Tree of Life Web Project: http://tolweb.org

Introduction to Learning with the ToL

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To help you prepare for the conference and get acquainted with the Tree of Life, the ToL has prepared a short guided tour of the site for you. Your tour guide's name is Sarah Darwin.

Hi, how are you all doing today? As soon as you are ready to go we will start the tour. Let me tell you some of the tour's highlights. We will:

Visit various Tree of Life web pages on the Earth's organisms, authored by different types of ToL contributors.

See what ToL contributors do and find out how to become a contributor!

Test out the ToL's tools for contributing treehouses and media

Learn about the the structure of the Tree of Life (the ToL) and how to use the ToL to learn and teach about phylogeny and diversity.

Process Steps

1. The ToL, Its Contributors and their Work
2. Scientist Contributors: Branch, Leaf and Note Pages
3. Teacher and Learner Contributors: Treehouses
4. Building Treehouses
5. Register as a Treehouse Builder
6. Finding and Contributing Media (images, sounds, movies and documents)
7. What is phylogeny and why is phylogeny important to the Tree of Life?

Step 1: The ToL, Its Contributors and their Work

Process Step Instructions

There are several different types of ToL pages that ToL contributors can author. In this step we will look at some of these pages. First, we will visit the ToL home page to learn a little bit about the background of the ToL and how to browse ToL pages.

ToL Home Page

The Tree of Life biology project is a database of information about the world's organisms. As

you can see on the bottom of this page, over 350 biologists from around the world have contributed to the ToL, putting together information about the diversity of life on Earth, the evolutionary history (or phylogeny) of Earth's organisms, and their characteristics. The ToL includes more than 4000 pages.

Most of the ToL's current content consists of contributions from expert scientists. The ToL is now working on expanding its contributor base to k-12 learners, teachers, and science enthusiasts, thereby providing a place for learners to publish their research on biodiversity, organismal biology and related topics. The ToL is a place where you can find pages of peer-reviewed information contributed by scientists, as well as information accessible to a wide range of learner levels contributed by treehouse builders.

You can **browse** different types of ToL pages by selecting links off of the ToL home page, such as Popular Pages, Sample Pages, Treehouses and the "Learn About..." section.

You can also browse ToL pages by using the **ToL simple or advanced search** located in the top right corner of every page (left side on home page).

Another way to browse is to visit major groups of organisms by clicking the images of organisms on the picture of the tree.

Step 2: Scientist Contributors: Branch, Leaf and Note Pages

Process Step Instructions

The core scientific content of the ToL is organized into **"branch" and "leaf" pages**. The phylogenetic biologists and systematists who create the branch and leaf pages that are the ToL's core scientific content are chosen by coordinators from the relevant scientific community for a particular group of organisms. Core branch and leaf pages are subject to review by ToL editors, coordinators and external reviewers, and different page status levels are assigned based on the scrutiny a page has received.

Notes can be created by professional scientists, science educators, or advanced graduate students who register as ToL general scientific contributors. Notes pages vary widely in content and are attached to many of the ToL's core branch and leaf pages. You can always look under the Notes menu in the right sidebar to see if there are any "extra" pages for you to view!

To give you a better idea of what these pages look like, first we will take a look at a typical branch and leaf page, and then we will browse some of the many note pages found on the ToL.

Salticidae

© 1994-1995 Wayne Maddison

A good example of a **branch page** is Salticidae (Jumping Spiders)

Branch pages can be recognized by the small tree diagram in the upper right corner. On this page you can see some typical branch page sections:

- A phylogenetic tree
- An introduction to the group
- Characteristics of the group
- Classification of the group
- Discussion of phylogenetic relationships within and between groups
- In the right sidebar you can see Treehouses and Notes (pages with extra information) attached to the branch page
- The right sidebar also gives you a way to visit other groups related to the particular organism whose page you are visiting

> This is a good time to **set your preferences for viewing ToL pages**. You can expand your learning on the ToL by setting various preferences. To do so, in the navigation sidebar menu on the right, click "Preferences" if it is not already open. From there click "Show glossary entries". This will highlight words defined in the ToL glossary in yellow and when you mouse over them you will get a definition. Next click "Show random pictures from this group." As the name suggests, this will show you random pictures from the group. This feature is particularly useful when looking at a broad group like mammals or green plants.
> *You can also click Setting Preferences to see other options.*

Habronattus decorus

© 1994-1995 Wayne Maddison

A good example of a **leaf** page is the one for the jumping spider Habronattus decorus.

Leaf pages can be recognized by the green leaf in the top right corner. Leaf pages represent the tips of the tree, or individual species.

The Habronattus decorus page has images of the organism and a quicktime movie of courtship attached. Click on the still from the movie to watch this spider's courtship display.

Life on Earth

The **root** of the Tree is the Life on Earth Page.

To get to the root, simply open up the containing group menu on any branch, leaf, note or treehouse page and click Life on Earth.

This page has some excellent links and references.

Characteristics of Odonata Larvae

© 1997 Richard J. Rowe

Check out this **Note** on the characteristics of Odonate Larvae (including the larvae of a damselfly and a dragonfly).

