

## Lesson: Follow the Footprints

\*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 can we reduce our energy use and help the environment?

**Unit/Lesson Sequence:** This is one of two lessons in the “Sustainability” module based at Arlington Echo.



### Content Standards:

#### Environmental Literacy Quarter 3

3.B.1.d. Explain and diagram how greenhouse gases increase thermal energy in the atmosphere and its effect on Earth’s temperature and systems.

6.A.1. Identify and describe natural changes in the environment that may affect the health of human populations and individuals.

#### Science

4.ESS 3.1 Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.

6.4.B.1. Recognize and describe that people in Maryland depend on, change, and are affected by the environment.

#### Common Core Standards for English Language Arts Standards- Speaking and Listening-4<sup>th</sup> Grade

##### Comprehension and Collaboration

- 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:** 45 minutes (times subject to change based on arrival to Arlington Echo)

### Student Outcomes:

- Students will be able to use background knowledge of climate change and environmental impacts of human actions to participate in the ecological footprint challenge course.
- Students will investigate how they can reduce their ecological footprint.

### Knowledge of the Learner:

- Prerequisite knowledge, skills and processes: Students should view the video Air Pollution in the Chesapeake Bay to gain an understanding of the effects of pollution in the atmosphere on the environment.
- Student needs, interests, previous learning: These will be identified in the Engage section.
- Conceptual difficulties: Understanding that our everyday choices impact the environment.
- Differentiation: This lesson will appeal to different types of learners. The auditory learner will do well hearing the facts at each challenge. The visual learner will do well seeing the real-life

examples of ecological footprint reduction strategies at each station. The kinesthetic learners will do well moving through the challenges.

**Knowledge of Content:**

• **Vocabulary:**

Ecological footprint	Conservation
Steward	Natural resources

• **Resources:**

Clue, Challenge, and Score Cards	“Sort it Out” items and labels	Soil
Footprint Poster	Potmakers	Newspaper scraps
Stopwatch (or phone stopwatch)	Acorns	Clothes and clothespins
Classifications Sheet	Fill the Barrel drops	Charade cards
Score-keeping marker/pencil	Board to draw on	Colorful markers
		Whiteboard

• **Supplements:**

A: Footprint Poster  
B: Challenge Score Card  
C: Challenges  
D: Map  
E: Conservation Point Classifications  
F: Vocabulary

**Instructional Delivery**

**Lesson setup:**

Arlington Echo staff will help you set up during your training. Materials will be kept in the Boat House. The ecological footprint poster, clue card 1, board with paint/coloring materials, and conservation point classification sheet should stay at the lesson’s meeting station (either the picnic table by the Boat House or West Cabin). Challenge materials and clue cards will be distributed to the various stations as a staff person goes through training with you.

**Engage:**

1. Meet students at the picnic tables by the Boat House (or in West Cabin during cold or inclement weather).
2. Introduce yourself and welcome students to the ‘Follow the Footprints’ challenge!
3. Show students the “How big is YOUR footprint?” poster and explain that just like we leave behind footprints when we walk on sand at the beach, we also leave behind an “ecological footprint” on the Earth based on the resources we use and the waste we create.
4. Briefly discuss the resources we use and the types of waste or pollution we create that make up our ecological footprint (**Supplement A**).
5. Ask students “do you think the average American has a small or large ecological footprint compared to the rest of the world?”

- a. *Large, according to the Global Footprint Network, the U.S. has the third largest footprint per person, and the second largest footprint per country.*
6. Have students guess how many Earths worth of space and resources we would need if everyone in the world (about 7.5 billion people) had as large of an ecological footprint as the average American?
  - a. *About 4...that's not sustainable!*
7. Ask students "why is it important to keep your ecological footprint small and conserve (*use less of, save*) resources?"
  - a. *Because there is a limited amount of resources*
  - b. *So there are enough resources for other people, living things, and future generations*
  - c. *Because we only have one Earth*

### **Follow the Footprints challenges:**

We will work as a team and "follow the footprints" through a series of challenges that reduce our ecological footprint. Depending on how well the group completes the challenges, they will earn "conservation points". At the end, they will find out what level of environmental stewardship they have achieved!

### **Explore:**

1. Read the first clue, then "Follow the footprints" to the first challenge! **(Supplement D)**.
2. At each stop, ask if the kids can guess what their challenge is, based on the clue. Explain anything they didn't figure out (i.e. time constraints, how the points work, etc.).
3. After completing each challenge and before you travel to the next challenge, read the rhyming clue and see if the kids can figure out what their next challenge will be.
4. "Follow the footprints" (footprint markings) to the next challenge around the loop **(Supplement D)**.
5. As you travel with the group, keep score of points using the scorecard **(Supplement B)** and the descriptions of challenges and challenge scoring **(Supplement C)**.  
*\*Don't forget about the bonus points available at certain challenges and the ROADBLOCK (as indicated in Supplements B and C)—bonus questions should be posed to students after completing the specific challenge OR at the end of the lesson*
6. Once you complete the loop and return to the picnic tables by the boat house, ask the remaining bonus questions (if you haven't already) and have students add up their group's points to find their total score.

### **Explain:**

Once students total their conservation points, read their classification **(Supplement E)**. Remind students that, regardless of how few or many points they earned, there is always room to improve. At the end of each classification description, there is a question in italics asking students how they can reduce their ecological footprint.

### **Elaborate**

#### **Action Project:**

- Inform the students that today they will be 'Taking Action' to help conserve energy by doing an action project.
- Students will think of ideas of projects they can do here at Arlington Echo to help conserve energy while the instructor records them on the whiteboard, and then vote on which project to do.
- There will be several possible action projects to conserve energy set up around Arlington Echo's campus. Projects may include planting, letter writing, poster making, and more. Based on what the students voted for, they will work on one of these projects.

