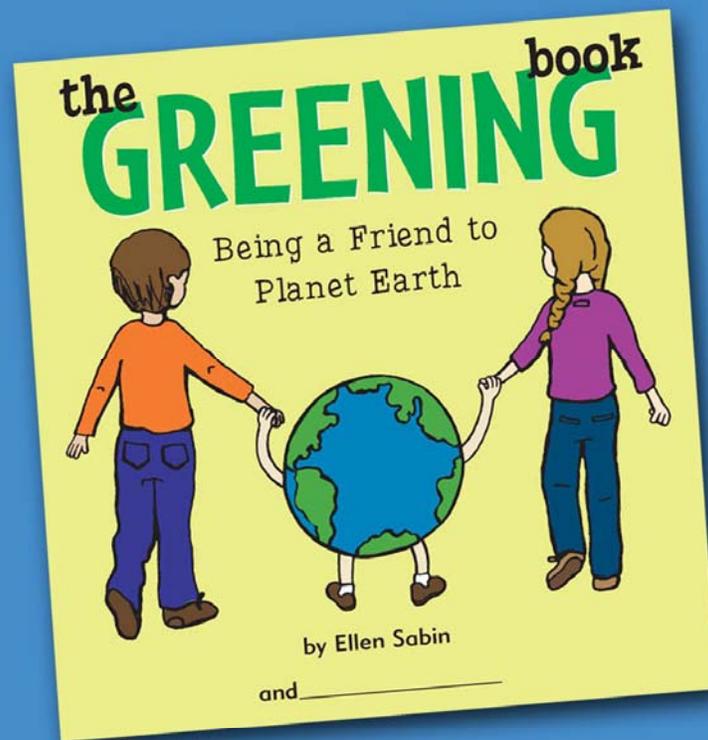


*The Greening Book:  
Being a Friend to Planet Earth*

**TEACHER'S GUIDE**



**For more information or to order  
copies of *The Greening Book*  
go to [www.wateringcanpress.com](http://www.wateringcanpress.com).**





# A Guide for Teachers

*The Greening Book: Being a Friend to Planet Earth*  
by Ellen Sabin

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## Introduction

*The Greening Book: Being a Friend to Planet Earth* lends itself to teaching many lessons and fulfilling numerous National and State Content Standards.

Each lesson plan provides creative ideas for using *The Greening Book* in classrooms and other group settings. The lessons can serve as a basis for accomplishing various curricular and school goals; both formal and informal.

Just as the book is geared towards children aged 6-13, some of the lessons are more advanced, and others are for a younger population. The lessons can be easily adapted or modified as needed based on student age, ability, and goals.

The standards referenced are drawn from the Mid-Continent Research for Education and Learning' National Standards (which can be viewed at [www.mcrel.org](http://www.mcrel.org).)

Several of the lesson plans focus on teaching character development issues. In states with character education requirements, these lessons fulfill many additional standards (which are not all noted in this document as these vary state to state). These lessons guide children to think beyond themselves, treat other living things with respect, and/or practice leadership and team work.

We hope that these lesson plan ideas encourage and empower educators to invite students to delve into their *Greening Book* journey while learning academic lessons in science, language arts, character education, math, geography, history, and arts.

We also hope *The Greening Book* stimulates everyone to grow their own special friendship with the earth and become excited about protecting, caring for, and nurturing our Planet.

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SUBJECTS: Math, Science, Geography, Language Arts

TITLE: **Water Conservation: Where Does Your Water Come From?**

Grade Level: 3-5

OBJECTIVE: Students will be able to explain where their own water comes from and to articulate the importance of water conservation in their homes and schools because freshwater sources are so limited. They will also be able to list practical ways to reduce water consumption.

MATERIALS: The Greening Book, a world map, graphing supplies, a one liter bottle, a dropper, art supplies, writing supplies.

