An Environmental Guide from A to Z
Parent's Guide

Thoughts behind the Book

The best of nature lives far away and right under our noses too. Far away is exotic and exciting but also abstract and difficult to embrace for young learners. Learning begins with the nearby and moves to the far away. The best way to learn about nature is with nature, in nature. Luckily, nature invites us to investigate, explore, and connect with our natural neighbors. Nothing engages the senses like being a part of the experience.

Use this Guide as a supplement to *An Environmental Guide from A to Z.* The discussions and activities within this guide provide opportunities to get outdoors, to discover where we live, who lives with us, and understand how all the pieces and parts involved in our lives work together.

The Guide promotes outdoor activity necessary for healthy childhood development. It gives children a chance to bond with and understand nature, a chance to become excited about and involved in the places we live. Uncovering the secrets of nature, opens opportunities in transforming how we live-—from changing where energy is derived to how products are made.

Through direct contact with the world in which we live, we aim to move nature to the center. Rather than environmental education as an add-on, we aim for it to be a practical tool to teach sketching, reading, writing, math, science, history, and social studies.

This guide is divided into 3 sections. Although all of the concepts in *An Environmental Guide from A to Z* are covered in each section, some concepts are more directly suited to specific sections. At the end of each section is a table to help choose activities corresponding to specific concepts.

Section 1. Where do we Live? Who Lives with us?
Bees & Insects, Darwin, Habitat, Inuit Eskimos, Native, Trees, & Us

Section 2. How does it Work?
Amazon Rainforests, Cycle, Energy, Fossil Fuels, Greenhouse Gases, Kilimanjaro, Paolo Lugari, Muir Woods, Ocean, Plankton, Sun, & Water

Section 3. Can we protect our places? Keep it working for a better future?
Jacques Cousteu, Vo Quy, Reduce, Reuse, Recycle, Rethink, & Redesign, Urban Farming, & Yvon Chouinard

Section #1:
Where Do We Live? Who Lives With Us?

How well do we know the places we live? The best ways to learn is through real contact with nature. These activities provide opportunities to connect with nature nearby and become backyard, schoolyard, and community experts.

Adapted from the following spreads: Bees & Insects; Darwin; Habitat; Inuit Eskimos; Native; Trees; & Us

Be a *Detective* Questions:

1. What is a climate and what are the characteristics of your climate?
2. What plants and animals are native to your area?
3. Where are the nearest bodies of water?
4. What is the origin of your drinking water?
5. What food is grown near you? What happens to it? Where does the food you eat originate?
6. What did your area look like 50 years ago? 200 years ago? 1,000 years ago? Why the changes?
7. How much time do we spend outside on a typical day? How about 30 years ago? How about 500 years ago?
8. What are the nearest semi-wild areas to you? Tree groves? Forests? Prairies? Mountains? Deserts? Wetlands? Which ones are closest and how well do you know them?

Activity Ideas:

9. **Animal Charades** or animal twenty questions. Have children act out animals or have volunteers act out a skit with multiple animals.

10. **Children as Wild Animals.** Have the children imagine they are animals, picking out their favorites. Describe, or have them locate, where they live and why. How do they survive?

11. **Habitat Living**. Choose two animals or plants. Take a good look at where they live. Could they live in each other's homes? Why or why not? If they did switch, what would have to change?

12. **Animal Observation**. Watch an animal move in its habitat. Observe what it does. Place birdseed on a window ledge or place a birdfeeder near a window. Do different foods attract different birds (or other animals)? Is it different in different seasons?

13. **Catch insects**. Set an insect trap by placing a cut-off, two-liter bottle into a hole so its top is level with the ground. Put in a little soda, leave for a day or two and see what you've collected. Who are these insects, and what do they do? Try putting several two-liter bottle traps out in different types of locations (hang one from a tree, put one near water, put one next to a building, etc). Are the same types of insects visiting all of them? What would happen if you put a small piece of meat in the bottles instead of soda? Are the bottles still visited by the same insects? What other types of bait could you use?

14. **Sketch bugs**. Take a close look at two bugs, draw them and compare the differences. What are the most interesting characteristics? Take the most interesting characteristics of both bugs and made one bug from them. How does that bug differ from the two bugs? Sketch your new bug.

