

Homework #10
AS101 Summer 2006
Dr. Withers

Assigned: 2006.06.15
Due: 2006.06.16, start of class

1) Read Chapter 10

2) Purpose: Encourage reading of Chapter 10

People on Earth's surface are often hit by raindrops falling from clouds. The atmosphere of Venus is very cloudy, but rain never falls on the surface of Venus. Why not?

3) Purpose: Understand the greenhouse effect.

Which of the following is the best description of the basic principles that are responsible for the greenhouse effect?

A) The Sun emits thermal radiation at infra-red wavelengths, the Earth emits thermal radiation at visible wavelengths. Earth's atmosphere transmits visible photons, but absorbs infra-red photons.

B) The Sun emits thermal radiation at visible wavelengths, the Earth emits thermal radiation at infra-red wavelengths. Earth's atmosphere transmits visible photons, but absorbs infra-red photons.

C) The Sun emits thermal radiation at visible wavelengths, the Earth emits thermal radiation at infra-red wavelengths. Earth's atmosphere transmits infra-red photons, but scatters visible photons.

D) The Sun emits thermal radiation at visible wavelengths, the Earth emits thermal radiation at infra-red wavelengths. Earth's atmosphere transmits visible and infra-red photons.

4) Purpose: Understand seasons

Which planet has the most extreme seasons, Venus, Earth, or Mars? Why?

5) Purpose: Mathematical exercise

Read the Mathematical Insight about "No Greenhouse" temperatures on page 294 of the textbook. What is the "no greenhouse" temperature of a planet that has a reflectivity of 0.2 and is 1.5 AU away from the Sun?