



كلية العلوم

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{{ مكتبة A to Z }}

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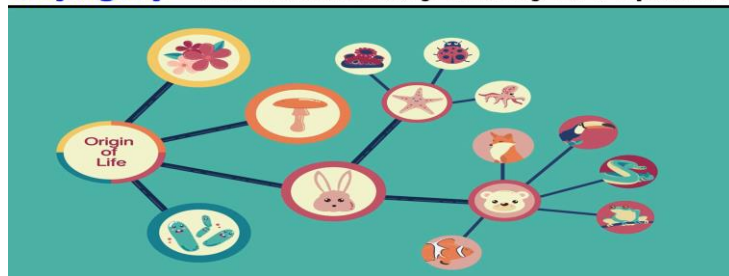
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## The tree of life

We want to know about the phylogeny of various species.

This is their evolutionary history, or ancestry, and the discipline of taxonomy is what we use to classify every species in the context of its ancestry.

**Phylogeny - The Evolutionary History of a Species**



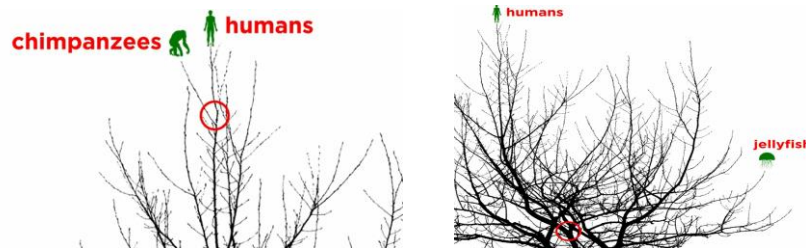
For greater context, we look at the tree of life.

This tree has many branches, where different species evolved from a common ancestor.

The more recently two species converge as you go down, the more recent their common history, and the more closely related they are.



As you continue to go down the tree, species become less and less related, so humans and chimpanzees, whose branches are very close to one another, diverged from a common ancestor only a couple million years ago, whereas humans and jellyfish are much more distantly related, having diverged hundreds of millions of years ago, when all life was in the sea.



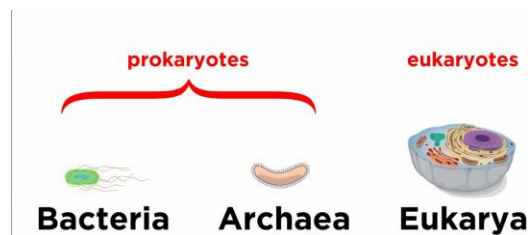
If we get all the way to the bottom, the trunk of this tree marks the beginning of life on earth, a single-celled organism that everything alive today is descended from.



Since we don't know precisely what that was, we start with what we know, and at the most basic level, we consider three domains of life.

These are bacteria, archaea, and eukarya.

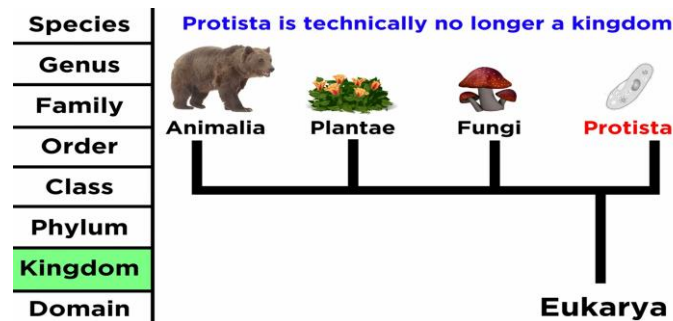
Bacteria and archaea are the unicellular prokaryotes we talked about, and eukarya is all eukaryotes.



This means unicellular protists as well as all multicellular life on earth, including every plant and animal there is.

Within the domain eukarya, there are several kingdoms.

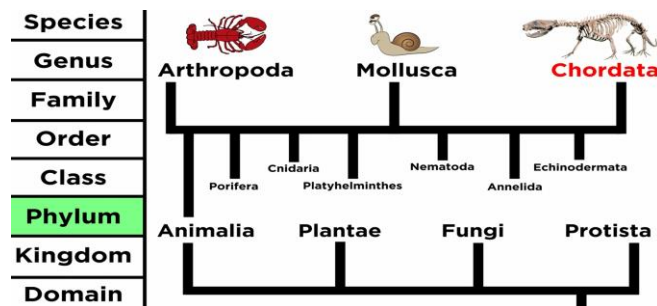
Animalia contains all animals, plantae contains all plants, fungi contains all mushrooms and molds, and protista contains all the rest, though many biologists don't recognize this as a valid kingdom any longer.



Within each kingdom there are several phyla.

Within the animal kingdom there are nine major ones.

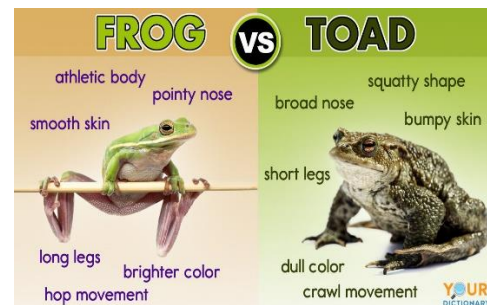
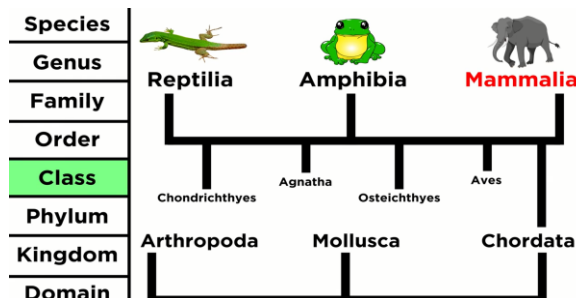
There is the phylum arthropoda, which contains all kinds of bugs and lobsters and creepy crawlies, mollusca, which contains octopi and snails and other such things, and most notably there is chordata.



