

# March 4, 2020

## Sit with your Apocalypse Now? Group

**Entry:**

**First Get out a computer** and pull up powerschool and look at what you are missing. Check to see if you have those missing assignments and turn them in. If you don't have them, come to me for additional copies

**In your notebook answer the following**

1. Just before the sun rises the parking lot asphalt has a temperature of  $10^{\circ}\text{C}$ . At the end of the day the asphalt has a temperature of  $50^{\circ}\text{C}$ . The mass of the parking lot segment you are investigating is 50 kg, and the specific heat ( $C_p$ ) of asphalt is 920 J/kg $^{\circ}\text{C}$ . How much heat did the asphalt absorb?
2. A stone with a temperature of  $40^{\circ}\text{C}$  is placed in a bath of water at a temperature of  $40^{\circ}\text{C}$ . What happens to the temperature of the water? Why?

# Housekeeping

- Problem Set #11 due Thursday for Everyone
- Climate Impact Research is due today though!
- Problem Set #12 out today
- Honors Assignment #6 out
- Honors Research Plan out
- Mornings
- Make-up opportunities for Labs and Movie/Office Hours
  - Thursday March 5th before school (8:15 AM)
  - Next week before school - Tuesday, Wednesday, and Thursday (8:15 AM)
  - Next week after school - Wednesday (12:30-2:00)
- Reminders from Ms. Abdullah
  - Update Naviance
  - Check Portals

# Today

- DP Walkthrough
- Climate Change and Carbon Cycle Connections
- Arctic Amplification and the Albedo Effect
- Project Work Time: Share research, Brainstorm, Project Pitch development

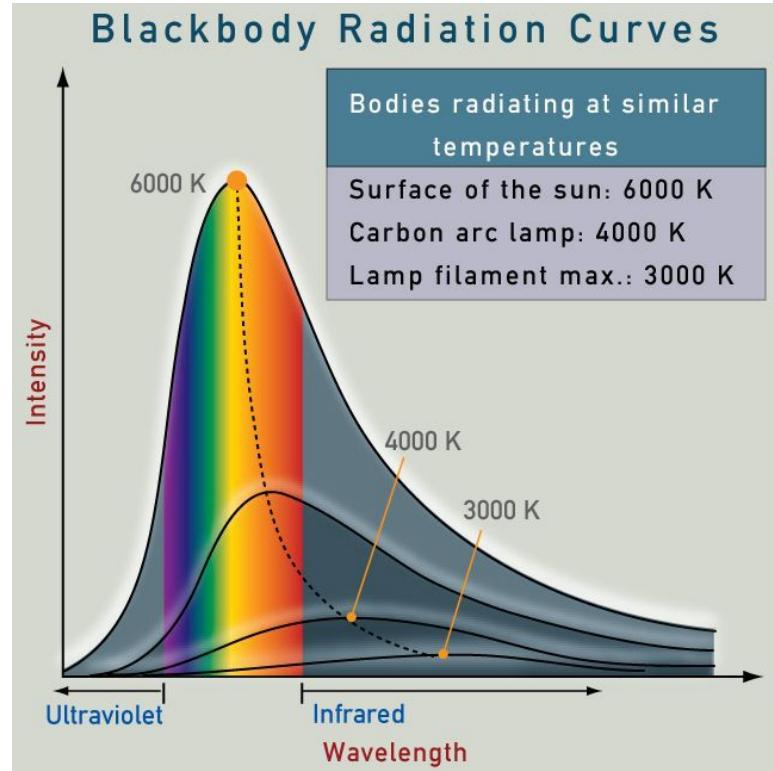
# Blackbody Emission

A Blackbody is an object that absorbs all Electromagnetic Radiation.

The object radiates Electromagnetic Energy according Planck's Law:

$$B_\lambda(\lambda, T) = \frac{2hc^2}{\lambda^5} \frac{1}{e^{\frac{hc}{\lambda k_B T}} - 1}$$

