

Things we went over in the Review Session 1:

Quiz will focus on lectures from Sep 6-15. However, all material from this course (book and lecture notes) are fair game.

Why is there a warm layer near the surface during the day.

Surface heats up faster because it is absorbing all the radiation that hits it ("blackbody"). The atmosphere only absorbs some of the radiation that hits it ("selective absorber"). The surface then radiates IR back to the atmosphere. The gases that we've talked about in this class absorb within the IR. Therefore the atmosphere is being radiatively heated by the surface.

The earth is also a poor conductor of heat, so heat does not transfer into the ground, it stays on the surface and the surface heats up. Water, on the other hand, can conduct heat somewhat better (as can wet soil), so does not warm up as much right at the surface. Heat is transferred below the surface.

Why is there a cold layer at night.

Radiative cooling of the surface is more efficient than the cooling of the air.

We also went over HW1 - you have the solutions. Make sure you read skew-T diagrams correctly. The temperature lines are skewed at 45° angles so don't read the temperature straight down from the temperature curve, follow the 45° line to the x-axis where you can then read the temperature of the point you are interested in.

Earth's peak radiation is in the IR range of the electromagnetic spectrum. Sun's peak radiation is in the visible range of the electromagnetic spectrum.

Heat transfer - understand the various forms of heat transfer. Radiation, convection, conduction, latent heating.

No, you will not have to reproduce the numbers on the Earth's Radiation Budget diagrams. You will have to understand the path the emitted radiation from either body goes through to get the concepts of greenhouse effect, runaway greenhouse effect, differences between how hot the surface gets vs how hot the atmosphere gets, etc.

