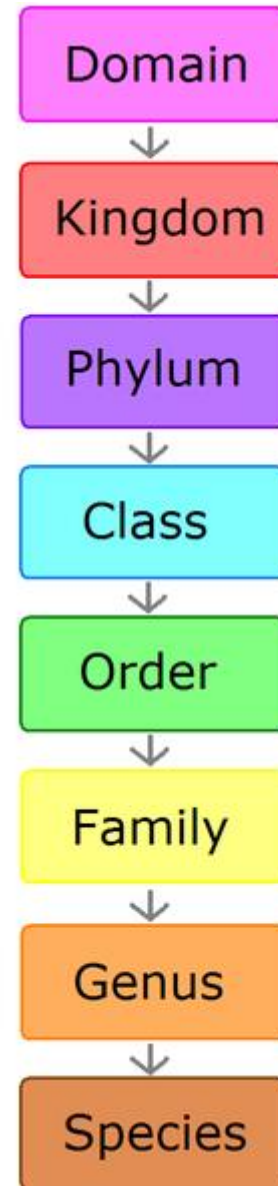
1. Why is it important to identify, define, and name species?

2. Which of the following scientific name for a cat ?
 - a) Felis Catus
 - b) Felis catus
 - c) *Felis catus*
 - d) *felis catus*

