

Unit 1 – Geography and Climate



In this introductory study of ecology, students will learn about the ecology and climate of Barro Colorado Island (BCI), Panama and the ecology and climate of Milwaukee, Wisconsin. Within this context students will review how ecosystem and climate are determined, examine the importance of healthy ecosystems, study how organisms meet their basic survival needs, consider how organisms have evolved, demonstrate ecosystem interactions, analyze the relationship between omnivores and herbivores and justify the importance of forest conservation.

Students will also engage in learning about how humans understand and explain the natural world through an interactive web-based resource that was built with interviews of scientists and students working on BCI during the summer of 2010. They will realize their ability to pose questions and conduct research, in the same way scientists do on BCI, by participating in a performance task that assesses student understanding of climate and species diversity in partnership with the Urban Ecology Center (UEC) in Milwaukee, WI.

Students will develop and apply inquiry-based research to make comparisons between Milwaukee and BCI. In a culminating performance task, students will present their understanding of the similarities and differences of the climate and biodiversity of BCI and Milwaukee. Students and teachers will work with Urban Ecology Center staff to census the flora and fauna of Riverside Park and compare that data to what they have learned and what is published about BCI. The product will clearly display similarities and differences between a temperate climate, flora and fauna, and a tropical climate, flora and fauna. Each student will also have the opportunity to conduct a student driven inquiry project that may be inspired by the work they have done in the unit or scientists they have learned about from BCI. The unit concludes with students persuading their peers of the importance of habitat conservation.

Curricular Goals

National Science Content Standard:

C. Life Science (Characteristics of Organisms, Life Cycles, Organisms and Environments)

WI State Standard

F.4.4 Using the science themes, develop explanations for the connections among living and non-living things in various environments

Essential Question

How are Ecosystem and Climate determined?

Students will understand that...

- location on the earth, elevation, type of land, precipitation and temperature determine what will live in a particular area.

Students will know. . .

- there are four major climate zones on earth – tropical, desert, temperate, and arctic/polar.
- the way seasons are recognized are unique to the latitude of a location.
- how to describe the climate of Barro Colorado Island and its geographical location.

Students will be able to. . . (skills)

- locate different environments on earth using a map.
- describe the climate of different ecosystems.
- use internet resources to gather information.

Performance
task

- Describe the climate of Milwaukee, including seasonality and compare it to one other location on earth.

other
evidence

- student notebooks
- daily participation

Assessment Task Blueprint (for teacher use only)

Understandings or goals will be assessed through this task:

Students will describe and compare climates and ecosystems on earth.

Criteria are implied in the standards and understandings, regardless of the task specifics. Qualities student work must demonstrate to signify that standards were met.

Students make connections between living and nonliving things in various environments.

Authentic performance task for students to demonstrate understanding: (task overview)

We have spent the last week studying geography, climate and ecosystems – specifically we've researched Milwaukee and BCI, Panama. We have taken notes about how and why our ecosystem is different from the island in the Panama Canal.

Your task is to describe the similarities and differences between Milwaukee, WI and one other place of your choosing in the world. You are in charge of planning a trip to the place you selected and need to tell your family what kind of weather they should pack for and what plants and animals they should take pictures of.

You will use a world map to locate your destination, use a Venn diagram to compare the two places, and answer a few questions about your work.

Quality work will correctly indicate which one of the three major climate zones your destination is in, accurately describe the climate (precipitation and temperature during each season), and name at least four plausible plants or animals that you can photograph.

Student products and performances to provide evidence of desired understandings:

Venn diagram, world map, series of questions

Criteria by which student products and performances be evaluated:

Accurately identify and describe temperate zone and compare it to one other location on earth (from a different climate zone).

Name at least 3 significant differences between locations.

List 4 plausible plants or animals that would live in each place.

Please find 3-5th grade student version of this assessment as separate document.

Unit 1

Learning Activities

Lesson number	WHERE TO	activity, learning objective
1.1	Where and why Equip	<p>What is an ecosystem? Ecosystems on earth. ***Comparison – our community = ecosystem. Teachers and students will work together to briefly identify components of our community (houses, stores, library, school, bank, fire dept, police, etc) and how they work together to provide a suitable place to live.</p> <p>If you were a squirrel... what would you have in your 'community'? This example can be used to describe an ecosystem and how it has components that are essential to the balance and survival of plants and animals. If you remove one from the system, many could suffer. Use vocabulary strategy.</p>
1.2	Equip Tailored	<p>Describe the climate and ecosystem of southeastern Wisconsin. Find Milwaukee on the map and describe location and seasonality. What animals and plants do we have here in WI? Make lists/notes in science notebook – have prepared a copy of large Venn from day 1 for each child to add to science notebook, the copy should have room for students to add on information as able. Refer back to the Venn Diagram that was begun and add to it as needed.</p> <p>Tech Resource: http://www.teachers.tv/videos/lesson-starters-weather-around-the-world</p>
1.3	Equip	<p>Why is there seasonality? Use globe/flashlight demonstration to teach revolution of the earth about the sun and how that creates seasons.</p> <p>Shared writing summary of demonstration to be copied into science notebooks. Students should add illustrations to solidify understanding.</p> <p>Also see video resource... http://www.youtube.com/watch?v=DuiQvPLWziQ</p>
1.4	Evaluate	<p>Use <i>The Remarkable Rainforest</i> p. 7 <i>What is a rainforest?</i> as a pretest. Discuss answers as a whole class, students can self correct. Teacher should circulate to ascertain informally students' current knowledge of rainforest basics.</p> <p>More specifically, What is the rainforest? Start a large, multi poster RAN chart. Students should share what they already know about rainforests and then watch the video to build common knowledge among the students: http://www.thewildclassroom.com/biomes/rainforest.html</p> <p>Close lessons by reflecting on how geography and climate determine the ecosystem and completing a color-coded map for science notebook that identifies different climate zones around the world. (Use internet resources.)</p>

1.5	Tailored Explore	Students can work with laptops or desktops to investigate other biomes on www.thewildclassroom.com/biomes in partners or groups of three.
1.6 (several days – 1 week)		Science A – Z Ecosystem book. Follow teacher plans for reading the three leveled texts with appropriate groups of children. Play the board game with review questions. Conduct the ecosystem exploration as described in the teacher notes. After a week of observation and data collection, record further questions in ‘wonder...’ format as possible student-led inquiry projects during Unit 4.
1.7	Evaluate	Performance Assessment
Key Vocabulary		climate, ecosystem, seasons, seasonality, rotate, spin, day, year
Print Resources		<i>The Remarkable Rainforest</i> by Toni Albert
Online Resources		www.thewildclassroom.com http://www.youtube.com/watch?v=DuiQvPLWziQ http://www.teachers.tv/videos/lesson-starters-weather-around-the-world http://www.urbanecologycenter.org/ www.sciencea-z.com Habitat/Environment grade 3-4 readers and resources