

How to Desalinate Water

Two Parts: [Gathering Your Materials](#) [Making the Desalination Device](#)

When you desalinate water, you remove dissolved salts from the water. Desalination or desalting technologies can be used to produce drinkable water from seawater or brackish water, and it can also be used in the oil and gas industry. 97.5% of the world's water is salt water from its oceans and only 2.5 percent is freshwater. Scientists are currently looking at ways to use desalination to make the world's seawater a viable source of drinking water, but you can try to desalinate water on a smaller scale at home by building a simple desalination device.

Part 1

Gathering Your Materials

- 1 Use bottled drinking water and iodized salt.** Before you can desalinate the water, you will need to create saline water, or salt water. Do this by buying a bottle of drinking water and iodized salt from your local grocery store. You can also use a bottle of tap water if you do not want to buy a bottle of water.^[1]
 - If you happen to live near an ocean, you can skip these materials and fill a bottle with seawater. Seawater is full of salt and great for use in the desalination process.
- 2 Get a heavy ceramic mug and a large glass bowl.** You will use the ceramic mug as a container for the desalinated water and the large glass bowl will act as a receptacle for the salt during the desalination process. The glass bowl should be big enough to fit the mug.^[2]
 - You will also need a piece of plastic cling wrap, enough to go over the glass bowl, and a small weight like a rock.
- 3 Make sure you have access to a spot with direct sunlight, like a window sill.** You will need to place your desalination device in direct sunlight to warm up the water in the device and create humid air. The humid air will then condense into water droplets that you can drink.^[3]

Part 2

Making the Desalination Device

- 1 Pour 1 inch of drinking water into the mug.** You do not want to fill the mug up too much, just until it appears 1 inch deep with water.^[4]
 - Mix enough salt into the water so it tastes salty. Start with a small amount of iodized salt and taste it to ensure it is salty. Make sure you fill the mug with more water if you drink some of it, as you want there to be a depth of about 1 inch of water in the mug.
- 2 Put the salt water into the large glass bowl.** You will then need to rinse and dry the mug to ensure there is not salt residue in the mug.^[5]
 - Once you have rinsed and dried the mug, you can put it in the center of the glass bowl in the 1 inch of salt water.
- 3 Cover the glass bowl with plastic cling wrap.** Make sure the cling wrap is stretched tightly over the mug and the sides of the bowl, with no open areas around the rim of the bowl.
- 4 Place the bowl in direct sunlight.** Look for a window sill or a spot on your deck outside that gets lots of direct sunlight and make sure the bowl is on a nice, even surface in the sun.^[6]

- Place the small weight or rock on the top of the plastic wrap, right above the cup. The plastic wrap should sag in the center of the cup due to the weight of the rock. This will ensure the condensed water falls into the cup so you can drink it.

5 Leave the bowl in the sun for three to four hours. After several hours in the sun, there will be a build up of humid air in the bowl. This will lead to the formation of water condensation on the plastic wrap. The water droplets should then flow downward into the cup.

6 Check the cup for fresh water. After the bowl has been in the sun for three to four hours, check the cup for a small amount of water. Remove the plastic wrap and drink the water in the cup. You should taste pure, clean fresh water that has been desalinated.^[7]

- This desalination device works by using the sun to warm up the salt water. The plastic wrap helps to trap the water vapors in the bowl as the salt water evaporates. Because the top of the plastic wrap is much cooler than the rest of the bowl, the humid air in the bowl condenses on the top of the plastic wrap and forms water droplets.
- Over time, the water droplets on the plastic wrap grow larger and start to flow to the center of the bowl due to the weight of the rock. As the water droplets build up, they grow heavier and eventually fall into the cup. The result of this simple desalination device is a cup of fresh drinking water that does not contain any salt.

Community Q&A

What happens to the salt?



The salt remains in solution in the larger bowl, just in greater concentrations. If the concentration becomes high enough, it will precipitate (i.e., form solid salt) in the bottom of the bowl.

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Is desalination a feasible way to purify water when camping? Can stream water be collected in a bowl and heated in a similar fashion to yield potable water?



You can provide water for camping this way, but it will take a long time for the water to evaporate in a bowl out in the sun. Try using a cooker or a bonfire to heat the water. Or you can simply bring water with you, or use one of the many water purification products designed for hikers and campers such as pumps, filters, and tablets.

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Can I follow the same steps with a non-glass bowl?



This is unlikely, as glass has a property to allow in the heat from sunlight and contain it. (Think greenhouses). You may only be able to achieve this result with a non-glass bowl if an external source heats the water till condensation occurs, like a pot on a stove. If using this method, keep in mind that you'll need to find a safe alternative to plastic wrap to replace that function in this diagram.

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Does the bowl have to be glass?



No, for example if you were on the beach, you can dig a round whole down to the wet sand and put a bowl in the middle with a tarp over the whole and you will get the same results.

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Would a source of heat work?



Steam it and capture the gassed water. In the original container will be the salt from the water you just steamed.

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Instead of letting the sun do all the work, can I boil the water?



That's essentially what large desalination plants do. Just keep in mind the heat so you don't melt any plastic.

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Would a focus light such as a lamp work instead of sunlight?



Probably not, unless it were of a higher wattage, or a heat lamp. The reason being, it has to generate enough heat to make the water evaporate so it can re-condense on the plastic wrap (leaving the salt behind). You could try it, though

Contributor but you can't be certain of the results.
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Things You'll Need

- Iodized salt
- A bottle of drinking water or tap water
- Seawater (if available)
- A ceramic mug
- A large glass bowl
- A piece of plastic cling wrap
- A small weight, like a rock
- Access to direct sunlight

Sources and Citations

1. <http://www.sciencefairadventure.com/ProjectDetail.aspx?ProjectID=155>
2. <http://www.sciencefairadventure.com/ProjectDetail.aspx?ProjectID=155>
3. <http://water.usgs.gov/edu/drinkseawater.html>

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