Biome Laboratory: 5.D.1

What Is A Biome?

5			
1 – approximately 60 minutes			
2 – approximately 60 minutes			
N/A			
Whole class			
3-4 students			
05.SC.LS.01			
05.SC.LS.06			
05.SC.LS.09			
05.SC.LS.12			
05.SC.LS.14			
05.SC.LS.15			
05.SC.TE.01			
05.SC.TE.04			
05.SC.TE.06			
3-5.LS.07			
3-5.LS.08			
3-5.LS.09			
3-5.LS.10			
3-5.LS.11			
3-5.TE.1.1			
3-5.TE.2.3			
biome, climate, environment, habitat			

Summary

Students will be able to identify what plants and animals they would find in a natural habitat, in a specific portion of the world. They should also be able to identify what type of land and weather conditions/temperatures exist in this area. Students should be able to design a biome based on these conditions, and they should understand why the types of plants and animals that live there can survive there.

Learning Objectives

2002 Worcester Public Schools (WPS) Benchmarks for Grade 3-5

Life Science

05.SC.LS.01 – Describe how organisms meet some of their needs in an environment by using behaviors (patterns of activities) in response to information (stimuli) received from the environment.

05.SC.LS.06 – Discuss the reasons and methods of animal migration (e.g., birds, reptiles, mammals).

05.SC.LS.09 – Recognize that many plants and animals can survive harsh environments because of seasonal behaviors, e.g., in winter, some trees shed their leaves, some animals hibernate or estivate, and other animals migrate.

05.SC.LS.12 – Discuss the importance of wetlands to human survival. Investigate how an invasive species' changes an ecosystem.

05.SC.LS.14 – Describe how energy derived from the sun is used by plants produce sugars (photosynthesis) and is transferred within a food chain from producers (plants) to consumers to decomposers.

05.SC.LS.15 – Beginning with the sun as the source of energy and ending with decomposers, make a food chain. Create links that show the relationship of plants and animals in the chain. Show the direction of the flow of energy and discuss the results if various links in the chain are broken.

Technology/Engineering

05.SC.TE.01 – Identify materials used to accomplish a design task based on specific property, i.e., weight, strength, hardness, and flexibility.

05.SC.TE.04 – Identify a problem that reflects the need for shelter, storage or convenience.

05.SC.TE.06 – Identify relevant design features (i.e., size, shape, weight) for building a prototype of a solution to a given problem.

Additional Learning Objectives

- 1. At the conclusion of this lesson, the students will be able to describe the weather and climate of different global regions.
- 2. At the conclusion of this lesson, the students will be able to describe specific aspects of various biomes (e.i., plants, animals, weather, climate).
- 3. At the conclusion of this lesson, the students will understand the important relationship between predator and prey.

Required Background Knowledge

Students should have a basic knowledge of concepts associated with:

- 1. The Engineering Design Process
- 2. Habitats and Environments

Essential Questions

- 1. What will the weather/climate be like in your Biome?
- 2. What plant life will you find in your Biome?
- 3. What animals will you find in your Biome?
- 4. How do the plants and animals work together to survive?
- 5. Why do predator and prey need each other to survive?

Introduction / Motivation

Before lesson begins, teacher should go through copies of the worksheet and indicate which area on the globe each team will be creating a Biome for. Start out lesson with a brief description of how climate and weather changes in relation to geographical location on earth. Students will have to complete the **Biome** worksheet and build a biome in their teams.

Procedure

Note: Feel free to alter the following lesson as you see fit based on your resources, student needs, and student capabilities.

Session 1 (50-60 minutes)

The instructor will:

- 1. Break up students into small teams (3-4 students per group).
- 2. Assign each group a different biome to research and build.
- 3. Allows the students research the biome they were assigned.
- 4. Have the students fill in the **Biome** and **Biome Food Chain** worksheet as they research to prepare for the building process.
- 5. Aid students in completing their worksheets.

Note: Information on the Biomes and the food chain associated with each biome are included with the lesson and may be used when necessary.

Session 2 (50-60 minutes)

The instructor will:

- 1. Place the students back into their assigned teams.
- 2. Distribute materials to students.
- 3. Instruct students to make their biomes based off the two worksheets they filled out in the previous session, including all plant life and animal life that accurately represents the food chain they described.
- 4. When teams are finished, have the student teams present their Biomes to the rest of the class.

