

Marietta City Schools

2023–2024 District Unit Planner

Grade & Course: Environmental Science	Topic: Climate Change	Duration: 6 Weeks
Teachers: Hunter Fisher, Diana Perez, Jeremy Armstrong, De’Vante Tremble		
Georgia Standards and Content: SEV2. Obtain, evaluate, and communicate information to construct explanations of stability and change in Earth’s ecosystems. a. Analyze and interpret data related to short-term and long-term natural cyclic fluctuations associated with climate change. (Clarification statement: Short-term examples include but are not limited to El Niño and volcanism. Long-term examples include but are not limited to variations in Earth’s orbit such as Milankovitch cycles.) b. Analyze and interpret data to determine how changes in atmospheric chemistry (carbon dioxide and methane) impact the greenhouse effect. SEV4. Obtain, evaluate, and communicate information to analyze human impact on natural resources. a. Construct and revise a claim based on evidence on the effects of human activities on natural resources. b. Design, evaluate, and refine solutions to reduce human impact on the environment including, but not limited to, smog, ozone depletion, urbanization, and ocean acidification. Climate change is caused by factors such as biotic processes, variations in solar radiation received by Earth, plate tectonics, and volcanic eruptions. Certain human activities have been identified as primary causes of ongoing climate change, often referred to as global warming.		
Narrative / Background Information		
Prior Student Knowledge: (REFLECTION – PRIOR TO TEACHING THE UNIT) Allow students to post discussions of their understanding of climate change using padlet, KWL, or CER charts.		
Year-Long Anchoring Phenomena: (LEARNING PROCESS) Human activities have negatively impacted ecosystems, global climate, energy resources, and population.		
Unit Phenomena (LEARNING PROCESS) If emissions continue to rise at the present rate, the global average surface temperature will rise between two and six degrees by the end of this century due to the amplification of the greenhouse effect.		
MYP Inquiry Statement: Climate change is caused by factors such as biotic processes, variations in solar radiation received by Earth, plate tectonics, and volcanic eruptions. Certain human activities have been identified as primary causes of ongoing climate change, often referred to as global warming.		

MYP Global Context:

Scientific and Technical Innovation

Approaches to Learning Skills:

Developing and Using Models
Engaging in Argument from evidence
Obtaining, evaluating, and communicating information
Collect and analyze data

SEPs

Analyze and Interp Data

Constructing Arguments

Asking Questions and Design Solutions

Develop and Use Models

Planning and Carrying out Investigations

Obtain, Evaluate, Communicate information

Using Math and Comp Thinking

**Disciplinary Core Ideas:
(KNOWLEDGE & SKILLS)**

Changes in the atmosphere due to human activity have increased carbon dioxide concentrations and thus affect climate change.

- Short term Natural Cyclic fluctuations
- Long term Natural Cyclic fluctuations
- Atmospheric Chemistry
- Greenhouse Effect
- Human Impact on Natural Resources

**Crosscutting Concepts:
(KNOWLEDGE & SKILLS)**

Patterns (CC)
Cause & Effect (CC)
Systems & System Models (CC & MYP)
Stability & Change (CC & MYP)

MYP Key and Related Concepts:

Patterns and Environment

Possible Preconceptions/Misconceptions: (REFLECTION – PRIOR TO TEACHING THE UNIT)

It's still cold. Climate change is not real.

This has always happened. There is nothing we can do about the earth getting warmer.

One country can't make a difference in slowing down the effects of climate change.

Natural climate change in the past implies that current climate change is also natural.

Vocabulary: (KNOWLEDGE & SKILLS)

Greenhouse effect

climate change

atmospheric chemistry

La Nina

El Nino

Milankovitch Cycles

Inquiry Questions:**Factual**

How do Greenhouse gasses affect climate conditions?

Explain how each greenhouse gas affects environmental conditions?

Conceptual

How would you determine the relationship between carbon dioxide and climate change?

Suggest a way to reduce Humanity's effect on Climate Change.

Suggest a way to remediate Humanity's effect on Climate Change.

Debatable

Is human activity enough to alter atmospheric chemistry?

Would atmospheric chemistry be changing without Human activity?

Is the Earth's average temperature changing at an unnatural rate?

What potential government regulations would be effective in reducing the rate of Climate Change?

Are current consequences enough to deter intentional damage to the environment?

MYP Objectives	Summative assessment		
Sciences Design	Assessment Task: Short term and long term causes of climate change Prezi Unit 2 Assessment	Relationship between summative assessment task(s) and statement of inquiry: Summative assessments will allow students to demonstrate their understanding of the long and short term causes of climate change.	
Unit Objectives:			
Learning Activities and Experiences	Inquiry & Obtain: (LEARNING PROCESS)	Evaluate: (LEARNING PROCESS)	Communicate: (LEARNING PROCESS)
Week 1:	Milankovitch cycles El Nino La Nina Volcanic Eruptions	Past vs Present Climate Change Activity https://ncse.ngo/sites/default/files/TMEO%20Lesson%203%20-%20Past%20and%20Present.p df	Create a Google Slides presentation to discuss the short and long-term effects of natural events that affect climate change.
Week 2:	Students will investigate the climate patterns of ENSO. Article and Questions	Students will analyze and interpret data related to short-term. ENSO Graphing Activity	Students will compare and contrast: El Nino vs La Nina Venn Diagram Formative Quiz Quiz w/ Answers
Week 3:	Greenhouse effect--atmospheric chemistry Students will investigate heating of containers with and without heat-absorbing materials to simulate	Students will graph their data, create axis labels, legends, and answer written prompts that guide them to analyze their data	Students will apply their data skills to real world carbon and temperature data Summative quiz on graphing and greenhouse effect

	greenhouse gas absorption of heat.		
Week 4: Human Impact/Formative	Human Impact - the Human Element? https://thehumanelementmovie.com/	Will there be enough freshwater? https://ngss.nsta.org/Resource.aspx?ResourceID=409 Interactive Simulation, Model, Activity, 100% online. Students will submit their formative results to the teacher.	PIXTON (Comics and Storyboard Template Program) Activity for Human Sustainability - "Factors Influencing Human Activity". https://www.pixton.com/schools/teacher-resources/lesson-plans/human-sustainability#activity-factors-influencing-human-activity
Week 5: Summative	Review for tests using Quizizz and Kahoot.	Discovery Education Science Techbook Constructed Responses	Discovery Education Studio Board presentations
Week 6: Remediation	Extension Lab	Remediation Quizzes	
Resources (hyperlink to model lessons and/or resources): https://www.turnersgraphoftheweek.com/ Turner's Graph of the Week Discovery Education Science Techbook			
Reflection: Considering the planning, process and impact of the inquiry			
Prior to teaching the unit	During teaching	After teaching the unit	
Allow students to post discussions of their understanding of climate change using padlet, KWL, or CER charts.	Students are making connections between carbon dioxide and temperature and the role that humans have played. Teachers are spending more time discussing long and short-term causes of climate change.	Students were able to demonstrate a strong understanding of the content. Teachers were more intentional and focused more on providing instructional materials related to Milankovitch Cycles. The students retained more information as a result.	

