

U2D12&13 – Carbon Dioxide
and Temperature Data



U2D12 – Bell Ringer – 11/11

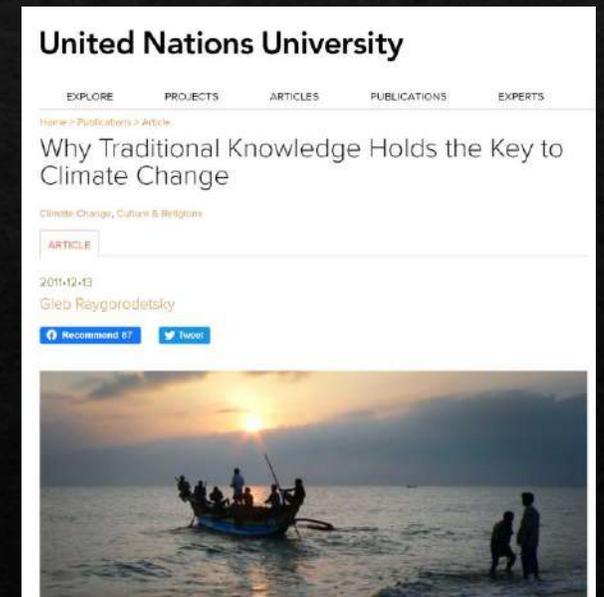
1) Click the link below to the article: Why Traditional Knowledge Holds the Key to Climate Change

<https://unu.edu/publications/articles/why-traditional-knowledge-holds-the-key-to-climate-change.html>

2) Be Ready to discuss the following:

a. What problems does the article discuss in the first paragraph?

b. What are ways that indigenous populations can and have led the way in fighting climate change?



Objectives

CONTENT
OBJECTIVE: ANALYZE
AND INTERPRET CO₂
AND TEMPERATURE
DATA.

LANGUAGE
OBJECTIVE:
DESCRIBE AND
JUSTIFY GRAPHICAL
TRENDS IN WRITING.

Quick Review: Turn and Talk

1. Describe the carbon cycle, including its reservoirs and flows.

Review

2. Describe how the greenhouse effect works, including the natural greenhouse effect and the human-enhanced greenhouse effect.