Materials per class	Amount	Location
Shoeboxes	One per group	Shoe Store or Craft Store
Modeling clay	Depends on Design	Craft Store or Office Supply Store
Construction paper	Depends on Design	Craft Store, Supermarket or Office Supply Store
Magazines (to cut	One or Two per Biome	Convenient Store, Supermarket, or Craft Store
pictures from)		
Cotton balls	Depends on Design	Supermarket, General Store, or Craft Store
Scissors	One per group	Craft Store, Supermarket or Office Supply Store
Glue	Depends on Design	Craft Store, Supermarket or Office Supply Store
Таре	Depends on Design	Craft Store, Supermarket or Office Supply Store

Materials List

Materials per student	Amount	Location
None	N/A	N/A

Vocabulary with Definitions

- 1. *Biome* A major regional or global community, such as a grassland or desert, characterized by the forms of plant life and the climate.
- 2. *Climate* The meteorological conditions, including temperature, precipitation, and wind, that are characteristic of a particular region.
- 3. *Environment* The circumstances or conditions that surround one; surroundings.

4. Habitat – the place or environment where a plant or animal naturally occurs.

Assessment / Evaluation of Students

The instructor may assess the students in any/all of the following manners:

- 1. When the students are finished presenting, have a class discussion about which ideas will work the best and write them on the board so that the kids can better understand Biomes.
- 2. Look for participation in building in teams.
- 3. Evaluate the **Biomes** worksheet (attached).

Lesson Extensions

The instructor might use this lesson as an introduction to the other lessons in this unit.

Attachments

- 1. Biomes Worksheet
- 2. Biomes Food Chain Worksheet
- 3. Biomes Food Chain Examples
- 4. Biomes Examples Sheet

Troubleshooting Tips

None

Safety Issues

None

Additional Resources

None

Key Words

Biomes, climate, environment, habitat

Biome	Water	Temperature	Soil	Plants	Animals
Desert	Almost none	hot or cold	poor	sparse - succulents (like cactus), sage brush	sparse - insects, arachnids, reptiles and birds (often nocturnal)
<u>Chapparal</u> (scrub)	dry summer, rainy winter	hot summer, cool winter poor		shrubs, some woodland (like scrub oak)	drought and fire- adapted animals
<u>Tundra</u>	dry	cold permafrost (frozen soil)		lichens and mosses	migrating animals
<u>Taiga</u> (coniferous <u>forest)</u>	adequate	cool year-round	poor, rocky soil	conifers	many mammals, birds, insects, arachnids, etc.
Temperate Deciduous Forest	adequate	cool season and warm season	fertile soil	deciduous trees	many mammals, birds, reptiles, insects, arachnids, etc.
Grassland	wet season, dry season	warm to hot (often with a cold season) fertile season		grasses (few or no trees)	many mammals, birds, insects, arachnids, etc.
Tropical rain forest	very wet	always warm	poor, thin soil	many plants	many animals
Swamp	very wet	warm	nutrient-rich soil	many plants	many animals
<u>Cave</u> (terrestrial)	variable	cool (and dark)	rocks	almost no plants	few animals

Some Land (Terrestrial) Biomes:

Biome	Primary	Primary	Small	Large
	Producers	Consumers	Predators	Predators
Tundra	Lichens, Grasses, Willows, Sedges, Moss	Musk Oxen, Insects, Lemmings	Snowy Owl, Artic fox	
Temperate Deciduous Forest	Deciduous trees, fruit trees, berry bushes, fungi, ferns, flowers	Deer, rodents, birds, insects	Foxes, owls, opossum, birds, skunks	Cougar, Beers
Desert	Cacti, sage brush, annual flowers	Insects, lizards, rodents	Tarantulas, scorpions, lizards, snakes	Hawk, Kit fox
Taiga Coniferous Forrest	Evergreen trees, grass, shrubs, ferns, moss	Moose, elk, insects, birds, small rodents	Birds, skunk, owls, weasels, foxes	Wolves, Lynx, bears
Tropical Rain Forest	Canopy level trees, understory trees, vines, epiphytes, flowering plants	Small mammals, insects, birds, monkeys, bats	Reptiles, bats, amphibians, insects, birds	Jaguar, snakes
Cave (terrestrial)	Moss, fungi	Insects, worms, reptiles	Bats, insects, spiders, reptiles	
Swamp	Many Plants Trees, grass, shrubs, vines, flowering plants, ferns	Many animals Insects, worms, birds, dear	Many animals Reptiles, insects, amphibians, small mammals	Many animals, Snakes, reptiles, bears, large mammals
Grassland*	Grass, shrubs, flowering plants	Insects, small mammals, birds, small rodents, larger mammals	Birds, insects, small mammals, reptiles	Birds, large mammals, snakes, reptiles
Chaparral* (scrub)	Tall dense shrubs, some woodland (ex scrub oaks)	Fire and drought adapted animals, Insects, small mammals, birds, rodents	Fire and drought adapted animals, insects, lizards, birds	Fire and drought adapted animals, small mammals, birds, snakes

Biome Food Chain Information

* Animals in grasslands differ greatly determined by location.