ACTIVITY:

- Read page 36 of The Greening Book as a class.
- Explain that the earth's water is located in various places and in different forms. About 97% of all water is in the oceans and only about 3% is freshwater, which is the water that humans use for everyday life. Of the 3%, about 69 % is found in glaciers and icecaps, mainly in Greenland and Antarctica. Show the students a map of the world and point out where the oceans, glaciers, and icecaps are located. About 30% of the Earth's freshwater is found in ground water and the remaining 0.3% is found in surface water, such as lakes, rivers, swamps, and streams. Explain that the ground water found in the earth and surface water is where the majority of the water we use comes from. Again, make it clear how small this amount of water is compared to the total amount of water in the earth's supply. (Note to teacher: You may wish to draw a bar or pie graph outlining the percentages above or ask students to make their own graphs.)
- Fill a one liter container with water and ask the students to imagine that this container represents all of the water on the earth. Ask students if you were to take all the fresh water out of the container (i.e. all the water in rivers, lakes, wells, reservoirs, etc.) how much they think you should take out. Record the responses. Use a dropper and take out only one centiliter. This shows how much of the earth's water is usable in our homes.
- Find out where your community's water comes from so that you can explain it to your students. For example, in Troy, Michigan (the author's home), water comes from the largest freshwater supply in the world - the Great Lakes. Troy's water source is Lake Huron's 850 cubic miles of water. Troy purchases water from the Detroit Water and Sewerage Department (DWSD). Their system filters and treats the lake water at its plant in Port Huron before releasing it into the pipes that deliver Troy's water. New York City's water comes from watersheds in the Catskills and Croton that extends 1,972 square miles. There are also neighborhoods that receive groundwater supplies mixed with some surface water. The government's Environment Protection Agency's website ([www.epa.gov](http://www.epa.gov)) can lead you to information about water supply in your area or you can contact your local or regional government offices.
- Ask students what they think they can do to help preserve the fresh water sources available to us. Brainstorm some ideas and write them on the board. Read page 37 of The Greening Book for additional ideas.
- Conclude the lesson by breaking the students into small groups of 3 or 4. Ask them to design an exciting flyer that can be distributed to all of the other classes in the school which explains where their drinking water comes from and ways that they can help reduce the amount of water used in the school building. Make copies of the flyers and ask students to distribute them to the other classes in the building. You could also consider having a competition and the group with the best flyer will be the one that is distributed throughout the school.



**Water Conservation: Where Does Your Water Come From? -- CONTINUED**

**STANDARDS:**

Geography:

- Understands the characteristics and uses of maps, globes, and other geographic tools and technologies
- Knows the location of places, geographic features, and patterns of the environment
- Understands the characteristics and uses of spatial organization of the Earth's surface
- Understands global development and environmental issues

Math:

- Understands and applies basic and advanced properties of the concepts of geometry
- Understands and applies basic and advanced concepts of statistics and data analysis

Science:

- Understands Earth's composition and structure

Language Arts:

- Uses the general skills and strategies of the writing process
- Uses the stylistic and rhetorical aspects of writing
- Uses grammatical and mechanical conventions in written compositions
- Gathers and uses information for research purposes



SUBJECTS: Arts, Language Arts

TITLE: **Earthy Slogans: Carrying Your Message to the World**

Grade Level: 3-6

OBJECTIVE: Encourage students to think about ways to educate others about the environment and become leaders and trendsetters.

MATERIALS: The Greening Book, environmental slogans or phrases, a variety of project materials including art supplies.

ACTIVITY:

- Ask students to read pages 52 and 53 in The Greening Book together.
- Ask students to become environmental leaders and to try and start a trend in school. Brainstorm ideas of what environmental issues need attention in the school and make a list of their ideas.
- Break students into small groups and ask each group to think of a slogan or phrase that could help bring awareness to others about the importance of protecting the environment. Give them some examples and discuss what these examples mean to them. They might include:
  - "We won't have a society if we destroy the environment"* Margaret Mead
  - "Every creature is better alive than dead, men and moose and pine trees, and he who understands it aright will rather preserve its life than destroy it."* Henry David Thoreau
  - "We never know the worth of water till the well is dry"* Thomas Fuller
- Share the slogan ideas that the students came up with and list them on the board.
- Allow students to pick a slogan that speaks to them and to work with each other on developing a song, poster, t-shirt, bumper sticker, or other mode of communication to help get their message out and start a trend.
- Offer time, support, and supplies to the students as needed. Ask students to share their projects when they are complete and encourage them to use their designs to start trends throughout the entire school and to educate their peers.

STANDARDS:

Life Skills

- Contributes to the overall effort of a group
- Demonstrates leadership skills

Arts and Communication

- Understands the principles, processes, and products associated with arts and communication media
- Knows and applies appropriate criteria to arts and communication products
- Uses critical and creative thinking in various arts and communication settings.