Amphilinidea Juvenile and Adult

Check out this **Note** on the structure of adult and juvenile worms.

Polymorphism in Ptiliidae

© 1997 W. Eugene Hall

This **Note** is about how certain genera of Ptiliidae posses species that exhibit forms of polymorphism (Dybas, 1978; Taylor 1981, 1980).

Cephalopoda Glossary

© 2002 S. O'Shea and C.C. Lu

This **Note** is a Cephalopoda Glossary, with illustrations and links.

Step 3: Teacher and Learner Contributors: Treehouses

Process Step Instructions

Treehouses are ToL pages that present materials specifically aimed at K-16 learners, including research undertaken by learners, exercises, stories, scientists' biographies, webquests, instructional games, and teacher resources. Treehouses are built by scientists, k-16 learners, teachers and science enthusiasts who have a particular interest or expertise in some facet of the material covered in the Tree of Life.

The Tree of Life is proud to offer the opportunity for teachers and learners to publish their work and research on biodiversity, organismal biology and related topics in the context of a scientific publication. Check out the links in this step to view some of the first treehouses, and get an idea of what you could contribute. Right now the ToL has several investigations and teacher resources, as well as couple of fun and games contributions that vary widely in their scope.

Note that Treehouses can be recognized by a treehouse icon in the top right corner of the page.

Marine Discovery Lab

© Marine Discovery

Click on the images to view movies of students in the lab.

What are they learning?

Marine Discovery Slide Show

© Marine Discovery

Watch the slide show.

Where is Puerto Penasco?

Do you think other places have similar marine life?

Weeds in Rylan's Yard

© Rylan Higgins

A backyard investigation.

What could you investigate in your backyard?

Diversity of Ant Mandibles

© 2004 Chris A. Schmidt

View detailed pictures of ant mandibles taken by a graduate student in Entomology.

What pictures might you be able to take of organisms that interest you?

Why is it useful to take pictures of organisms you are studying?

Snail Investigation Inquiry

© 2004 Lisa Schwartz

Here are some sixth-grader's basic questions about snails.

Beetle Treehouse

© 1996 David R. Maddison

Beetle trivia!

Sonoran Desert Species Game

A card game to learn about endangered species.

Life as a Lizard Unit

© A. T. Holycross

Life as a Lizard is a collection of lessons, information, and a role playing game that teaches about Sonoran desert lizards. This unit will soon be turned into a teacher resource portfolio to simplify navigating between the resources contained in the unit.

Making ToL Models

© 2005 Eric Lee

Use this teacher resource to learn about how to make 3-D models of the Tree of Life to help visualize the complex web of life.

Primate Features

© 2001 California Academy of Sciences

Kathryn's investigation of the distinguishing features of primates. This page inludes lots of excellent images illustrating the points of the treehouse. Kathryn is a PhD student in in Biocultural and Medical Anthropology at the University of Arizona.

Treehouse Builders Guide

This page is very helpful for treehouse builders as it links to example forms, editing topics, building steps and other support pages.

Treehouse Building Steps

This page presents some steps you could follow for building a treehouse, as well as links to pages that will help you complete the process.

Step 4: Building Treehouses

Process Step Instructions

The ToL offers you the chance to build treehouses and contribute media in order to document research in a variety of ways. Publishing your research allows you to share the results of your work with all ToL visitors. Building treehouses with the ToL's web-based tools isn't that complicated but there are lots of things you should know about to help you create a great page, and lots of resources on the ToL for helping you do so. This process step highlights where you should go to get help, ideas and resources for building treehouses.

Treehouse Editor Practice

This page gives you a few tasks to accomplish in order to practice using the:
- Treehouse Editor for completing all the steps of building a treehouse
- ToL Easy Editor for formatting text and adding media to your page

You need to go to the link above and open up the Practice Treehouse Editor.

Treehouse Builders Toolkit

The Builders Toolkit provides links to all the pages that you can visit to get information on how to build treehouses. There is a link to the toolkit from all of the treehouse online editing forms.

The links featured in the toolkit page are also in the navigation sidebar of all "ToL Learning Pages." You can access the Learning pages from the top navigation links of any ToL page.

The teacher resource page is not listed in the toolkit, but it is a page that should be visited by teachers planning to build treehouses with their students.

Treehouse Builders Guide

The Builders Guide is an especially helpful page for building treehouses, as it contains links to sample editing forms, example treehouses, help topics, the building steps and more.

Teacher Resources

The teacher resource page has many of the same links as the builders toolkit, such as links for a treehouse building rubric and guidelines. In addition this page has links to:

- treehouse building and Arizona and National Education Standards for Science
- treehouse building and National Technology Standards
- lessons for building treehouses
- a great list of related links

How Rylan Created his Treehouse Investigation

Walk through each step of how a treehouse builder named Rylan created a treehouse on weeds in his backyard. Click on a step or two to see the planning process and editing work that went into Rylan's treehouse.

Building Steps

This page offers some steps you could follow to create a treehouse, as well as links to pages that will support the step by step building process.

