

April 13, 2015

Warm-Up

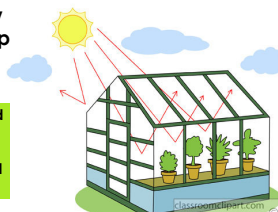
Today you will need your notebook and pencil.

- Computer Modules 1, 2 and 3 due tomorrow.
- Quiz on HW 1 & 2 on Thursday.

Please pick-up your weekly homework page!

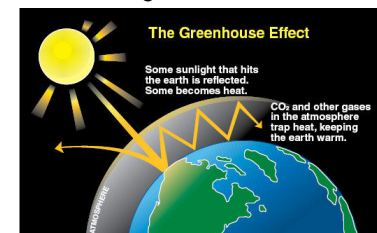
• **What do you think: How does a greenhouse help plants grow?**

As the greenhouse draws in and collects sunlight, it warms the air within. This occurs naturally. The process is releasing thermal (heat) energy.



Greenhouse Effect – What?


- **Definition:**
- Natural heating of Earth's surface by certain atmospheric "greenhouse" gases which helps keep Earth warm enough to sustain life.



Greenhouse Effect – How?

- Imagine a car, sitting in the sun with all the windows closed.
- On a 86°F day, the inside of a car can reach as much as 158°F!

Solar radiation enters the car mostly through the car windows and this is absorbed by the interior of the car – the dashboard, the seats, the carpet all absorb the heat energy. This is then re-radiated into the air inside the car, effectively heating up the car's interior

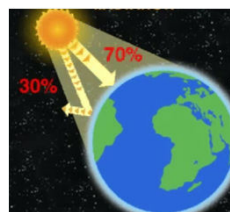


Greenhouse Effect – How?

- Greenhouse gases are responsible for the greenhouse effect
- **Greenhouse Gases (GHG) Definition:**
- Any gas that absorbs infrared radiation in the atmosphere
- **Example:** Carbon Dioxide Gas
- The greenhouse effect works in the same way as a hot car or a greenhouse. In this case, the greenhouse gases act like the car windows, and the land and water on Earth represent the car's interior.

Review: Solar Radiation in the Atmosphere

- 30% of solar radiation is reflected back into space from ice, water, clouds and other bright surfaces.
 - **Review: known as albedo!**
- The other 70% is absorbed by land and water, which heats up and is slowly released back into the atmosphere where some escapes into space and some is absorbed by the greenhouse gases and re-emitted into the Earth's atmosphere.




Simulation!

How Greenhouse Gases Work

- You have a similar simulation on your computer modules assignment
- <https://phet.colorado.edu/en/simulation/greenhouse>


Greenhouse Effect – Why?

- Without the greenhouse effect, it is estimated that the Earth's average temperature would be 33°C lower than it is, making it too cold for life to survive!
- To give you a comparison, the last Ice Age had average temperature of only 4°C lower than today.


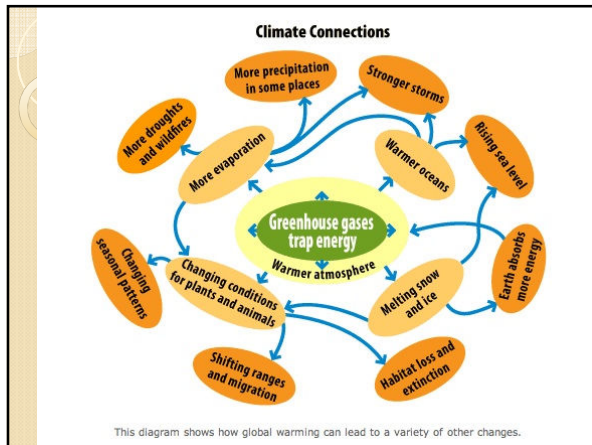


Greenhouse Effect – Problem?

- Greenhouse gases are so efficient at their job that the Earth can be at risk for getting too warm.


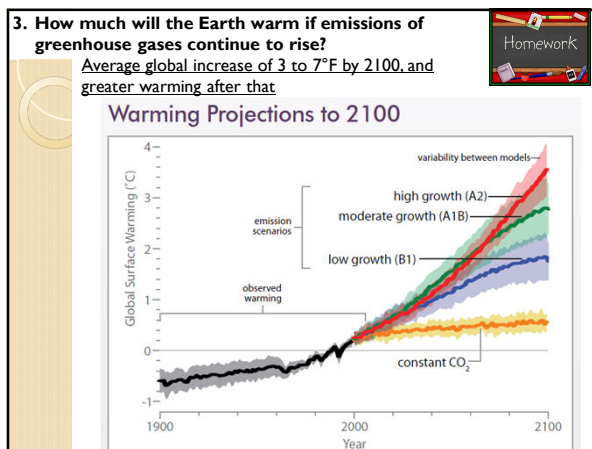


- Global Warming**
- Definition:**
- The progressive gradual rise of the earth's surface temperature in recent decades

Global Climate Change vs. Warming

- 1. How are the terms global climate change and global warming different?**
- Global climate change refers to any major changes in temperature, rainfall, snow or wind across the Earth whereas global warming is an average increase in temperatures near the Earth's surface.
- Global warming can be considered part of global climate change.

Activity – Greenhouse Gases

- Use the information page in your baskets to learn about six different greenhouse gases. There are many more than just carbon dioxide!

