

LEARNING RESOURCE MATERIAL

About *Tree of Life*

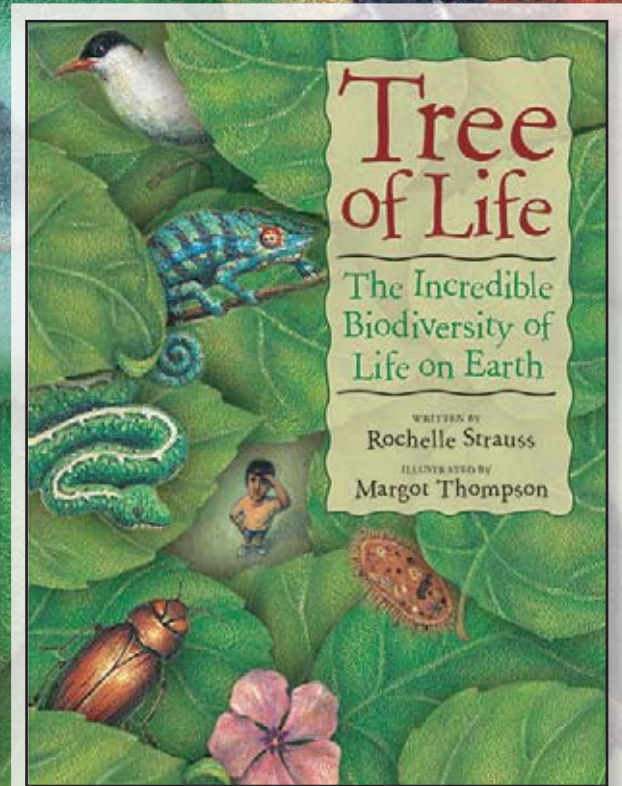
If every known species on Earth were a leaf on a tree, the tree would have 1 750 000 leaves. Humans count for just one leaf on this Tree of Life. *Tree of Life* is a dazzlingly illustrated and child-friendly introduction to biodiversity — the incredible variety of life on Earth — and shows how living things are classified, or organized, into five branches. This book also reminds us that every species is important to the Tree of Life. A problem with just one branch, one twig or one leaf may affect the whole tree.

About the Author

Rochelle Strauss is an environmental education consultant in Toronto, Canada. She has designed and developed award-winning education programs, as well as consulted on numerous environmental projects, including a biodiversity museum in Panama and a national park in Canada. Through her work, Rochelle combines her love of nature and passion for stories to teach children about the wonders of the natural world.

About the Illustrator

Margot Thompson holds a bachelor's degree in biology from the University of Toronto and a diploma in illustration from the Ontario College of Art and Design. She works as a graphic designer at the Royal Ontario Museum and as a freelance illustrator.



Tree of Life: The Incredible Biodiversity of Life on Earth © 2004.
Written by Rochelle Strauss and
illustrated by Margot Thompson.
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Discussion Questions and Activities

1. FOOD CHAIN

CLASS MATERIALS: For this activity, you will need to create enough large blank 4 in. x 6 in. (10 cm x 15 cm) name tags for every student in the class. You will also need several balls of colored yarn or string and two or three black markers.

Take students to an open area (outside, in the gym or clear a space in the classroom) and have them stand in a large circle. Begin this activity by asking students to name a familiar plant (e.g., grass). The first student to answer this question will receive a name tag. Write his or her response on it with a black marker and tape it to his or her clothing. Give the student a ball of yarn and explain that he or she must hold on to one end of the yarn. Next ask the question, What eats grass? The first student to answer this question will then write the name of that animal on a name tag, attach it to his or her clothing and receive the ball of yarn from the first person. This second student must hold on to his or her part of the yarn and be ready to pass the unraveling ball along. Repeat the question, And what eats that? until students can no longer provide an answer. Explain to students that they have created a food chain, with the ball of yarn representing the energy that is passed along the food chain.

