

Animals of the Biomes

Peggy Dawson

Introduction

Increasing a student's mental map of the world can be done by teaching them the location of a mountain range or a river they did not know existed. The goal of this lesson is to add a few layers to the mental map by having students start with the equator and move outward. I want my students to develop their mental map by looking at the biomes of the world while they investigate the affect that global warming is having on the organisms that make their life there.

The idea for my unit came from the lessons presented during our DTI seminar with Dr. Bartley. In our DTI seminar, Organisms - Adaptations for Survival in Aquatic Environments, we learned how organisms have three different types of adaptations. The categories of adaption include; morphological, physiological and behavioral. Dr. Bartley challenged us to research our own animal and determine adaptations our animal acquired in each category. Many of the articles we read for seminar focused on how climate change or global warming was affecting animals in different areas of the world. I know that whenever I include animals in my lessons I seem to get more enthusiasm from the students. When do students really get to study about animals? I thought that by creating a lesson that included animals from the different biomes I may be able to increase my students' mental maps of the world and at the same time teach them how humans have impacted the different biomes by having them identify the threats to the animals in each biome. I plan to have my students create tri-folds or power points to showcase the animals, vegetation, and human or natural threats occurring in each biome while increasing their mental maps of the world.

Rationale

In the State of Delaware, the Department of Education has created thematic lessons that are recommended for each grade level in Social Studies. My lesson focuses on the lesson titled Mental Mapping. My goal is to introduce some of the concepts in the other two geography lessons titled "Reasons for Regions" and "Humans Interact with the Environment." These two units have been created around the Delaware content standards to ensure rigor in the classroom discussions, activities and assessments in achieving the standards. The state standards I intend to touch upon with my unit are from the 6th to 8th grade level and they include:

1. “Students will demonstrate mental maps of the world and its sub-regions which include the relative location and characteristics of major physical features, political divisions, and human settlements.”
2. “Students will understand the processes affecting the location of economic activities in different world regions.”
3. “Students will apply a knowledge of the major processes shaping natural environments to understand how different peoples have changed and been affected by, physical environments in the world's sub-regions.”

The essential questions for these standards are,

- “How do personal mental maps effectively change and develop?”
- “What are mental maps? How can mental maps be created and used effectively?”
- “How can we help build our mental maps through visual association?”
- “What’s “special” about a given region and how could it change?”
- “Under what conditions should human cultures attempt to change the processes that shape the natural environment?”

For my lesson, I will focus on teaching my students lines of latitude and where they intersect the continents of the world. I will have them read about what factors determine climate and how climatologists have organized the earth’s surface into different climate zones based on those factors. Next, I will introduce the different biomes of the world through a mapping activity and power point presentation. To prepare them to understand how humans have impacted these biomes I will have them read about climate change. In groups of four I will challenge them to research one biome by focusing on the organisms that live in the biome and how they have adapted to the conditions. Lastly, they will be required to research how climate change and/or other human interactions has been affecting the biome and what can be done to slow or reverse the effects of those interaction.

Demographics

Gauger-Cobbs Middle School is one of the four middle schools in the Christina School District. We are one of the largest middle schools in the State of Delaware with 1,130 students attending in the 2014-2015 school year. Due to our large numbers we have been closed to choice for the last few years. Our school contains grades 6 through 8 with 365 in the 6th grade, 378 in the 7th grade and 387 in the 8th grade for the 2014/2015 school year. Within our school 33.9% of our students are classified as low-income. We have 19.1% in our special education program. We are a very diverse school; in 2014- 2015 we had 39.4 % African American, 33.8% White, 21.3 % Hispanic/Latino, 2.5% Asian, and 2.6% Multi-racial. I am currently teaching 6th grade Social Studies. I have also taught 7th and 8th grade Social Studies. This year our school added an early Cambridge program

which placed students with higher ELA and Math test scores in a separate Social Studies class taught by our Talent and Development teacher. The rest of the students are now tracked and they move with one another to each of their core classes. Three of the Math and ELA are co-taught classes because of the high special education numbers; however, there is still no additional support in the Science or Social Studies classes. One of the classes I am teaching will also have a group of level B special education students who receive small group instruction for ELA and Math but not Social Studies or Science.

Common Core Standards/ “I can” statements

CCSS.ELA-Literacy.RH.6-8.1

Cite specific textual evidence to support analysis of primary and secondary sources.

