Student Education Learning Material

Global warming is the increase in the average temperature of Earth's near-surface air and oceans since the mid-20th century and its projected continuation. According to the Intergovernmental Panel on Climate Change (IPCC), global surface temperature increased 0.74 ± 0.18 °C (1.33 ± 0.32 °F) during the 20th century and indicate that the global surface temperature is likely to rise a further 1.1 to 6.4 °C (2.0 to 11.5 °F) during the 21st century. Most of the observed temperature increase has been caused by increasing concentrations of greenhouse gases, which result from human activity such as the burning of fossil fuel and deforestation. Global dimming, a result of increasing concentrations of atmospheric aerosols that block sunlight from reaching the surface, has partially countered the effects of warming induced by greenhouse gases.

An increase in global temperature will cause sea levels to rise and will change the amount and pattern of precipitation, probably including expansion of subtropical deserts. Warming is expected to be strongest in the Arctic and would be associated with continuing retreat of glaciers, permafrost and sea ice. Other likely effects include changes in the frequency and intensity of extreme weather events, species extinctions, and changes in agricultural yields. Warming and related changes will vary from region to region around the globe, though the nature of these regional variations is uncertain. As a result of contemporary increases in atmospheric carbon dioxide, the oceans have become more acidic; a result that is predicted to continue.

Earth's climate is an elusive equilibrium of energy inputs, like chemical processes, and physical occurrences. Hotness on planet Venus is too high for the human being. Surprisingly, on the planet Mars, it is too cold. This dissimilarity in temperature is due to the varying constitution of each planet's atmosphere. All these three planets obtain enormous amount of solar energy from the sun, but the quantity of heat emitted back into space depends on the atmospheric constitution of the specific planet. Some gases, such as CO2 (carbon dioxide) and Methane, suck up and uphold heat in the same way that glass entraps heat in a greenhouse. These gases in Earth's atmosphere allow warmth to build up, keeping our planet warm and fit for human habitation.

That is why the amplified build up of these and other gases caused by pollution is over and over again called the "greenhouse effect." It is crucial, on the other hand, to differentiate between the "natural" and a possible "improved" greenhouse effect. The normal greenhouse effect creates a climate in which life can survive, causing the represent temperature of Earth's surface to be about 33 degrees Celsius (91 degrees Fahrenheit) warmer than it would be if expected greenhouse gases were not present. Devoid of this process, Earth would be frosty and not fit to live in.

Natural proceedings cause modification in climate. For example, huge volcanic eruptions release minute particles into the atmosphere that obstruct sunlight, ensuing in surface cooling that remaining for a few years. Differences in ocean currents such as El Niño can also alter the sharing of heat and rainfall. Over longer time spans, tens to hundreds of thousands of years, natural changes in the geographical allocation of sun energy and in the amounts of greenhouse gases and dust in the atmosphere have produced the climate to transfer from ice ages to relatively warmer periods. On a longer period of time the presence of life on Earth has changed the environment of the planet fundamentally, transforming a largely reducing atmosphere made up of methane and ammonia to today's oxygen-rich gaseous covering.

Human actions can also change the atmosphere. Orbiting satellites have photographed the conversion of deserts into agricultural areas. On the other hand, satellites have followed the advance of deserts and the demise of forests as a result of human activity. One core cause of desertification and deforestation is the use of wood as the basic resource of energy, with the resultant loss of trees and degradation of the soil. The most noticeable blow of desertification is the humiliation of range land and irrigated cropland and the weaken in soil fertility and soil formation. Desertification influence about one-sixth of the world's inhabitants and affects 70 percent of all dry lands, amounting to 3.6 billion hectares, or one-quarter of the total land area of the world.

Nearly in the year 1985, scientists taking O3 (ozone) measurements in the Antarctica sensed an alarming decline in stratospheric ozone concentrations over the South Pole. This decrease in atmospheric ozone was confirmed by devices aboard the National Aeronautics and Space Administration's (NASA)'s Nimbus-7 satellite. Under normal circumstances ultraviolet radiation helps generate and obliterate ozone molecules. It is

tough enough to break both ozone and oxygen molecules into individual oxygen atoms. This demolition of molecules allows the free oxygen atoms to union with other oxygen molecules and form more ozone. However, CFC (chlorofluorocarbon) compounds such as the freon used in refrigerator disturb this balance and destroy ozone. CFCs also are greenhouse gases. The reduction of ozone caused by CFCs results in improved ultraviolet radiation at Earth's surface, that could be very much damaging to vulnerable Arctic life forms. Ozone losses over the Arctic could also decrease ozone levels over the middle latitudes as a consequence of the mixing of air masses. Even if some types of ozone-destroying CFCs have been banned, Arctic ozone exhaustion might be increased over the next few decades by further build up of greenhouse gases in the atmosphere. By catching more heat near Earth's surface, these gases cause the stratosphere to become cooler and create more stratospheric clouds, which have been concerned in rapid ozone loss.

So what we can we do.....

Each time we turn on a light or TV, we use energy. Most often, fossils fuels coal and oil are burned to create that energy. This causes greenhouse gases to be released. Greenhouse gases are making our planet warmer. Even a small increase in temperature over a long time can change the Earth’s climate.

You can help save energy every day. Start in your home. Use energy only when you need it. Turn off lights, TVs, and stereos when you are not using them. Set your computer to “go to sleep” when you are away. Doing these easy things each day adds up and can really help our environment.

Walk or cycle more as a replacement for using your motor vehicles.

Avoid very long showers, and don't waste hot water.

Handle the dishwasher only when it is full and do not overload the fridge.

Utilize the microwave rather than a power-consuming oven-toaster-griller.

Buy a car that gives you more mileage, and then avoid wasting fuel.

Buy energy-efficient electrical appliances. They also save you plenty of money.

Try to pick products with recyclable packaging.

When you use products with the Energy Star you use less energy, which means you are helping to protect the environment by reducing greenhouse gases.