• Africa - aardvark, African wild cat, African elephant, many antelopes, baboon, buffalo, Cape hunting dog, cheetah, giraffe, gnu, hartebeest, hippopotamus, hyena, impala, jackals, kudu, leopard, lion, meerkat, mongoose, oryx, ostrich, red-billed oxpecker, rhinoceros, vulture, wildebeest, zebra, and many other animals.

• Australia - dingo, emu, kangaroo, wallaby, wombat, and many other animals. Many non-native animals have been introduced, including the camel, donkey, goat, horse, rabbit, and sheep.

• North America - American toad, badger, black-footed ferret, bison, black-tailed jack rabbit, bumble bee, burrowing owl, carrion beetle, coyote, deer, dragonfly, eagles, eastern cottontail, elk, ferruginous hawk, fox snake, golden owl, gopher snake, grasshopper, gray wolf, ground squirrels, killdeer, lady beetle, larks, meadow vole, monarch butterfly, northern grasshopper mouse, prairie chicken, prairie dog, prairie rattlesnake, prairie skink, pronghorn antelope, red fox, red-tailed hawk, shrew, skunk, stink bug, tiger beetle, western meadowlark, and many other animals.

• **South America** - armadillo, opossum, fox, jaguar, llama, puma, rhea, tapir, many rodents, and many other animals.

• Eurasia - golden pheasant, leopard gecko, snow leopard, vole, and many other animals.

*Animals in Chaparrals different greatly determined by loction.

• **Coastal Southern California, USA** - Bewick's wren, cactus mouse, California quail, California striped racer Snake, California thrasher, chipmunk, coyote, deer, deer mouse, fox, kangaroo rats, lizards, lynx, mountain lion, northern red diamond rattlesnake, orange-throated whiptail lizard, pocket mouse, rabbit, Southern Pacific rattlesnake, spiders, spotted towhee, wood rats, wrentit, zebra swallowtail butterfly

• **Mediterranean Sea coast** - Apennine wolf, beech-marten, deer, black stork, black vulture, dormouse, Egyptian mongoose, great bustard, hare, hedgehog, Iberian lynx, Spanish Imperial eagle, weasel, wild boar, wild goat, wild sheep

• Coast of Chile, South America - Chilean deer, huemul (South Andean deer)

• **Coastal Australia** - Australian brush-turkey, gray kangaroo, red-bellied pademelon, scrub-birds, scrub python, tammar (scrub or black-striped wallaby, Atrichornithidae), scrubwren, thornbill

• South Africa - Cape sugarbird, sunbirds

Biome Food Chain Worksheet

Biome_____

Answer the following questions and then draw a food chain for your biome on the back of this worksheet.

- 1. What primary producers, also know as the primary plant life, would you find in your biome?
- 2. The animals that eat and survive off of the primary producers are the primary consumers. What primary consumers would you find in your biome?
- 3. Animals known as small predators survive by eating the primary consumers. What kinds of small predators would you find in your biome?
- 4. The large predators are the highest in your biome's food chain. They survive by eating the small predators and the primary consumers. What large predators would you find in your biome?

Food Chain Directions

- 1. Your food change should include all the plants and animals you listed above.
- 2. There are four categories: primary producers, primary consumers, small predators, and large predators.
- 3. You should put your biome's animals and plants into these four categories.
- 4. You should show what primary consumers are eaten by what primary producers and also what prey is eaten by what predator.

 Name
 Biome

Biome Worksheet

1. What will the weather be like in your Biome? How will the weather change with the seasons?

2. What kind of soil will there be in your Biome?

3. How much rain/snow will your Biome receive each year?

4. What geographical features such as mountains or coastline does your Biome have?

5. Based on your answers above, what type of plant life will grow in your Biome?

6. What animals will you find in your Biome?

Think about what your Biome will look like because you will be creating a model of your biome during the next lesson.