CCSS.ELA-Literacy.RH.6-8.2

Determine the central ideas or information of a primary or secondary source; provide an accurate summary of the source distinct from prior knowledge or opinions.

CCSS.ELA-Literacy.RH.6-8.4

Determine the meaning of words and phrases as they are used in a text, including vocabulary specific to domains related to history/social studies.

CCSS.ELA-Literacy.RH.6-8.7

Integrate visual information (e.g., in charts, graphs, photographs, videos, or maps) with other information in print and digital texts.

CCSS.ELA-Literacy.RH.6-8.8

Distinguish among fact, opinion, and reasoned judgment in a text.

I can identify different biomes of the world on a map.

I can identify lines of latitude.

I can identify how human culture has changed a process that shapes the natural environment.

I can identify how changing the natural environment can have an economic impact on an area.

I can identify how changing the natural environment can have unintended consequences on the animals living in the environment.

Content

During our seminar and through some research, I learned a great deal about the biomes of the world. In our class we learned how climate has created the different biomes of the world. The directness of the sun's rays determines the energy reaching the surface of the Earth. The tilt of the Earth on its axis alters the seasons. Temperature, spin of the Earth and geology determine wind patterns, and the amount of rainfall is affected by all of these factors. Due to the age and ability level of my students I decided it would be best to start with a reading that would explain climate. I found a reading from ReadWorks.com titled "Climates, An introduction to Climates," that has a 770L that will introduce students to five factors that make climate vary from place to place. It provides a brief explanation about latitude, altitude, oceans and lakes, mountain ranges and wind. A second article "Climate, Climate Zones," with an 800L describes five climate zones and is a great resources because it begins by referencing lines of latitude which I plan to teach first.

Dr. Bartley identified six biomes that I want to focus on for this unit.

The first is the tundra. We learned that the tundra is categorized by cold temperatures, very short growing seasons and low precipitation. The soil is permafrost and decomposition is slow. The vegetation consists of grasses, moss and lichens. In researching tundra I learned this habitat has an average temperature that ranges from -40 F to 65 F. This is the coldest habitat with extremely cold winters and occasionally warm summers. The average rainfall in this habitat is 6 to 10 inches of rain per year. The habitat may have blizzards that can produce up to 80 inches of snow in one night. The animals of this living area wither hibernate all winter or go into semi-hibernation. This habitat covers around four million square miles of the earth's surface.¹

The second is the Taiga or Boreal Forest. The taiga is categorized by cool temperatures, long winters, and short growing seasons. The soil is acidic with slow decomposition. The dominant vegetation is various species of conifers. The taiga can be found in Northern Canada, Europe and Asia. In researching the taiga, I found it is often referred to as the coniferous forest. Coniferous means "coming from the cones;" therefore, it consists mostly of trees that grow needles and cones instead of leaves and flowers. This habitat is the largest land habitat on earth, covering about 50 million acres of land. The average rainfall in this habitat is 12 to 35 inches of rain per year. This area has four defined seasons with cold, long, snowy winters and warm, humid summers. The average temperature ranges from -40 F to 68 F. the average summer temperature is 50 F.²

The third is the Temperate Deciduous Forest. This forest has moderate precipitation and temperatures. The soil is rich due to deciduous plants and decomposition. In researching this biome I learned that the name is derived from the Latin word that means "to fall off" because during the autumn season the leaves on the trees change color and eventually fall off. The habitat has an average temperature that ranges from -22 F to 86 F. The average yearly temperature is 50 F. The average rainfall in this habitat is 30 to 59

inches of rain per year. The habitat covers large areas of the Northern Hemisphere and has really cold winters and really hot summers.³ Our school is located in this biome.

The fourth is the Grasslands or Savanna. This area has moderate to higher temperatures and low precipitation. Grasslands can be found in Central North America, parts of South America, parts of Europe and Africa. The savanna in Africa is categorized by high temps and migratory herd animals. In researching the savanna, I learned that it has an average temperature that ranges from -4 F to 86 F. The temperatures vary in each region due to their latitude position on earth. The average rainfall in this habitat is about 20 to 35 inches of rain per year. It is often located between deciduous forests at high latitudes and deserts at subtropical latitudes. The grasses in this habitat die back to their roots annually. Soil and sod protect the roots and any new buds from the cold of winter or dry conditions. There is an estimated 40 million square miles of this habitat on earth.⁴

