

Lesson 1

Climate Change



Unit Title: Carbon Cycles through Ecosystems	
Theme: Ecosystems & Cycles	Grade Level: 9-10
# of sessions for the unit: 1-3 suggested 2-3 class period(s) (~45min)	Session #1: What is Climate?
Date created: Summer 2017	Authors: J. Andrews, J. Lichtenwald, R. Rex, E. Sabo

Unit Description

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

Standard(s)

Based upon the 2016 MA Science & Technology/Engineering Curriculum Framework

HS LS 2-1. Ecosystems: Interactions, Energy and Dynamics Analyze data sets to support explanations that biotic and abiotic factors affect ecosystem carrying capacity

Unit Goals

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

Lesson Objectives & Essential Vocabulary

Students will be able to differentiate between weather and climate and recognize climate differences in various biomes.

Essential vocabulary

- weather
- climate
- micro-climate
- abiotic factors
- biotic factors
- biosphere
- latitude
- longitude
- altitude
- biome

- ecosystems

Note any potential barriers to the lesson — consider variability

Vocabulary/reading/writing ability — provide scaffolding, diagrams to clarify text, vocabulary assignments: word splash, etc. sentence starters, writing prompts, sentence frames, text to speech software

Background knowledge: search youtube for a short video to illustrate the term

Evaluation/Assessment

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

Students will be able to differentiate between weather and climate and recognize climate differences in various biomes.

Demonstrate a working knowledge of the difference between weather & climate by:

- daily informal check ins:
- vocabulary quiz, worksheets

Group (small group large group whole class)presentation (multiple options written format, picture form, verbal video:) following teacher rubrics

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)

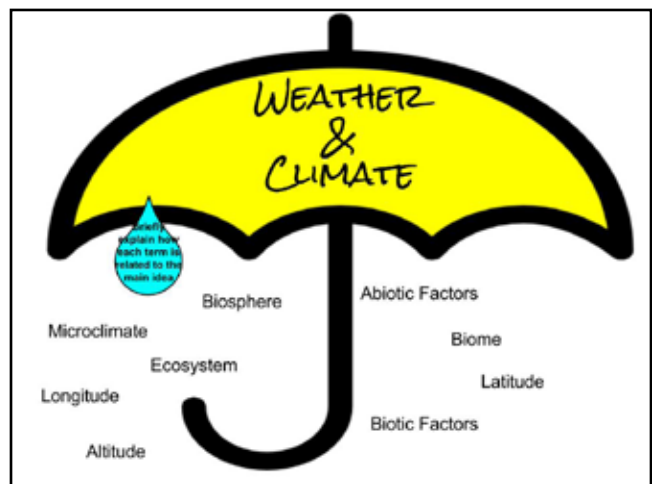
Before beginning the unit, as a pre assessment, students will determine their carbon footprint: <http://web.stanford.edu/group/inquiry2insight/cgi-bin/i2sea-r2b/i2s.php?page=calculate#>(provide print, speech to text options so all can access the pre assessment)

Pre-teach the vocabulary and activate prior knowledge (see main idea umbrella vocab activity listed in materials): https://docs.google.com/a/gloucesterschools.com/drawings/d/1A11tRHAAD5XL-658CrjT41VNYG13jzw_OWdEZ4Ev_-A/edit?usp=sharing

Teacher will introduce lesson using multimedia approach showing pictures of different regions, have students brainstorm location and characteristics of regions, then discuss weather patterns vs. climate conditions.

Teacher will provide a working definition of climate and weather.

At any time during Lesson 1, you could show the following video from the National Academies of Science,



Engineering and Medicine. What is Climate? Climate Change, Lines of Evidence: Chapter 1: <https://www.youtube.com/watch?v=qEPVyrSWfQE&list=PL38EB9C0BC54A9EE2&index=1>

Students will work in cooperative groups (option: students can choose to work individually) to research (in text, online) different terrestrial and aquatic biomes focusing climates, longitude, latitude, world location they report out findings in google slides/poster presentation. Students can rehearse presentation with a peer. Presentations do not have to be classwide. Options include presentation to teacher only, present a video of the student presenting, jigsaw presentation

Students will interpret graphs of various biomes. The students will compare the climate of various biomes to differentiate between various climates. Enrichment opportunity: students can develop climate graphs of the biome they researched.

Students will demonstrate an understanding (write an explanation) of the difference between weather and climate.

Materials

1. Text materials *Miller & Levine Biology chapter 4: Climate* but any Biology or environmental science text would suffice
2. access to online research (chromebooks, laptop cart, library/media center).
3. Online pics of various biomes to show students, world map, TED Talks: topic Climate Climate
 - A. Carbon footprint: <http://www.alamedaschool.org/NewsNotes/Earthweek%20challenge%20log.pdf>
 - B. word splash using essential vocabulary: https://docs.google.com/a/gloucesterschools.com/drawings/d/1A11tRHAAD5XL-658CrjT41VNyG13jzw_OWdEZ4Ev_-A/edit?usp=sharing

Notes and Comments

Should your students have solid prior knowledge regarding weather and climate, teachers can proceed directly from discussion generated from multi-media intro into the research portion of the lesson. Teachers are encouraged to generate tests or quizzes based on essential vocabulary and lesson objectives.