Impacts of Climate Change 2/3

Type of Lesson: Practice

Description of lesson: Students will be analyzing, interpreting and drawing conclusions from climate data graphs and infographics. The purpose of this lesson is for students to learn to read climate data and also for students to be aware of all the impacts of climate change.

Enduring Understandings	**Essential Questions**
Climate is made up of multiple variables, a change in any of those variables can have a major impact on the planet	If predicted future impacts of Climate Change are as bad as the scientific community is predicting, is our home planet doomed or saveable?

Academic Standards:	**Student learning targets:**
HS-ESS3-1. Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity HS-ESS3-6. Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity. HS-ENV1-2.* Use a computational representation to illustrate that humans are part of Earth's ecosystems and how human activities can, deliberately or inadvertently, alter ecosystems HS-ENV1-3. Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.	● Students will be able to interpret climate data ● Students will be able to identify key elements to a climate data graph ● Students will be able to draw conclusions about climate change through interpreting data

Assessment task - Impacts of Climate Poster Project (On Lesson 3)

Differentiation:	**Accommodations:**
Interpreting data can be hard for students, it can be hard for adults too. For students who are struggling, doing the Data Dive worksheet as a class discussion might help. For students who are pros at analyzing data, pull more graphs from the IPCC AR5 and ask higher level Depth of Knowledge questions. Encourage students to create their own graphs based on data they receive.	● Pre-filled notes printed out for students ● Embedding the PowerPoint in the LMS so that students can follow along at their own pace ● Vocabulary as a reference only instead of having them fill it out ● The use of notes during assessments

Discovering the Science of the Environment

Prior Learning: • X and Y axis • Aspects of Climate (4 lessons) •	**Prerequisite skills:** • Identifying patterns •
Materials • Printed worksheets and notes • Or 1-1 devices so that students can fill in the worksheets and notes •	**Technology:** • Presenter • Youtube •

Vocabulary Development: See Lesson 1
In addition, students are learning/reviewing important data vocabulary. The following words students should be familiar with

- Trend
- X axis
- Y axis
- Variable
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Procedures:

Prior to the lesson, it is recommended the teacher review the following material:

- Please visit https://ourclimateourfuture.org/videos/ and watch the videos for Chapters 2, 3 and 4. This should take just under 15 minutes.
- Additionally, watch the videos found at the following links:
  - https://climate.nasa.gov/causes/
  - https://www.youtube.com/watch?v=70Vj4fnJA48
- Could read the NCA4 chapter on climate changes
  - https://nca2018.globalchange.gov/chapter/2/

Other Helpful Lesson-Specific Info: Becoming comfortable interpreting figures is an important skill for any scientist as no claims about climate change carry any weight without data to support it. Figures bridge the gap between raw data and consumable product which allows even the average layperson to understand what the data means. Being able to draw the intended conclusions of a figure is something that allows individuals (including young students) to develop a greater understanding of a topic.

Start the lesson with printed cards of the Graph and Major Trends Matching. Students will work to match the caption with the graph it corresponds with. At this stage it is alright if they do not know which graphs match with the caption. Have them try their best.

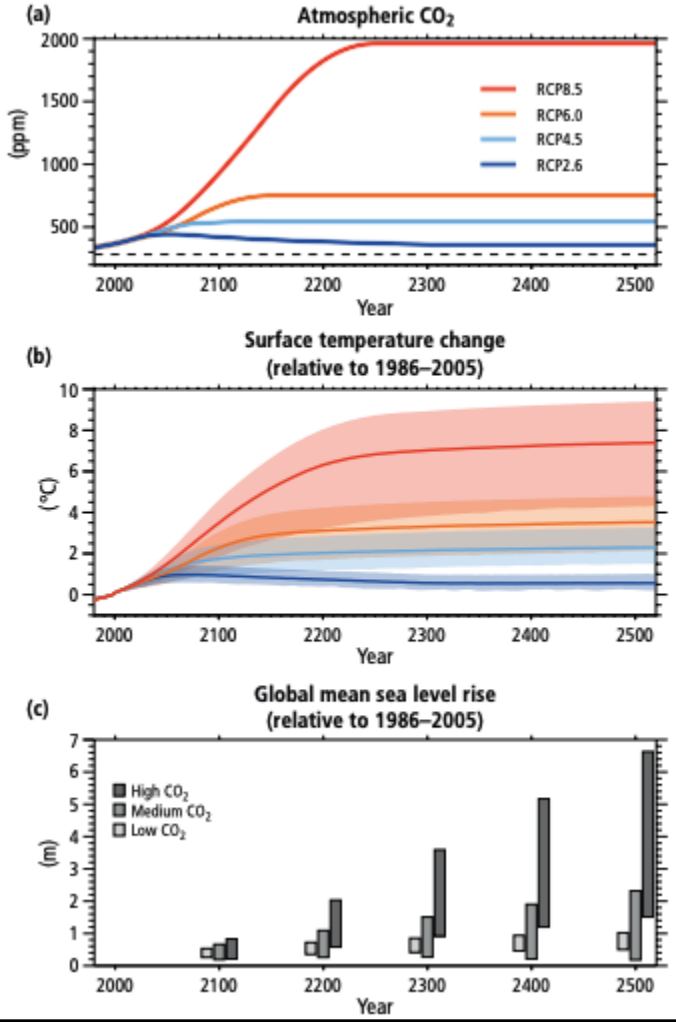
Next show the How to Interpret Climate Graphs PowerPoint. This presentation will help guide students through different parts and trends they might see on a climate graph. This presentation can be used as a classroom discussion or paired with the student note sheet for students to keep as reference.

Have students analyze the trends from the Graph and Major Trends matching. Have them identify the variables, x and y axis, the descriptions and the keys. Give students a couple of extra time to make adjustments to their matching based on what they have learned so far. Go around to each table and identify student mistakes. Guide students thinking to find the correct match

Next say, "I know analyzing climate graphs can be difficult, and oftentimes this is why people do not understand climate change. They do not know how to interpret the data. This is a very important skill to have so that some day when you are shown climate data on a news source or from a politician, you can interpret it yourself. Now we will be practicing this skill on your own"

Hand out the Data Dive worksheet - or have students do it on their devices.
The images in the Data Dive worksheet come from the IPCC AR5. These graphs can easily be swapped out for easier or harder data to interpret. However, the questions of the worksheet should be focused on interpreting the data and the impact climate change is having on the United States (or wherever the students live).

At the end of the lesson, consider an exit ticket where students analyze a graph. Use the following example or adjust it for your own classroom



Exit Ticket: For each graph, answer the questions below

1. What is the title of the graph?
2. What is the range of the x axis?
3. Why are there different lines and what do they represent?
4. What is the general trend of the graph?

Attach:
Graphs and Major Trends Matching
How to Interpret Climate Graphs PowerPoint
How to Interpret Climate Graphs Student Notes
Data Dive Worksheet