If students are familiar with decomposers, challenge the remaining students to create a circle going back to the grass or the first plant that was named. They will form this food chain around the existing chain of students. Next, pick an animal in the first chain, give that student another ball of yarn and ask, What else eats that animal? to create a branch. Keep going, passing the ball of yarn to new or already-assigned students, until they have created another food chain. Use different-colored balls of yarn to differentiate between each food chain.

As an extension of this activity, ask students to create their own food chain as part of an individual take-home assignment to be discussed the next day in class.

Upon completing several food chains the result is a food web.

This activity is suitable for grades 3–6.



2. SCAVENGER HUNT

CLASS MATERIALS: For this activity, make sure to have enough paper, pencils and clipboards for at least half of the students in your class.

Organize students into pairs and provide each pair with a pencil, a piece of paper and a clipboard (or hard surface for them to write on). Ask students to divide their sheets into two columns and label one column **Living** and the other **Non-Living**. Take students to a nearby park, garden or natural area (one that you are familiar with) and challenge them to a scavenger hunt of “natural” things (not made by humans). Explain to students that they will have twenty minutes to look for as many living and non-living things as they can find and to list their findings under the appropriate columns on their sheet of paper. (Remind students not to disturb the items that they find.)

After twenty minutes, return to the classroom and create a master list, either on the chalkboard or on chart paper, using the same headings. Then, ask each pair to share their findings with the class and explain which heading they think each item should go under and why. Once each pair has had a turn sharing their list, discuss any items that might have been misclassified. If an item is duplicated, only write it down once and place a number beside the item to show how many times it was observed.

After the master list is complete, discuss with your class some or all of the items that were mentioned. Ask students the following questions: How do we know they are all living? What do these living things have in common? Based on students’ answers, develop a list of common features of living things.

As an extension of this activity, challenge students to add more examples of living things to their lists by including life forms that we cannot see with the “naked eye.”

This activity is suitable for grades 3–6.

Tree of Life *reference: p. 5*





3. KINGDOMS OF LIFE

CLASS MATERIALS: For this activity, you will need five pieces of bristol board or chart paper and different-colored markers. You will also need some old magazines for students to look through and cut pictures from (i.e., *National Wildlife*, *National Geographic*, fishing magazines, scuba-diving magazines, etc.).

Ask students to look through each magazine in class and cut out 8 to 10 pictures of as many different kinds of living things as they can find. Explain to students that they should look for really strange and unusual things as well as familiar ones. Once students have collected all of their pictures, prepare five poster-sized sheets of bristol board and ask students to list the “five kingdoms of life” (refer to the book *Tree of Life*). Write these names in the center of each poster (one per poster), and discuss each kingdom with the class. Work together with the class to create a point-form list of important characteristics for each kingdom and write these lists at the top of each poster.

Next, divide students into small groups and ask each group to work together to organize all of their pictures under the five kingdoms using tape to attach them to the bristol board. Afterward, discuss with students why each picture belongs under each category. Students should refer to the point-form list of characteristics of each kingdom of life when responding.

This activity is suitable for grades 4–6.

Tree of Life reference: pp. 6–7

4. THINGS WITH WINGS

As part of a class discussion, ask students to list as many animals that fly as they can think of, while you record them on the board. Divide students into pairs and assign each group an animal from the list (try not to duplicate them). Ask each group to research how that animal is categorized (insect, fish, mammal, bird, etc.) and include at least three other pieces of information about it. Each pair will then use their research to create a presentation about the animal to present to the class.

As an extension to this activity, divide students into groups of four or six and have each group compare their animals and role-play a short “conversation” that the animals might have together about how they are adapted for flight and the benefits and drawbacks of flying.

This activity is suitable for grades 4–6.

Tree of Life reference: pp. 18–31

5. VERTEBRATE TRIVIA

CLASS MATERIALS: For this activity, you will need to provide each student with a piece of cardboard paper or construction paper to make into a “quiz card.” All quiz cards should be cut the same size.