15. **Attract birds**. Find a quite place outside in a semi-wild area. Sit as still as you can. Make a sound like a bug by saying "pshhhh, pshhhh" repeatedly. See if you can attract any birds. What birds did you see, or hear? Did you see any other animals? Or find evidence of other animals?

16. **Listen to nature.** What does nature sound like? Compare and contrast these sounds to the sounds human activity produces. How do the different sounds make us feel? Always?

17. **Nature walk.** Go on a short walk and ask and answer questions like: Why are those trees here? How did those boulders get here? What animals travel through here? You may want to walk through once only compiling questions. Then take the time to research some possible answers and then take the walk again. What did you learn?

18. **Observe and feel nature**. Use samples of bark, buds, sticks, flowers, leaves, and roots. Close your eyes and feel them. Make observations about them and discuss your observations. If you're given these to feel with your eyes closed, can you identify everything?

19. **Track a branch for a year**. If it's winter, find a bud on a tree or plant. To make it easier to keep track of, tie a piece of yarn on the branch and take a picture of it at regular intervals. What happens to leaves during the fall?

20. **Tree Differences**. Why do some trees grow wide and some tall? Find a tree and guess how it ended up here. Where did its seed come from? Where do its seeds go? Find the tallest tree, and figure out how tall it is. What types of food grow on the trees near you? Who benefits from these trees? How are trees here different than those near the equator?

21. **Tree Varieties.** How many species live in the trees near you? Are there other plants living in the treetops or on the trunk? Are there animal nests in the tree? How many insects might be in the tree? How many animals don't live in the tree, but rely on the tree?

22. **Study tree rings.** Find a recently cut-down tree and examine the annual rings with a hand lens or magnifying glass. Take a photo, blow it up, and print it out. Look at the years represented and "read" its life story. Make educated guesses (or research past weather or past historical events) as to why some rings are bigger and some are smaller than others. What significant events happened during the tree's lifetime?

23. **Sketch a nearby tree or plant.** From up close, do your best to incorporate who else might be in the tree, and from faraway include other factors impacting the life of the tree.

24. **Local expertise**. See if local farmers, gardening experts, or someone from your local county extension office will speak to your group about what grows best in your area? Have the children put together a list of questions to ask. If a personal visit isn't possible, try phone, email, or web chat. Could they help you plan a vegetable garden or plant native species nearby?

25. **Free drawing.** Go to a natural area armed with paper and writing/drawing utensils. Have children make pictures of an animal, a plant, a tree and the landscape.

26. **Conduct scavenger hunts.** (Note: Whenever possible have scavenger hunters take a bag and gloves to collect litter to throw away or recycle.)
    a. Take close up photos of various natural items and see if the students can find each location. Place a letter or word at each location and see if they can find all of the locations to spell out the word or sentence you chose.
    b. Have the students collect a piece of the natural surrounding or picture of a natural item for each color of the rainbow.
    c. Have the students collect pieces of the natural surrounding or pictures of natural items that illustrate as many different shapes as they can (square, trapezoid, heart, etc)
    d. Have a rock scavenger hunt. How many different types of rocks can be found within any one area? Who has the most variety of types, colors, weights, sizes, etc.?
    e. Have an observatory scavenger hunt. Have the students observe as many different examples of movement as possible. Have them come back and play a game of charades with their movements. See which group collects the most and which group can identify the most. Examples of movement would be a tree blowing, an ant eating, an ant carrying a heavy object.

f. Go on a measurement hunt. Send each group with a different measuring tool: a yardstick; a millimeter ruler; a scale; calipers (if possible); a thermometer; etc. Select a variety of items to measure. Have the students come back and make a measurement chart as a group.

Writing Activities:

27. **Make a nature book**. Create a book to write in using paper, string, small sticks, scissors, and a hole punch. Cut the paper into quarters to create four pages. Punch holes near the 'spine.' Use string, yarn, or twine to tie the stick to the paper through the holes. For eight pages, use two pieces of paper. Use the book to collect. Tape or glue parts of nature into the book or use it for any of the following writing activities.

28. **Create a weather journal**. For ten minutes a day, head outside and write about the weather, Be as descriptive as possible. E.g. if it's raining, how big are the drops? How many are there? Are they cold? Making puddles? What do the clouds look like? What color is the sky?