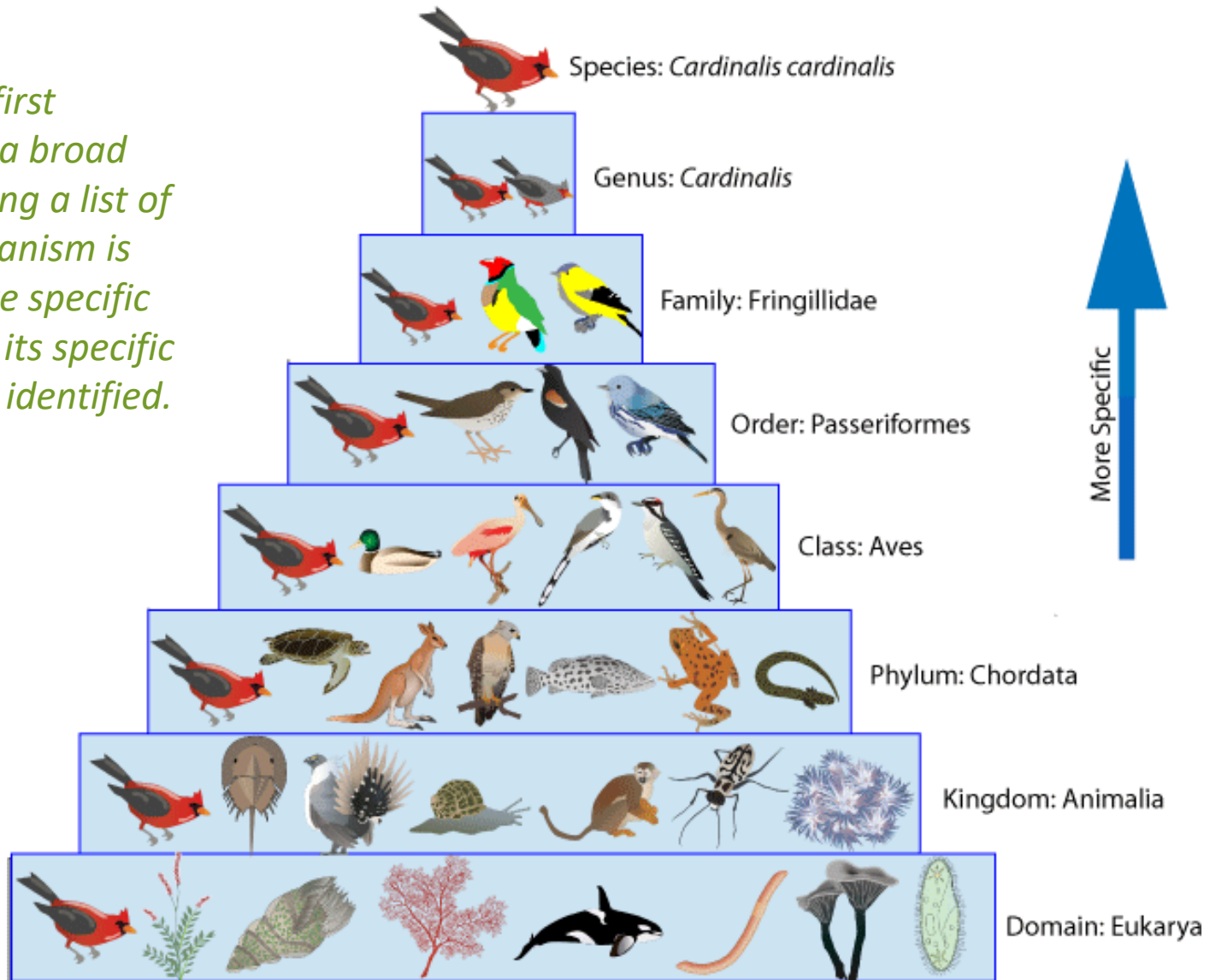
Hierarchical Classification

Scientists have classified organisms into 8 main taxonomic categories. The categories start off broad and become more and more specific.

Hierarchical Classification:



Organisms are first classified using a broad category. By using a list of criteria, the organism is placed into more specific categories until its specific species name is identified.

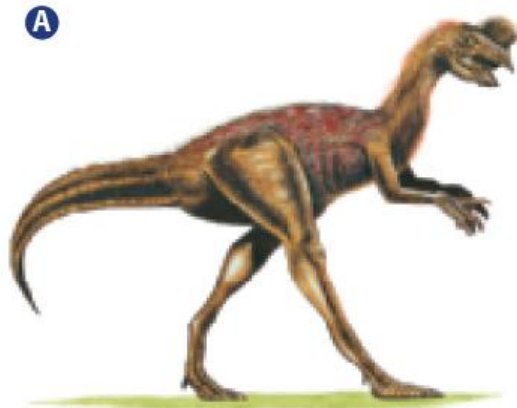


Evolutionary Evidence

What type of evidences can scientists use to determine how closely related two species are?

1. Anatomical Evidence

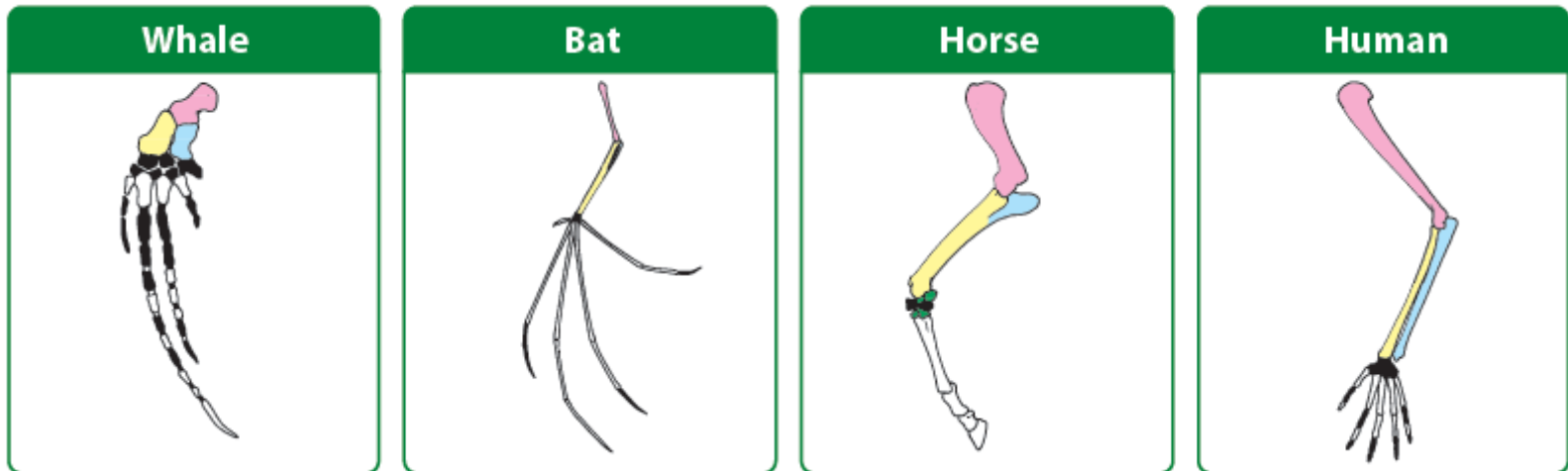
Scientists may use anatomical evidence of fossils to determine how closely species are related and when they shared a common ancestor.