Have each student choose one species of vertebrate and write a detailed description of the animal on a card. Ask students to go to the library or use the Internet to research a detailed description of the animal, its habits and its habitat, and write this information in point form on one side of the card. (The description should include which of the five main classes it comes from.) Ask students to pair up and try, by asking “yes or no” questions, to guess the identity of the other person’s animal. If students are unable to guess the animal after going through all of the questions, ask them to move on. Ask students to keep track of how many animals they were able to guess correctly by recording them on the blank side of the card.

Once the game is over, have each person share his or her information with the class. Then gather up the cards and place them around the class for students to look at and read.

This activity is suitable for grades 4–6.

Tree of Life *reference: pp. 21–33*

6. GETTING AROUND

CLASS MATERIALS: For this activity, you will need to photocopy and hand out the Getting Around activity page and Characteristics of ... activity page, which are located at the end of this guide to each student in the class.

Photocopy the Getting Around template and the Characteristics of ... template located at the end of this guide for each student in the class. Ask students to work on the Getting Around activity first and write the names of as many animals as they can in each of the circles, thinking about how the animals move around. Remind students that some animals will fit into two or even three circles.

Once students have filled in each Venn diagram (minimum of four animals for younger students and minimum of eight animals for older students), ask them to work on the Characteristics of... activity page. On this page, students are asked classify their animals as they are classified on the Tree of Life – Invertebrates, Fish, Reptiles, Birds, Amphibians, Mammals. Students should then list the characteristics of each group.

Follow up this activity with a class discussion, emphasizing how animals from many different families have developed similar characteristics. Explain that, although many animals have, for example, wings, scientists do not group these animals together because they are very different in other ways (e.g., some are vertebrates and others are invertebrates, some lay eggs and others give birth to live young).

This activity is suitable for grades 3–7.

Tree of Life *reference: pp. 18–32*

7. YOUR ENVIRONMENT

All living things need shelter, food, clean air and water to survive. Ask students to think about the environment around them — their schoolyard, their neighborhood and their part of the country. Students should ask themselves, Where do living things live? Students should realize that there are living things almost everywhere, but that bigger living things, such as large animals and big trees, need a lot of room to live.

Next, ask students to think of and list more things they can do to help keep the environment a place where animals would like to live. You could leave this question wide open for the students' own ideas or suggest the following headings to prompt ideas:

- Disposing of garbage
- Growing our own food
- Using alternative energy sources
- Getting around/Transportation
- Actions that help wildlife

Students should aim for between five (for younger students) and ten ideas (for older students) under each heading. For example, if students want to encourage songbirds to live in their neighborhood, they might suggest setting up birdfeeders and avoiding the use of toxic chemicals (e.g., pesticides). Or, to improve the environment for humans, students might suggest cutting down on the amount of fossil fuel burned by taking fewer car trips.

This activity is suitable for grades 3–7.

Tree of Life reference: pp. 34–37

8. WHAT IF ...

Assign your class an individual writing assignment in which each student picks one familiar animal or plant, and predicts how the world would be different without that organism on Earth. They should think about the impact that the organism has on other plants and animals, as well as how it affects humans. Ask students to research this information and write a report, minimum one page, maximum two pages.

This activity is suitable for grades 3 and up.

