

Teacher's Guide

Plants Live Everywhere!

Introduction

This teacher's guide helps you teach young children about where they can find plants. It highlights diverse plants found in different biomes and some of their unique features. In addition to natural growth of plants, children will learn about intentional planting in cities. Plants will grow anywhere they have sunlight, water, air and food.

National Standards

This series supports Science, and Language Arts, curricula. Go to www.enslowclassroom.com and/or www.enslow.com and click on the Curriculum Correlations tab. Click on your state, grade level, and curriculum standard to display how any book in this series backs up your state's specific curriculum standard.

Classroom Activities

Activities for teaching the five curriculum areas: Reading/Language Arts; Math, Science; Social Studies; and the Arts, can be found in this teacher's guide. Students will take a trip around the globe through plants that grow in different habitats

Guided Reading Level: M

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I like Plants! Teacher's guide
for
Plants Live Everywhere!

Whether it's in a clay pot on the windowsill, the yard behind their house, trees at the park or the blooming flowers found at a local nursery, plants surround children. Plants live everywhere. In addition to understanding the plants that grow locally, different biomes are characterized by specific kinds of plants. This book focuses on six distinct natural biomes and the types of plants that grow in them. A city habitat is also included and it can be found in several different biomes.

A biome is a large area with similar plants, animals and microorganisms. Species within a biome are adapted, or suited, to living in the soil, water, light and moisture conditions present in that biome.

Arctic (Tundra)

Precipitation in the Arctic averages ten inches, or less, per year. Winters are long and cold; the summers are cool and short. Only the uppermost layer of soil thaws during the summer. Below the surface layer is the permafrost. This ground remains permanently frozen. Plant roots and water cannot penetrate this layer. The surface can be covered by snow until June and the growing season is short. The top layer of soil, or active layer, is ice and snow free for 50 to 90 days per year. Since plant roots cannot penetrate the permafrost, only plants with shallow root systems can grow there. Some common plant adaptations are growing close together and low to the ground. This helps protect plants from damage caused by ice, snow and driving winds. Plants bloom quickly and tend to have small leaves. Since plants lose water through their leaf surface, small leaf size helps them retain moisture. Some plants, such as cacti, store water in their roots, stems or leaves.

Desert

Precipitation in the desert averages ten inches, or less, per year. Since a desert is so dry, it has large daily temperature variations. Daytime temperatures can be extremely hot. There is little humidity in the air to protect from the sun's rays. This same lack of humidity allows nighttime temperatures to be low. Any heat absorbed during the day is quickly released since there is no moisture in the air to hold it in. The main adaptations found in desert plants are ones that conserve moisture or allow extremely fast growth after rain. Root systems of some plants form a broad shallow network maximized to soak up rain. Other root systems are centered on a long taproot (20 to 30 feet) that grows down toward underground water sources. Small leaves limit the impact of drying heat; shiny leaves reflect the sun and reduce plant temperature, and waxy leaves help keep moisture from escaping.

Rain Forest (Tropical)

This is the most diverse biome. Warm and rainy, with 60 to 160 inches of rain per year, the rain forest is home to millions of species of plants and animals. Rainfall is fairly evenly distributed throughout the year. Since a great deal of the sunlight is blocked by the tree canopy, plants have larger leaves to capture the sunlight that is available. Unlike desert plants, they do not need to retain moisture in the hot humid climate. Leaves often have drip tips to release water efficiently. Riverbeds in the rainforest break up the tree growth and allow sunlight to reach the forest floor.

Woodland Forest (Deciduous Forest)

This biome has a warm and a cool season. Average yearly precipitation ranges from 30 to 60 inches. Most trees are deciduous, losing their leaves in the fall. The leaves decompose on the

forest floor and add nutrients back into the soil. Unlike the rain forest, it is typical to see large stands of trees with a single species. There are several growth layers in a woodland forest. The tree canopy is not as dense as the rain forest so more light reaches the forest floor. After the mature trees the second growth layer contains saplings and shorter trees. The next layer down contains shrubs and finally wildflowers and berries. This lowest layer grows quickly in the spring to take advantage of the available sunlight before the trees leaf out. Other adaptations are the light, thin, broad tree leaves. These allow maximum sunlight capture.