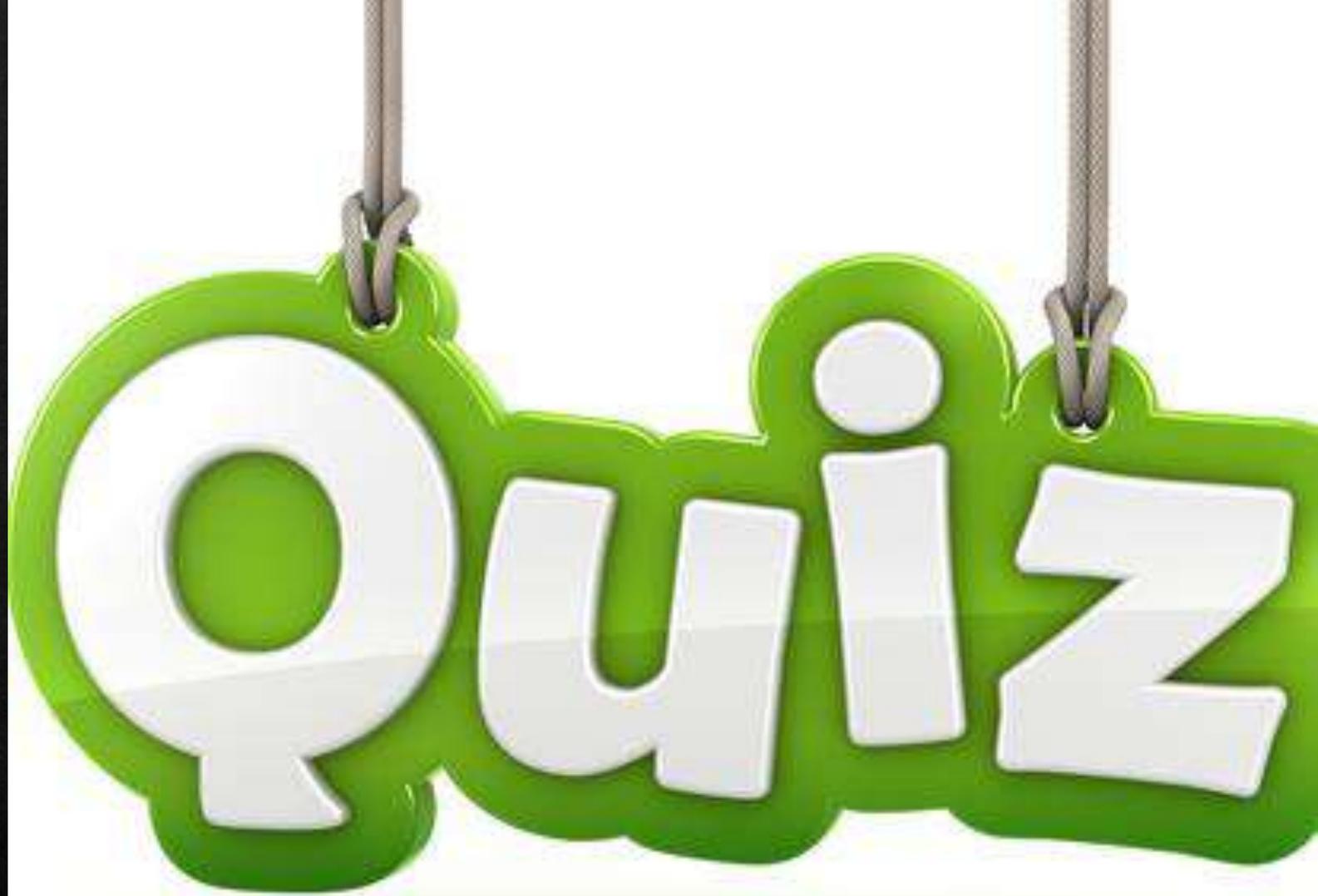
Review

3. What is ozone, and why is it important?

4. How did we start to fix the hole in the ozone layer?

Quiz 2 - in
"Teams"

On your own.



Combustion

reaction of an element or compound with oxygen to form an oxide and produce heat.

hydrocarbons combust with oxygen to produce carbon dioxide and water



Vocab Alert!

- Hydrocarbons = fossil fuels
 - they have hydrogen and carbon...hydrocarbons
- This helps us understand why burning fossil fuels produces carbon dioxide!



Analyze and Interpret

State trend and explain why it is that way.



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Visit the Carbon Emissions Calculator. Answer each question as best you can.

<http://www.ei.lehigh.edu/learners/cc/carboncalc.html>

1. Record your total annual CO₂ emissions. -->
2. What is the largest source of your carbon emissions?
3. How does your annual emissions compare with the average US emissions?
4. What are 2 things you think you could do to reduce your emissions?

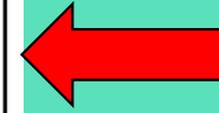
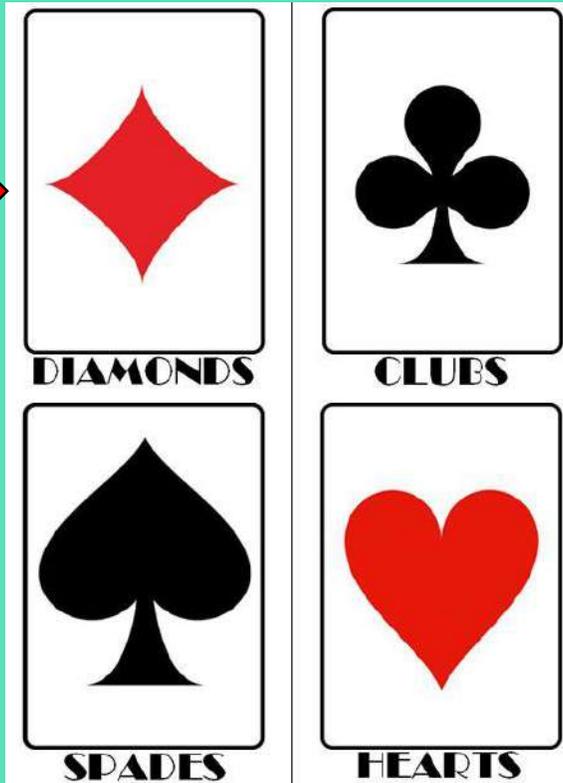
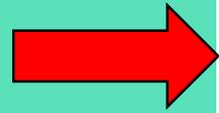
Climate Change Data Analysis