**Evaluate:**

- *What other strategies could we use to reduce our footprint besides the ones we learned in our challenges?*
  - Carpool, use public transportation, bike, or walk when possible
  - Eat and shop sustainably
  - Reduce electricity use at home
  - Enjoy the outdoors whenever possible 😊

**Notes for Clean Up:**

Please clean, organize and return the lesson materials to their proper locations at the end of each day of instruction. Remember to inform the Arlington Echo staff if you need assistance or if any materials are damaged or missing.

**Notes for Inclement Weather:**

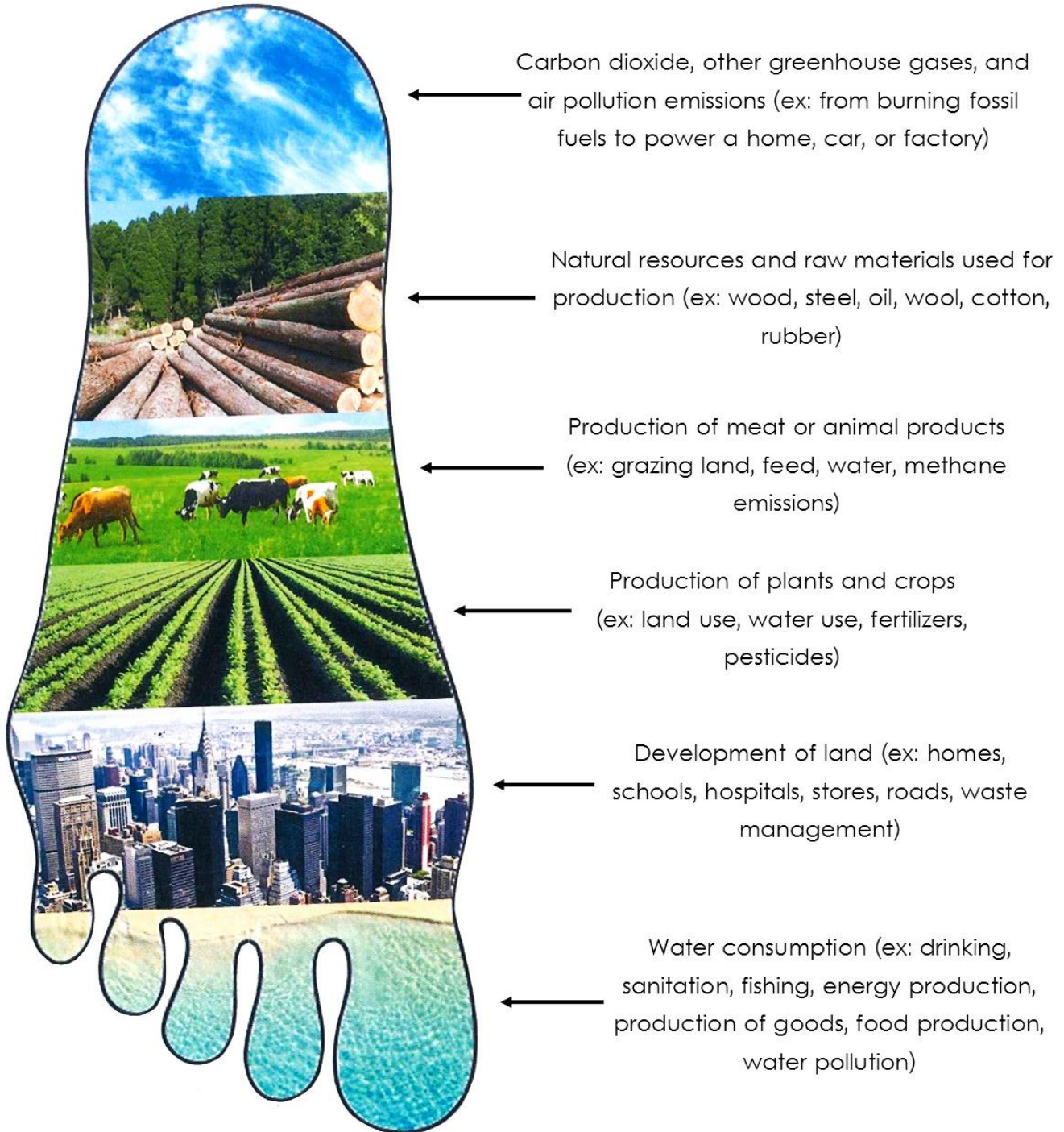
Arlington Echo encourages keeping our outdoor activities outdoors—even in the rain—but in the case of severe weather (thunder/lightning extreme cold, etc.), the rain location for this activity will be inside West Cabin. An alternate activity will be given to the instructor in case of inclement weather.

**Notes for Morning Set Up (Overnight Trips)**

Remember to set up your materials and be at your activity's location before morning lessons begin.

**Supplement A: Footprint Poster with Explanations**

# How big is YOUR footprint?



**Supplement B: Follow the Footprints Challenge Score Card**

<b>Group #:</b>	
Sort it Out	
Clothesline Relay	
Fill the Barrel	
BONUS POINTS	
<b>Total # Conservation Points:</b>	

**SCORING:**

**Sort it Out**  
1 point for each item sorted  
correctly  
Maximum: 20

**Clothesline Relay (timed)**  
< 1:00 min. = 20 points  
1:00-1:30 min. = 15  
1:31-2:00 min. = 10  
> 2:00 min. = 5

**Fill the Barrel**  
7-8 drops = 20 points  
5-6 drops = 15  
3-4 drops = 10  
1-2 drops = 5

**Maximum Possible Points: 100**