This phylum includes any animal with a spinal cord, and the divergence of vertebrates and invertebrates was a major step in evolution.

Within each phylum we can find different classes of organisms.

Chordata contains the class reptilia, which are reptiles like crocs and snakes and lizards; amphibia, which are amphibians like toads and frogs; and mammalia, which are all the mammals, from kangaroos to elephants.



Humans belong to mammalia, and within this class there a number of orders.

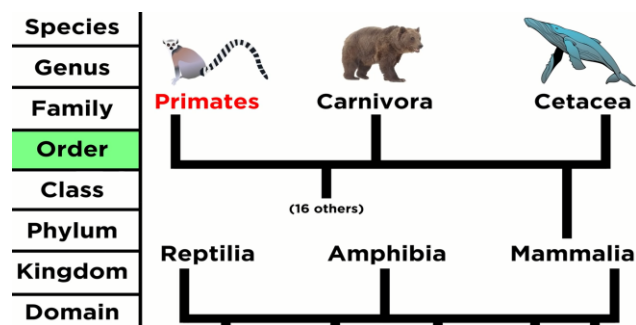
The order cetacea contains all the whales and dolphins.

Carnivora contains bears and weasels.

Then there are the primates.

That's got everything from orangutans to lemurs, and humans are in there too.

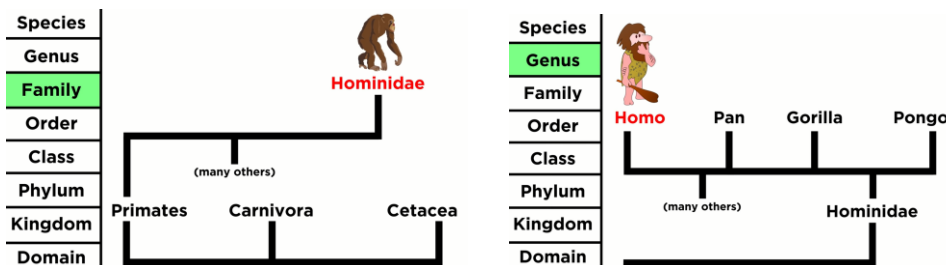
Within the order of primates, there are several families



The family hominidae contains all the great apes.


Within hominidae every organism belongs to a particular genus.

Our genus is called homo, which means man in latin.



Wise man, sits at the very top of the tree, the only species to have evolved an intelligence that spawned complex civilizations and information storage, first as written language and eventually the omnipresent internet, which you're using right now.

To review, we humans belong to the genus homo, the family hominidae, the order primates, the class mammalia, the phylum chordata, the kingdom animalia, and the domain eukarya.

<b>Domain</b>	(Eukarya)	
<b>Kingdom</b>	(Animalia)	
<b>Phylum</b>	(Chordata)	
<b>Class</b>	(Mammalia)	
<b>Order</b>	(Primates)	
<b>Family</b>	(Hominidae)	
<b>Genus</b>	(Homo)	

We can trace a path from the tip of our branch all the way to the trunk, and every organism on earth will converge with our path at some point, whether very recent, or very distant, which means that every living thing is related in some way.

To see precisely how related two species are, we could use sophisticated techniques like ribosomal RNA sequencing, or we can simply examine homologies.

These are similarities between organisms, be they genotypic or phenotypic, and they typically suggest common ancestry, as an organism's evolutionary history is documented in its genome.

**Wishing you the best of luck**

**Dr. Maissoun Ziadeh**

Phylogeny	علم تطور السلالات	Octopi	الأخطبوطات
Tree of Life	شجرة الحياة	Snails	القواقع
Ancestry	الأصول- الأسلاف	Chordata	شعبة الحبلديات
Taxonomy	علم التصنيف	Vertebrates	الفقاريات
Classify	تصنيف	Invertebrates	اللافقاريات
Species	أنواع	Classes	الصفوف
Evolved	تطورت	Class Reptilia	صف الزواحف
Converge	تتقارب	Crocs	التماسيح
Common History	تاريخهم المشترك	Snakes	الثعابين
Closely Related	ارتباط وثيق	Lizards	السحالي
Diverged	يتشعب	Amphibia	البرمائيات
Jellyfish	قنديل البحر	Toad	العلاجوم
Descended from	ينحدر منه	Mammalia	الثدييات
Precisely	على وجه التحديد	Orders	الرتب
Kingdoms	الممالك	Cetacea	رتبة الحيتان
Animalia	مملكة الحيوانات	Carnivora	رتبة آكلات اللحم
Plantae	مملكة النباتات	Primates	رتبة الرئيسيات
Fungi	مملكة الفطريات	Weasels	القوارض
Mushrooms	أنواع الفطر	Orangutans	قرود إنسان الغاب
Molds	العفن	Families	الفصائل
Protista	الأوليات	Family Hominidae	عائلة البشر
Biologists	علماء الأحياء	Homo Genus	جنس الإنسان
Phyla	شعب	Intelligence	ذكاء
Phylum Arthropoda	شعبة المفصليات	Civilizations	حضارات
Bugs	الحشرات	Omnipresent	موجود في كل مكان
Lobsters	الكرkend	Sophisticated Techniques	تقنيات متطورة
Creepy Crawlies	الزواحف	Sequencing	تتابع
Mollusca	شعبة الرخويات	Homologies	التشابهات



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