1. Sketch your group's assigned graph on your poster.
2. Discuss the first two analysis questions for your data. Look in your OneNote for more specific prompts for your graph.
 1. What is the trend in your data?
 2. What is causing that trend?
3. Write your group's answers on the poster, leaving space for the third question.

Graph	What is the trend in your data?	What is causing that trend?	
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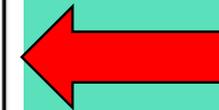
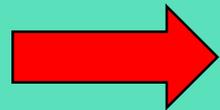
Climate Change Data Analysis Group Roles

Facilitator:
Make sure everyone's ideas are heard.



Reporter:
Shares out group findings with the whole class.

Recorder:
Draws a **QUICK** sketch of the graph and answers the group's questions on the poster.



Quality Control:
Makes sure the group answers each prompt in complete sentences and fully explains ideas in detail.

Share-Out

1. What is your graph of?
2. Analyze: What is the trend of your graph? (and any other relevant questions)
3. Interpret: What caused that trend?

Active Listening

1. Fill in your note-catcher as you listen.
2. Ask any questions that you have, clarifying or wondering.

Essential Question:

How have **humans**
impacted carbon
and energy in the
atmosphere so
also affect climate
and temperature?



Group Discussion

3 minutes GROUP – Discuss YOUR graph's role in answering the essential question.

4– Discuss any of the other graphs you found interesting.

Class Discussion

6 – Discuss any answers to and evidence for the essential question

Essential Question:

How have humans impacted carbon and energy in the atmosphere so also affect climate and temperature?

Climate Modeling

Turn and Talk:

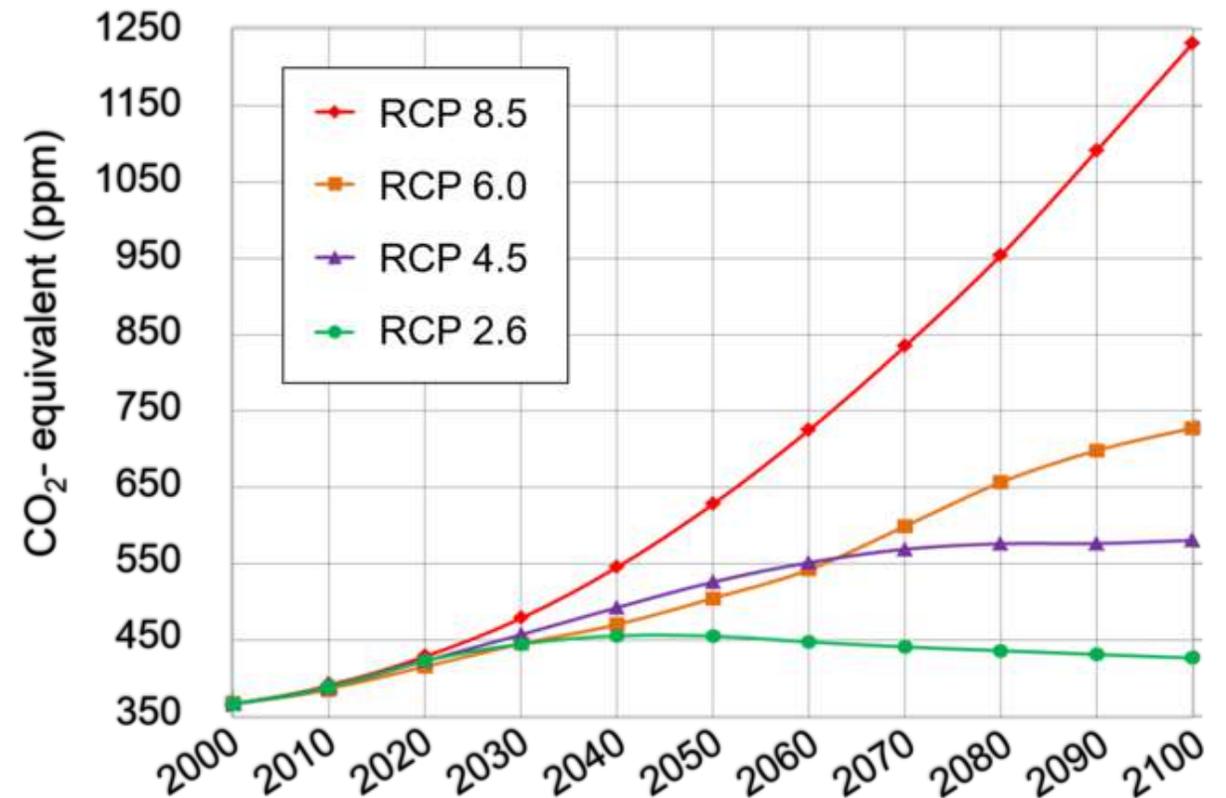
- Which RCP would be the result of the most aggressive policies and efforts to reduce carbon dioxide emissions?
- Which RCP is the result of no efforts to reduce carbon dioxide?
- Which RCP do you think is most realistic?