SUBJECTS: Science, Language Arts  
TITLE: **Environmental Round Robin**  
Grade Level: K-5

OBJECTIVE: Students will have the opportunity to explore a variety of activities related to environmental awareness for themselves and others.

MATERIALS: Four copies of The Greening Book; one for each station, trash of various types, containers labeled as paper, aluminum, plastic, glass, and other, tree seeds previously soaked in water, empty milk cartons, soil, paper, pencils, art supplies, grocery bags.

ACTIVITY:

- This lesson could be done on Earth Day, Arbor Day, World Environment Day, or another day to raise awareness about the environment. Set up the classroom so that there are four different stations. Each station will house a different activity for the students.
- Begin the lesson by introducing page 11 of The Greening Book. Read the page to the class and explain that the class will be exploring ways in which to protect the earth and all of the things that the earth gives us that we use and enjoy.
- Break the students into groups of 4 or 5. Explain that each group will move from one station to the next after 15 minutes. They will complete the activity outlined at each station. You may need classroom or parent assistants to help at each station to be sure students understand the directions.
- The station activities are as follows:

**Station #1** – Reduce, Reuse, Recycle

Place different types of trash in a large container. Ask the students to turn to page 28 of The Greening Book and read it together. Students should discuss the following questions and record their answers: When you create trash, where does it go? What can we do to reduce the amount of trash that goes to the landfill? Provide bins for the students to sort the trash labeled paper, plastic, aluminum, glass, and other. Students should end their time at the station by creating a poster which encourages the school and classroom to recycle and explains how they can do it with ease.

**Station #2** – Trees, Glorious Trees

Ask students to read pages 42 and 43 of The Greening Book together. Ask students to make a list of items that they use each day that are made from trees. Their lists might include paper, pencils, furniture, mail, medicines, cosmetics, mulch, etc. Ask students to work to replace some of the trees they use by planting some seedlings as a class. Provide students with seeds that are indigenous to your area as well as soil and empty milk cartons with their tops removed. Be sure the seeds have been soaked in water for a couple of days before doing the activity. Be sure to follow the directions for seed depth before planting them in the empty milk containers. Place the seedlings under a heat lamp and as the seeds grow, point them out to the students. When they are large enough, take the students to a location outside and plant the trees together.



**Environmental Round Robin -- CONTINUED**

**Station #3 – Giving Thanks for the Food We Eat**

Ask students to turn to page 13 in The Greening Book and read it together. Ask the students to make a list of their favorite foods and to write down all of the ingredients that they think are in the food. Ask them to count how many of the items on the list come from the earth. Explain that the students can help raise awareness about how much of our food comes from the earth by decorating grocery bags to be distributed to shoppers at a local grocery store. Borrow the bags from the store in advance and ask students to decorate as many bags as possible with messages of protecting the environment. This project can be independent or as part of a larger Earth Day project found at [www.earthdaybags.org](http://www.earthdaybags.org). It can also be a whole school project.

**Station #4 – Honoring the Wonders of the Earth**

Ask students to turn to page 14 of The Greening Book. They should use a piece of paper and write about a time when they had fun outside in nature. They can either draw a picture illustrating this experience or write an essay about it. Ask them to think about each of the five senses; smell, taste, sound, touch, and sight, and to remember which of the senses they used when they were outside in nature. Ask students to try and do this each time they do something outside in the environment so that they can appreciate all of its wonders even more.

**STANDARDS:**

Arts and Communication

- Uses the general skills and strategies of the writing process
- Uses the stylistic and rhetorical aspects of writing
- Uses grammatical and mechanical conventions in written compositions
- Understands the principles, processes, and products associated with arts and communication media
- Knows and applies appropriate criteria to arts and communication products
- Uses critical and creative thinking in various arts and communication settings.

Life Skills

- Works with others and contributes to a group
- Understands the importance of citizenship and responsibility

Science

- Understands how human actions modify the physical environment



SUBJECTS: Science, Language Arts

TITLE: Energy Sources: What Type Do You Use?

Grade Level: 2-6

OBJECTIVE: Students will learn and be able to explain the difference between renewable and non-renewable resources.

MATERIALS: The Greening Book, pinwheel for each student, strips of paper, bucket.

