

Lesson 11

Climate Change



Unit Title: Climate Change	
Theme: Ecosystems & Cycles	Grade Level: 9-10
# of sessions for the unit: class period(s) 2-3 (~45min each)	Session #11: Individual and Community Solutions
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Unit Description

Provided in a separate document. *Please see High School Curriculum Overview.*

Standard(s)

HS-LS2-7. Analyze direct and indirect effects of human activities on biodiversity and ecosystem health, specifically habitat fragmentation, Introduction of non-native or invasive species, overharvesting, pollution, and climate change. Evaluate and refine a solution for reducing the impacts of human activities on biodiversity and ecosystem health.

Unit Goals

Students will understand the causes and effects and possible solutions of climate change with an emphasis on carbon sequestration (capture)

Lesson Objectives & Essential Vocabulary

Students will describe and develop individual and community solutions to reduce the local carbon footprint.

Essential vocabulary:

- carbon footprint
- habit change
- sustainability
- food security

Note any potential barriers to the lesson — consider variability

Vocabulary/reading ability — provide scaffolding, diagrams to clarify text, vocab assignments: word splash, etc.

Writing skills: solution provide writing prompts or sentence frames

Graphic organizers, chunked instructions for action plan.

Evaluation/Assessment

(directly linked to the goals, i.e., Formative/Ongoing Assessment or Summative/End of Lesson Assessment)

Assess guiding question for ‘Human Footprint’

Assessment of local footprint compared with developed and developing countries

Food log check off

Rubric to assess individual and community Action Plan

NOTE: Consider the [UDL Guidelines](#) in selecting methods and materials to ensure that you provide options for engagement, representation, and action and expression.

Methods

(e.g., Anticipatory Set, Introduce and Model New Knowledge, Provide Guided Practice, Provide Independent Practice)

1. Preteach vocabulary and activate prior knowledge: The vocabulary list is short, and 2 of the terms have already been introduced. With everything students have learned throughout this whole unit, students should be able to infer the meanings of the new vocab terms. As an activity, pass out an index card to each student. Have student write the 4 essential vocabulary terms on the index card. Ask students to write 2-3 sentences showing how the vocab terms are related to each other. Students can pair-share their sentences, then share out with the rest of the class.
2. Students will calculate the carbon footprint for their household.
<http://web.stanford.edu/group/inquiry2insight/cgi-bin/i2sea-r2b/i2s.php?page=calculate>
Student’s individual data can be compared to the carbon footprint activity students did at the beginning of this unit. The class should be looking to see if, over the course of this unit, students (and their families) have made any lifestyle or habit changes in light of what they’ve learned regarding climate change. (*there are many carbon footprint calculators available online. There is another link to a second carbon footprint calculator below in materials. Feel free to use one provided, or use one you may be familiar with or have found on your own)
3. Students can determine carbon footprint for their school, community, etc. Students can locate representations of the carbon footprint by states and by countries. Additionally, students could complete a comparison with their data and that of developed and developing companies.
4. Food analysis activity: Have students look at foods in grocery store and log where it comes from which leads to a discussion surrounding the carbon footprint of that food which will hopefully lead to the solution of buying local and food sustainability. Article: “Your food choices affects earth’s climate”. <https://www.sciencenewsforstudents.org/article/your-food-choices-affect-earths-climate/>
5. Show National Geographic’s documentary, “The Human Footprint” with guiding questions (available online). *Suggestion: preview the documentary and decide if you would benefit from showing it in its entirety, or showing brief excerpts.*
6. Finally, have students develop an action plan on an individual/family/community level for reducing carbon footprints. Action plan could be presented to school/community as a powerpoint, poster, podcast, video.

Materials

1. Text materials Miller & Levine Biology, environmental science text would suffice, access to online research (chromebooks, laptop cart, library/media center). Rubric for student generated video/podcast/movie
2. Bozeman Science video link: Renewable energy <http://www.bozemanscience.com/ap-es-028-renewable-energy/> there are several other bozeman science videos that would be applicable

3. Calculating your carbon footprint
4. www.chicagobotanic.org/downloads/nasa/Unit_4_Grades_10-12_Activity_4.2_CalculatingYourCarbonFootprint.pdf