Predictive Data from the IPCC (Intergovernmental Panel on Climate Change)

The climate models below follow different “what-if” scenarios. Those scenarios depend on the carbon dioxide concentration in the atmosphere, and follow different Representative Concentration Pathways, or “RCP’s”, shown below.

IPCC AR5 Greenhouse Gas Concentration Pathways

Representative Concentration Pathways (RCPs) from the fifth Assessment Report by the International Panel on Climate Change



Climate Impact Models

For each model:

- ◆ What pattern do you observe? (which model is more extreme?)
- ◆ What causes that pattern? (Why would increased carbon dioxide make this issue more intense?)

EXIT TICKET: IN YOUR NOTEBOOK

- Choose 1 of the questions from our question list that has to do with **human impact** on the atmosphere and answer it.

1st per. Questions

- How does the ozone layer affect the rays of the sun?
- How does climate change affect the earth?
- What determines where the heat of the sun goes?
- How does the density of gasses in the atmosphere affect it?
- Why is earth the only planet in the solar system with a breathable atmosphere?
- How is the climate changing the atmosphere?
- How does the ozone affect the rays of the sun?
- How does climate change the earth so much?
- What determines where the heat of the sun goes?
- What is the carbon cycle?
- What is the estimated death of the human population w/ climate change?
- Will the amount of trash kill us before climate change?
- How does air pollution affect layers of the atmosphere?
- When the sun is not facing a side of the earth, how does that affect climate and temperature?
- How does the moon affect the amount of energy in the atmosphere?

EXIT TICKET: IN YOUR NOTEBOOK

- Choose 1 of the questions from our question list that has to do with **human impact** on the atmosphere and answer it.

2nd per. Questions

- How do the layers of the atmosphere affect climate?
- How does the ozone layer affect climate?
- What are ways climate data is collected?
- What makes carbon move through a cycle?
- How are some ways we can control the temperature on Earth?
- How can we control climate change?
- What are ways we can repair the hole in the ozone layer?
- How can we reduce climate change?
- How does climate modeling affect the Earth?
- What is the Carbon Cycle?
- How do we prevent climate change?
- What can we do to fix the ozone layer?