29. **Keep a Nature Notebook/Journal**. Go outside, find a place to sit down and write as Darwin did his entire life—from his trips to exotic places to the notebooks he filled writing about the activities of the earthworms in his garden. Write about everything you see, hear, and smell. See how keen your observations can be, i.e. the sky is more than just "blue." What kind of blue? Keep track of the place you write and the time you wrote. Occasionally try writing from the same place at different times and different days. Occasionally try writing from slightly different places at the same times or looking a different direction from the same place.

30. **Free writing.** In a quiet, semi-wild area, write about everything around you and be as descriptive as possible. In addition to all the sights, consider the smells and sounds. Is your hand tired after the exercise?

31. **Research local history**. At the library or with the local historical society or a longtime resident, find out what life was like during a specific time period within the last 100 years. Put yourself in the shoes of a child during that time period and write a story about a day-in-the-life of that child. What differences stand out between your childhood and your historical child's?

32. **Life as a Native American**. Learn which Native Americans lived in your community before the Europeans arrived. Learn the local topography and imagine how they lived, i.e. where they hunted and how they found water. Based on what you learn, write a story.

33. **Be another part of nature.** What would life be like if you weren't a person? Write a story about your life as a part of nature of your choosing, a tree, cloud, worm, or bird for example

34. **Engage the senses**. Put on a blindfold. Have someone lead you to a good place to sit outside. Use your sense of hearing and smell to take in the world from your seat. Now have your leader take you back inside. Write out as much as you can from what you remember. Go outside with your leader again, this time without the blindfold, and see if you can find the place where you sat.

Map Activities:

35. **Radius Map**. Draw a map around your home and around your school. Note places to explore nature. Include the cardinal directions, N, S, E, & W. Plan a trip to one or more of these places. How would you get there? How long would you be there? What would you *need* to take? What would you *want* to take? When you got back, how and with whom you could share your excursion?

36. **Direction Giving.** Make a map of a walk you take often and write out directions you could give to someone who has never been there. Note nature highlights along the route. Describe the prominent trees, any significant natural formations, the nests and homes you see, and anything else you're interested in or feel is significant. Imagine you were giving directions to the same walk 100 years ago. What has changed? What will the walk be like 100 years from now?

37. **Go on an animal hunt**. Seek out animal tracks. Try and identify the tracks. Map out the tracks as far as you can. Can you find the animal or where they live? What were they doing where you found the tracks? Were they eating? Hiding? Playing?

38. **Tour Guide**. If you welcomed a first time visitor to the area, could you play the role of Tour Guide? Act out the role of Tour Guide. Take someone around the neighborhood, and show them all the highlights!

39. **Area Topography**. Find a topographical map of your area. Search out the highest and lowest places in your area. Find out how high it is and compare it to the height of Kilimanjaro. What are the differences between the high and low points? If there aren't temperature differences, how are the areas impacted by rain and by storms? How does the lowest point in your area compare to sea level? If your area is relatively flat, check out area buildings. Use them as your high points.

Section #2: How does it Work?

Adapted from the following Spreads:
Amazon Rainforests, Cycle, Energy, Fossil Fuels, Greenhouse Gases, Kilimanjaro, Paolo Lugari, Muir Woods, Ocean, Plankton, Sun, Water, Worms.

The study of the relationships and interactions between living and other living and their environment is ecology. Exploring this concept reveals connections and shows how everything fits together. Each player and part of the environment plays a role in making the system work. Nothing lives in isolation and all life is connected to one another, so whenever something happens energy flows and nutrient cycles.

"When we try to pick out something by itself, we find it hitched to everything else in the universe." John Muir

Be a *Detective*. Find answers to the following:

40. How can a worm seem so insignificant and yet be so important?
41. Why are there no trash cans or garbage dumps in nature? i.e. within the five kingdoms, what is waste for one is food for another.
42. How many examples of biomimicry can you think of? E.g. the idea of velcro came from burrs dispersing seeds by attaching themselves to the fur of animals)
43. As a group, discuss the life cycle of a tree, including the shedding of leaves and what happens to them.
44. How does your habitat vary from that of the Eskimos? How is it the same?
45. How many different forms of energy can you think of? Where did the energy come from in the food you ate in your last meal? How far back can you trace each energy trail?
46. If a plant isn't doing well, what could the possible reasons be?
47. What do we need the ocean for? Why do we need a healthy ocean?
48. How many different ways do you use or rely on water each and every day? Where does the water originate? What happens to it after it goes down the drain?

