| **Name: Date: Per:** | **Lesson 3: Greenhouse Effect Climate Models** |
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| **🎯 Objective:** I can interpret models to explain why (too much) CO2 is a problem for the climate and how other factors affect the climate. | |
| **Part 1: Explain why too much CO2 is a problem for the climate.**   1. *How does CO2 affect the climate?*    1. It absorbs and re-emits infrared radiation, trapping heat in the atmosphere.    2. It reflects sunlight back into space, leading to cooling temperatures.    3. It releases excess oxygen, which warms the planet.    4. It depletes the ozone layer, resulting in warmer temperatures.  | 1. *Below (left) is a model of an earth climate at equilibrium. The amount of light going in (2 arrows) is equal to the heat going out into space (2 arrows). Draw arrows on the second model to show what happens if there is too much CO2 in the atmosphere.* | 1. *Will this lead to a warming or cooling climate?*  * Warming * Cooling | | --- | --- |  1. *Referring to your model above in question 2, explain how CO2 affects light (input energy) and heat (output energy) and why that leads to a warming or cooling climate.*  * **More on back -**   **Part 2: Explain how other factors affect the climate.**   | 1. *How do volcanic eruptions impact climate change?* 2. At first, volcanoes emit ash that blocks sunlight and can lead to temporary cooling. 3. They release CO2 that will eventually warm the planet because its a greenhouse gas 4. They are sometimes used as an example that humans aren’t the only cause of climate change, but their effects don’t explain the large changes that have happened over the last 50 years 5. All of the above. | 1. *How does deforestation affect climate change?* 2. By releasing large amounts of oxygen, leading to global warming. 3. By reducing carbon dioxide (CO2) absorption, there are more greenhouse gasses in the atmosphere. 4. By causing an increase in cloud cover, resulting in cooling temperatures. 5. By promoting the growth of new forests, offsetting climate change effects. | | --- | --- | | 1. *Circle the event that would cause a cooling climate.*   A) Deforestation (cutting down forests)  B) Reforestation (planting new forests)  C) Glaciers melting  D) Burning coal | *Briefly explain how this event would cause the climate to cool. Describe how energy input and/or output change.* |   **🏆 Criteria for Mastery:**   * Q1-Q3 correct * Response to Q4 accurately explains how CO2 affects light (input energy) * Response to Q4 accurately explains how CO2 affects heat (output energy) * ⅔ responses correct for Q5-7   **Mastered? Circle one: ✅ Yes** (advance to next lesson) / ↩️ **No** (revise practice work, then reassess) | |