

Phylogeny:  
Evolutionary History and  
Ancestry  
Background

# Why Study Trees?

View the video to find out how the information scientists gather from trees is used to address relevant issues.

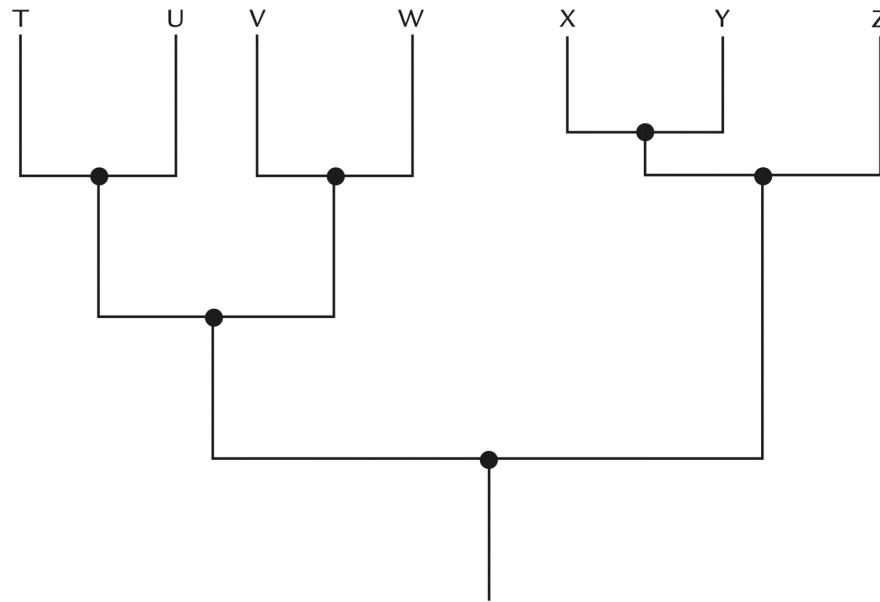
[http://peabody.yale.edu/exhibits/treeoflife/film\\_study.html](http://peabody.yale.edu/exhibits/treeoflife/film_study.html)

# Tree Hypotheses

Scientists use tree hypotheses to represent evolutionary relationships between groups of organisms.

In a previous activity, you examined a tree showing relationships between species of primates on the island of Birindy.

# Primate Species on Birindy



Any group of named organisms is called a **taxon**. Groupings that refer to more than one taxon are called **taxa**.

Each of the following is a taxon:

- Vertebrates
- Dogs
- *Homo sapiens*

The following grouping is a taxa:

- Dogs and cats

# Tree Hypotheses

Often there are multiple trees possible with the evidence available about a group of taxa.

Therefore, trees represent hypotheses about evolutionary relationships.

Scientists must decide which tree best represents the relationships based on the available data.

When large amounts of data are used to construct trees, computer programs are used to process the data.

There are many types of data that can be used including:

- Fossils
- DNA
- Proteins

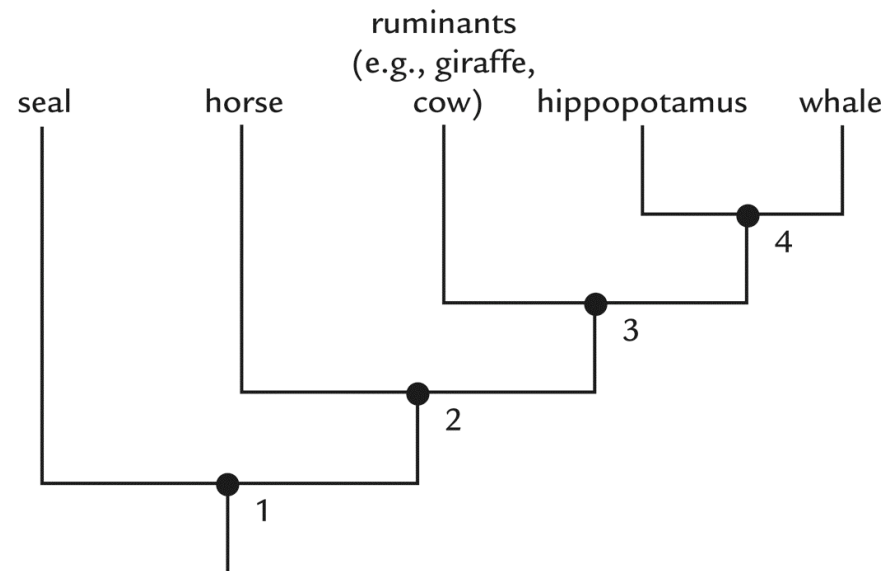


Nodes lead to tips that represent taxa.

The taxa may be different species or higher level taxa ( i.e. genus or family).

Those lineages that split from the same node are called sister groups.

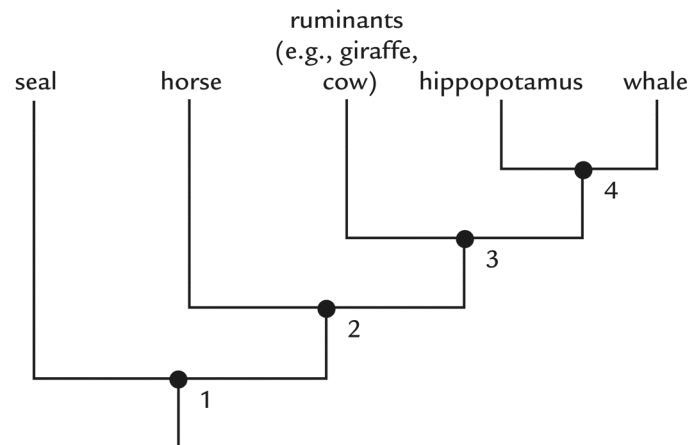
In the tree shown below, the whale and the hippopotamus are sister groups that separated, or diverged, at node 4.



# Clades

A group that contains the node and all of the descendant sister groups is called a **clade**.

In the tree shown below, the hippopotamus and whale taxa along with node “4” make up a clade.



Now you will read about different types of trees and examine several examples of trees.