Take-Away here is **Emission depends on the temperature** of the object

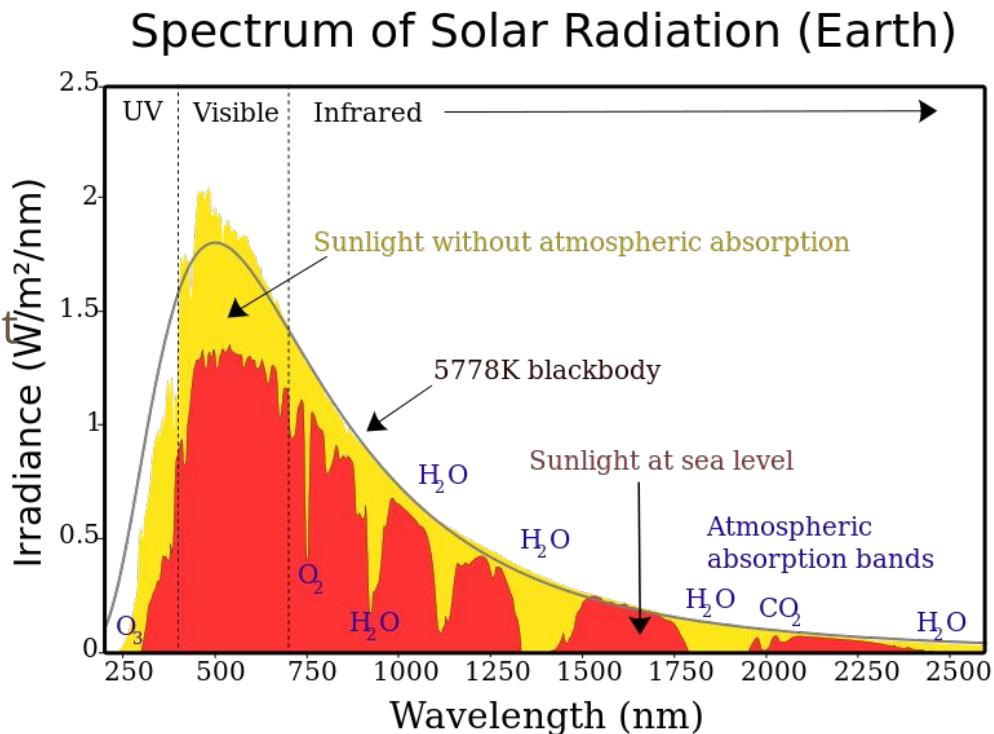


# Energy Entering the Earth System

There are no ideal blackbody objects in existence, but some objects come close.

Stars, our sun included, almost act like an ideal blackbody.

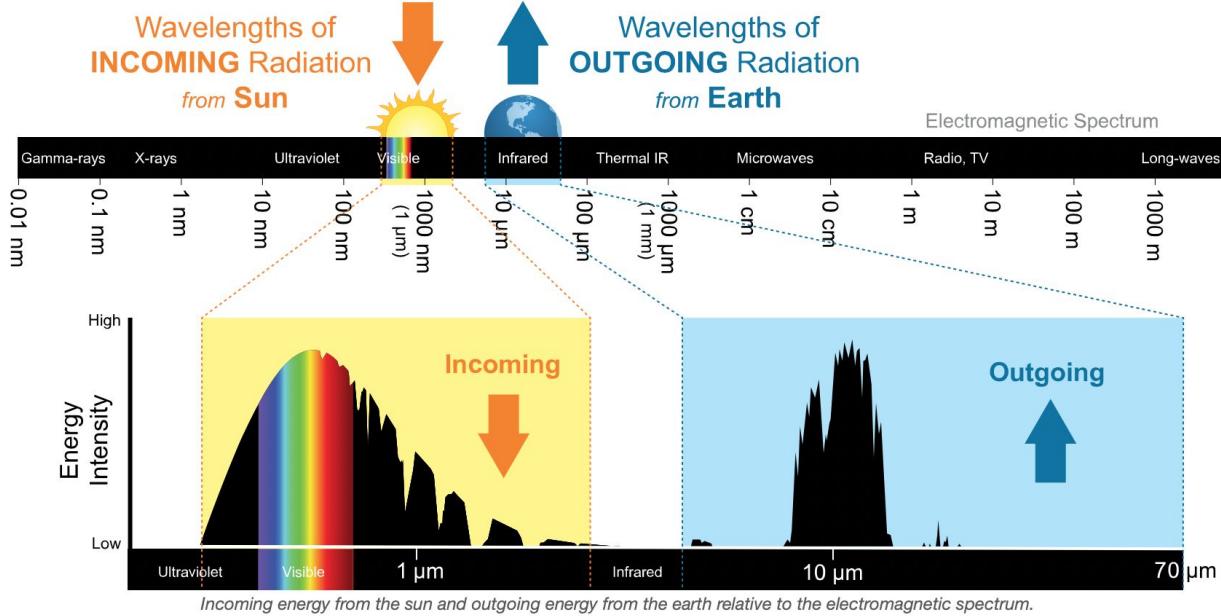
This is one way we know the temperature of stars in far away galaxies.



# Emission

The Sun Emits Electromagnetic Radiation that the Earth absorbs.

The Earth then emits radiation (at different wavelengths, Infrared) back out to space.