Scientists have found that dinosaurs and birds share many anatomical characteristics thus indicating an evolutionary relationship

1. Anatomical Evidence

Homologous and Analogous structures are also often compared to determine evolutionary relationships between species.



2. Physiological Evidence

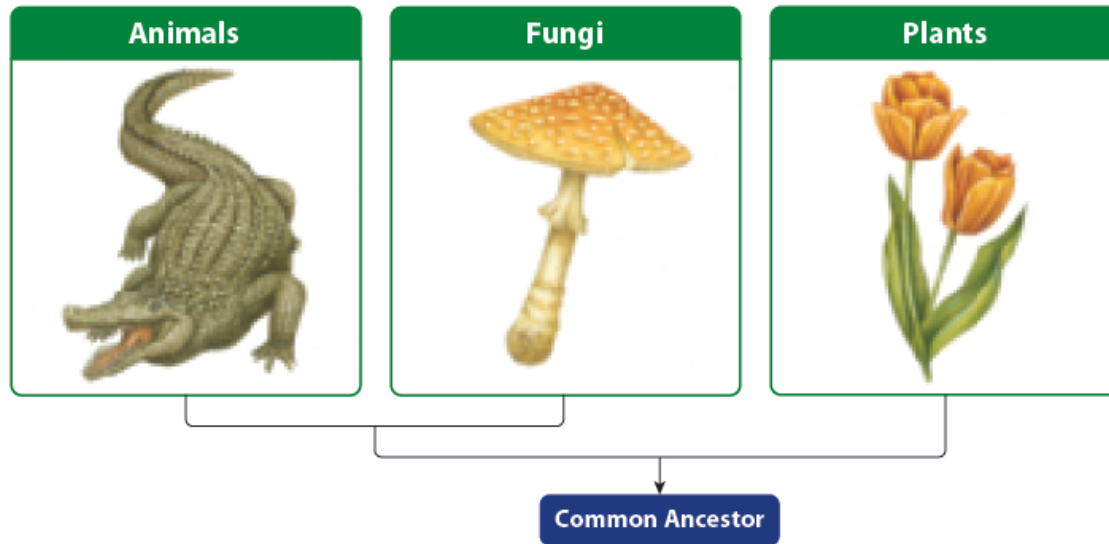
Physiology:



Guinea pigs have been found to be very different from other rodents and should be placed in a separate order.

