Impacts of Climate Change 3/3

Type of Lesson: Assessment

Description of lesson: Impacts of Climate Change mini poster project - This is the assessment task for this section of the unit. Students will be analyzing, researching, and synthesizing information about climate change and the impacts it has on their daily lives. This lesson is specific to Indiana; however, information about impacts of climate change for other midwest regions will be linked at the bottom of the lesson plan.

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 - Create a poster to educate others about the impacts of climate change in their region. Students will be assessed on the following SEPS: research skills, interpreting graphs, communicating results, professionalism, and

Differentiation:	**Accommodations:**
For lower ability students (middle school or students who need more scaffolding) - see accommodations For higher ability students (APES) - have individual students make a poster, instead of working in groups. Or have students make other forms of education materials. Some examples are: Websites, social media posts, videos, infographics, Have them assess the impact of certain media on the public - which format will reach the widest audience and sway the public the most?	● Instead of having students make posters from what they research and interpret, have students interpret posters and infographics that already exist. Create a worksheet with guiding questions to assess how well they can interpret graphs and climate data.

Prior Learning:
● Aspects of climate
	Prerequisite skills:
	● How to read a climate graph and interpret climate data
	● Critical reading skills
	  ○ Highlighting
	  ○ Pulling out important information

Materials ● Poster Paper ● Markers ● Color printer ● Access to the reading, either through their one-to-one device or a computer lab	**Technology:** Computers/iPads for student research If you want them to do digital posters use PowerPoint, Canva, Pages etc.

Vocabulary Development: Bellringer/Anticipatory Set covering some of the vocabulary they learned in the last lesson. For example, place a graph on the screen. Have students identify the **trend, key, variable, axis, title**…etc…

Procedures:

In this lesson students will be reading parts of the National Climate Assessment and Indiana Climate Report. For teacher homework you will need to review the following documents in order to familiarize yourself with them.
- National Climate Assessment - https://nca2018.globalchange.gov/
- Indiana Climate Change Impacts Assessment - https://ag.purdue.edu/indianaclimate/

This activity relies on a learning strategy called JigSaw. Instead of students reading the entire climate assessments, it is broken up into sections. Each student is responsible for learning the material in that section and reporting it to the rest of the class. The point of this activity is to give students the many, many impacts of climate change on their lives.

The following procedure is an example of how to set up this activity.
The teacher needs to divide the chosen reading into sections. These can be enough sections that each student gets a section, that each group in a classroom gets a section, or each group in each class gets a section. So for example, here is how I have split up the Indiana Climate Change Impacts Assessment
- Health
  - Heat related illnesses and impacts
  - Air quality
  - Insect borne illnesses
  - Water borne illnesses
- Forest Ecosystems
  - Forest Regeneration
  - Forest composition
  - Tree Growth and Harvest
  - Habitat and Other Benefits
  - Forest Products
- Urban Green space - make sure to read WHY we need urban green spaces
  - Responses of Urban Trees
  - Impacts on Green Infrastructure

- Agriculture
    - Agronomic Crops
    - Specialty Crops
    - Livestock and Poultry
    - Soil Health and Water Resources
    - Pests and Disease
- Aquatic Systems
    - Water Temperature
    - Amount and timing of water
    - Agriculture and nutrients
    - Lake Michigan
    - Invasive Species
- Tourism
    - Water based recreation
    - Land based activities
    - Sports and events
    - Winter tourism and recreation
- Energy
    - Statewide Residential Demand
    - Commercial Energy Demand
    - Urban heating and cooling demand
    - Future Electric Supply
    - Other climate and energy impact pathways

Students will pick a section under each heading. There are 30 sections - so that is about 1 section per student per class. However, if you have multiple classes, you can assign sections to different classes and do a giant gallery walk.

Have students read the section and create a poster with the following criteria.

Find your section and read how climate change is impacting your issue. You might also need to read other parts of the chapter such "Indiana's Changing Climate" and "Key Knowledge Gaps"

Construct a poster with your group that gives the following information about your topic

- **Describe your topic - how would you describe this to a small child?**
- **How is climate change affecting this issue? - read the Indiana's Changing climate section**
- **How will this topic impact the people that live in Indiana?**
- **Is there a way to manage this problem (can we fix it, or do we just deal with it?) - You might have to research other sources to find ways to fix or manage this issue**
- **Add graphs and pictures so that others who know nothing about climate change can understand!**

Once the posters are complete (my students took about a class period and a half) have students hang them up around the classroom or public space. Have students do a gallery walk and a peer review. The following list of questions could be used as a gallery walk scavenger hunt to get students engaged in the material.

1. How does climate change impact our health? (cite evidence from someone's poster)
2. How does climate change impact forest ecosystems (cite evidence from someone's poster)
3. How does climate change impact agriculture? (cite evidence from someone's poster)
4. How does climate change impact aquatic ecosystems? (cite evidence from someone's poster)
5. How does climate change impact water availability? (cite evidence from someone's poster)
6. How does climate change impact tourism and recreation? (cite evidence from someone's poster)
7. How does climate change impact energy? (cite evidence from someone's poster)
8. What impact of climate change will impact YOUR life the most?
9. Which impact of climate change do you think will be easiest to manage?
10. Which impact of climate change will impact the economy of Indiana the most?
11. Which impact are you most concerned about?

Resources for Teacher outside of Indiana
https://statesummaries.ncics.org/
https://nca2018.globalchange.gov/
https://nca2014.globalchange.gov/highlights/regions/midwest#:~:text=Extreme%20heat%2C%20heavy%20downpours%2C%20and,change%20is%20affecting%20the%20Midwest.

https://climatechange.chicago.gov/climate-impacts/climate-change-impacts-region

Attach: Example of the Poster Project