

Evolution Chapter 2 Notes: Taxonomy and Classification

Scientists classify millions of species	<ul style="list-style-type: none"> _____ years ago, scientists believed that _____ animals looked alike, and classified animals based upon their _____ and behavior. Classification and _____ are the two scientific processes that deal with _____ and _____ living things. <ul style="list-style-type: none"> Classification: the process of arranging organisms into _____ based on _____. Taxonomy: the science of _____ and classifying organisms.
Why is classification important?	<ul style="list-style-type: none"> A good classification system allows you to organize a _____ amount of information so that it is _____ to find and understand. It should provide a tool for _____ very _____ groups of organisms as well as smaller _____. A good taxonomy system allows people to _____ about organisms. Biologists need both a system for _____ and a system for _____ organisms. <ul style="list-style-type: none"> To classify organisms, scientists use _____ and differences among _____. A classification system can help you identify _____ organisms. If two organisms have many _____ characteristics, then their _____ will be similar in the classification system.
Taxonomists study biological relationships	<ul style="list-style-type: none"> A taxon is a group of organisms that share certain _____. Taxonomists study the _____ between species to see how species _____, and species who share _____ are grouped together.
How do we classify organisms?	<ul style="list-style-type: none"> Scientists compare characteristics/_____ to determine how to _____ organisms. <ul style="list-style-type: none"> A _____ is a characteristic or behavior that can be used to tell two species _____ <ul style="list-style-type: none"> Ex: _____, bone structure If organisms share a _____, taxonomists try to figure out if they share the trait because they have a common _____.
How do we figure out how closely related species are?	<ul style="list-style-type: none"> Taxonomists take _____ and try to reconstruct the _____ of a species, then place the species in the _____ system. <ul style="list-style-type: none"> Evidence used includes _____ evidence (bones, fur, _____, behavior) and _____ evidence (looking at _____). Physical evidence helps scientists see that all living organisms are _____ through evolution. _____ evidence usually _____ physical evidence, but not _____. <ul style="list-style-type: none"> Ex: Pandas: Red _____=genetics shows it's more similar to a _____, Giant Panda=more similar to _____.
Carolus Linnaeus	<ul style="list-style-type: none"> Carolus Linnaeus developed system for both _____ species and _____ them into groups. Linnaeus named 4000 species of _____ and animals; today we have named over a _____ species
Naming Species	<ul style="list-style-type: none"> Scientists used _____ words to name organisms <ul style="list-style-type: none"> _____ : a group of species that have similar _____; members of the same genus are _____ related. Binomial nomenclature: the system for _____ species (<i>Genus species</i>) <ul style="list-style-type: none"> Binomial= "_____ names" Nomenclature= "list of _____" Most scientific names are _____ words This is the basis of modern _____.
Using Scientific Names	<ul style="list-style-type: none"> Binomial nomenclature made _____ about certain species much _____ Rules: <ul style="list-style-type: none"> The _____ name comes first; the _____ letter is CAPITALIZED and the _____ name is in <i>italics</i>. The _____ name is also written in <i>italics</i>, follows the _____ name, and the first letter is _____. Example: <i>Chameleo gracilis</i>: a type of lizard called a _____.
Organisms can be classified into seven (7) levels	<ol style="list-style-type: none"> _____ (most organisms, LEAST specific): Ex: Animalia=animals _____ : Ex: Chordata=animals with backbones _____ : Ex: Mammalia: mammals, or furry animals that nurse their young _____ : Ex: Carnivora: carnivores, or animals that kill and eat other animals

	<p>5. _____: Ex: Felidae: the cat family—all cats (big and small)</p> <p>6. _____: Ex: <i>Felis</i>: housecats, cougars, many others</p> <p>7. _____ (least organisms, MOST specific): Ex: <i>catus</i>: all housecats</p> <ul style="list-style-type: none"> • Kings Play Chess On Fat Green Stools • (Kingdom, Phylum, Class, Order, Family, Genus, species)
Classification Examples:	<ul style="list-style-type: none"> • Classification Hierarchy of _____: _____→Chordata→Mammalia→_____→Felidae→<i>Felis</i>→<i>catus</i> • Classification Hierarchy of _____: _____→Chordata→Mammalia→_____→Hominidae→<i>Homo</i>→<i>sapiens</i> • The more _____ an organism shares with another organism, the more _____ related they are.
Identifying Organisms:	<ul style="list-style-type: none"> • Dichotomous keys and field guides help people _____ organisms. • Dichotomous key: a tool that asks a series of _____ that can be answered in only _____ ways. • The questions in a dichotomous key gradually _____ down the possible organisms to help you _____ the organism. • The questions can be about any _____. • Field guides include paintings or _____ of familiar species and can help _____ organisms.
How do we show relationships between species?	<ul style="list-style-type: none"> • Phylogeny: the “_____” of a species, showing the _____ of a species and their relationship to other species. <ul style="list-style-type: none"> – The “root” of the tree shows an _____, and the “branches” show _____ – The place where 2 branches split represents _____ from a _____ ancestor. • _____: a diagram that shows a phylogeny. <ul style="list-style-type: none"> – A clade is a group in a phylogeny that includes a common _____ and all the descendents (living and _____) of that ancestor. – Clades may include _____ of species or just a few. • Lineage: the descent in a line from a common _____.
Draw and Label a Phylogeny. Label common ancestor, speciation, and descendents, and circle a clade.	
How do we construct phylogenies?	<ul style="list-style-type: none"> • To build a phylogenetic tree, biologists collect data about the _____ of each organism they are interested in. Characteristics are heritable _____ that can be compared across organisms, such as _____ characteristics (morphology), _____ sequences, and _____ traits. <ul style="list-style-type: none"> – When grouping species, scientists look for shared _____ characteristics. A derived characteristic is one that evolved in the common _____ of a clade and that sets members of that clade _____ from other individuals. <ul style="list-style-type: none"> • Ex: All land animals (not insects) have _____ limbs because they had a distant common ancestor. – Shared derived characteristics can be used to group organisms into _____.
Taxonomy changes as scientists make discoveries	<ul style="list-style-type: none"> • Scientists are learning more about the _____ of species and how they _____. • Most scientists use a classification system that has _____, but a new level, called a _____, has been added _____ the kingdom level. <ul style="list-style-type: none"> – _____: the most broad level of a classification system based on _____ type – There are _____ domains: _____, Archaea, and _____ – Cells that contain a _____ are called eukaryotic cells; cells that do not contain a nucleus are called _____ cells. <ul style="list-style-type: none"> • The domain _____ contains organisms with eukaryotic cells. • The domains _____ and Archaea contain organisms with _____ cells.
Species and environments change	<ul style="list-style-type: none"> • Although over a _____ species have been named, scientists estimate that there are millions (maybe _____ of millions) that haven’t been _____. • Species _____ over time as individual organisms and environments _____