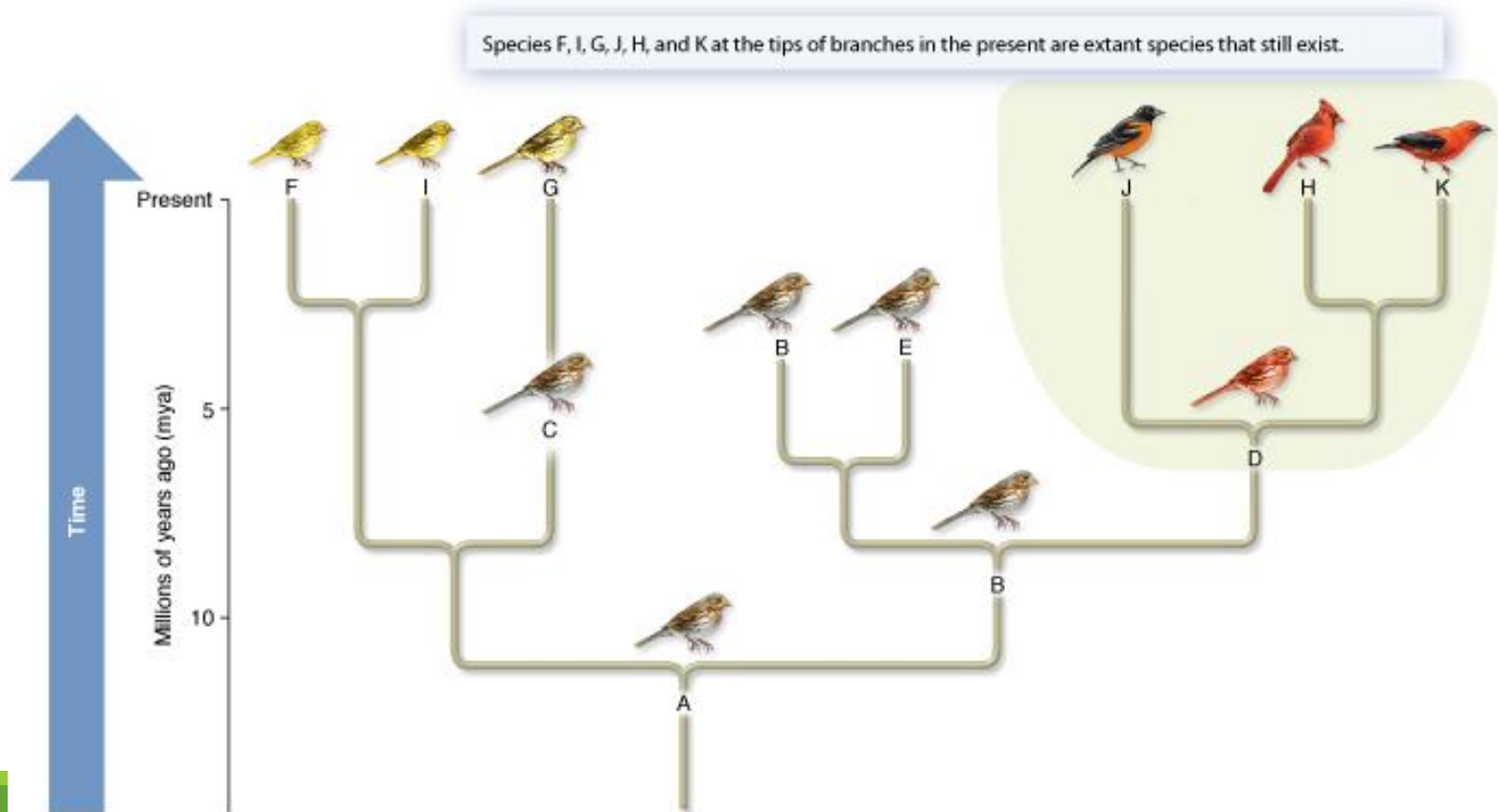
3. DNA Evidence

DNA evidence is commonly used to identify evolutionary relationships if the information available. Often times, prior assumptions based on other evidences had to be re-evaluated based on the DNA evidence.

