

Smart STEM Challenge

Drinkable Seawater

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Category: Environmental Science

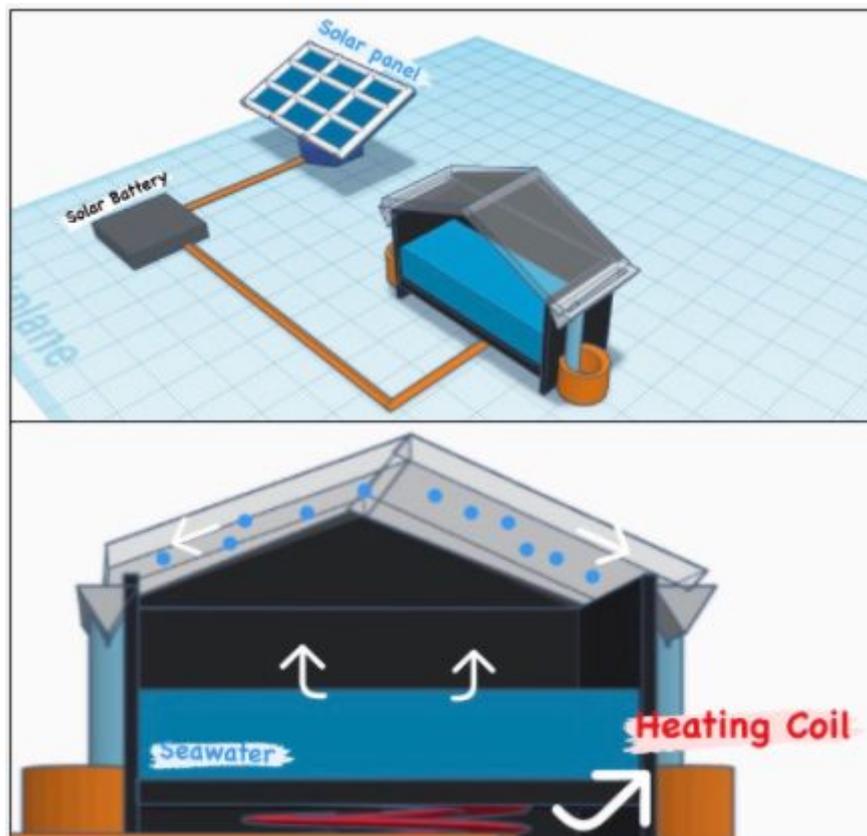
Age Group: Senior (Grade 10-12)

The earth is what we all have in common. Each year our earth is starting to change little by little. Before there used to be lakes, rivers, ponds but now they are rather wet. Climate change is even more hazardous, there are droughts. Population growth is increasing slightly every year, it is the primary source of environmental damage. When there are too many people, the amount of current needs is rising too. For instance, freshwater is required for every living thing, even human beings to survive and to use in daily life. Sadly, some of us are wasting water each day because they don't know the worth of it. If all these actions are still continuing, we will face one major impact which is lack of freshwater. For every drop of freshwater we waste, we should know that somewhere one earth there are people who are thirsty and trying to find a drop of water. In order to avoid this issue, we should change the way we consume and should recycle the used water. On our earth, there is 96.5% of seawater. Then I ask myself; How about we create something that could make seawater drinkable? After that, I came up with one idea to create solar stills that could convert seawater into freshwater. This project will guide us to the new world, where seawater is drinkable and there won't be any more worries about lack of freshwater. This will provide people with portable water, provide water to agricultural industries and help preserve current freshwater supplies. There won't be any pollution because all we use is the heat energy from the sunlight.

As I saw on the internet most people create it by using normal things like normal color, but I want to change it by using black color. There are two experiments because I want to know between mine and others which one is more effective. First one a cup filled with water, salt because seawater is a combination of water and table salt. There is a smaller cup in there and it should be a bit heavier than the big one. Then there is a plastic cover on the top of the big cup and use a rubber band to wrap it. After that push the middle of the plastic and put a stone or something that is not light on it. The second is similar but the cup is black. So the process went like this: put the two cups under the sunlight. It is better to put it in the morning and keep it until sunset. Sunlight is one of several forms of heat energy that can be used to power this process. When the water got heated by sunlight, it then caused it to evaporate. The water then condensed on the plastic covering, which is slanted to allow the fresh water to drain into a collection unit which was the small cup. After three days, I went to see it and I observed that the small cup filled with freshwater but the black cup had the most amount of water. It was half a cup when I combined it together. The reason is because black color absorbs all wavelengths of light and converts them into heat, so the object gets warm. White color reflects all wavelengths of light, so the light is not converted into heat and the temperature of the object does not increase noticeably. It means to produce more freshwater we should use something black. For the taste of the converted water, I was surprised because it wasn't salty, it was like normal freshwater. This experiment I just wanted to know if it is working or not. Lately, I came up with another idea by making it bigger and replacing the plastic with glass. The process is the same as the last one, but this

one will convert more freshwater. It could produce 2-4 litres/m² per day, so if we create it a lot it will produce more freshwater per day. If one day it is not sunny but raining, there will be a solar panel that absorbs the sun's rays as a source of energy for generating electricity or heating. No sunlight no worries because we will use the heat energy from the solar panel. There will be a heating coil under the solar still and it will heat the water so the process is still working. The new one is like what shown in the photo below.

To sum up, according to the experiment that I had made it is clear that my project is working. The converted water from seawater is drinkable and this project serves my purpose. The new idea that I came out also the same as the old one but it produces more fresh water per day. Therefore in the future if our world lacks fresh water we could convert seawater and drink it. Water desalination plants can provide drinking water in areas where no natural supply of potable water exists. It provides to agricultural industries. So if there are people who are stuck on an island, they can create this project to survive.



Resources:

[10 green inventions, simply amazing!](#)

[Can you make seawater drinkable?](#)

[Advantages of drinkable seawater](#)