

Passports



Celebrating Science: Biomes Around the World

Grade: 5-8

Description of our Tour:

The world is full of different types of landscapes! Each of these incredible biomes features unique plants, animals, and characteristics that carry their own treasures and challenges! Join us as we explore five of the world's major biomes and learn about their locations around the globe. The series will focus on one biome each session featuring: desert, aquatic, forest, grasslands, and tundra.

Information for Trip Leader:

Lesson Outcomes:

The student will:



- Be able to distinguish between and describe the major biomes on earth.
- Understand the different ways organisms interact with one another.
- See the impact of human activity upon the different biomes on earth.

Activities:

Activity # 1: Terrestrial Biome Table

Have students use the information provided during our live webcast, textbooks, and the Internet to complete the table at the end of this resource guide on the world's biomes. Students may work in pairs or larger groups. This activity can be followed up by group or individual projects on specific biomes or specific ecosystems in the world.

Activity # 2: Biome Brochure

Each cooperative group of four or five students will research and create a brochure for their biome. Give each group copies of the Biomes Brochure Criteria as a guideline for creating their brochures. The students should use word-processing, presentation, or publishing software, to create brochures that describe the location, landforms, average temperature and rainfall, animal and plant life, climate, ecological concerns and conservation efforts of a biome. The brochures should convince travelers to buy land in that particular biome!

Activity # 3: Biome Children's Story

In this activity the students will create a children's book. Each student will pick one biome and make a native creature from that biome the main character in the book. The students will write a story about their creature's adventures in its biome. Using their knowledge of the conditions of the biome, they should brainstorm problems their creature may encounter and ways to overcome that problem. Make sure the students include the necessary elements of a good story: introduction, rising action, climax, falling action, and resolution. Also, make sure they have all parts of the story: characters, setting, and plot.

(Reproducibles and Answer Keys follow)

Passports

Grades 5-8

Challenge Questions:

1. *What are the two types of rainforests on earth? How are they different?*
2. *The following is a description of one biome:
The plants here grow very long roots and few leaves, if any, to adapt to the low rainfall conditions. These biomes are generally found in the subtropics located between 15 and 30 degrees latitude (North and South).
Can you name that biome?*
3. *The following is a description of one biome:
Constant high temperatures and year-round rainfall combine to produce the most luxuriant vegetation in any biome. This biome is dominated by many different species of plants and animals; in fact, it is not uncommon for hundreds of different species to inhabit a single square kilometer of this biome.
Can you name that biome?*
4. *How are deciduous trees adapted to the temperate climate in which they are found? How are these different from coniferous trees?*



Responses:

1. There are *tropical* rainforests that are located along the Equator and *coastal* rainforests, like those located in the Pacific Northwest of the United States. Tropical rainforests are much warmer and have much greater species diversity than coastal rainforests. However, both are consistently humid and receive enough rainfall per year to be classified as rainforests.
2. Desert!
3. Tropical rainforest!
4. Deciduous trees tend to grow broad leaves that allow them to maximize the area of photosynthesis in the spring and summer. In order to conserve water in the fall and winter, deciduous trees drop their leaves. Coniferous trees tend to have small needle-like leaves that only have small surface area. These plants don't need to lose these leaves in the fall and winter as they don't lose too much water through them! The leaf shape and size for both types of trees are important adaptations developed for the biomes where these trees are natively located.

Passports

Grades 5-8

Vocabulary Words:

Population: A group of organisms of the same species in a designated area.

Community: A group of plants and animals living and interacting with one another in a specific region under relatively similar environmental conditions.

Species: A taxonomic category of organisms who share common attributes and are capable of reproducing fertile offspring.

Biome: A community of plants and animals living together in a particular climate/region. (Arctic, Deserts, Forests, etc.)

Ecosystem: An ecological community together with its environment, functioning as a unit.

Adaptation: To make adjustments to be suitable for a new use or condition.

Flora: Plants considered as a group, especially the plants of a particular country, region, or time.

Fauna: Animals, especially the animals of a particular region or period, considered as a group.

Parasitism: A type of symbiotic relationship where one organism benefits and the other is hurt or damaged in some way.



Coniferous: Bearing cones, as the pine and cypress.

Deciduous: Shedding of or losing leaves/flowers at the end of a growing season.

Forest: A dense growth of trees, together with other plants.

Writing Prompts:

If I could live in any biome, it would be _____, because...

What do you think our world would be like if global warming continues? Write down what you think would happen if the Earth's average temperature increased by 2 degrees.

