



UNIT 5: CHEMISTRY OF CLIMATE CHANGE

Workbook 5.1: Gas Laws

Lesson 10: Earth's Greenhouse



GUIDING QUESTION: EXPLAIN HOW EARTH'S
ATMOSPHERE ACTS AS A GREENHOUSE FOR
THE PLANET.

- Do Now:

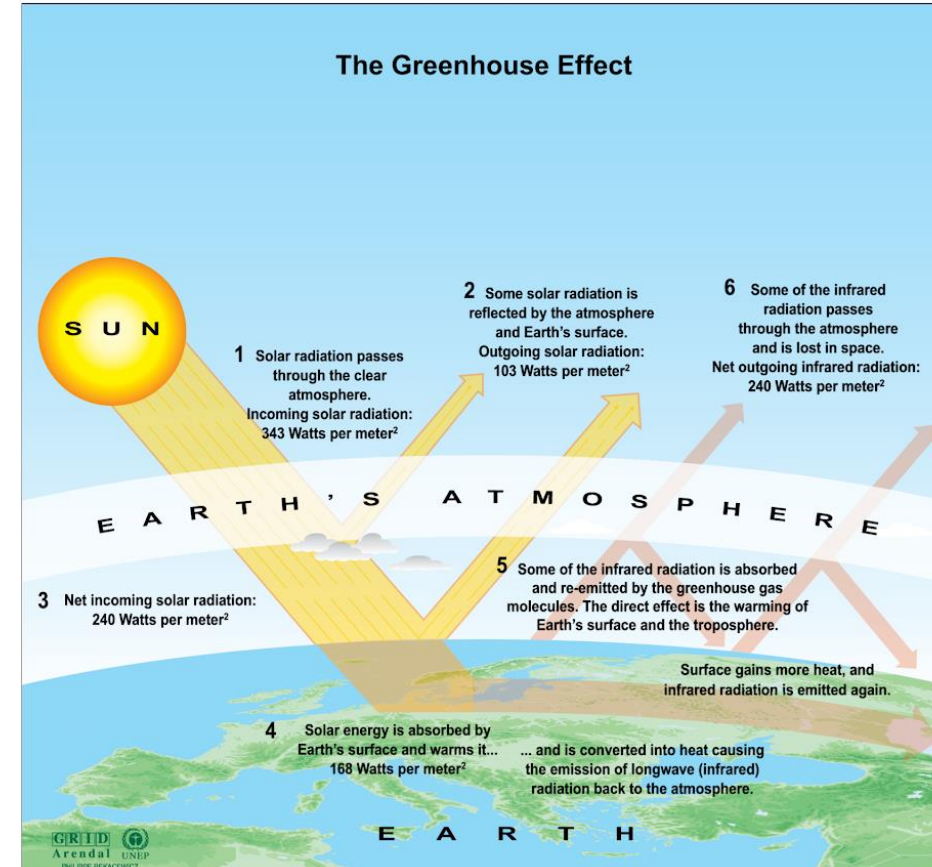
How do you think our planet is able to host life?

TURN IN WORKBOOK 5.1!