The fifth biome is the Tropical Rain Forest. The Rain Forest is categorized by high temperatures and precipitation. The soil, unfortunately, is poor. The plants lock up the nutrients and it is the biome with the highest species diversity. In researching, I learned this habitat has an average temperature that ranges from 68 F to 77 F. The average rainfall in this habitat is about 79 to 394 inches of rain per year. This biome has more species of plants and animals than all the other land habitats combined. Bacteria and other microorganisms are found on the floor of this habitat because of the hot, moist atmosphere. Few plants are found here because of the lack of sunlight. Over seven thousand square miles of this habitat are destroyed every day.⁵

The last biome we learned about was the desert. With very low rainfall the desert has the lowest species diversity. The plants are highly specialized due to the low organic content of the soil. While researching I learned this habitat has an average temperature that ranges from 25 F to 100 F. the temperature is the hottest during the day and the coldest at night. The average rainfall in this habitat is about 10 inches of rain per year. Perennials can survive here for several years by becoming dormant when it is dry and flourishing when water is available. This habitat is the driest of all the habitats; therefore, the plants and animals that live here need to be able to survive without water for a long period of time. Deserts cover about 1/5 or 20% of the earth.⁶

Strategies

White Boards

Students will use their small white boards to record their response to questions about what landforms they know and I will use their white boards to create a master list on the classroom board. I like this strategy because it gives students who may not like to speak in class an opportunity to add their ideas to the class discussion. It also allows the teacher to ascertain what prior knowledge the students have in a fun and non-threatening way.

Collaborative Groups

Learning to collaborate with one another is an important skill that all students need to practice. Working together encourages students to share ideas and work towards a common purpose. In this unit students will work together to put together a puzzle of the world. They will work in small groups to identify the major mountains, deserts, oceans and seas of the world. Students need to learn how to work respectfully with one another and learn how to combine their work into one product once they start the biomes component of the lesson. Collaboration also benefits students in that by listening to their peers they can develop a better understanding of the topic.

CSET

CSETs are a type of formative assessments that have students make a Claim, Support it with Evidence and provide a Tie-in. The Claim is when the student answers the question. The Set-up is transition words that introduce a quote. The Evidence is one or more sentences copied word for word from the article that directly supports the claim. The evidence should always be in quotation marks. The tie-in explains the quote and how it supports the claim.

Frayer Diagram

Students will use the Frayer diagram graphic organizer to learn vocabulary. This type of organizer consists of four sections and usually includes definition, examples, non-examples and either a picture or student version of the definition.

Entrance Tickets

I will use this tool to determine what prior knowledge my students have about the continents and oceans.

Graphic Organizer

Students will use graphic organizers to record the key ideas that I want them to learn. We will use a variety of “foldables” to record our notes. The use of graphic organizers assists students in identifying the important aspects of the readings and organizing them in a manner that assists the students.

Lessons

My first concept is maps. I start this unit with a lesson about the essential features of a map. We create a six tab foldable folded “hot-dog” style titled TODALS on the outside. TODALS stands for Title, Orientation, Date, Author, Legend, and Scale. On the inside of

the foldable I give them the definition of each term on the left hand side and examples on the right hand side. I have my students create a 3D compass rose due at the end of the week to make them spend a little more time learning their cardinal directions and to unleash their creativity. On day two, I start with various types of maps and have students search for each feature of the TODALS foldable. I normally rotate the maps twice and have students search again for the essential features of the map. I feel this gives them exposure to all different types of map. Next, I distribute copies of an amusement park map that utilizes a grid system. I picked these up on my summer vacation but you can also use resort town maps that utilize a grid system. We do a group activity of locating place my children and I visited while we were there using the grids. I have created a small packet of worksheets to practice each concept and they work on this for the rest of the class so that I can mingle and check on individual students to see if they are understanding the concepts. I collect and check for completion then return them the next day and we go over the answers. On day three I teach my students about the difference between absolute and relative direction. I have created a foldable for this lesson as well. We have a short reading about the difference between latitude and longitude and then we use the information to complete the foldable. Once we finish, students work on practicing the concept on a worksheet featuring latitude and longitude.