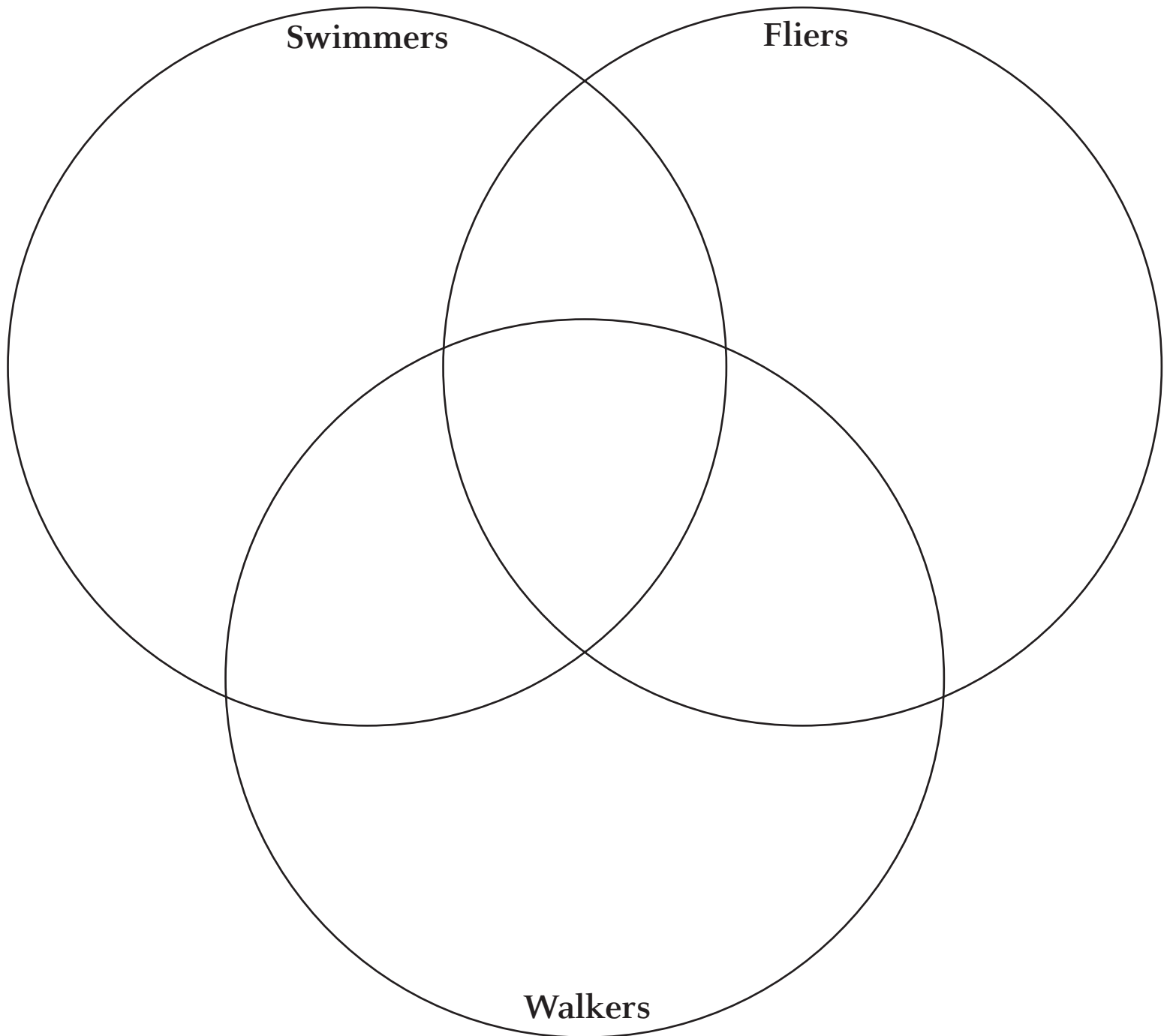
Tree of Life reference: pp. 34–37



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Getting Around

Fill in the following Venn diagram by listing as many animals as you can think of in each circle, under the headings Swimmers, Walkers and Fliers. Think about how the animals move around. Remember, some animals will be able to fit into two or even three circles. Once you have filled in enough for each circle, move onto the next activity page.



Characteristics of ...

Refer back to the Getting Around activity and group (classify) all the animals you came up with under the headings: Invertebrates, Fishes, Reptiles, Birds, Amphibians and Mammals. List the characteristics of each group – for example, what makes a mammal a mammal?

The image contains six apple-shaped outlines arranged in a 2x3 grid. Each apple has a short stem at the top. The labels are written vertically inside each apple:

- Top-left: Invertebrates
- Top-middle: Fishes
- Top-right: Reptiles
- Bottom-left: Birds
- Bottom-middle: Amphibians
- Bottom-right: Mammals

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