How Kathryn Created Her Treehouse Investigation

This page goes through how Kathryn constucted her treehouse according to the Treehouse Building Steps that are part of the Treehouse Builders Guide.

Step 5: Register as a Treehouse Builder

Process Step Instructions

Follow the links in this step to see how to register as a treehouse builder, and learn about the option of registering a classroom project.

Building Treehouses: ToL Treehouse Builders

From this page you can register as a treehouse builder, find out more about how the ToL will use your work and log-in to build treehouses.

Only individuals over 18 can register as treehouse builders right now, however, teachers who are already registered can choose to register classrooms of students of any age. Teachers need to log-in and then choose "register a classroom project" link from the treehouse manager.

Parents can also register in order to create a treehouse with their family members who are

under 18.

Students who are registered as a class will be assigned pseudonyms to protect their identity, unless we receive permission to post their names and other identfying information.

We plan on opening registration up to children of all ages soon, and will protect their privacy in the manner discussed above.

Once you are registered you can use the link to log-in from this page, or the log-in link in the right sidebar.

Registering a Classroom Project

Visit this page to learn about options for registering a classroom project for learners of any age.

Step 6: Finding and Contributing Media (images, sounds, movies and documents)

Process Step Instructions

The Tree of Life has a large collection of images of organisms and related information, as well as a growing collection of sounds, movies and documents. Treehouse contributors, media contributors and core scientific content contributors all add media to the Tree of Life. Depending on the copyright and terms of use chosen by the contributor this media can be used in the classroom, on published ToL pages, or for viewing with the media sampler or image/media search.

Whether you contribute media or view what the ToL has in its database, you will definitely enjoy the collection.

ToL Home Page

From the ToL home page can click "Advanced" under the search block, and it will take you to a page where you can select "Group Search," "Text Search," or "Image Search"

Select Image Search

Place your cursor in the "Images of Organisms in Group" box

Type "Primates" - the search should return several pictures of monkeys, apes and humans

Type "Elephant" - the search should return elephants but also non-elephant animals with "elephant" in their names, for example, elephant shrews and sea elephants

Contribute Media

Registered treehouse builders, media contributors and scientists may also contribute media to the ToL.

You must log in before you can upload an image, sound, movie or document that is on your own computer to the ToL database. Once you have uploaded the media file you will need to fill out the form associated with media contributions. The information you provide helps others use and understand what you have contributed.

If you set the terms of use as restricted, other contributors will not be able to use the media file you contributed on their pages. If you set the terms of use as anywhere on the ToL or share with ToL partners, other users will be able to access and use the media you contribute.

It is important to attach your media to a group of organisms so that others searching for media can find what they need.

Adding Media

Treehouse builders should use the Adding Media section of the treehouse builders guide for assistance with how to create, find, upload and insert images and media to the ToL.

If you have any questions about copyright, the Copyright Issues page is the place to find out about how to go about finding out what you can and can't use on your treehouse pages.

The Multimedia Reference will help you with preparing media for the web.

Step 7: What is phylogeny and why is phylogeny important to the Tree of Life?

Process Step Instructions

Many sites provide information on organisms, but one thing that sets the ToL apart is its emphasis on phylogeny, or the study of the evolutionary history of organisms. Every page and media file on the ToL about organisms is attached to a space in the ToL database for a particular group of organisms. This allows the ToL to connect pages together according to the genentic connections between the Earth's organisms.

The ToL illustrates that organisms living today are like the leaves of a tree. If you were to trace these leaves back to their branches, you would see common ancestors of living species where the branches fork, and eventually you could track back to the beginning of all life on earth. The Tree of Life uses the the internet to depict the complexity of the Tree of Life from the root to its branches and leaves, on web pages linked together by their phylogenetic relationships.

Use the links below to learn more about phylogeny and to browse ToL leaf and branch pages in a manner that emphasizes phylogenetic relationships.

What is Phylogeny

A phylogeny of organisms shows how (to the best of our scientific knowledge at this point) all the organisms on earth are genetically related, and relies on the knowledge that new organisms arise from previous forms through genetic descent. Charles Darwin, the first to coin the term "Tree of Life" defined evolution as "descent with modification".

Rana Perezi

On each page about an organism in the ToL, you can view "containing groups" and "subgroups" that allow you to move up and down the tree from the particular group you are examining.

Use the Containing Groups menu in the right sidebar to go to the containing group Terrestrial Vertebrates.

To go up the tree is to move from larger groups like Animals, Vertebrata, Terrestrial Vertebrates and Living Amphibians out to smaller divisions like Rana perezi, this particular species of frog. To go "down" the tree is to do the opposite – move from an individual species like Homo sapiens (modern humans) down to the groups that contain that species, like Primates, Mammalia, Terrestrial Vertebrates, and Animals.

Terrestrial Vertebrates

Look at the tree diagram on this page and see where Living Amphibians branched off from the rest of the groups of organisms that also have Terrestrial Vertebrates as a containing group.

Go to the Living Amphibians page by clicking on the link in the tree.

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