Activity Ideas:

49. **Main groups of life**. As a group, make a list of the wildlife in your area. Divide your list up into producers, consumers, and decomposers. What is a tree? Where do we fit in? Pretend one of the groups disappears. What would happen?

50. **Connections.** Go outside. Independent of everyone else, write about anything you can think of for sixty seconds. Now, take the writings and randomly pull out subjects and find the connections between them. E.g. a tree & a house. The house may be constructed with wood or the tree may shade the house.

51. **Energy**. Look at an outdoor area near your home or school. Figure out what things in that area consume energy, where that energy came from and where it went to. Draw a picture that traces the energy cycle. Now draw a picture that traces where the energy comes from to fuel our cars, homes, and buildings down to the most basic level. For example, an ant pushes dirt. The ant gets energy to push dirt from the sugars in the plants it eats. The plants produce the sugars from the energy they get from the sun.

52. **Changing Landscapes**. Can you find areas nearby that have changed recently? Perhaps an area of trees which has been cut down or an area where more nature life is being added. What specifically has changed? What has remained the same?

53. **Time Perspectives.** What is a long time for a bug, a leaf, a squirrel, a turtle, an acorn, a stream, a mountain. Take the oldest living thing in town and compare it to 3 other things from the previous list.

54. **Go for a walk.** Choose a rock that looks interesting to you. Find out the "life" cycle of your rock. How was it made? What do you think the purpose of this type of rock is? How old is it?

55. **Bee watching**. Spend time observing bees and how they interact with flowers. Discuss your observations with each other. How does the work of bees impact what we eat?

56. **"Pest" research.** Find insects to observe. Find out what their value beyond being a "pest" might be. Share your findings with someone else, or get together and make a "Pest Book."

57. **Native or non-native.** Choose a plant or animal to study. Is it native or not? If not, when did it arrive and how? And how has it adapted itself? If it is native, what traits make it well suited to the area?

58. **Invasive vs. Native Game.** <u>You'll need :</u> a table surrounded by chairs (1chair/person); 3 food tokens/person (paperclips, squares of paper, etc) <u>Set up:</u> Put the "food" on the table; 5 students start in the chairs (1 invasive animal and 4 native animals); Invasive animals get 2 chairs and native animals get 1 chair; Everyone else waits to be chosen as offspring. <u>Play:</u> Take turns; Each turn each invasive animal gets 2 pieces of food and each native animal gets 1; Every 2 turns, each invasive animal has 2 offspring. Every 3 turns, each native animal has 1 offspring. When food and/or space start to run out, invasive animals begin "eating" native animals. Those students who were "eaten" join the other students waiting to become offspring. <u>Discussion:</u> How many turns does it take until everyone sitting on the chairs are invasive animals and the native animals are gone? This happens in real life with invasive species. Often the invasive species are bigger, mature faster, reproduce faster, need more food, and are more

aggressive than the native species. The animal roles in this game could refer to birds, frogs, plants, bugs, or mammals. Now play again without an invasive animal. Every 7 turns an animal dies of natural causes. What's different?

59. **Picture hunt**. Take a camera and go on a walk, taking pictures of natural interactions, like a squirrel eating an acorn or two birds playing. Print out the pictures and write captions describing what happened and where it happened.

60. **Food drop**. Drop a small piece of food on the sidewalk and record how its presence changes what happens on the sidewalk. How do you think the piece of food thrown from a car window affects interactions along the road?

61. **Temperature differences.** Set several tanks (or similar containers) of water outside for several days. One in the shade, one in full sun, and one wrapped with paper to control the temperature. Record the temperature of each tank everyday. Record any interactions that take place in and around the tanks.

Writing Activities:

62. **Interactions**. Write about several natural interactions, e.g. a plant photosynthesizing, a hawk eating a mouse. Describe the energy flows.

63. **Actions and re-actions.** Pick one natural event, e.g. a worm wiggles to the surface of the Earth. Write a simple book for a younger child describing the chain of events that result from that one event. Find a younger child or class to share your book with.

