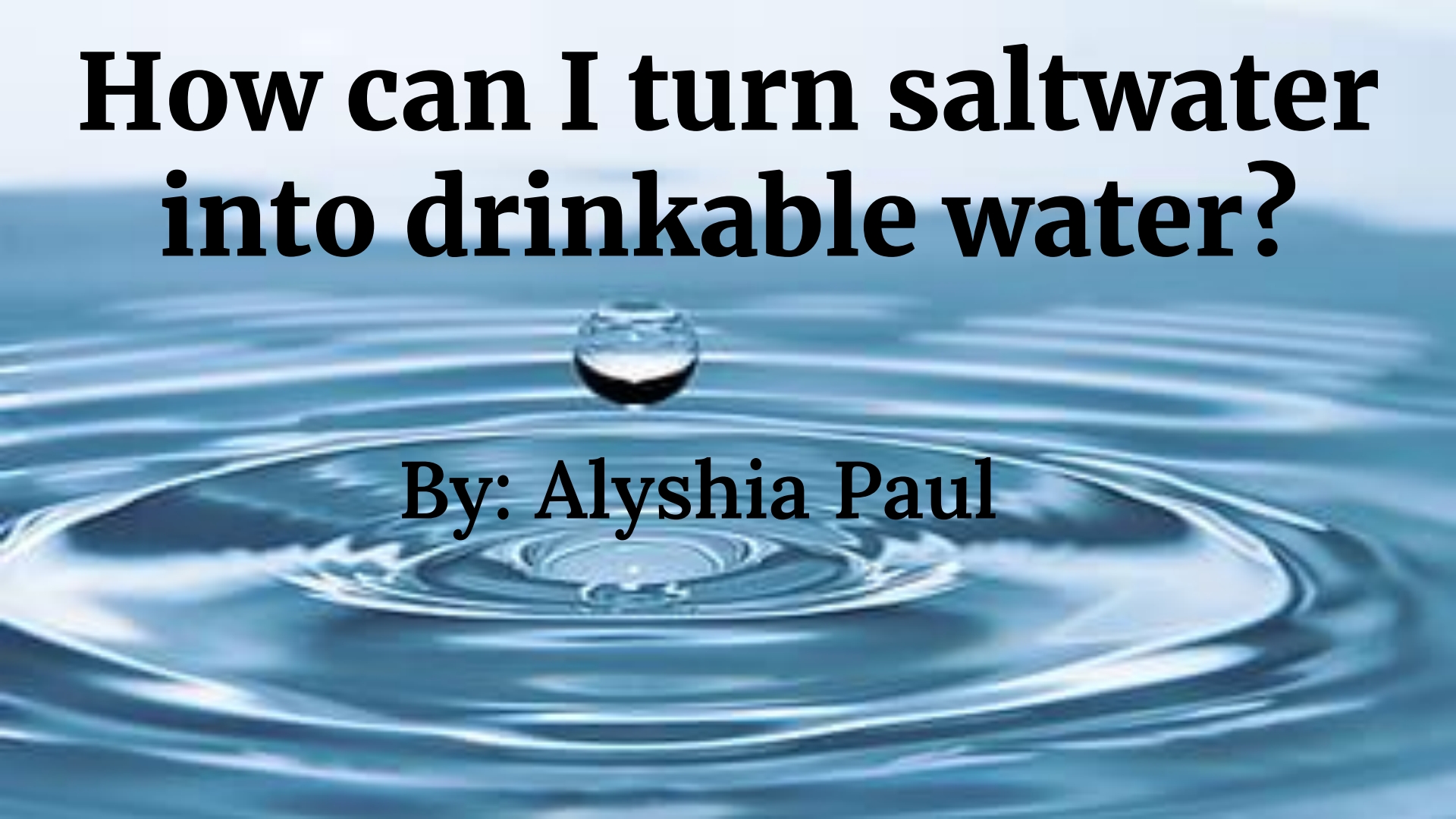
How can I turn saltwater into drinkable water?



