

T=10G./ Fellow Unit Template *

Subject: Science Grade: 8 Unit Title: Effects of Climate Change Time Needed: 4 weeks?

Unit Summary: Students will research how climate change has affected nations around the globe by analyzing weather data and then apply their research and scientific knowledge to design methods to monitor and reduce the impact of climate change in a nation of their choice. The United Nations Sustainable Development Goals (specifically Goals 7, 11, 12, and 13) shall be used as frameworks the students shall draw upon as they resolve the challenges.

Stage 1 Desired Results

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| <p>ESTABLISHED GOALS:</p> <ul style="list-style-type: none"> ● Students will learn about the United Nations Sustainable Development Goals <ul style="list-style-type: none"> ○ Take urgent action to combat climate change and its impacts ● Students will practice communication, cooperation, critical thinking, and problem-solving with partners and within small groups. ● Students will use science and engineering skills to address climate-change issues around the world. <p>Next Generation Science Standards:</p> <p>MS-ESS3-2 Earth and Human Activity Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.</p> <p>MS-ESS3-3 Earth and Human Activity Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.*</p> <p>MS-ESS3-4 Earth and Human Activity</p> | Transfer | |
| | <p><i>Students will be able to independently use their learning to...(real world purpose)</i> apply scientific concepts and problem-solving skills to real-world issues.</p> | |
| | Meaning | |
| | <p>UNDERSTANDINGS <i>Students will understand that...</i></p> <ul style="list-style-type: none"> ● sustainable development is a noble and worthy goal. ● a number of challenges stand in the way of sustainability and development here on Earth, yet there is evidence of positive change and reason for optimism. ● Climate change is now affecting every country on every continent . It is disrupting national economies and affecting lives; costing people, communities, and countries dearly today and even more tomorrow. ● Scientific concepts explain processes of the real world, they can and should be applied, through engineering and technology, to address current problems the world faces to day. | <p>ESSENTIAL QUESTIONS</p> <ul style="list-style-type: none"> ● What are the major causes of anthropogenic climate change? ● What are the effects of anthropogenic climate change? ● Why are more places at risk than others? ● How can science and engineering practices be used to solve real-world problems? ● What does it mean to be a global citizen? What responsibilities does this place on scientists? ● What is trans-nationalism? How has this idea been affected by climate change ● What is culture? Why is it important to consider culture when we develop solutions to global problems? ● How do events that occur in different places around the world affect us in Hawaii and vice versa? ● How can global change be started locally? |

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| <p>Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.</p> <p>MS-ESS3-5 Earth and Human Activity</p> <p>Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.</p> <p>Cross-cutting Concepts:</p> <ul style="list-style-type: none"> ● Patterns ● Cause and effect ● Scale, proportion, and quantity ● Systems and system models ● Energy and Matter: Flows, cycles, and conservation ● Structure and function ● Stability and change <p>GLOBAL COMPETENCY:</p> <ul style="list-style-type: none"> ● Investigate the World: students will learn about the effects of anthropogenic climate change on the world.. They will do their own research to identify an area of concern (Maldives, Yap, Ice caps/glaciers, Great Lakes region of Africa, etc), and design testable solutions for some of those problems. ● Recognize Perspectives: students will discuss how the effects of climate change abroad are similar to those in Hawaii. By discussing the similarities between these two places, they will be encouraged to show empathy for others ● Communicate Ideas: students will work together to solve problems. Students will share their solutions with the class. | <ul style="list-style-type: none"> ● they are global citizens, and their roles and responsibilities in a trans-national world. ● solutions to global issues must be inclusive of cultures ● local solutions can be found for global problems. ● there is no “one correct way” to address global issues. ● how having a global mindset will help them be college/career ready. | <ul style="list-style-type: none"> ● How can I better prepare myself for college and careers? ● What are the opportunities and challenges created by globalization? |
| Acquisition | | |
| | <p><i>Students will know... (Content)</i></p> <ul style="list-style-type: none"> ● The content of the United Nations Sustainable Development Goals (specifically Goal 13, and 7, 11, and 12 as they relate to 13). ● That they can affect real change in the world, no matter how small. ● content from the Next Generation Science Standards that applies to this topic: MS-ESS3-2,3,4,5. ● the global competencies. ● how anthropogenic climate change affects multiple places around the world. ● that culture is defined by the rituals, relationships, and restrictions of a group of people. | <p><i>Students will be able to... (Skills)</i></p> <ul style="list-style-type: none"> ● apply science and engineering practices to develop a solution and action plan to address Goal 13 of UNSDGs. ● work together in partners or small groups. ● express differing opinions respectfully. ● share and articulate solutions with students, teachers, and local climate change experts. ● use Thinglink to share research about their selected location ● develop solutions and actions plans that meet the needs of a specific region, including cultural considerations. ● use animoto, prezi, and google docs to collaborate and present their research and designs. |

