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Greenhouse Effect Lab

DIRECTIONS: For each part, read and follow the directions. Then answer the questions using complete sentences. **50% will be taken off for each question not answered using a complete sentence**.

KEY VOCABULARY: (use these terms to help you describe what is happening)

Emit – to produce or release light
Reflect – to cast back light from a surface
Absorb – to take up without reflecting

Part 1: On Greenhouse Effect **Waves** tab, set greenhouse gas concentration to **NONE**. Observe the sunlight and infrared energy waves.

a) What happens to sunlight Energy Waves?

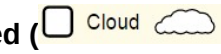
b) What happens to the infrared Energy Waves?

c) What does the temperature read?

d) Uncheck "Cloud". How does the activity of the sunlight energy wave change?

e) How does the activity of the infrared energy change?

f) What is the temperature reading after removing clouds? **How was temperature affected by the cloud?**

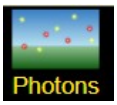
Part 2: Keep **CLOUD unchecked (**  **)** and set greenhouse gas concentration to **LOTS**. Observe the sunlight energy waves and infrared energy waves.

a) What happens to the sunlight energy waves? (hint: use the vocabulary key above to describe)

b) What happens to infrared energy waves? (hint: what did you add in part 2?)

c) What is the temperature reading? How does the temperature compare to when there were no greenhouse gasses in the atmosphere?

Key Vocabulary: Emit Absorb Reflect

Part 3: Go to 

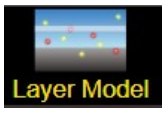
tab. Select  . Then, select the ice age, 1750's, and 2020 tabs and record the Greenhouse gases and temperature for each period. **Include units for full credit.**

Units Key		
ppm = Parts per Million	ppb = Parts per Billion	℃ = degrees Celsius

Greenhouse Gas Concentration	**Time period**			**Circle one:** Did these values Increase or Decrease over time?
	Ice Age	1750's	2020	
Carbon Dioxide Concentration (CO_2)				Increase or Decrease
Methane Concentration (CH_4)				Increase or Decrease
Nitrous Oxide Concentration (N_2O)				Increase or Decrease
Temperature				Increase or Decrease

a) Based on the table above, have greenhouse gas concentrations **increased or decreased** since 1750?

b) What happens to temperature as greenhouse gas concentration increases? Explain your answer using details from the table.

Part 4: Go to the 

tab.

a) Click start Sunlight. Wait until you see infrared photons then record temperature.

b) Add 3 absorbing layers. What effect do the absorbing layers have on temperature?

c) Wait for temperature to stabilize and record the **surface temperature** (bottom one) again.

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d) What effect do the absorbing layers have on the infrared photons?

e) How are the absorbing layers similar to greenhouse gases?

Analyze: Based on this lab, what would the effect on surface temperature be if greenhouse gases continued to increase beyond 2020 levels?

Use complete sentences and Claim, Evidence, and Reasoning to support your answer.