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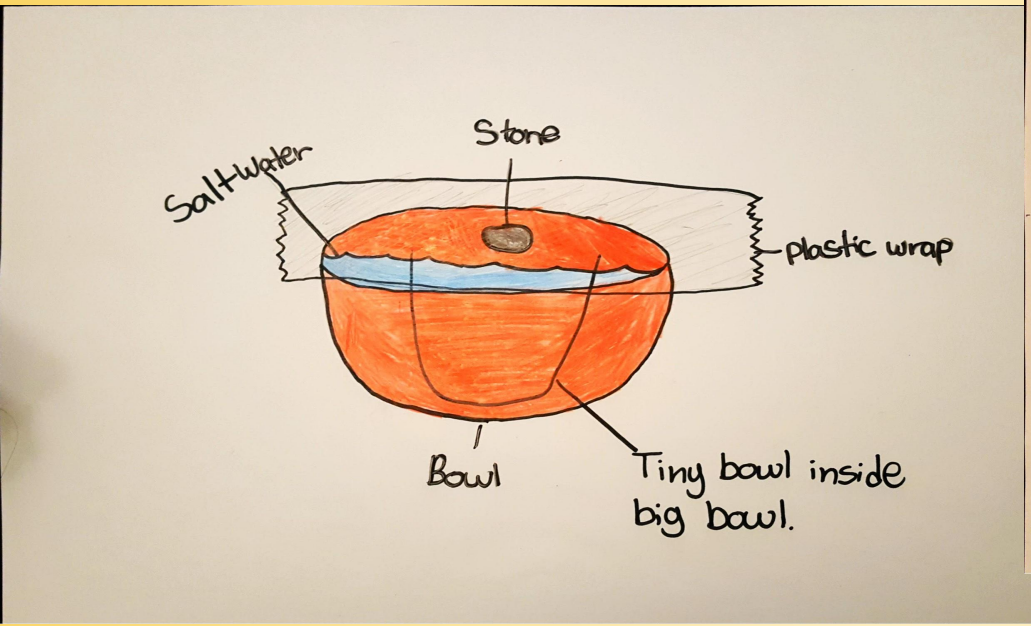
Problem:

More than 2,000 people around the world die from dehydration. People face these problems everyday. Many people live close to lakes and ponds, but are still dehydrated since the water is contaminated and undrinkable. People die because they are forced to drink the polluted water, to stay hydrated. The body is almost 60 percent water, and the brain and heart are composed of 73 percent water. Losing the water from your body would lead to a fast heartbeat and will affect how the brain functions. This explains the need for water filters, to help all people get clean water.

Possible Solutions:

1. We could use the pot and a glass to boil the water and the erosion of the salt water would turn it into drinking water.
2. We could use a solar desalination and pour the saltwater into a bowl and leave it in the sun, as it is heating up the salt water will become clean and drinkable.
3. For my last solution we could use polymer to separate the water from the salt. Polymer is a large type of molecule made up from joining together smaller molecule

Diagram of my solution ideas:



This is solution 1. It needs lots of sun and it would take along time. I won't be doing this solution.

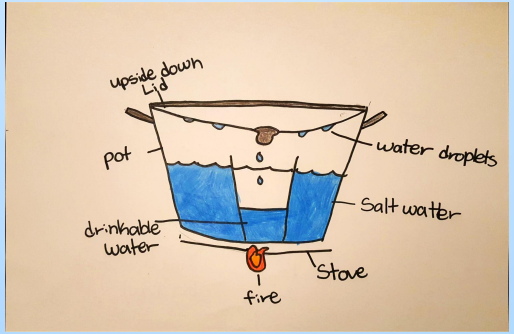
This is solution 2. It will need more materials, but it will take less time. I will do this solution.

My Plan:

I think my solutions will work because bacteria and viruses cannot survive in boiling water. I chose the second solution because when boiling the water, it will erode on the lid and will start dripping down inside the cup. The droplets falling down the cup will start filling it up with fresh drinkable water. I cannot do the second solution because it includes hot weather and we don't get too much hot weather here.

Steps:

1. Pour the saltwater into the big pot.
1. Place the empty glass in the big pot.
2. Place the lid upside down on the big pot.
3. Set the temperature into a boil.
4. Wait for 20 minutes or more as the cup fills.
5. Carefully remove the glass.
6. Wait for it to cool.