My second concept is landforms. I begin my first lesson with an entrance ticket to determine if my students know the seven continents and five oceans. Once we are finished the entrance ticket I distribute a world map puzzle to each group. They work together to put the puzzle together and the winning group earns a reward. Usually as each group finishes I give them a piece of candy and a sheet of blank paper and have them sketch out the puzzle. Next, I distribute cutouts of the continents to the students so that all the continents are represented and all students have their own construction paper cutout. (Our local teacher center has the letter press continents and I cut out a set before each school year to have on hand for this lesson. You can always check your elementary schools to see if they have the continent blocks for their letter press system). I ask them to look at their continent and see if it looks like something, for example, Africa looks a dinosaur head when tilted sideways or Antarctica looks like a ladies dress. I have them sketch on the cutout and then we share them using the overhead projector. I save the good ones to show the next year in case the kids do not see things for themselves. Next I have them compare the sizes of the cutouts and I ask if they think these are to scale or if they were made to fit on an 8.5 x 11 sheet of paper. I ask if they know what the term distortion means. I use some optical illusion pictures to get them interested in my power-point about the different types of maps (Mercator, Peters, Robinson, etc.). I focus a great deal on Antarctica and even rip one of the cut-outs to show how most people really think Antarctica is shaped. I have them create a Frayer diagram of the term distortion to make sure they learn the term. Once I teach about the continents and oceans I ask what other landforms are on the earth's surface. Next we use our mini white boards to list what other landforms we have on the earth. I try to make a master list on the board before I begin my power-point lesson on sixty different landforms found on the earth. I found a power point

on the internet created by Angela Ballas and I have used it for a number of years. I give the students the list of landform definitions with the terms whited-out and have them guess and we go through them. Next, I have them create a Geographic Dictionary of Landforms. They are required to write the term, definition and draw a picture for twenty different landforms in alphabetical order. For extra credit they can use our classroom resource to find and record examples for each of their landforms provided they have used their time wisely. The final lesson for this concept requires a two day atlas search to identify, label and color the major landforms on each continent according to the directions I have placed on each map.

My third concept is focused on the climate. To introduce the concept I like to show my students the video "Pole to Pole" from the Planet Earth series. It takes them from the South Pole to the North Pole and back again exploring all of the different biomes of the world. I use a few readings of Readworks.org to facilitate the lessons on climate. There is one titled "Climates: An Introduction to Climates" that introduces students to the five big factors that make climate vary from place to place: Latitude, Altitude, Oceans and Large Lakes, Mountain ranges and Wind. I give this reading to my students as a homework assignment it has an 800 Lexile. They are tasked with creating their own graphic organizer to showcase the "Big 5 Climate Factors." Another reading from ReadWorks.org that I use for class is called "Climates: Climate Zones" and it gives a description of the major climate zones. I found a wonderful map online that has the climate zones numbered so that the students color by number to see a visual of the different climate zones which I then have them use for their final project. The idea for including animals in this lesson was two-fold. I have always found my students interested in the animals in the Planet Earth video because as it travels the globe it shows them the animals of the different biomes and the vegetation needed to support them and second I found a wonderful sorting game from Oriental Trading that focused on the biomes. The game gave me the idea to print our different animals with facts and have the students try to figure out in which biome the animal would make its habitat based on what they had learned about the biomes from the readings. Once I have sparked their interest in the animals of the biomes I have them read the third article from Readworks.org titled "Is the Earth Getting Warmer?" This reading does have a 1090 Lexile but I do read it with my students. This reading introduces students to the problem of carbon dioxide building up in the earth's atmosphere, positive and negative feedback loops and it gives examples of how it impacts animals and vegetation of some of the different biomes. I use this article to set the stage for our final product of this unit in which students work together in groups to create a tri-fold about their selected biome. I have students include the Big 5 Climate factors of their biome, animals and vegetation in their biome with pictures and how climate change is impact their biome. Students are required to use the CSET structure to write their paragraph for climate change to support our school goal of increasing the uniformity of paragraph writing.

Bibliography

"Animal Habitat Sorting Boxes." *Oriental Trading*. Web. 12 Aug. 2015. <<http://www.orientaltrading.com/animal-habitat-sorting-boxes-a2-13656324.fltr?Ntt=animals>>. These boxes were part of the inspiration for creating my own set of sorting cards. I used these animals and added a few of my own from my research. It was a great place to start. These would be great for use with younger students.

Ballas, Angela. "Landforms 60 - PowerPoint." *Landforms 60 - PowerPoint*. June 12, 2012. Accessed August 30, 2013. <http://www.slideshare.net/yaryalitsa/powerpoint-landforms-60>.

This is the power point I used to identify the various types of landforms.

Burnie, David, and Don E. Wilson. *Animal*. Washington, D.C.: Smithsonian Institution, 2005.

This is the book I used to decide which animals to put on my cards and what facts to include. It is an incredible book with a great deal of information. It also has information about each biome; however, the reading level was too high for use with many of my students. I found it a great resource for my information.

