

Lesson: Severn Science—Climate Hike

Arlington Echo works to continuously improve our lessons. This lesson may be modified over the course of the school year.



Environmental Literacy Question: “How have humans affected The Chesapeake Bay and its watershed?”

Topic/Essential Question: How is the earth’s climate changing?

Unit/Lesson Sequence: One of two lessons in the “Severn Science” 4th grade module based at Arlington Echo Outdoor Education Center.

Content Standards:

- **Environmental Literacy**

4.A.1.b. Explain and demonstrate that the earth can be described as one single global food web, and food webs can be described for a particular environment.

5.A.1. Analyze the effects on human activities on earth’s natural processes.

5.A.2.d. Evaluate the effects of an alien species on the Chesapeake Bay ecosystem.

8.F.1.b. Identify actions that can be taken as individuals and those that require the involvement of other people, organizations and government.

- **Science**

4.F.1.a. Identify and describe the interactions of organisms in an environment.

- **Common Core State Standards for English Language Arts**

CCSS.ELA-Literacy.SL.4.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 4 topics and texts*, building on others’ ideas and expressing their own clearly.

Length of Lesson: 35 minutes

Student Outcome: Students will demonstrate an understanding of climate change as it relates to animals and plants in the Chesapeake Bay Watershed and describe how these animals and plants can adapt in the future.

Knowledge of the Learner:

- Prerequisite knowledge, skills, and processes: Students must have a basic understanding of the climate change, the roles humans play, animal adaptations, and migration.
- Students’ needs, interests, and previous learning will be determined during the pre-assessment.
- Differentiated: This lesson will appeal to different types of learners. Kinesthetic learners should do well with the physical act of hiking and playing games. This lesson will give critical thinking skills during each task

Knowledge of Content:

Vocabulary:

Wetland

Adaptation

Temperate Region

Migration

Interactions

Climate

Hibernation

Habitats

Climate Change

Resources:

Climate Change Poster

Hiking in the Wilderness Poster

Cougar Distribution Poster

Bags for children

Fake animal figurines

Hibernation handouts

Cougar Scat

20 Hula hoops

Two ropes

Tree Distribution Chart

Tree Identification Handout

Tree Distribution Map

Supplements:

- A: Map of the trail and the stops
- B: Climate Change Poster
- C: Hiking in the Wilderness Poster
- D-1, D-2: Cougar picture and distribution map
- E-1, E-2: Tree Identification Chart and distribution maps
- F: Bird Migration Game
- G: Examples of Hibernation Homes
- H: Vocabulary

Lesson Setup:

Before the first group, set up the bags with the animals in them as well as the stations along the trail during training with the Arlington Echo staff. The trails are marked by color as labeled on the map along with where each activity is located and what those activities are (**Supplement A**). Follow the map to know where each station is. Meet the first group of students after the Severn Science Module introduction held behind the dining hall.

Module Introduction

This lesson will follow an introduction about the watershed given by an Arlington Echo Staff member.

Instructional Delivery

Pre-Assessment:

- Welcome the students to the activity “Climate Hike” and introduce yourself.
- Ask students the following questions:
 - What is climate? *Climate is the pattern of seasonal weather that happens year after year.*
 - What seasons do we have? *Fall, Summer, Winter, Spring*
 - Because we have 4 seasons, what region are we? *Temperate Region: we lie between polar and tropical regions.*
 - What is climate change? *Climate change is any major change in the measures of climate that last for long periods of time, 10 years or more. These include temperature, precipitation, wind patterns, and other effects.*
 - Show the “Climate Change” poster to give them visual examples of climate change. (**Supplement B**)

Motivation/Warm-up:

1. Engage the students by explaining that they will be going on a hike. We will be exploring the cove at Arlington Echo by foot playing games along the way.
2. Before you start the hike, please go over the “Hiking in the Wilderness” Poster (**Supplement C**).
3. Begin the hike following the map as your guide (**Supplement A**).