64. **Remove the animal!** Chose an animal and write about its habitat and interactions. Write about why that habitat and those relationships work for that animal. Consider who they compete with in their environment and who they cooperate with. Now write a story about your animal's habitat if it weren't there.

65. **What happens when it rains?** Observe & document how trees, birds, ants, and people react to rain. It might be easier to observe the same things when it's sunny out, right before a big rain, during a rain, and right after a rain so you have some comparisons to make. Does weather impact your mood?

66. **The life of a raindrop.** Imagine you as a raindrop. Write a story and go through several cycles, and in different environments, i.e. falling into a garden, on a roof, a street, etc. After you run off and create a puddle what happens to you next? See if you can take yourself all the way through the water cycle until you become a raindrop again.

67. **Your favorite.** Do some research on your favorite part of the nature world. What other things interact with it? How does it fit into the food & energy web?

68. **Your life and how you fit in.** What have you interacted with that you can think of? How do you fit into the food & energy web?

69. **Suggested journaling**: Are you native to your community? Did you grow up there? Did your parents? If so, how are you connected to your community? What traits make you well suited to live there? If not, what have you had to change to fit in better with your community? Have you changed how you dress, talk, what you do, or what you eat?

Section #3: How do we protect our places, keep them working and build a better future?

Adapted from the following spreads:
Jacque Cousteau, Vo Quy, Reduce, Reuse, Recycle, Rethink and Redesign, Urban Farming and Yvon Chouinard

As children age, their immediate world expands. For those who have been given the opportunity to bond with their immediate natural surroundings, there will be a natural tendency to want to learn more as they mature. At the same time, their worlds expand from the backyard and nearby park to downtown and the mall and local nature preserve. And as they gain more knowledge of the connections, they become protective of their local ecosystem. This is the early adolescence and time to engage in stewardship projects and working to transform how we interact with nature.

"Knowledge without love will never stick. But if love comes first, knowledge is sure to follow." -John Burroughs.

This section is for those children old enough to already be in love, those who are searching for knowledge, those who want to make a difference.

Be a *Detective*. Find answers to the following:

70. Who are all the local officials that make decisions that impact the place you live?
71. Currently, what are the main environmental issues in your area?
72. Who are the champions of the local environment?
73. Where does your trash go? Where does the recycling go?
74. Which local businesses are working on treating nature better?
75. Are there any local businesses benefiting from imitating nature?

76. Where does all the local water come from? Who uses what amount?

Activity Ideas:

77. **"Waste" comparisons.** What does nature do with its waste and what do we do? Explain, draw pictures or glue items on poster board. Choose examples, i.e. tree versus building.

78. **Trash digging**. Carefully empty out a trash can, separate, examine, and document the findings. (Be sure to wear gloves and beware of sharp items.) Where did it come from? What is it made of? Where will it end up? Now, visit a semi-wild area. Do you see any of the same types of items you found in the trash can there?

79. **A 2nd life?** Go through trash at home or find something your family no longer needs/uses that might be valuable to someone else or remade into something else. Giving gifts of things you no longer want or need like old toys in good condition, may give someone a lot of fun. Is it OK to pass along or receive old toys/gifts/clothes? How would you feel if you received a "used" gift? Why might this be twice as good as buying new?

80. **Copy nature.** Vermi-composting at school, or home. See the book "*Worms Ate My Garbage*."

81. **Recycling our material goods**. What are the issues involved in recycling? (pick up, sorting, chemical processes necessary, etc) What creative solutions can you think of to solve or work on the issues you thought of? Share them with a recycling center, business, city, or other organization that could benefit with your findings.

82. **Nature experts**. Invite nature experts to visit. Prepare questions to ask, e.g. what they do, what challenges do they face, what were their lives like as children, etc. Ideal candidates might be found at the local Audubon Society; zoo; botanical garden; forest preserve, etc.

83. **Change Yard Maintenance and help local animals**. Add to the habitats they like. Build and put up a birdhouse or bat box, grow native plants and grasses, or plant a wild garden. What impact does doing these things have?