Try to document your footprint upon the earth. How do your daily activities impact the earth?

Passports

Grades 5-8

Web Resources:

Blue Planet Biomes

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

The World's Biomes

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

World Biomes.com

<http://www.worldbiomes.com/default.htm>

EPA Student Center

<http://www.epa.gov/students/ecosystems.htm>

Tropical Poison

<http://www.cet.edu/ete/modules/troppois/tpdeforestation.html>

Save the Rainforest

http://www.savetherainforest.org/savetherainforest_006.htm

Earth Day Footprint

<http://ecofoot.org/>

Books Related to Biomes for Grades 5-8:

Antonio's Rain Forest by Anna Lewington

Saving the Rain Forests by Sally Morgan

Artic Lights Artic Nights by Debbie S, Miller

The Temperate Forest: A Web of Life by Philip Johansson

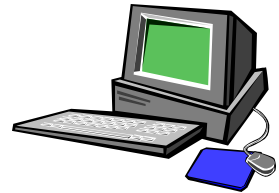
One Small Place in a Tree by Barbara Brenner

The Dry Desert: A Web of Life by Philip Johansson

The Desert is theirs by Byrd Baylor

The Wide Open Grassland: A Web of Life by Philip Johansson

One Day in the Prairie by Jean Craighead George



Passports

Grades 5-8

Biome Table



Name: _____ Date: _____

Directions: Use the information provided by the scientist's lecture, textbooks, and the Internet to complete the following table on the world's biomes.

<u>Biomes</u>	General Location	General description	Climate (average temperature and precipitation)	Flora and Fauna found there	Major threats to the this biome
Rainforests					
Taiga					
Tundra					
Desert					
Temperate					
Grassland					

Passports

Grades 5-8

Biome Table Answer Guide

Biomes	General Locations	General description	Climate	Flora and Fauna	Threats
Rainforests	Tropical rainforests occur in a broad zone straddling the equator. The latitude range for rainforest climate is 15° to 25° North and South of the equator.	Most plants are evergreen with large, dark green, leathery leaves. Some scientists believe that 30 to 50% of all of the Earth's animal species may be found in this biome. Decomposition is rapid in the tropics because high temperatures and an abundance of moisture. Because of the frequent and heavy rains, tropical soils are subject to extreme weathering. These environmental conditions also make tropical soils acidic and nutrient poor.	Annual rainfall, which on average is 250 cm, is generally evenly distributed throughout the year. Temperature and humidity are relatively high through the year, with average temperatures of 77F.	Flora is highly diverse. The various trees form a thick continuous canopy some 25 to 35 meters tall. Orchids, bromeliads, palms, ferns, and vines, are very characteristic. Fauna: diverse species of amphibian, reptile, mammal, and birds.	Deforestation for cattle industry, hardwood exports, and oil industry, global warming impacts upon precipitation.
Taiga (boreal coniferous forest)	Between 45° and 57° North latitudes	The predominant vegetation of taiga biomes are needle-leaf evergreen variety tree species. The understory is relatively limited as a result of the low light penetration even during the spring and fall months. Understory plants in the deciduous biome take advantage of the leafless condition of trees during these seasons concentrating their growth during this time period.	The climate of this biome is cool to cold with more precipitation than the tundra, occurring mainly in the summer because of mid-latitude cyclones. The temperature range is - 65° F to 70°F. The taiga climate has an average annual rainfall of 30 - 84 cm. Most of it falls in the summer as rain.	Flora: Spruce, Balsam, Fir, Pine, and Hemlock trees. Also found in the understory are shrubs like rose, blueberry and cranberry. Fauna: moose, bear, deer, wolverine, marten, lynx, wolf, snowshoe hare, vole, chipmunks, shrews, and bats.	Deforestation for industry and development, human population growth, acid rain, and global warming.
Tundra	Poleward of 60 degrees (mostly North) latitude.	The tundra biome is characterized by an absence of trees, the presence of dwarf plants, and a ground surface that is wet and spongy. Soils of this biome are usually permanently frozen (permafrost) starting at a depth of a few centimeters to meter or more. The permafrost line is a physical barrier to plant root growth.	Temperature, precipitation, and evaporation all tend to be at a minimum. Most locations have summer months with an average temperature below 50° F. Precipitation in the wettest month is normally no higher than 25 millimeters. However, despite the low levels of precipitation the ground surface of the tundra biome is often waterlogged because of low rates of evapotranspiration.	Flora: Few species of dwarf shrubs, grass, sedges, and mosses, and lichens (like Reindeer Moss). Fauna: caribou, musk ox, arctic hare, voles, lemmings, and migratory birds. Carnivores include the arctic fox, snow owl, polar bear, and wolves.	Global warming, oil prospecting and potential drilling for oil.
Desert	Between 15° to 30° North and South latitude, in the interiors of continents. Their global range covers about 1/5 of the earth, including the world's great deserts: Sahara, Sonora, Thar, Kalahari and the Great Australian.	Desert habitats typically have sparse vegetation and nutrient poor soils. Desert flora and fauna have to be well adapted to the harsh conditions of this biome. Most desert mammals tend to be nocturnal to avoid the high temperatures. Desert habitats have a rich lizard and snake fauna because high temperatures promote the success of cold blooded organisms	Many desert areas have less than 25 cm of precipitation annually. High monthly average temperatures in the desert are over 64° F.	Flora: drought resistant shrubs, sagebrush, creosote, cacti. Fauna: few mammals, many lizards and snakes and cold-blooded organisms, many insects as well.	Development and competition for limited water resources.