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| <ul style="list-style-type: none"> ● Take Action: Students will use their research to develop a plan that they will put into effect in Hawaii to address Goal 13: Take urgent action to combat climate change and its impact. <p>Resources:</p> <ul style="list-style-type: none"> ● UNSDGs ● https://youtu.be/HnJ1bqXUnIM ● https://youtu.be/LLGSO4Avn68 ● https://youtu.be/oMO3U0UbREo ● https://www.youtube.com/user/TEDtalksDirector (to use as examples for TEDtalks) | <ul style="list-style-type: none"> ● terms: global citizenship, cosmopolitanism, transnationalism, global perspective, and globalization | <ul style="list-style-type: none"> ● express the importance of being a global citizen, as well as indicate HOW they engaged in global citizenship through this unit. ● express the benefits of a cosmopolitan mindset in preparing for college and future careers. |
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Stage 2 - Evidence

| Assessment | Evaluation Criteria (Learning Target or Student Will Be Able To) |
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| <p>Assessments FOR Learning: (ex: kwl chart, exit ticket, observation, draft, rehearsal)</p> | <p>In the beginning, students will establish questions they want to pursue throughout the unit. They will revisit these questions throughout the unit.</p> <p>They will write a K/W/L chart to track their own learning.</p> <p>At the end of each day, they will make short Twitter-style posts (on Google Classroom) to comment on what they've learned and what they're still confused about.</p> <p>They will write rough drafts of their TED-Talks.</p> <p>They will produce short Animoto clips as teasers of the TED Talks.</p> <p>Throughout the unit, I will make observations of their learning, provide guidance when necessary</p> <p>They will develop and revise scientific models that will explain the phenomena they are investigating.</p> <p>Each week, students will reflect on how they were global citizens and scientists as they worked and learned throughout the week</p> |
| <p>Assessment OF Learning: (ex: performance task, project, final paper)</p> | <p>Students will devise an experiment to more deeply investigate their chosen phenomenon, and write a formal lab report. They will use these findings in their TED Talk</p> <p>Students will write a proposal that will justify why their topic should be included in our Climate Change TED Talk.</p> <p>They will develop a presentation to give as a TED-Talk to faculty, students, and administration.</p> |

Stage 3 – Learning Plan

Summary of Key Learning Events and Instruction (Make this a useful outline or summary of your unit, your daily lesson plans will be separate)

Week One:

Students will watch **Before the Flood** and discuss. They will discuss the UNSDGs students will select 1 of the UNSDGs to use as a guiding theme as they select a topic to research. Share readings and TED Talks on Global Citizenship (homework), discuss TED Talks in class.

Week Two:

Students will further research selected UNSDG, and will select a nation/region to research how climate change has impacted the area, making sure to include stories of success (see graphic organizer). Produce Thinglink to share research. TED Talk proposal due

Week Three:

Students will develop and conduct an experiment relating to their topic. Continue to research. Read Article: Carry on Polluting. produce a rough draft of their TED Talk

Week Four:

Students will continue experiment (if needed). Conduct further research in their topics (local issues). Read Article: Cap and Trade. Revise drafts of TED Talks

Week Five:

Philosophical Chair: Can Global Warming be Stopped?. Conclude experiment, and write lab report. Develop infographic to share details of experiment. Conclude research.

Week Six-Seven:

Final draft of TED Talks due. Develop Animoto trailer for TED Talk (in school and community). Host TED Talks through week and after school.

****adapted from Understanding by Design Model***