

**GREENTIMES TEACHER GUIDE**  
**Biomes & Plants Around the World**  
**January 2005**

**This guide includes suggested cross-disciplinary activities, background information, and reproducible pages of discussion questions that relate to *Greentimes: Plants Around the World*. We hope that these suggestions will help you incorporate *Greentimes* into your classrooms! Please feel free to tell us what you want to see in these guides in the future – just e-mail Heather at [hfreeman@greenscreen.org](mailto:hfreeman@greenscreen.org)!**

**Hands-on Science**

- Bring in a small bamboo plant. Observe its rate of growth. (You can buy bamboo in some flower shops – NOTE: “Lucky Bamboo”, the curly plant that looks like bamboo, is not actually bamboo!)
- Demonstrate the unique ability of a cactus to retain water. Have your students experiment with several cacti by watering each on a different schedule. How do the cacti respond? Which appears healthiest?
- Save the Trees: Save all the paper you would normally throw out or recycle in a week in your classroom. Have your students weigh the paper. Use the number you find to estimate how much paper you and your students throw out in a month or in the whole school year. What about per person? Can your students think of ways to use less paper?

**Art Activities**

- Create posters with pictures of different biomes. Draw all key characteristics and note the differences and similarities between the biomes.
- Have students pick a specific biome and research unique plants in it. Make a chart that includes the names of the plants, facts about them and pictures.

**Reading Suggestions**

- “A World of Biomes” series by Philip Johansson (ages 9 – 12)
- “Biomes of North America” series by Rebecca L. Johnson and Phyllis V. Saroff (ages 9-12)
- “What is a Biome?” by Bobbie Kalman (ages 9 – 12)

**Writing Exercises**

- Have students write a short article about any of the environmental problems discussed in this issue. Require a current reference, such as a newspaper or magazine article, to supplement what they learned in *Greentimes*. Your students can even submit their articles to be published on [www.greenscreen.org](http://www.greenscreen.org) (we will post as many as we have room for).
- Ask students to compare and contrast the characteristics of any two biomes.

**Geography**

- Identify countries (or US states) in each biome region. What are the capitals of these countries and states? Where are the Tropic of Cancer and Tropic of Capricorn? Which continents have all biomes?

**Math**

Ask your students to make up their own questions, based on samples in italics, or create problems for them.

**5<sup>th</sup> and 6<sup>th</sup> grade:**

Create problems that help students practice using expanded notation and exponents.

- *The Amazon River is more than 2000 miles long. Express this number in expanded notation.*

Create problems that require using the order of operations.

- *A forest contains 100 trees. A lumber company promises to plant 2 new trees for every tree it cuts down. If 50 trees are cut down, how many trees will be in the forest after the company plants new trees?*

Write problems that ask students to think about ratio and proportion.

- *If there are 5 species of birds in a biome, and 10 species of ants, what is the ratio of bird species to ant species?*
- *Tropical rainforests get exactly 12 hours of sunlight a day. What is the ratio of sunlight to darkness?*

## 7<sup>th</sup> and 8<sup>th</sup> grade:

Create problems that require students to decipher order and fractions.

- *A bamboo plant is 6 inches tall. On the first day it grows 25%. On the second day a person cuts off 25% of its height. On the third day it again grows by 25%, and on the fourth day another person comes and cuts 25% of its height. How tall is the bamboo at the end of day 4?*

Make problems that use variables.

- *John found 10 types of edible plants in his backyard. If he is going to eat 2 of these plants a day, how many days will it take for John to eat all of the plants?  $10 = 2x$*
- *A savanna receives 40 inches of rain in one year. Assuming that it rained equal amounts every month, how much did it rain per month?  $40 = 12x$*

Create problems that ask students to do metric conversions.

- *It can snow up to 100 centimeters in one year in a Boreal Forest. How many meters, inches, feet is this?*
- *The desert typically experiences temperatures around 38 degrees C during the day, and 10 degrees C at night, express these temperatures in Fahrenheit.*

## **Biomes not covered in Greentimes Articles**

1. **Chaparral/Scrub:** The smallest of all biomes grows in hot, arid climates with high atmospheric pressure and in cool, wet climates with low atmospheric pressure, like on the US West Coast, western Australia and west coast of South America. Can be found in between forest and grassland, or between desert and grassland biomes, where there are flat plains, rocky hills and sloping mountains.

### **Resources:**

[http://www.for.nau.edu/azproject/Biozone/int\\_chap.html](http://www.for.nau.edu/azproject/Biozone/int_chap.html)

<http://jojodamonkey2.tripod.com/>

<http://www.specialedprep.net/MSAT%20SCIENCE/Chaparral.htm>

2. **Alpine:** Mountains, at least 10,000 feet high or above where the snowline begins, are the home of the alpine biome. Cold, snowy and windy this biome has a short summer and a long winter.

### **Resources:**

<http://www.blueplanetbiomes.org/alpine.htm>

3. **Aquatic:** Water covers 75% of Earth's surface. The aquatic biomes are split into two categories: marine and freshwater.

### **Resources:**

<http://www.ucmp.berkeley.edu/glossary/gloss5/biome/aquatic.html>

**Marine Aquatic:** These are salt water regions (oceans, coral reefs and estuaries) that contain most of the world's oxygen supply in its algae and take in a large amount of atmospheric carbon dioxide. Their four different parts are inter-tidal zone, pelagic zone, benthic zone and abyssal zone.

### **Resources:**

[http://www.realscience.breckschool.org/upper/MB\\_Biome01/3/3.oceans](http://www.realscience.breckschool.org/upper/MB_Biome01/3/3.oceans)

[http://www.biomes.org/biomes\\_aquatic.htm](http://www.biomes.org/biomes_aquatic.htm)

**Freshwater Aquatic:** Has fewer salts than the marine aquatic biome and is divided into two parts: running waters (rivers, streams) and standing waters (lakes, ponds, wetlands).

### **Resources:**

<http://www.nceas.ucsb.edu/nceas-web/kids/biomes/freshwater.htm>

[http://www.perry-lake.k12.oh.us/phs/classdept/sciencedept/esci/biomes/FreshWater/Fresh\\_index.html](http://www.perry-lake.k12.oh.us/phs/classdept/sciencedept/esci/biomes/FreshWater/Fresh_index.html)

## **Background Information**

[www.bagelhole.org/article.php/food1](http://www.bagelhole.org/article.php/food1) – This site has useful and fun facts.

[www.junglephotos.com/](http://www.junglephotos.com/) - This site has pictures of any plant or animal in the Amazon you could possibly think of.

Each picture is explained and provides good educational material.

[www.enchantedlearning.com/biomes/](http://www.enchantedlearning.com/biomes/) - This site could be used by teachers or kids. It explains all biomes in depth and is very easy to navigate.

<http://www.biomes.org/default.htm> – Offers articles about 5 world biomes. Also offers suggested readings.

## **Discussion Questions / Worksheets**

The following pages are two sets of questions that can be used to further discuss plants and biomes with your students. These are appropriate to be used as individual worksheets or in small groups or even with a whole class. Set one is aimed at our younger readers while set two is a bit more difficult and is targeted at the middle school level!