The oxygen revolution essay

History, Revolution

Oxygen Revolution {text: bookmark-start} {text: bookmark-end} Oxygen Revolution {text: bookmark-start} {text: bookmark-end} Oxygen Revolution The oxygen revolution, which is sometimes known as the oxygen catastrophe is believed to have occurred about 2. 4 billion years ago with the evolution of cyanobacteria, a type of blue- green algae. Before this time, the atmosphere had a very different chemical make-up, high in carbon molecules; unsustainable for life as known today. These prokaryotes were the first photosynthetic organisms to release oxygen into the atmosphere (Campbell, Reece, & Simon, 2007). Photosynthesis is using light energy to produce sugars and other types of organic food molecules from water and carbon dioxide.

This process is used by plants, autotrophic protists and some bacteria. The end result of which releases unadulterated pure oxygen into the atmosphere (Campbell, Reece, & Simon, 2007). The oxygen atmosphere that is depended on was generated by numerous cyanobacteria. Cyanobacteria gradually started to have a higher population, leading to more oxygen to be released into the atmosphere. Being aquatic bacteria the ocean and seas were filled with the oxygen produced. The oxygen underwater began to react with the abundant iron, eventually chemically cleaning the oceans of the iron through oxidation. Once the oxidized iron started settling to the ocean floor, the green color began to dissipate and the blue tint of oxygen took over.

These developments were ecological disasters– oxygen was poison to the ancient inhabitants due to the tendency to attack bonds of organic molecules (Campbell, Reece, & Simon, 2007). The survivors of this catastrophe hid themselves in the depths of the ocean away from the threat

of oxygen; the others adapted the ability to use photosynthesis. Atmospheric changes drastically affect all organisms. Today, there is a threat of atmospheric changes with global warming.

Logging, development, and destruction of natural plant inhabited areas are a few of the major contributors to global warming. Without photosynthesis, there is no production of oxygen or productive use of carbon dioxide. Plants and animals will not have the necessary elements to create energy, without sufficient oxygen and water. A current ongoing debate is the effect that logging has on global warming. There are many greenhouse gases responsible for global warming, primarily carbon dioxide, or CO2. Since plants absorb carbon dioxide and release oxygen through photosynthesis, it can be argued that by reducing the amount of leaf plants, the rate at which carbon dioxide is eliminated from the environment, and the amount of oxygen being released into the atmosphere is also reduced. Take for example the Amazon rainforest.

Also known as the lungs of our planet, approximately 20% of earth’s oxygen is produced by the Amazon rainforest (blueplanetbiomes. org, 2003). However, more than 20% of the Amazon rainforest has been destroyed for cattle ranches, mining, logging, and agriculture (blueplanetbiomes. org, 2003). The destruction of the biggest rainforest could cause irreversible damage. During 2002 to 2003, it is estimated that the deforestation was nearly 2.

4 million hectares, or 6 million acres. Each hectare of destroyed forest releases approximately 200 tons of carbon into the atmosphere, worsening

the greenhouse effect (Naranjo, 2005). In each of these examples, the importance of photosynthesis cannot be denied. It is through this process that carbon dioxide is utilized by plants for energy, and releases oxygen. Without the ability that plants have to recycle and use carbon dioxide, the amount inthe atmosphere would be much higher.

Replanting trees, creating carbon sinks, and saving forests, can greatly affect global warming. Reference lueplanetbiomes. org. (2003). Amazon Rainforest. Retrieved on August 23, 2009 from: http://www. blueplanetbiomes. org/amazon.

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