EXIT TICKET: IN YOUR NOTEBOOK

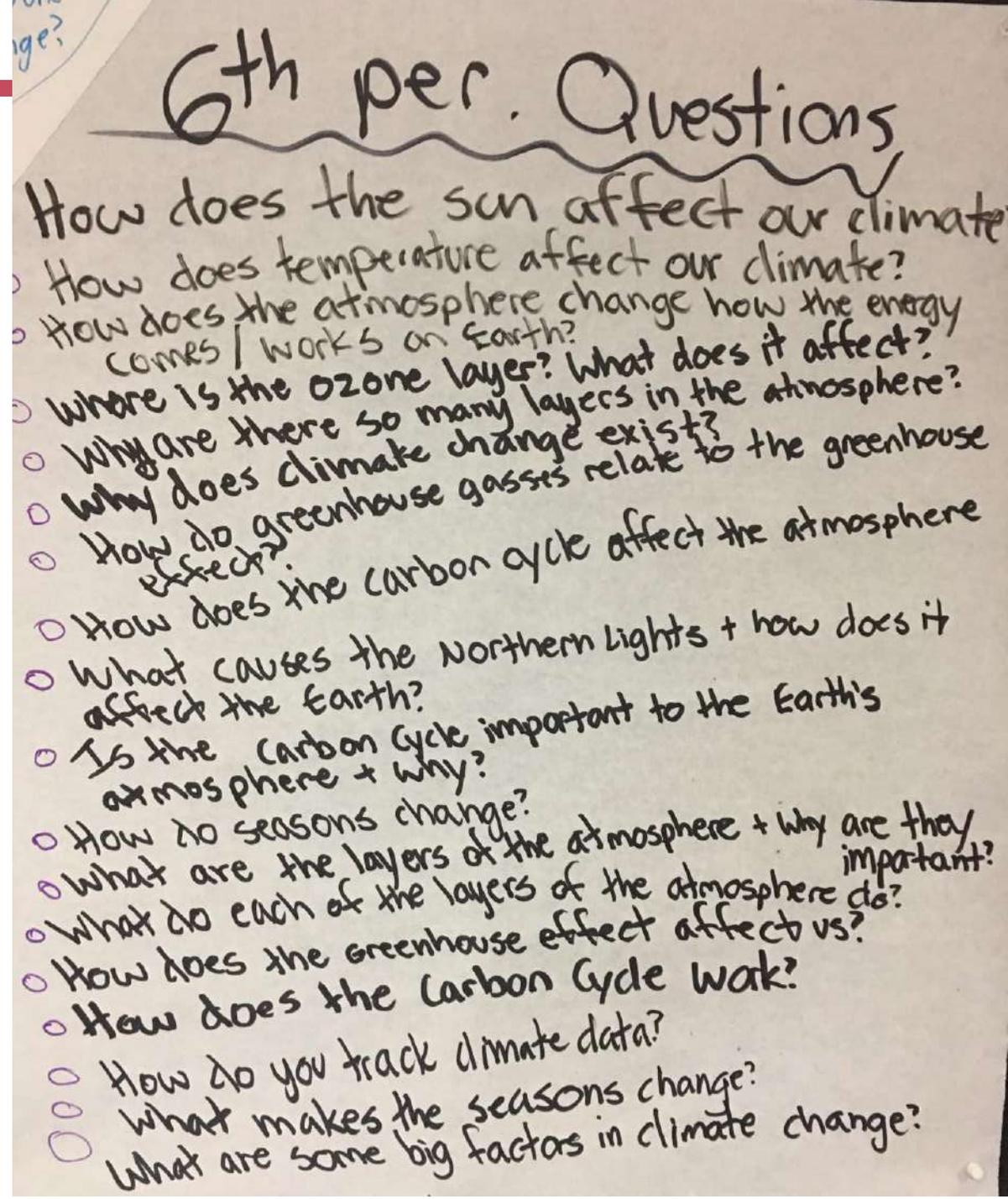
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4th per. Questions

- How does each layer of the atmosphere work?
- How is each layer of the atmosphere different?
- How does the sun affect weather?
- How does climate modeling work?
- How does the Greenhouse Effect affect the atmosphere?
- How does the Carbon Cycle affect the atmosphere?
- Why is there an ozone layer?
- Why are there different layers of atmosphere?
- How do you model climate change?
- What do the layers of the Earth (atmosphere) do?
- Why is climate change increasing?
- How does the carbon cycle affect the Earth?
- How can we reduce climate change?
- How does climate affect larger cities?
- What is climate?
- How does electromagnetic + other rays/satellites affect our atmosphere?
- What type of energies does the atmosphere produce?
- How much impact does energy have on climate?

