BiologyContent Objective: Relate cause and effect of human actions on
ecosystems.Unit 8: EcologyLanguage Objective: Use evidence to engage in a socratic seminar,
using phrases like "as shown in the graph", and "as stated in the
article".



Socratic Seminar Questions:

What is the trend in earth's temperature data?What is causing that trend?What are some implications of this trend? (impacts on ecosystems and on society)What are some counter arguments for your explanation? Can you refute them?

This will first be done as a group, where you will gather and summarize evidence that you'll use in the socratic seminar.

Evidence Example Note-catcher:

Practice Using this evidence:

Gathering Evidence! (15 minutes)

Gathering Evidence Note Catcher

Article Title	Summary of Article/Data	How can you use this in the discussion?



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Article: Couldn't the increase in atmospheric CO_2 be the result of natural cycles.	



Greenhouse Effect

Unfortunately, the label has stuck, but the greenhouse effect in our atmosphere is not exactly like an actual greenhouse. A greenhouse lets in solar energy (mostly in the form of visible light), which keeps it warm and allows the plants inside to grow. The greenhouse stays warm primarily because its glass windows prevent the wind from carrying away the heat. This is very different from the greenhouse effect.

The greenhouse effect occurs on our planet because the atmosphere (the gaseous cloud that surrounds Earth) contains greenhouse gases. Greenhouse gases are special in that they absorb heat. In doing so, they warm the atmosphere around them. Not all gases are greenhouse gases. In fact, nitrogen and oxygen - the most

abundant gases in the atmosphere - aren't greenhouse gases. Fortunately for life on Earth, which depends on some atmospheric warming to exist other gases *are*, including water vapor, carbon dioxide, and methane. Without its greenhouse atmosphere, Earth's temperature would plummet to well below freezing.

We know that Earth has been a habitable planet for over 3 billion years. This means that there has always been a greenhouse effect. The carbon dioxide that humanity is adding to the atmosphere today isn't creating the greenhouse effect, it's simply intensifying it.

How the Greenhouse Effect Works

Greenhouse gases allow sunlight to pass through the atmosphere and heat the Earth, but they interfere with the loss of heat from the land and ocean, redirecting some of that heat back to the surface.

- 1. Earth absorbs solar energy and warms up
- 2. Like all warm objects Earth begins to radiate (emit) heat.
- 3. Heat radiating from Earth encounters greenhouse gas molecules in the atmosphere, and is absorbed. The atmosphere warms; as a result, it too radiates heat. Some of this heat is radiated out into space, but the rest is radiated back to Earth's surface This extra energy warms Earth to higher temperatures. When averaged over several years, the energy radiated into space very nearly balances the solar energy absorbed by Earth. Currently, however, Earth is radiating slightly less heat into space than it is receiving from the Sun, because of the recent addition of greenhouse gases to the atmosphere. Consequently, the planet is warming.

Climate Summit - Expert Task Preparation Note-catcher	
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Article Title	Summary of Article/Data	How can you use this in the discussion?
Article: Couldn't the increase in atmospheric CO_2 be the result of natural cycles.		
Article: How does modern warming differ from past Warming trends? OR It's getting hotter down here!		

Article: What can a decade of Western North American drought tell us about the future?	
Serious Negative Impact	
Global Climate Change Effect #1: Extreme Weather	
Global Climate Change Effect #2: Glacier Retreat and Disappearance	
Global Climate Change Effect #3: Sea Level Rise	
Global Climate Change Effect #4: Ocean Acidification	
Global Climate Change Effect #5: Methane Release from Melting Permafrost Peat Bogs	
Global Climate Change Effect #6: Increase in Disease and Death	
Global Climate Change Effect #7: Ecosystem Damage and Extinction	
So what exactly is in the paris climate accord?	
Mapping the potential economic effects of climate change	
Paris Climate Accord: Syria to Sign up, isolating US	
What is in the Paris climate agreement?	
Other?	

Climate Change Summit Note-catcher: Follow the discussion, does it answer the guiding questions?

What is the trend in earth's temperature data?What is causing that trend?What are some implications of this trend? (impacts on ecosystems and on society)What are some counter arguments for your explanation? Can you refute them?

Summarize each group's presentation:

Establishing priorities:

Calculating Carbon Footprints:

Each of us consumes some of the Earth's products and services every day. How much we take depends on the ways in which we satisfy our needs and wants - the many habits together create our lifestyle.

How much carbon dioxide do YOU emit! http://www.footprintcalculator.org/

- 1. How many Earth's would it take to sustain the world's population if they all lived like you do? _____
- 2. What are some things you could do that would change your carbon footprint?

Level 1 - Using your notebook, answer the questions

Level 2 - Checking with a partner, answer the questions

Level 3 - Unassisted, answer the questions

Short answer simulation

1. Explain why the fox population might increase or decrease if the deer population goes down.



By Land Type

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8.5 *7*1 By Consumption Category 2. What abiotic factor is the original source of energy for all terrestrial trophic systems?

3. Create a food chain with a minimum of 5 trophic levels and label each organism in the food chain with as many labels as possible. (do this on paper or a whiteboard

4. Define and differentiate between the terms: species, community, population, and ecosystem.

5. If a population of producers took in 250,000 kJ of energy, approximately how many kJ would transfer up a food chain to the tertiary consumer trophic level? Show your work.

6. As you learned in Physics, energy cannot be created or destroyed since it is always conserved. Explain some of the ways that the energy is used at each trophic level.

7. How are the terms "keystone species" and "trophic cascade" related? Use an example.

Mastery Check Google Form!!