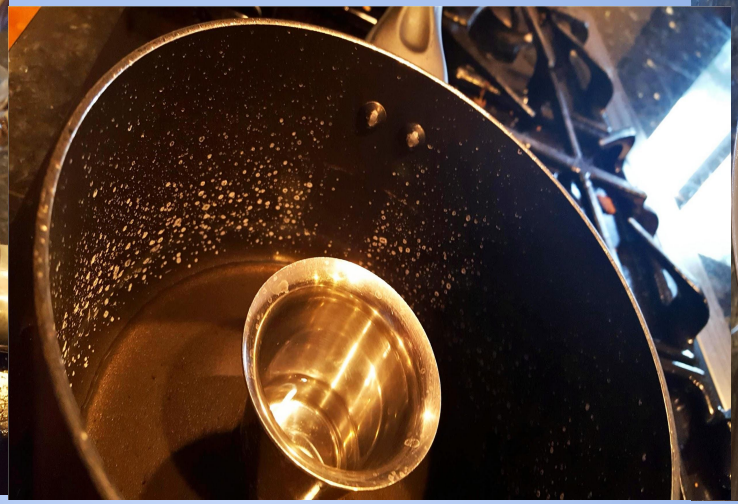


Materials:

1. Big pot.
2. Lid for the pot.
3. Saltwater
4. Empty glass.

Pictures of the experiment:

This is Trial 1



This is Trial 2

This is Trial 3

These pictures shows the saltwater eroding and dripping into the cup.

Results:

	Salt:	Time:	Water:
Trial 1:	3 teaspoons	10 minutes	11 mL
Trial 2:	3 teaspoons	15 minutes	11 mL
Trial 3:	3 teaspoons	20 minutes	14 mL

All three trials worked and did not have any salt in it.
I did not get much water.

Challenges and Redesign:

A challenge was that we had to wait for a long time and get not much fresh water.

Another challenge we faced is that the water did not give that much, and it smelled like salt. However, the water was still drinkable and did not have any salt in it.

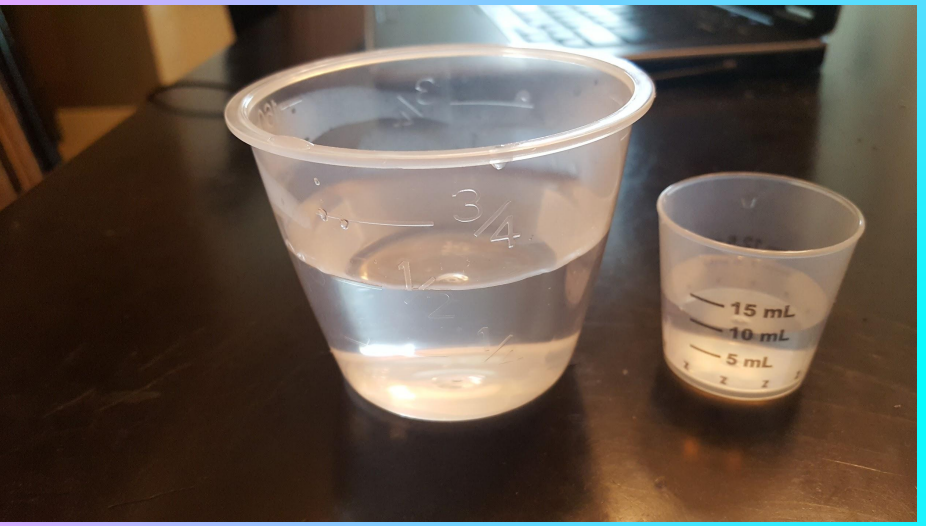
I could redesign this by putting some ice cubes on top of the upside down lid and using a wider pan. This would make the vapored water more cooler and the water would erode faster.

Redesigned solution trials:

	Salt:	Time:	Water:
Trial 1:	3 teaspoons	10 minutes	15 mL
Trial 2:	3 teaspoons	15 minutes	16 mL
Trial 3:	3 teaspoons	20 minutes	10 mL The vessel dried up and collected water started evaporating.

All three trials worked and did not have any salt.

Pictures of redesigned solution:



The picture above shows the smaller measuring cup was how much water I got before I redesigned my solution. The bigger measuring cup is how much I got after I redesigned it.

This picture shows the ice cube on top of the lid.

Conclusion:

My redesigned solution did help because the Ice cube make the water more cooler making it to erode quicker. I also found out that if you increase the temperature of the heat it would make it the salt water erode faster, giving more water. My data says that I got more water with my redesigned solution then my regular solution. On my first solution, I got 14 mL of water and on my redesigned solution I got 16 mL of water. I could apply this in the real world because, many people around the world have died from dehydration, they could use one of the techniques to get fresh water.

Sources:

- https://www.medicinenet.com/dehydration/article.htm
- https://www.mayoclinic.org/diseases-conditions/dehydration/symptoms-causes/syc-20354086
- https://rehydrate.org/dehydration/index.html