# Emission

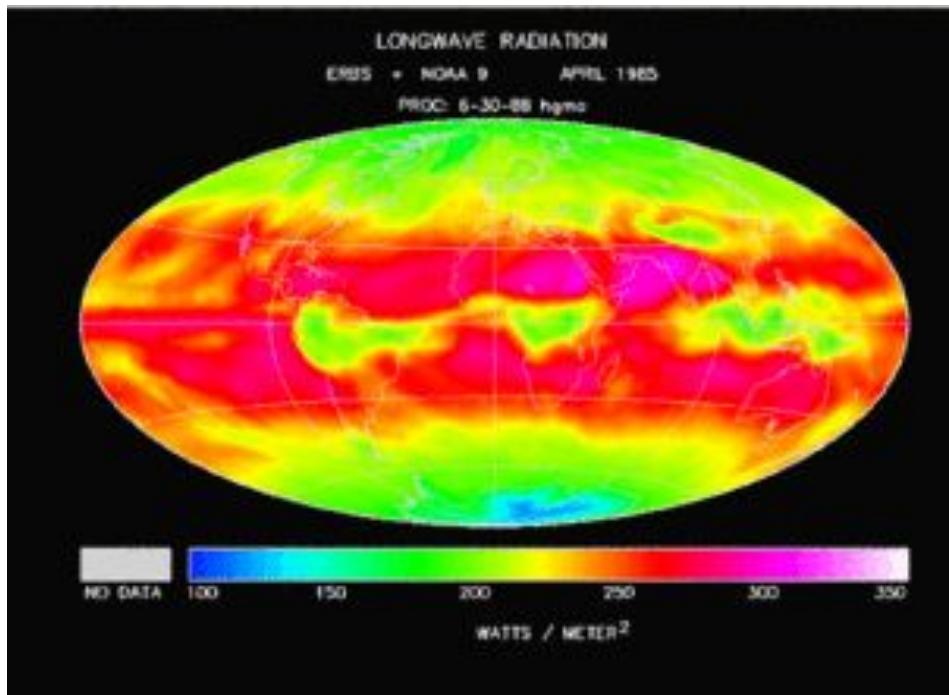
Materials absorb energy and then radiate (or emit) energy at different wavelengths to help balance out their thermal Energy.

The Earth is no different.

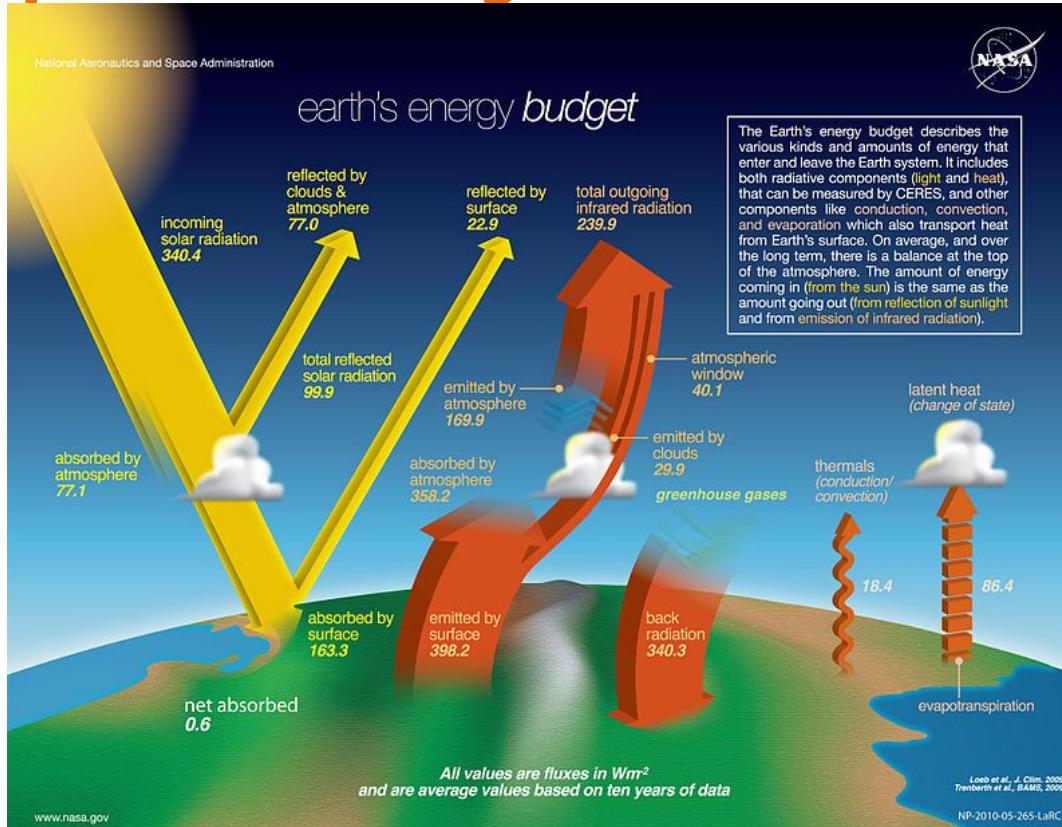
Other words for Emission:

