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| **TGC Fellow Unit Template** | | |
| **Prepared by:** Elise Bostic **School/Location:** PREP Academy/ Denver, Colorado | | |
| **Subject:** Earth Science **Grade:** 9 **Interdisciplinary Unit Title:** Current and Future Impacts of Climate Change to Earth System  **Time Needed:** 15-20 days | | |
| Unit Summary:   * **Unit Introduction:** Melting Away Photo Essay and Climate Change KWL Chart (1-2 days), Flipgrid post about current knowledge of climate change, questions they have about climate change, and ideas they have to lessen the impact of climate change in their community * **Inquiry Lab:** Students will conduct a climate change lab to model one of the following phenomena: 1) melting ice and sea level rise 2) carbon dioxide and air temperature or 3) sea ice and ocean temperature (2-3 days) * **Science of Climate Change:** Students will learn the science behind climate change from 3-5 non-fiction text and various video clips. Students will answer comprehension questions and keep track of their learning using various graphic organizers. Students will take a 10 question quiz at the end of this portion of the UbD. (8-10 days) * **Global Connection to Climate Change:** Students will research how various countries are currently responding to climate change and participation in global climate change agreements (The Paris Agreement). Students will keep track of their learning using a graphic organizer. (1-2 days) * **Debate:** Students will be assigned a country (one that is taking steps toward mitigating climate change) to represent and will argue how their country’s plan of action is a model for others. Students will be required to research one country and present various points, supported by evidence, to present during the in-class debate. (2-3 days) * **Reflection:** Students will complete a two-three paragraph of their learning which includes future steps (an action plan) that they can take to mitigate climate change in their community. (2 day) * **Share Out:** Students will complete a second Flipgrid sharing their learning. These videos will be shown to other teachers and school staff. | | |
| STAGE 1: Desired Results | | |
| ESTABLISHED GOALS:   * Explain the science behind climate change using evidence * Compare and contrast the way various countries respond to climate change * Develop a clear and realistic plan of action to mitigate global climate change   GLOBAL COMPETENCY:   * Communicating ideas * Knowing and understanding multiple perspectives * Using critical and comparative thinking skills * Problem-solving abilities * Understanding global issues     TECHNOLOGY USED:   * Computers for research * Some sort of digital portfolio/info graph/college for their reflection     RESOURCES:   * **Unit Introduction:** [Melting Away Photo Essay](https://www.globalonenessproject.org/library?load=15) * **Inquiry Lab**: [Climate Change Inquiry Labs](https://pmm.nasa.gov/education/sites/default/files/lesson_plan_files/climate%20change%20inquiry/Climate%20Change%20Inquiry%20TG.pdf) * **Science of Climate Change**: [Denver Public Schools Climate Change LDC Teacher Resources](https://drive.google.com/drive/u/0/folders/0B244Wkqh3wtETDJQRXZ4Vk9JcWM) * **Global Connection to Climate Change:** [Climate Action Tracker](http://climateactiontracker.org/)   [ParisAgreement](http://unfccc.int/paris_agreement/items/9485.php)   * **Debate:** [Classroom Resources for Debates](http://www.educationworld.com/a_lesson/lesson/lesson304b.shtml) * **Reflection:** [Flipgrid](https://info.flipgrid.com/) | *Transfer* | |
| *Students will be able to independently use their learning to:*   * Investigate the science of climate change * Investigate environments beyond their own * Gain a deeper understanding of how different countries are responding to climate change * Develop a realistic plan to mitigate the impacts of climate change | |
| *Meaning* | |
| UNDERSTANDINGS  *Students will understand that:*   * The science of climate change is complex and data must be examined to fully understand the changes on Earth. * Different countries have responded to climate change differently, as shown through policies and actions taken * Climate changes result from alterations in Earth’s energy balance, which can have positive or negative impacts on ecosystems. * Climate change is an issues that impacts all organisms on Earth. | ESSENTIAL QUESTIONS:   * What is the science behind climate change? * How do different countries respond to climate change? * How can the impact of global climate change be mitigated? |
| Acquisition | |