Hiking:

1. Start at Station 1 Cougar, marked with a red ribbon.
 - Play the cougar noise on phone and ask the students what they think it is. Look and sound shocked! Be dramatic!
 - That sound is a cougar/ mountain lion. Have you ever seen one? Show picture of what they look like (**Supplement D-1**).
 - Where are they found? *They live in the western part of the US.*
 - Cougars have started to move east and have been spotted in New York City! Show distribution map (**Supplement D-2**). How do you think climate change has affected them? *They have been affected by climate change through drier conditions creating a lack of water. They are moving east toward urban areas following their food source, deer.*
<http://news.nationalgeographic.com/2016/12/cougars-mule-deer-climate-urban-area/>

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Draft Jan 2017

2. Once you finish with station 1, tell the students that along the way to the next station we will use a tree identification chart to demonstrate how to identify trees.
 - Hand out the tree identification charts which show bark, leaves, and other identifying characteristics of trees (**Supplement E-1**). Identify a tree as an example using the key. Arlington Echo staff will have trees labeled along the trail to help. All kids to touch leaves, bark, berries, etc. to explore the different things trees have that they provide for animals.
 - Why are trees important? *They provide shelter and food for us and other animals.*
 - As they are identifying trees, ask the students “How do you think trees can be affected by climate change?” *Some trees may not be able to adapt to climate change causing them to leave areas.*
 - Show them the maps about how trees, specifically our Red Maple and American Holly, may start to leave certain areas by dying out (**Supplement E-2**).
 - How will this affect animals around here? *Animals depends on Red Maples for their seeds in the spring and shelter in the winter. Animals depends on holly trees for their berries in the winter, especially at Arlington Echo because it is the only tree on site that blooms in the winter.*
3. You should be finished your walk and end down by the marsh. Walk out onto the marsh boardwalk and ask:
 - What is this area? *Marsh, Wetland*
 - What kind of animals live here? Why is this area important for those animals? *Birds, small mammals, fish etc. Wetlands have water and lands, provide a safe place for their young away from predators, and rich in food sources.*
 - Migrating birds use wetlands along their migration routes for food and shelter.
 - Play the bird migration game where you set it up with the Arlington Echo Staff (**Supplement F**).
4. Once you have finished the game, pass out the bags to the kids. Explain that inside the bag is an animal. These animals all hibernate in some way during the winter.
 - What is hibernation? *Hibernation is when animal or plant becomes inactive, or dormant, during the winter season.*
 - Along the way back to the stairs, they need to collect items that they think they will need for hibernation. There are duplicate animals so they can work in groups of 2-3.
5. Once you get back to the stairs at the end of the trail tell the kids “You have 5 minutes to build your hibernation home.” The kids can build them anywhere near the stairs like on the ground, in a tree, **make sure if they dig a hole they fill it back in and that it is off the trail.**
 - Once they are done, show them pictures of what some animal’s actual places for hibernation look like (**Supplement G**). Do theirs look similar? Why or Why not?
 - Discuss “What would happen with climate change? Would these animals still hibernate? Why or why not?” *Yes, because we will still have seasons. No, because temperature rise will make our area warmer.*
 - Make sure the kids grab their bags and animals, leave the resources they used there so that other groups may be able to find those same materials.

Assessment:

- Return to the overhang, collect their bags with the animals in them.
- Ask them:
 - What is Climate Change? *Climate change is any major change in the measures of climate that last for long period of time, 10 years or more. These include temperature, precipitation, wind patterns, and other effects.*
 - From what you learned today, what are some ways that animals or plants could be affected by climate change? *Some animals may not hibernate, migrating birds may not migrate anymore due to the loss of wetlands, tree distribution may change, lack of food for animals due to less trees, Changing weather patterns, animals may start moving east, like the cougar, etc.*
- Thank the students and ask them to wait for an Arlington Echo staff member to bring them to their next destination.

Module Debrief:

Once the students have finished both lessons, they will meet back up on the porch behind the Dining Hall to have a large group debrief. This will be an opportunity for students to tell an Arlington Echo staff member what they learned and discovered over the course of the two activities.

