# Sea Sponges and Silicon

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As climate change and pollution are on the rise, any way to eliminate greenhouse gases and harmful chemicals from our atmosphere would be beneficial. Large contributors to these emissions are industrial-sized purification plants for certain materials used in today's economy, one of which being silicon. The process to purify the silicon utilizes, among other small side processes, mining the silicon source material, transporting it, and firing it in a large chamber with coke coal to produce pure silicon and an abundance of carbon dioxide. The project's focus was to test the feasibility of a new source material, silicon sponge skeletons, compared to the usual source gravel to lessen the environmental impact such a process has on our world. Using high purity silicon dioxide as a control, metallurgical grade silica gravel and Euplectella aspergillum skeleton were tested chemically to extract the silicon from their structures with a minimum of byproducts by removing the oxygen from the silicon dioxide and dissolving impurities. It was found that the E. aspergillum skeleton is a highly rich source for silicon, and can be utilized in the forms of silicon farms to generate huge amounts of environmentally friendly silicon for our steel and electronics. The use of offshore sea sponge farms can produce nearly eight metric tons of silicon per hectare occupied by the sea sponges, at every harvest. This silicon would be renewable, as the E. aspergillum sea sponge filters pollutants, and sustainable in the modern world.

**Awards Won:**