Planet Earth. BBC Worldwide Ltd. /BBC Worldwide Americas, Inc., 2007. DVD. Narrated by David Attenborough. This is a wonderful series. I used Pole to Pole and on a few occasions I have shown the Great Plains video.

"ReadWorks.org | The Solution to Reading Comprehension." *ReadWorks.org*. Web. 3 Jun. 2015. <<http://www.readworks.org/>>. Our district provides access to this great resource. I used this site for multiple articles including "Climates: An Introduction to Climates" "Big 5 Climate Factors." "Climates: Climate Zones" "Is the Earth Getting Warmer?"

"Worksheetplace.com: Biomes." *Worksheetplace.com: Biomes*. Web. 24 Oct. 2015. <<http://worksheetplace.blogspot.com/2013/08/biomes.html>>. This is the Biomes map I found online that I used in my classroom. It was necessary to reduce the size of it for it to print completely on a regular sheet of paper. I used regular overhead transparencies to create the equator/tropics overlay. They have other great free resources that I wished I had seen before creating my own.

Notes

¹ <http://www.orientaltrading.com/animal-habitat-sorting-boxes-a2-13656324.fltr?Ntt=animals>

² Ibid

³ Ibid

⁴ Ibid

⁵ Ibid

⁶ Ibid

**Curriculum Unit
Title**

Animal of the Biomes

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KEY LEARNING, ENDURING UNDERSTANDING, ETC.

Delaware Social Studies Standards

Geography Standard One 6-8a: “Students will demonstrate mental maps of the world and its sub-regions which include the relative location and characteristics of major physical features, political divisions, and human settlements.”

Geography Standard Four 6-8a: “Students will understand the processes affecting the location of economic activities in different world regions”

Geography Standard Two 6-8a: “Students will apply a knowledge of the major processes shaping natural environments to understand how different peoples have changed and been affected by, physical environments in the world's sub-regions.”

Common Core Standards

CCSS.ELA-Literacy.RH.6-8.2: Determine the central ideas or information of a primary or secondary source; provide an accurate summary of the source distinct from prior knowledge or opinions.

CCSS.ELA-Literacy.RH.6-8.4: Determine the meaning of words and phrases as they are used in a text, including vocabulary specific to domains related to history/social studies.

CCSS.ELA-Literacy.RH.6-8.7: Integrate visual information (e.g., in charts, graphs, photographs, videos, or maps) with other information in print and digital texts.

CCSS.ELA-Literacy.RH.6-8.8: Distinguish among fact, opinion, and reasoned judgment in a text.

ESSENTIAL QUESTION(S) for the UNIT

The essential questions for these standards are,

- “How do personal mental maps effectively change and develop?”
- “What are mental maps? How can mental maps be created and used effectively?”
- “How can we help build our mental maps through visual association?”
- “What’s “special” about a given region and how could it change?”
- “Under what conditions should human cultures attempt to change the processes that shape the natural environment?”

CONCEPT A

CONCEPT B

CONCEPT C

Maps

Landforms

Climate

ESSENTIAL QUESTIONS A

ESSENTIAL QUESTIONS B

ESSENTIAL QUESTIONS C

I can identify the essential features of a map.

I can use a grid system to locate places on a map.

I can differentiate between absolute and relative directions.

I can identify the continents and oceans of the world.

I can identify distortions created on flat maps.

I can identify and draw twenty landforms found on the earth.

I can differentiate between the contributing factors in determining a location's climate.

I can explain the relative location of different climate zones to the equator.

I can identify how changing the natural environment can have unintended consequences on animals and vegetation.

VOCABULARY A

VOCABULARY B

VOCABULARY C

Orientation

Compass Rose

Cardinal Direction

Absolute Direction

Relative Direction

Latitude

Longitude

Distortion

Climate

Biomes

Altitude

Carbon Dioxide

Positive feedback loop

Negative feedback loop

Unintended consequences

ADDITIONAL INFORMATION/MATERIAL/TEXT/FILM/RESOURCES

"Animal Habitat Sorting Boxes." *Oriental Trading*. Web. 12 Aug. 2015. <<http://www.orientaltrading.com/animal-habitat-sorting-boxes-a2-13656324.fltr?Ntt=animals>>. These boxes were part of the inspiration for creating my own set of sorting cards. I used these animals and added a few of my own from my research. It was a great place to start. These would be great for use with younger students.

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