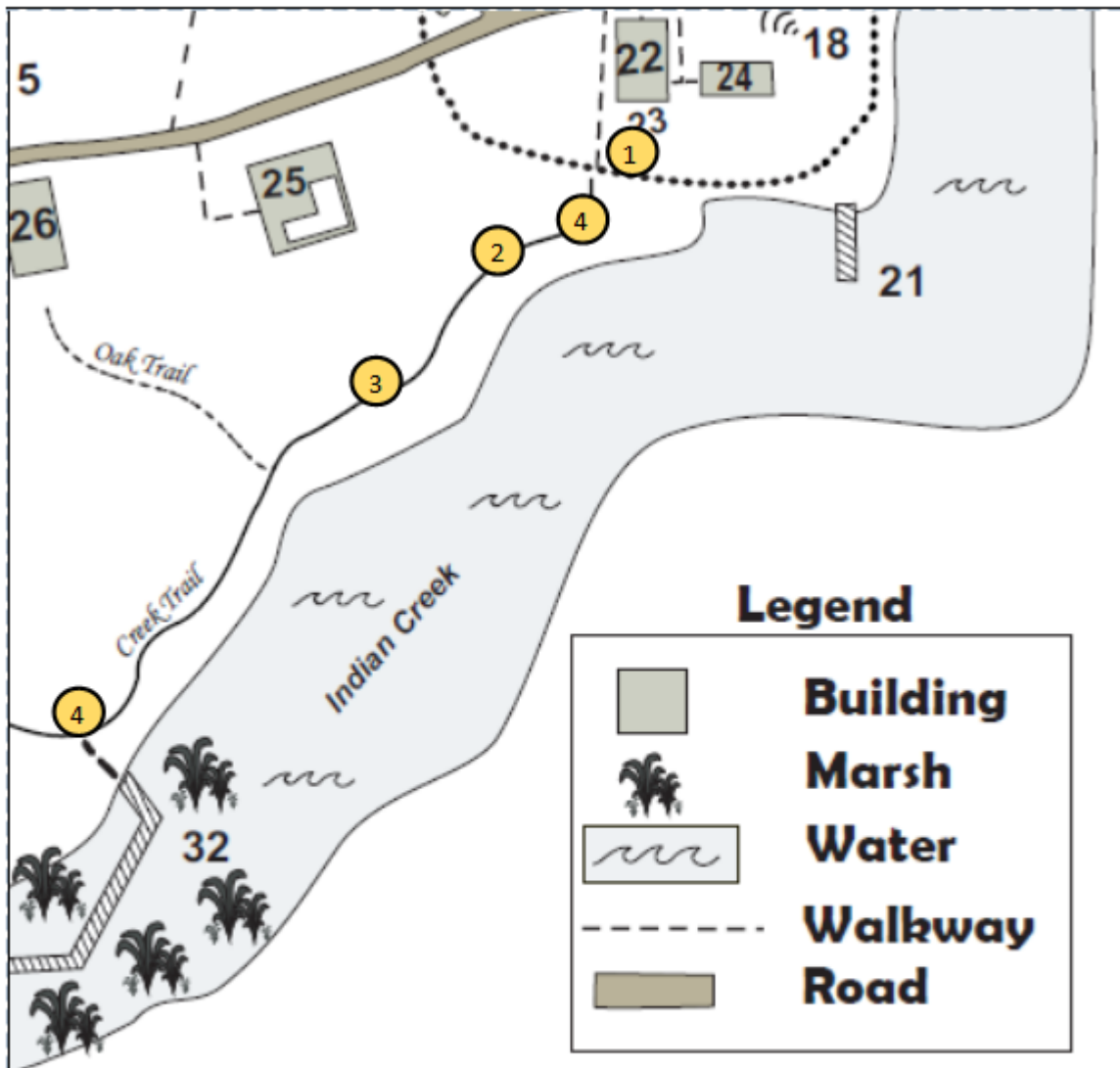
Notes for Clean up

Please clean up, organize, and return the lesson materials to their proper location (Resource Lab) at the end of the day. *Remember to inform the Arlington Echo staff if you need assistance, or if any materials are damaged or missing.*

Notes for Inclement Weather:

Arlington Echo encourages keeping our outdoor activities outdoors—even in the rain—but in the case of severe weather (thunder, extreme cold, etc.), the rain location for this activity will be determined at the time of your school's arrival and will be between buildings. Except for extreme conditions; this decision is made by Arlington Echo Staff and they will direct you appropriately. Student safety is our first concern.

Supplement A : Map of Trail with Stops



The circles represent stations of where you should stop for each activity. The Flipbook has corresponding pages for each stop. Number 23 on the map is the overhang where the lesson starts.