84. **Become informed**. Through local media or at town meetings, find out about local happenings concerning nature and the environment. Learn all you can. Which side of the issues are you on? Find out what you can do to help at least one cause and then do at least one thing. Notice that decisions are often not easy, e.g. when a developer is taking away wildlife by providing jobs and homes. Can you figure out a compromise, where both sides win (building energy

efficient houses, clustering homes within walking distance to businesses and schools and leaving plenty of open space)

85. **Debate.** Do research. Take sides. Debate the facts with each other. Take turns representing both sides of each issue. E.g. a housing development project to replace a farm. Quickly, children can understand the issues are far from black and white.

86. **Write letters and make phone calls**. Find out about the letters John Muir wrote. See what you can do to follow his example.

87. **Research local businesses**. See if you can find businesses like Patagonia that try to minimize their impact on the natural world while still producing good products.

88. **Visit a local farmers' market.** Speak with local farmers. Find out what they do, why, and how they do it. Research Community Supported Agriculture (CSA).

89. **Study Energy Flows at School/?Conduct anergy check**. Compare 2 or more different types of energy and see which works best at doing the same job. Be sure to use the same test (clock, light bulb, etc). You might try solar, potato power, rechargeable batteries, non-rechargeable batteries, people power (turning a crank, pedaling a bike, etc). Now consider natural impact, cost, and convenience. Is one type of energy "better" than another? Are there other considerations, such as what type of light bulb to use, or how much insulation you have?

90. **Gardening Methods.** Compare 2 or more different types of gardening and see which produces the most food. Be sure to use seeds from the same packet. You might try organic, non-organic, hydroponic, etc. Now consider natural impact, cost, and convenience. Is one type of gardening "better" than another? Is it true for all types of plants?

91. **Cardinal Directions.** Take a look at several different types of maps (neighborhood, town, regional, national, world, aerial, topographical, road, political, nature, flood plain, etc). Determine which way is North, South, East, and West. How do you know which direction is which way? Why is it important?

92. **Runoff.** What is water runoff? How does it impact us? In what ways do land development, mono cropping, and other human activities impact water runoff? If possible make a diorama to help illustrate the differences.

93. **Future Life.** Knowing what you know about how we used to live and how we live now, project how we may live in 100 years. Do you think we'll change how we deal with garbage? How do you think we'll deal with energy needs? How do you think we'll deal with water

needs? Do you think our houses or vehicles will change? Do you think our recreational habits will change? Make models of what you think life will be like.

94. **Pet Impact.** How do the interactions our pets have with nature impact our relationship with nature? Think about pet waste, food production, pets released into the "wild" & feral animals, squirrel chasing, hunting, etc. Are these good relationships, bad relationships, or neutral relationships? Are there issues we need to address? If so, how would you address them?

95. **Volunteer.** What are the volunteer opportunities in your area to help increase the number of positive natural interactions or reduce the number of negative natural interactions? How can you help? Find a park or wildlife sanctuary that is closest to your house. Can you walk, ride your bike or take public transit?

96. **Your Impact.** Track the number of interactions you have with nature over the course of a day/week. How did they make you feel? How can you increase the positive interactions and reduce the negative interactions in your life? Do you feel a need to change any of your interactions with nature? What are five things you could change? Are there any things you will change? What? Why or why not?

97. **New Growth.** Find someone to plant a tree or garden with and then plant one. Choose a spot for a win-win, i.e. in temperate region, plant a conifer on the north side of a home, a deciduous tree on the east side (to block the sun in the summer and allow it in during the winter).

98. **Local Heroes.** Find a person who you feel is a local hero. He or she may be a hero of nature or some other type of hero (preferably the former). Find the time to interview him or her.

99. **Help.** Come up with a list of ways you can help your school or home and the environment. Choose at least one of those things to work on implementing. E.g. Ways to save energy, composting, growing a vegetable garden, or collecting excess or wasted food for a homeless shelter or nearby livestock.

Writing Activities:

100. **Heroes in Ink.** Write a biography on your hero.

101. **Write a Book.** Write your own *Environmental from A to Z* for your local area.

102. **Be a Witness.** Go to a park or natural are. Observe the interactions people have with nature. Document seven interactions you witnessed. Were they positive, negative, or neutral interactions? How did you feel about what you witnessed? Write a story about the interaction

you felt the most strongly about (either positive or negative). Share your story with 3 other people.

103. **A New Gift.** Make a list of times or reasons when you could give someone a plant or tree as a gift instead of something else. Make a list of people you know who would like to receive a plant or tree as a gift. See if you can start a new trend in gift giving.