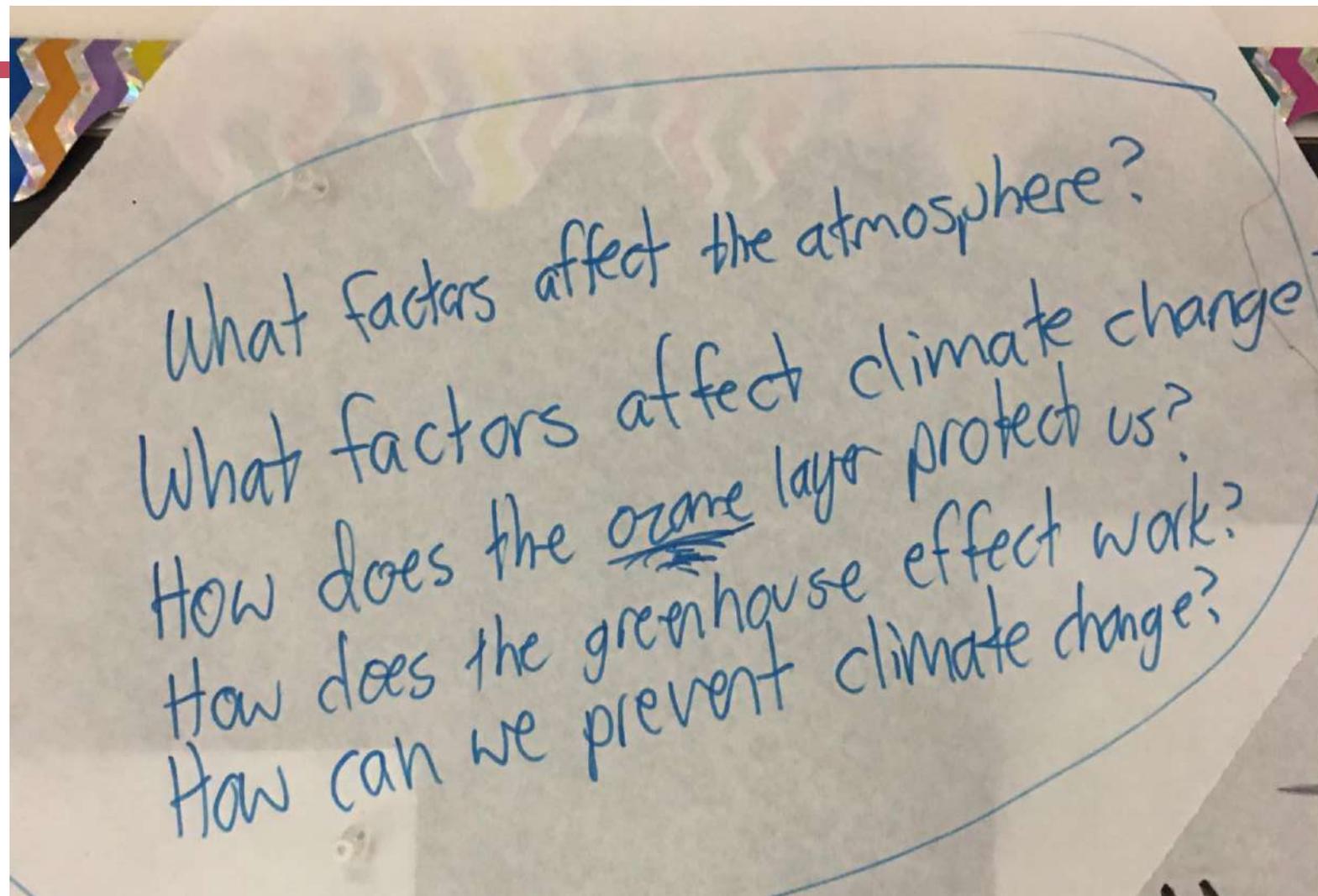
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EXIT TICKET: IN YOUR NOTEBOOK

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Exit Task

1) What is one piece of evidence you got today that helps explain climate change?

2) How did your group's data relate to the essential question: How do amounts of energy in the atmosphere change and how does that affect climate and temperature?