| *Students will know:*   * What variables distinguish various world climates * What Earth’s energy balance means * What factors change Earth’s energy balance * What factors control climates * How climatologists predict climate changes? * What natural hazards result from climates and climate changes * What technology monitors and predicts climate changes | *Students will be able to:*   * Accurately describe climate change using scientific terms * Debate, in details, one country’s response to climate change * Develop a plan to mitigate global climate change in their community |
| **Stage 2 - Evidence** | | |
| **Assessment** | **Evaluation Criteria (Learning target or Student Will Be Able To)** | |
| Assessments **FOR** Learning: | * Participation and ideas regarding “Melting Away” photo essay * Climate change KWL Chart * Inquiry lab participation and lab analysis * Graphic organizers and comprehension questions after non-fiction readings | |
| Assessments **OF** Learning: | * Multiple-choice climate change assessment * Preparation and participation in debate * Digital reflection (including plan of action for student’s local community) | |
| **Stage 3 - Learning Plan** | | |
| **Summary of Key Learning Events and Instruction:**  **Week One**: Students will be introduced to climate change through pictures and be asked to share their current knowledge through a FlipGrid. Additionally, students will complete a climate change inquiry lab.  **Week Two and Three**: Students will complete a variety of readings and graphic organizers to help better understand the science behind climate change. Students will complete a multiple choice quiz at the end of this portion of the unit.  **Week Four:** Students will begin to look at climate change through a global lens and compare and contrast how various countries are responding to climate change. Students will participate in a debate as well as a final reflection. The debate and the final reflection will be moderated and viewed by members of the school community. | | |

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| **TGC FELLOWS UBD Lesson Template** | | |
| Lesson Title: How Various Countries Responds to Global Climate Change Subject: High School Earth Science Prepared by: Elise Bostic  Materials Needed: Computers, Focus Country Graphic Organizer  Global Competency: Recognizing Perspectives | | |
| **W**here is the lesson going?  (Learning Target or SWBAT) | Students will be able to describe the strengths and weaknesses of one country’s climate change action plan, in writing, by completing a graphic organizer using content specific language. | |
| **H**ook: | | **T**ailored Differentiation: |
| * During the mini-lesson I will show students two brief videos about the Paris Climate Accord:   + [History of Paris Agreement](http://time.com/4801344/paris-agreement-climate-deal-donald-trump/)  (3:11)   + [Bill Nye Discusses Coal and Climate Change](http://www.msnbc.com/the-last-word/watch/bill-nye-on-trump-s-climate-orders-clean-coal-is-a-myth-908849731869) (5:00)   + [President Trump’s on Paris Accord](https://www.npr.org/2017/06/01/531090243/trumps-speech-on-paris-climate-agreement-withdrawal-annotated) (about minute 5:00 to 7:00 and 12:00 to 14:00) * As a class, we will discuss the Paris Agreement and I will introduce students to the website which rates countries based upon compliance with the Paris Agreement. | | Struggling Learners:   * Students will be placed in heterogeneous pairs to help struggling learners. * Students will be given an example of a completed graphic organizer. * The graphic organizer for students with IEPs will be adjusted (reduced number of boxes and sentence starters)   Advanced Learners:   * Students who complete their graphic organizer early should begin preparing for their debate on why their country has the best climate change action plan. |
| **E**quip: | |
| * Students will work in pairs and view the website: [Climate Action Tracker](http://climateactiontracker.org/) and complete a graphic organizer about one of the following countries: Bhutan, Costa Rica, Ethiopia, India, or the Philippines (these countries have a 2 degree C compatible rating | |
| **Rethink and revise:** | |
| * Students will identify strengths and weaknesses of their country’s plan and begin to prepare for the class debate. * Students will conduct further research on the specifics of their country’s climate change action plan to understand the science behind the plan. | |
| **Evaluate:** | |
| * Students will share their completed graphic organizers with another group and receive feedback. | |
| Notes: | |
| **O**rganization: |
| * Have computers charged before class. * Load videos that will be shown to the class before class. |