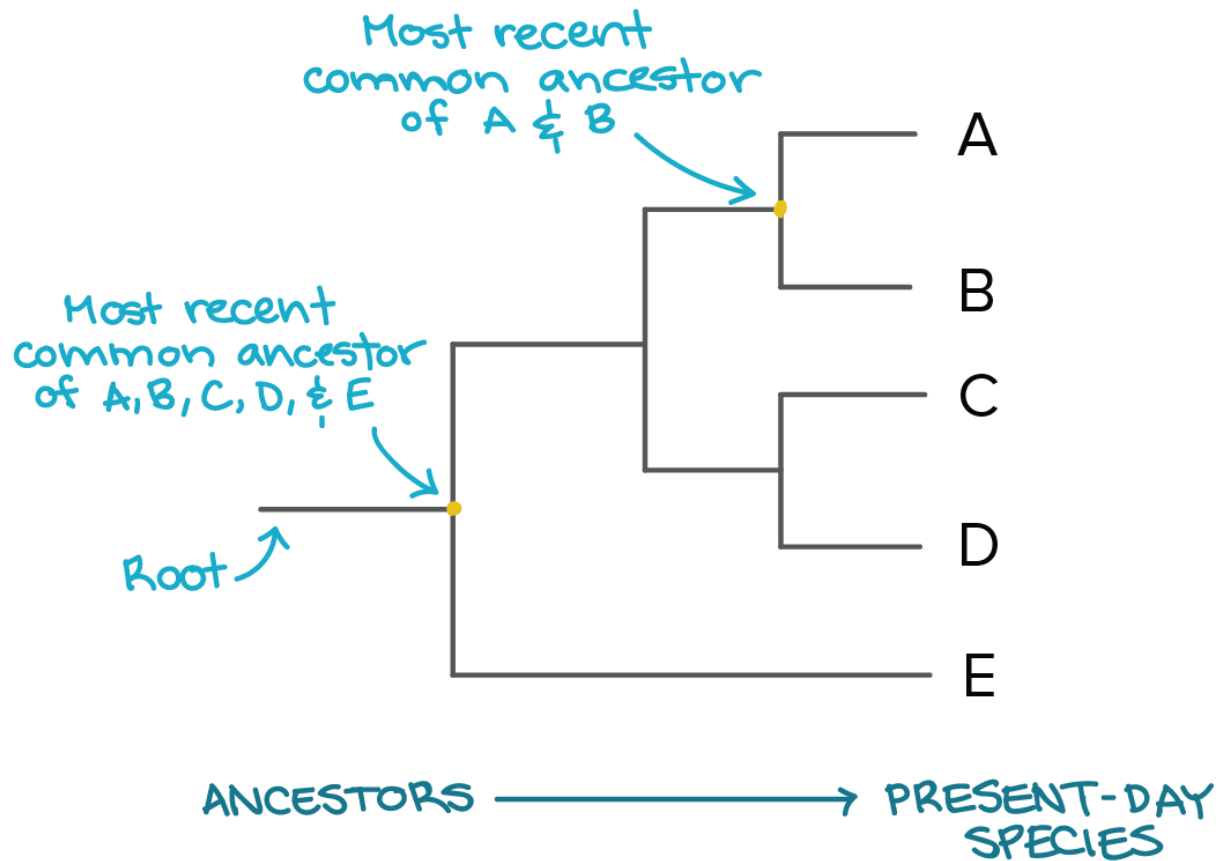


4. Phylogenetic Trees

Phylogenetic Trees:



4. Phylogenetic Trees



Checking for Understanding

What is the broadest category in the hierarchical classification system?

- A) Domain
- B) Family
- C) Kingdom
- D) Phylum
- E) Species

Checking for Understanding

What is the correct format for the species name for humans?

A) homo sapiens

B) *homo sapiens*

C) *Homo sapiens*

D) *Homo sapiens*

E) *homo Sapiens*

Checking for Understanding

Morphology is the branch of biology that deals with

- A) change in organisms
- B) reproductive success of a species
- C) genetic inheritance of an organism
- D) Evolutionary history of a species
- E) appearance or form of organisms

Homework

Textbook: pg. 16 # 2 & 10

pg. 23 # 5 , 6 & 7