Radiation

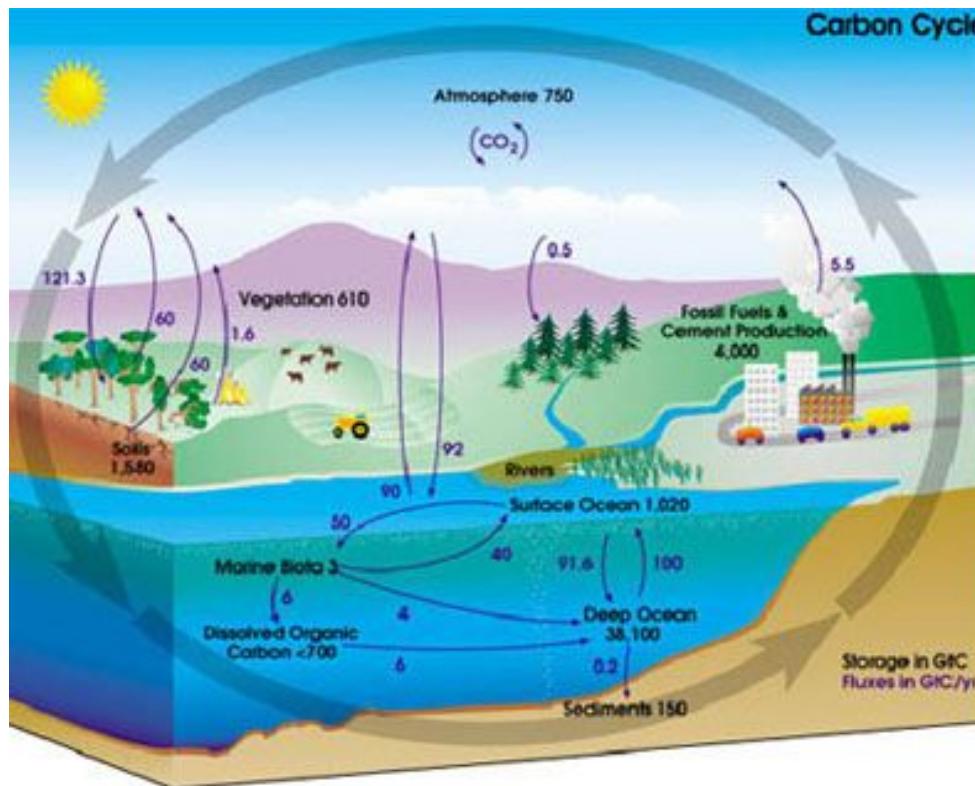
Incandescence



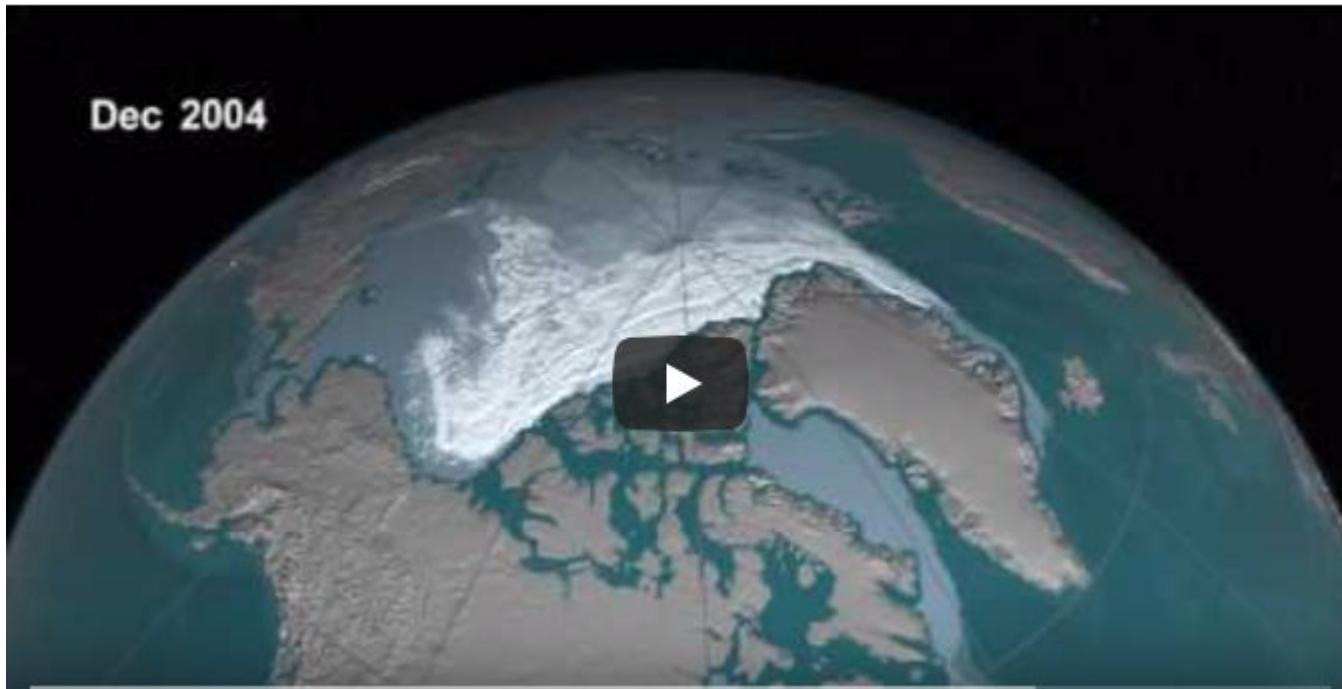
# What Happens When Light hits the earth?



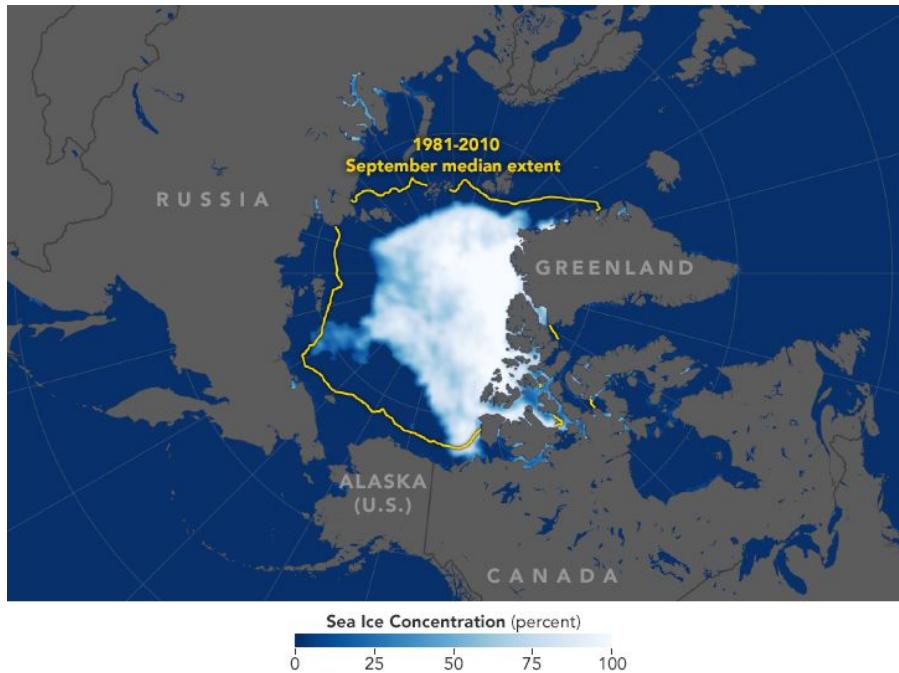
# Carbon Cycle Connections...



# One Impact on the Earth



# Which would be better?



# Arctic Amplification

- Please fill in the boxes below each step in the Earth's energy cycle as it connects to Arctic Amplification.
- Look at the step above the box and the step after the box to help you determine what goes in each box
- You can draw or write to communicate the information
- You can use the vocabulary lists to help you out
- When you finish have each table partner add to a section of the class gallery

# Project Pitch

- 1 to 2 minutes long
- Answer the following questions
  - What is your interactive concept
  - How are you informing the public about your impact (how it impacts them!)
  - How are you informing the public about connections to carbon in the atmosphere?
  - How are you informing the public about solutions?

# Guiding Questions for your Project

- How does the absorption, reflection, transmission, and/or scattering of sunlight cause your impact?
- What role does the specific heat capacity of the materials on Earth's surface in the cause your impact?
- What is the Earth's Energy system and how is it connected to your impact?
- How have changes in the Earth's Energy system caused your impact? What are the source of those changes?