ACTIVITY:

- Read page 12 of The Greening Book as a class.
- Make two sections on the chalkboard labeled renewable energy and non-renewable energy. Explain that a non-renewable resource is a natural resource that cannot be remade, regrown or regenerated. There is only a certain amount that is available for human use and it is being used up faster than can be made by nature. Fossil fuels (such as coal, petroleum and natural gas) and nuclear power are non-renewable resources. A renewable resource differs in that it may be used, but not used up. A natural resource qualifies as a renewable resource if it is replenished by natural processes at a rate comparable to its rate of consumption by humans or other users. Resources such as solar radiation and wind are *perpetual resources* that are in no danger of being used up. Other renewable resources that are also natural resources include oxygen, freshwater, and timber (these could become non-renewable if used at too great a rate).  
(Source for Background Information: [www.wikipedia.org](http://www.wikipedia.org))
- List the qualities of renewable energy sources and non-renewable energy sources in each of the sections on the board as you explain. Your list might look like the following:

Renewable Energy	Non-Renewable Energy
<ul style="list-style-type: none"><li>• Will not be used up</li><li>• Can be replenished by natural process</li><li>• Is replenished at a rate that is comparable to human consumption</li></ul>	<ul style="list-style-type: none"><li>• Cannot be remade, regrown, or regenerated</li><li>• There is only a certain amount available before it is completely used up</li><li>• It is being used up faster than it can be reproduced in nature</li></ul>

- Give each student a pinwheel that can be found at any local dime store or dollar store. Ask them to blow on the wheel and see if they can explain that wind is the energy resource making the wheel move. Make sure that students understand this is a renewable energy source as we always have access to wind. Explain that wind energy is sometimes used in place of other energy forms.
- Use strips of paper to list other forms of renewable and non-renewable energy sources. Write one energy source on each strip of paper. These might include: oxygen, fresh water, timber, gas, coal, natural gas, diesel wind, and hydropower. Make sure to define each of these energy sources if needed. Put each of the strips of paper in a bucket. Ask for student volunteers to draw out the strips of paper and place them in either the renewable energy or non-renewable column. If they need help from their classmates, encourage them to discuss it with each other.



Energy Sources: What Type Do You Use? -- CONTINUED

- Conclude the lesson by returning to page 12 of The Greening Book. Ask the students to work in groups and make a list of the things that they use every day that need electricity or some form of energy to work. Ask students to post their lists for the rest of the class and share their ideas.

STANDARDS:

Science

- Understands earth's composition and structure
- Understands the sources and properties of energy

Language Arts

- Uses the general skills and strategies of the writing process



SUBJECTS: Science, Language Arts, Arts and Communication

TITLE: **Protecting the Earth's Animals**

Grade Level: 2-6

OBJECTIVE: Students will learn about the importance of protecting the animals of the earth and teaching others about how to preserve their habitats and environment.

MATERIALS: The Greening Book, Internet access, colorful poster board, art supplies, access to research materials.

ACTIVITY:

- Read page 38 of The Greening Book as a class. Discuss what happens when humans disregard the needs of animals and destroy their habitat (be sure to define habitat for the students if they do not know what it means).
- Ask students to think about the animals that surround them each day. They may not be able to see them or hear them, but ask students to brainstorm a list of animals sharing their human habitat.
- Explain that the World Conservation Union has created a list of threatened species throughout the world and that each student in the class is going to have the opportunity to learn more about one species, its habitat, and environment.
- If possible, use a projector or Smart Board in front of the class to visit the World Wildlife Fund ([www.worldwildlife.org](http://www.worldwildlife.org)) and go to their list of endangered species.
- Ask students to look at the list and decide which animal they are interested in learning more about. Some options include: Atlantic Salmon, Elephants, Coral, Great Apes, and Marine Turtles. You may wish to focus on species found in your part of the country. It is possible that this project can be done in groups if desired.
- Assign students an animal and ask them to begin to conduct research about the animal using encyclopedias, the Internet, library, or other resources you would like to provide. Explain to students that as they conduct their research they should look for answers to the following questions:
  - What is the animal's natural habitat?
  - Where does the animal live?
  - What do scientists think caused the animal to become endangered?
  - Do scientists have any ideas about how to help this species survive?
- After students finish their research, ask them to create a poster on colored poster board which offers some information about the species. Be sure the students include a section on the poster board which explains what we can do to help the animal survive and not become extinct. Place the posters around the school so that other classes may have the opportunity to learn about these animals and about human's role in helping them to survive.