Grasslands

With an average annual rainfall between 10 to 30 inches, grassland experiences a wet season and a dry season. Most of the rain falls early in the growing season. This type of moisture distribution is good for perennial grasses and herbs but not trees. The grassland biome is known by different names around the world. In North America it is the prairie. In Asia it is the steppe. In South America it is the pampas. In South Africa it is the veldt. Grassland accounts for almost one quarter of the earth's land area. Deep-rooted grasses have adapted to dry, windy conditions.

Water (Aquatic, freshwater)

This biome can be found in many different places around the globe. The type of water determines the plant types that are found. Running or still, deep or shallow or even a wetland will produce different typical vegetation. Plants that live in water exhibit adaptations that protect them from damage from water movement much as plants that grow in other biomes adapt to protect themselves from the wind. Plants that have leaves that float on the water, such as water lilies, have air chambers in the leaves. Duckweed is found around the globe in still or slow moving waters. It grows rapidly and is an extremely small flowering plant.

City Habitat

Plants found in the city are extremely diverse. Since cities are found in most biomes the plants will vary. The plants growing in a city habitat are typically chosen and planted they reflect the desires of the residents. Whether for shade (trees), beauty (flowers) or comfort (grass) the plants are chosen for a purpose. The only limitation is the imagination and the sensitivity of the plant to temperature, light and moisture variations.

To learn more about plant adaptations visit <http://www.mbgnet.net/bioplants/adapt.html>

Activities The Five Curriculum Activities

SAFETY WARNING:

Before any activity, make sure your students do not have any allergies to items that you might use. Never use anything that is sharp or may cut a student. Do not use anything too hot or cold which might injure any student. Always have an adult supervise all activities to ensure the safety of you students.

Reading/Language Arts activity:

Beginning readers will find easy words and repetitive phrases throughout the book. Many words used in this book can be found in the Dolch word list. To learn more, visit www.dolch-words.com. Additional words, which may be specific to this book, can be found in the Words to Know on page 3. Pairs of students can write their own "Where am I" riddle based on the book. Have students read their riddle to the class and allow time for answers. This would be a good activity after completing the reproducible handout.

Math activity:

Give students 2 inch square pieces of paper. On one side have them write the names of the biomes. On the other side have them record the average rainfall. Include a square for local area. With the average rainfall facing up order the pieces from least to greatest. Without turning the pieces over have them predict which biome has the most rain and which has the least. Discuss why certain biomes have greater plant diversity and the part that rainfall plays in promoting diversity. Consider having students make a bar graph of the average yearly rainfall for each biome.

Science activity:

After reading the Biomes basic section of this teacher's guide, explore the variety of plants in our world. Ask students to look carefully at the photographs and note any adaptations that help the plant survive in that biome. Have students explain why the plant may not be able to survive in a different biome. For example, why would a cactus have a difficult time in the rain forest?

Social Studies activity

Using a globe or map, locate the area where you find each biome. Are there reasons why some plants can be found everywhere and some only in certain areas? Discuss the importance of the sunlight, water and air and how it affects all plants.

Arts activity

Have students pick a biome and cut out leaves to design a tree on a sheet of construction paper. On each leaf write an adjective to describe the biome or a fact about the kinds of plants found there. Discuss the trees they designed. Would they find it in a woodland forest (large broad leaves)? Is it a desert plant with tiny leaves or spikes? Is it a plant from the rainforest with a drip tip leaf that lets rain slide right off?

Reproducible

“Where am I?” Biome Riddles

Plants can give us clues about their biomes and habitats. Read what these plants have to say and pick the correct biome or habitat from the word bank.

city	arctic	Desert	rain forest
grasslands	water	woodland forest	

1. It is so cold and windy here. I have a very short growing season and my roots cannot go very deep.
2. It is windy with just enough rain here. It isn't as colorful as other locations but we get plenty of rain early in the growing season.
3. Nice mild weather here. Many plants lose their leaves here and big trees grow very well.
4. It is very, very wet here. In fact, it rains most of the time. It is humid and crowded with plants
5. Dry, hot and not much water. I have to store water in my stem. It gets cold after the sun goes down.
6. Love all this water! My leaves can float here and my stem can reach down to the mud.
7. I'm planted here on purpose. I really like the big clay pot and the sunlight I get here on the front step.

Now, unscramble these words and see if they match your answers above:

1. CCRIAT
2. SSSANDLARG
3. DWOOTSERNALDOF
4. NTISAERROF
5. TSREED
6. RAEWT
7. YCTI