

Admission Ticket 1:

Which of the following is not a source of methane (CH₄)? Swamps, Photosynthesis, Natural gas reserves, or Livestock.

The correct answer of photosynthesis (CO₂ + water + light -> glucose + oxygen), because photosynthesis does not produce methane. All other options produce methane

Argon makes up what percentage of the Earth's atmosphere? 0.002, 0.9, 0.09, or 21

The correct answer is 0.9%. Argon is a noble gas meaning it exists in its stable form and will not readily react with other species. Because noble gases do not react, their concentrations slowly build up in the atmosphere. Another example of a noble gas is Neon (0.002%).

In the development of the planet, land areas on Earth only became habitable when which of the following formed? Methane, Oceans, Trees, or Stratospheric ozone

The correct answer is stratospheric ozone. Stratospheric ozone (not to be confused with tropospheric ozone) protects us from harmful ultraviolet (UV) radiation. UV radiation destroys living things, so it needed to be blocked in order for land to be inhabited.

The early Earth's atmosphere was mostly water (80%). What was one source that added water to the atmosphere? Ozone, Water parks, Trees, or Comets

The correct answer is comets. The key word in the question is 'early' Earth, so waterparks and trees can be easily eliminated as they did not exist yet. Ozone consists of three oxygens and is not a source of water, thus comets is the only logical answer. During early Earth comets smashing into the Earth led to the release of water trapped in the existing Earth's surface.

In the atmosphere, the most abundant gases are called...Variable gases, Permanent Gases, Plasma, or Noble gases

The correct answer is Permanent gases. Permanent gases are most common in the atmosphere and their percentages do not change from day-to-day (ex. Nitrogen and Oxygen). Variable gases vary in amount over the short term or by location (ex. Water vapor, CO₂, ozone). Noble gases are unreactive gases (ex. Helium, neon, argon)

Admission Ticket 2:

If temperature increases as height increases it is called a___? Temperature inversion, Temperature Subversion, Temperature Diversion, or Temperature Inversion

The correct answer is Temperature Inversion. Temperature inversions play a key role in cloud formation and trapping substances near the surface. We know that hot air rises, but when there is an inversion the air rising can be stopped. In class you will learn radiation/nocturnal, subsidence/capping, and tropopause inversions.

Until recently, concentrations of atmospheric carbon dioxide (CO₂) held steady at about ___? 280 ppt, 280 ppm, 28 pmm, or 280 ppb

The correct answer is 280 ppm. Today CO₂ concentrations have risen to ~415ppm

Most of the ozone in the atmosphere is located in the ...?Chocosphere, Stratosphere, Mesosphere, Troposphere.

The correct answer is Stratosphere. Chocosphere is not an atmospheric layer. Ozone exists in the Stratosphere (good ozone because it protects us from UV) and in the Troposphere (bad ozone because it is toxic to breath).

In the troposphere, as you get farther away from the surface, temperatures___? Increase, Remain Unchanged, Taste Differently, Decrease.

The correct answer is Decrease. This is because Earth's atmosphere is heated from the surface of the Earth. The Earth receives energy in the form of visible and UV radiation and the surface of the Earth re-emits this energy in the form of Infrared or thermal radiation the heats the atmosphere from the surface up

The average environmental lapse rate of 6.5 C/km describes ___?how cold the surface would be without an atmosphere, how temperatures decrease with increasing height, average surface temperature, nothing of importance.

The correct answer is 'how temperature decreases with increasing height'. Thus for every km of height you go up, the temperature gets 6.5 C colder. This slope is the environmental lapse rate which is the value of lapse rate in the environment (when water is present). This is not to be confused with the dry lapse rate, which accounts for how temperature decreases with increasing height in a dry environment (10 C/1km).

Admission Ticket 3:

If the Earth emitted more radiative energy than it absorbed, it would lead to___? Nitrogen, cooling, warming, or methane.

The correct answer is cooling. Nitrogen and Methane are not relevant answers, so they can be thrown out. This is a radiative balance question. Emitted energy can be thought of as energy out of a system and absorbed energy can be thought of as energy in to the system. If energy out is greater than energy in than the system has a net loss in energy and will thus be cooling.

Transfer of heat energy by contact is called___? Contraction, Conduction, Convection, or Construction.

The correct answer is Conduction. Contraction and construction are not relevant to the question or the class, so they can be thrown out. This question is just recalling a question. Conduction is the transfer of heat energy by contact. Think of how a metal spoon gets hot in hot tea because it is conductive.

The vertical fluid motion due to buoyancy is called___? Contraction, Conduction, Convection, or Construction.

The correct answer is Convection. Contraction and construction are not relevant to the question or the class, so they can be thrown out. This question is just recalling a question. Convection is the vertical fluid motion due to buoyancy. Buoyancy is the force that describes how hot or less dense air rises. Think of a lava lamp.

Absorbed radiation is converted into ___? Jelly, heat, ice, or snow

The correct answer is heat. Jelly is a throw away option. Ice and snow are types of precipitation that form based off temperature in the atmosphere, they do not make sense as answers to the question though.

The broad wavelength band, centered on 10 μm , where infrared radiation is transmitted through the atmosphere and out to space is called the___? The happiest place on Earth, Radioactive Decay, Stratosphere, Infrared Window.

The correct answer is Infrared Window. The Infrared window is a range of the radiative spectrum that is not absorbed in the atmosphere. It is called the window because it is open for the Earth to freely emit back to space.