NOTES

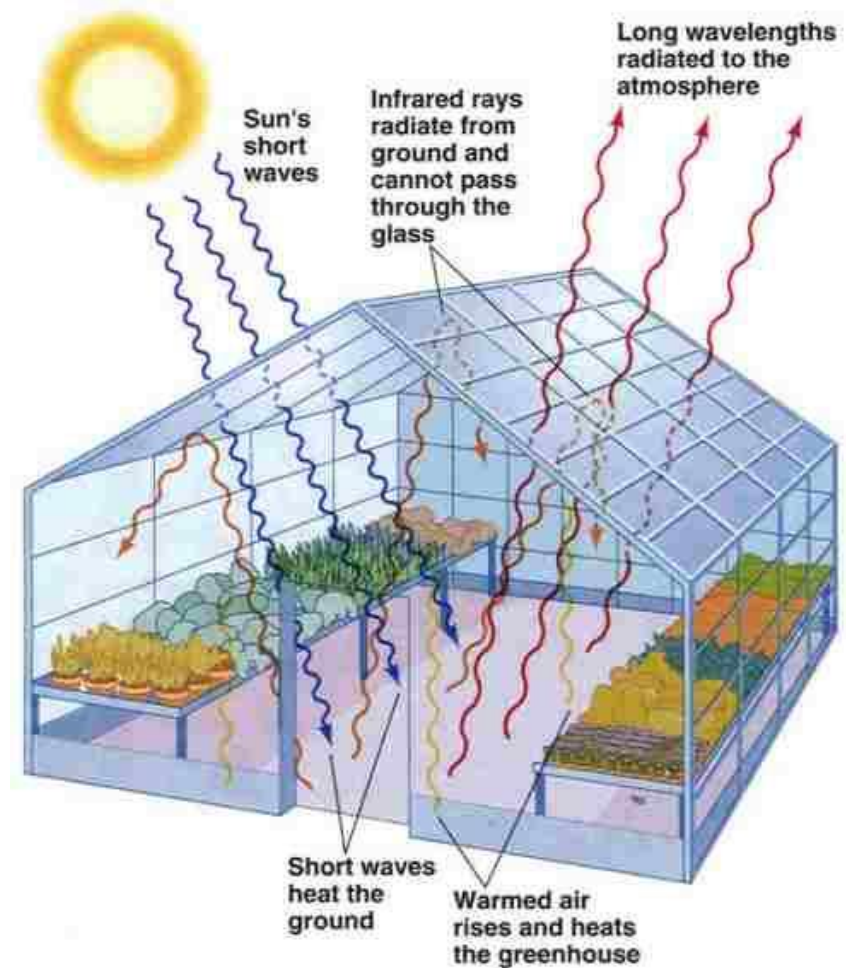
As energy enters Earth's atmosphere, it does many different things:

- It can be reflected high in the atmosphere and returns to space
- It can pass through the atmosphere and
 - Be absorbed by Earth's surface and warms it
 - Converted into heat and emitted back into atmosphere
- It can be absorbed by greenhouse gases and then re-emitted
 - Warming the Earth's atmosphere
 - Lost into space (leaves)



NOTES

- Earth's atmosphere acts like a greenhouse.
 - Greenhouses absorb energy from the sun and trap it, warming the air and facilitating life within.
- Gases in the atmosphere absorb energy from the sun (outerspace) and Earth's surface, then re-emit the energy, causing the planet to warm.



NOTES

- Without any atmosphere on Earth, there would be no gases to trap heat
- This would make life on Earth impossible!
- Earth would be more like the moon – barren, lifeless, and cold!

©JAXA/NHK

Earth's possible climates



Steamball Earth



Snowball Earth



Dry roasted Earth



Present-day Earth



Mars



Mercury




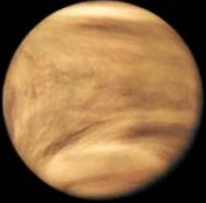
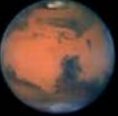
Venus



“Habitable Zone”

planetplanet.net

VA #3 Atmospheres of Earth, Venus, and Mars

	Earth	Venus	Mars
			
Carbon Dioxide (CO₂)	0.030 %	96.500 %	95.000 %
Nitrogen (N₂)	78.000 %	3.500 %	2.700 %
Oxygen (O₂)	21.000 %	Trace	0.130 %
Argon (Ar)	0.900 %	0.007 %	1.600 %
Methane (CH₄)	0.002 %	0 %	0 %
Nitrous Oxide (N₂O)	Yes	No	Yes
Water Vapor	Yes	No	No

CLOSURE

- Answer Guiding Question on page 5:
 - Explain how Earth's atmosphere acts as a Greenhouse for the Planet.
- Homework #10 due Thursday & Friday (4/26 & 4/27).
- Benchmark #4 next block (5/2 & 5/3).
- Achieve 3000: "Making the World Clean and Safe" due Friday, 5/4.