Passports

Grades 5-8

<p>Temperate</p>	<p>Deciduous forests can be found in the eastern half of North America, and the middle of Europe. There are many deciduous forests in Asia. Some of the major areas that they are in are southwest Russia, Japan, and eastern China. South America has two big areas of deciduous forests in southern Chile and Middle East coast of Paraguay. There are deciduous forests located in New Zealand and southeastern Australia also.</p>	<p>The animals adapt to the climate by hibernating in the winter and living off the land in the other three seasons. The animals have adapted to the land by trying the plants in the forest to see if they are good to eat for a good supply of food. Also the trees provide shelter for them. Animals use the trees for food and a water sources. Most of the animals are camouflaged to look like the ground. The plants have adapted to the forests by leaning toward the sun. Soaking up the nutrients in the ground is also a way of adaptation.</p>	<p>The average annual temperature in a deciduous forest is 50° F. The average rainfall is 30 to 60 inches a year. The deciduous forest has four distinct seasons, spring, summer, autumn, and winter. In the autumn the leaves change color. During the winter months the trees lose their leaves.</p>	<p>Flora: oak, beech, maple, chestnut hickory, elm, basswood, linden, walnut, and sweet gum trees, shrubs like rhododendrons, azaleas, mountain laurel, and huckleberries, mosses and lichens. Fauna: many mammals and birds and migratory species live here. Examples include deer, bears, coyote, chipmunks, fox, squirrels, many rodents, and weasels.</p>	<p>Deciduous forests have lost land to farms and towns, habitat loss due to construction and development</p>
<p>Grassland</p>	<p>Grassland biomes can be found in the middle latitudes, in the interiors of continents. In Argentina, the grasslands are known as pampas, in Europe and Asia, they are called steppes.</p>	<p>Grasslands vary depending upon location. In general, these are open areas of low lying vegetation dominated by grasses. In much of North America, these are areas where agriculture is now the dominant land use.</p>	<p>Grasslands can have either moist continental climates or dry subtropical climates. South American grasslands are humid and moist while European grasslands are cold and dry. Grasslands in the southern hemisphere tend to get more precipitation than those in the northern hemisphere. In general, temperatures in grasslands vary from -40 F in the winter to 70F in the summer. In temperate grasslands the average rainfall per year ranges from 10-30 inches. In tropical and sub-tropical grasslands the average rainfall per year ranges from 25-60 inches per year.</p>	<p>Flora: grass species, tall grasses and shorter grasses, flowering herbs, legumes, trees are limited. Fauna: prairie dogs, jack rabbits, squirrels, gophers, bison, antelope, elk, badger, coyote, ferret, wolf, cougar</p>	<p>Habitat destruction, conversion of land to agriculture.</p>

Passports

Grades 5-8

Biome Brochure

Biomes Around
the World

In groups of four or five, you will be designing a biome brochure to convince a traveler to buy land in your biome. Use the Biome Brochure Criteria as a guideline on how to create your brochure. You will need to use word-processing, presentation, or publishing software, to create brochures that describe the location, landforms, average temperature and rainfall, animal and plant life, climate, ecological concerns and conservation efforts of a biome.

Each group will need to do the following:

- Brainstorm ways to accomplish your tasks.
- Make a list of the research and work each student is responsible for.
- Research the designated biome topics.
- Meet with the group and exchange information and discuss findings.
- Use word-processing software to key in the biome information in column format. Edit the typed work and then get a classmate to edit it also.
- Correct any mistakes and print enough copies for each member of the group to review.
- Brainstorm ways to format the final combined version of the brochure.
- Create the final version of the brochure, using a format agreed upon by the group. Be creative.