Station 1– Beginning and End of the Lesson

Station 2– Cougar Activity

Station 3– Tree Identification Activity

Station 4– Marsh and Bird Migration Activity

Station 5– Hibernation Home Building Activity

Supplement B: Climate Change Poster



Supplement C: Hiking in the Wilderness Poster

Rules for hiking in the wilderness:

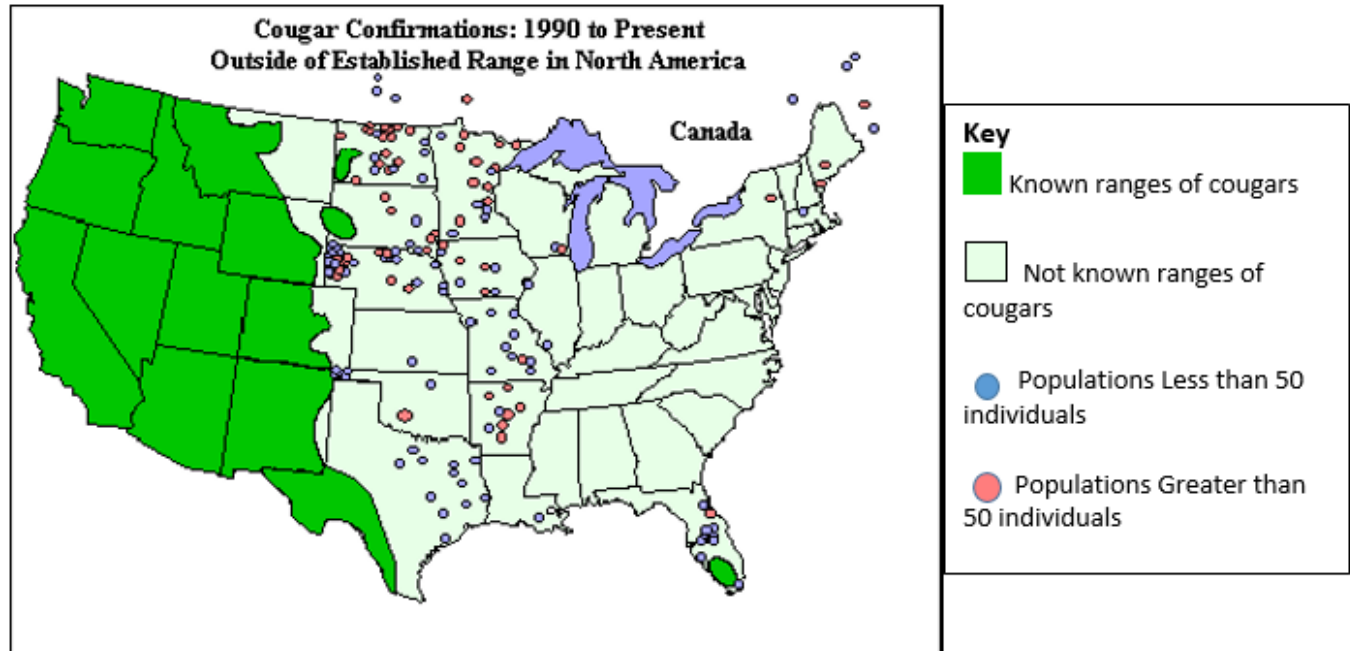
- Walk quietly
- Leave no trace. Leave anything that is found on the hike where it is. Never pick up anything that is living.
- Walk carefully and observantly. Use all your senses when on the hike. Listen carefully to the sounds of the woods, look for signs of animals, feel the bark of the trees, smell the air.

A cartoon illustration of two hikers, a man and a woman, walking through a lush forest. The man is wearing a blue cap and a yellow shirt, and the woman is wearing a red cap and a yellow shirt. They are both carrying backpacks and walking sticks. The forest is filled with green foliage, and there are several colorful butterflies (red, blue, and black) flying around them. A small stream flows in the foreground.

Supplement D-1, D-2: Cougar picture and distribution map

Picture of cougar is included in the lesson

Cougar Distribution Map



Red and blue dots are confirmed sightings of cougars outside of their normal living areas.

http://bioweb.uwlax.edu/bio203/s2008/cory_amy/habitat%20and%20geography.htm