STANDARDS:

Science

- Understands relationships among organisms and their physical environment
- Understands biological evolution and the diversity of life



Protecting the Earth's Animals -- CONTINUED

Language Arts and Communication

- Uses the general skills and strategies of the writing process
- Uses the stylistic and rhetorical aspects of writing
- Uses grammatical and mechanical conventions in written compositions
- Gathers and uses information for research purposes
- Uses the general skills and strategies of the reading process
- Uses reading skills and strategies to understand and interpret a variety of literary texts
- Uses reading skills and strategies to understand and interpret a variety of informational texts.



SUBJECTS: Character Education, History

**TITLE: Environmental Heroes**

Grade Level: 2-5

OBJECTIVE: Students will learn about past and present environmental leaders and discover that they can be environmental heroes too.

MATERIALS: The Greening Book, research materials and resources, and long pieces of paper to make paper chains, glue or tape.

ACTIVITY:

- Turn to page 50 of The Greening Book. Make a list on the board of all of the environmental heroes listed on the page. These include: Gaylord Nelson, Jacques Cousteau, Mardy Murie, John Muir, Rachel Carson, Diane Fossey, Aldo Leopold, and Teddy Roosevelt.
- Break the students into small groups and assign each group one of the environmental heroes listed above. Ask the students to research their person and prepare a skit or presentation about that person's life and what they did to help the environment. You may wish to invite parents or other classes to view the skits and presentations that the students prepare (in which case, you may need to help proofread their scripts and provide additional props.)
- Ask students to make a list of what all of these people have in common and to think about what makes them heroic? Ask students to write each of the individual qualities they mention on a piece of paper. After each student in the class offers at least one quality, link the pieces of paper together to create a chain. Hang the chain in the classroom.
- Conclude the lesson by asking students to think of other environmental heroes that they might have heard of that exemplify the qualities they've expressed. They might mention Al Gore or Steve Irwin. You can also ask the students to share the names of local environmental leaders; ones in the community, local organizations or corporations, or even ones in their homes.
- Conclude the lesson by asking students to think about everything they have learned in The Greening Book and in class about protecting the environment. Ask them to pick one thing that they would like to try to do in their own lives and homes to help the environment. Use page 51 of The Greening Book for this activity and remind students that they can be heroes of the environment too!

STANDARDS:

History

- Understands major discoveries in science and technology, some of their social and economic effects, and the major scientists and inventors responsible for them

Character Education

- Sets and manages personal goals
- Contributes to the overall effort of the group
- Demonstrates leadership skills



SUBJECTS: Science, Language Arts

TITLE: **Clean Water: How is it Made?**

Grade Level: K-5

OBJECTIVE: Students will create their own water filtration system in order to understand how clean water is made for human consumption.

MATERIALS: 2-Liter plastic soda bottle & lid, Straw, Cotton Batting, Gravel (large and small), Sand (large grain and fine), Coffee filter, 1 quart jar, Muddy Water.

ACTIVITY:

- Show students some muddy water from a local river or stream if possible and ask them if they know how the water becomes clean enough for humans to drink. Explain that they will create their own filtration system. Read page 36 of The Greening Book and ask students to list reasons why we need clean water.
- Work in groups or create a demonstration table for the experiment.
- Cut the bottom off the soda bottle. Poke a hole in the bottle's lid, just large enough to fit the straw. Put the straw through the hole. Turn the bottle upside down and rest it in the mouth of the jar.
- In the bottle, place a layer of cotton batting followed by layers of fine-grain sand, large-grain sand, small gravel and large gravel. Cut the coffee filter so it fits across the top of the bottle and place it on top of the gravel.
- Pour muddy water into the open end of the bottle and let the water seep down through the filter layers. Students will see that the muddy water becomes clear!
- Conclude the lesson by making sure the class understands that the filtration process they observed is very similar to the one that takes place to make our drinking water safe. Ask students to write a short essay about the filtration process and answer the following questions:
  - How did the materials in the filter work together to make the water clean?
  - Were you surprised by the results?

STANDARDS:

Science

- Understands atmospheric process and the water cycle

Language Arts

- Uses the general skills and strategies of the writing process



Resources:

The Environmental Protection Agency – [www.epa.gov](http://www.epa.gov)

The World Conservation Union – [www.redlist.org](http://www.redlist.org)

World Wildlife Fund – [www.worldwildlife.org](http://www.worldwildlife.org)

Earth Day Grocery Bags Project - [www.earthdaybags.org](http://www.earthdaybags.org)

Earth Day site – [www.earthday.org](http://www.earthday.org)