

Grade: 9 th Living Env	Topic: Climate Change and its Effects	# of Lessons: 3
Brief Lesson Description: Students will learn about climate change, data to support and then predict what bird species' habitats be changed in the near future due to the effects of climate change.		
Performance Expectations:		
<p>Specific Learning Outcomes:</p> <p>SWBAT discuss green house effect and different laws in play for the past 200 years</p> <p>SWBAT discuss different perspectives on climate change</p> <p>SWBAT find evidence of climate change and its effects</p> <p>SWBAT find evidence on human made climate change and argue various view points</p> <p>SWBAT compare different changes in climate and then model the effects for the next 100 years</p> <p>SWBAT determine changes in animal (bird) species using their model</p> <p>SWBAT create a poster of their models and present their findings</p>		
Narrative/Background Information		
Prior Student Knowledge: Students will not need any previous info but may have some information about photosynthesis and respiration, Carbon dioxide but it is not necessary		
<p>Science and Engineering Practices: Obtaining, Evaluating, And Communicating Information</p> <p><u>Developing and Using Models</u></p>	<p>Disciplinary Core ideas:</p> <p>ESS3: Earth and Human Activity</p> <p>LS2: Ecosystems: Interactions, Energy, and Dynamics</p> <p>PS3: Energy</p> <p>Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem. HS-LS2-4</p> <ul style="list-style-type: none"> • MP.4 - Model with mathematics. (HS-LS2-4) • HSN-Q.A.3 - Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. (HS-LS2-4) • HSN-Q.A.2 - Define appropriate quantities for the purpose of descriptive modeling. (HS-LS2-4) 	<p>Crosscutting Concepts:</p> <p>Patterns in the natural world can be observe</p> <p>Cause and Effect</p> <p>Systems and System models</p> <p><u>Models (e.g., physical, mathematical, computer models) can be used to simulate systems and interactions—including energy, matter, and information flows—within and between systems at different scales. (HS-LS2-5)</u></p>
Common Core State Standards: ELA/Literacy		

RST.11-12.1 - Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account. (HS-LS1-6), (HS-LS2-3)

SL.11-12.5 - Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. (HS-LS1-5), (HS-LS1-7)

WHST.11-12.9 - Draw evidence from informational texts to support analysis, reflection, and research. (HS-LS2-3)

WHST.9-12.2 - Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. (HS-LS1-6), (HS-LS2-3)

Mathematics

HSN-Q.A.1 - Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays. (HS-LS2-4)

HSN-Q.A.2 - Define appropriate quantities for the purpose of descriptive modeling. (HS-LS2-4)

HSN-Q.A.3 - Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. (HS-LS2-4)

MP.2 - Reason abstractly and quantitatively. (HS-LS2-4)

MP.4 - Model with mathematics. (HS-LS2-4)

LESSON PLAN – 5E Model

Engage: # class period 1 80 minute block

Objective: 5 SWBAT discuss green house effect and different laws in play for the past 200 years

Students will first have a discussion with 2 questions at Do Now

- 1) What do you think of when you hear the words “climate change”?
- 2) How long do you think scientists have been talking about the green house effect and climate change?

- Students will be given different “ timeline cards and “Climate Science Timeline” handout. They will work together to add the timeline on the floor and use the CO2 levels to make the graph of CO2 levels and the timeline of science and policy events.
- Students will answer the reflection questions on the handout and
- Class will end in watching a 13 minute video on Climate Change video from Forest Service

Explore: # class period 1 block

Objective: SWBAT find evidence of climate change and its effects

Students will start with the Fact or Fiction handout. They will try to make a determination about 8 “facts.” They will also discuss what their evidence for or against the 8 “facts” Students will then grab the “student perspectives” handouts and discuss different view points.

Students will get into small groups and discuss

Explain: # class period: 1-2 blocks

Objective: SWBAT discuss different perspectives on climate change

Students will get into different cards (#1-4) they will read over their given perspective and given some time to look up information for their perspective

They will then find the other 3 numbers (if they are a 3, find a 1,3 and 4) they will then get into groups and follow the handout to have a discussion from each of their perspectives.

Students will be reminded to be objective and use evidence to strength their position.

They will then discuss how they felt throughout the process and their personal beliefs on climate change after completing this activity.

Elaborate: # class period: 2 blocks

Objective: SWBAT compare different changes in climate and then model the effects for the next 100 years

SWBAT determine changes in animal (bird) species using their model

Students will be given "atlas guide" and use it learn about the modeling software online.

Students will learn about predictors of model changes to determine what the area will look like in 2100.

Students will learn about most likely animals to leave and stay backed on PCM-Low, GCMs-High and GCMs Low)

Student will then look at effects of those birds entering or leaving the local habitat.

Evaluate: # class period 2 blocks

Objective: SWBAT create a poster of their models and present their findings

Students will make a poster/ppt of their model and effects.

They will get into groups and determine if the students models are similar to others. They will get into groups of 1-3 students and design a poster using the rubric provided.

Students will present their model and back up using the evidence gained from the "atlas guide"

Students use "Poster Rubric" to construct their poster and then present their poster/ppt to the class.

Materials

Engage: 200ft paper or tape measure, Timeline handouts, timeline cards and CO2 levels cards

Climate change video

Climate change perspective index cards

Clearing the air handout

Atlas guide Handouts

Computer

Poster Rubric

Powerpoints for all sections

Fact or Fiction handout
Natural causes of Climate change perspectives
Role playing cards
Role Play guide handout

Images

All in powerpoint

Websites/Videos

https://www.youtube.com/watch?v=rr2W14ae_al

<https://sfccpl.org>