Passports

Grades 5-8

Making A Brochure: Biome Brochure

CATEGORY	4	3	2	1
Content - Accuracy	All facts in the brochure are accurate.	Almost all of the facts in the brochure are accurate.	Most of the facts in the brochure are accurate.	Less than half of the facts in the brochure are accurate.
Writing - Organization	Each section in the brochure has a clear beginning, middle, and end.	Almost all sections of the brochure have a clear beginning, middle and end.	Most sections of the brochure have a clear beginning, middle and end.	Less than half of the sections of the brochure have a clear beginning, middle and end.
Writing - Grammar	There are no grammatical mistakes in the brochure.	There are no grammatical mistakes in the brochure after feedback from an adult.	There are 1-2 grammatical mistakes in the brochure even after feedback from an adult.	There are several grammatical mistakes in the brochure even after feedback from an adult.
Attractiveness & Organization	The brochure has exceptionally attractive formatting and well-organized information.	The brochure has attractive formatting and well-organized information.	The brochure has well-organized information.	The brochure's formatting and organization of material are confusing to the reader.
Knowledge Gained	All students in the group can accurately answer all questions related to facts in the brochure and to technical processes used to create the brochure.	All students in the group can accurately answer most questions related to facts in the brochure and to technical processes used to create the brochure.	Most students in the group can accurately answer most questions related to facts in the brochure and to technical processes used to create the brochure.	Several students in the group appear to have little knowledge about the facts or technical processes used in the brochure.
Sources	Careful and accurate records are kept to document the source of 95-100% of the facts and graphics in the brochure.	Careful and accurate records are kept to document the source of 94-85% of the facts and graphics in the brochure.	Careful and accurate records are kept to document the source of 84-75% of the facts and graphics in the brochure.	Sources are not documented accurately or are not kept on many facts and graphics.
Graphics/Pictures	Graphics go well with the text and there is a good mix of text and graphics.	Graphics go well with the text, but there are so many that they distract from the text.	Graphics go well with the text, but there are too few and the brochure seems "text-heavy".	Graphics do not go with the accompanying text or appear to be randomly chosen.
Spelling & Proofreading	No spelling errors remain after one person other than the typist reads and corrects the brochure.	No more than 1 spelling error remains after one person other than the typist reads and corrects the brochure.	No more than 3 spelling errors remain after one person other than the typist reads and corrects the brochure.	Several spelling errors in the brochure.

Passports

Grades 5-8



Biome Children's Story Rubric

CATEGORY	4	3	2	1
Creativity	The story contains many creative details and/or descriptions that contribute to the reader's enjoyment. The author has really used his imagination.	The story contains a few creative details and/or descriptions that contribute to the reader's enjoyment. The author has used his imagination.	The story contains a few creative details and/or descriptions, but they distract from the story. The author has tried to use his imagination.	There is little evidence of creativity in the story. The author does not seem to have used much imagination.
Writing Process	Student devotes a lot of time and effort to the writing process (prewriting, drafting, reviewing, and editing). Works hard to make the story wonderful.	Student devotes sufficient time and effort to the writing process (prewriting, drafting, reviewing, and editing). Works and gets the job done.	Student devotes some time and effort to the writing process but was not very thorough. Does enough to get by.	Student devotes little time and effort to the writing process. Doesn't seem to care.
Neatness	The final draft of the story is readable, clean, neat and attractive. It is free of erasures and crossed-out words. It looks like the author took great pride in it.	The final draft of the story is readable, neat and attractive. It may have one or two erasures, but they are not distracting. It looks like the author took some pride in it.	The final draft of the story is readable and some of the pages are attractive. It looks like parts of it might have been done in a hurry.	The final draft is not neat or attractive. It looks like the student just wanted to get it done and didn't care what it looked like.
Spelling and Punctuation	There are no spelling or punctuation errors in the final draft. Character and place names that the author invented are spelled consistently throughout.	There is one spelling or punctuation error in the final draft.	There are 2-3 spelling and punctuation errors in the final draft.	The final draft has more than 3 spelling and punctuation errors.
Organization	The story is very well organized. One idea or scene follows another in a logical sequence with clear transitions.	The story is pretty well organized. One idea or scene may seem out of place. Clear transitions are used.	The story is a little hard to follow. The transitions are sometimes not clear.	Ideas and scenes seem to be randomly arranged.