Does Salt OR Sugar Help Water Boil?

By Kniya Middleton

Research:

- Salt increases the speed of boiling water by only a few seconds if you add less than 3.5% to the water
- To make an extreme difference, you need to add at least 20% salt to the water
- Salt raises the boiling point
- Lowers the specific heat
- If you add a little salt to the water, then the temp. Won't go up very much, but lots of salt will increase the heat
- The salt will absorb some of the water, which means that the vapor pressure will take longer to equal the atmospheric pressure
- Water starts to boil when the vapor pressure and the atmospheric pressure are equal
- Sugar absorbs water
- Sugar increases the boiling point of water
- Sugar gets in the way of water molecules when it is boiling, which makes the time slower.

Works cited:

https://thermtest.com/does-adding-salt-to-water-help-it-boil-faster

thermtest .com

https://astrocamp.org/blog/salt-water/

astrocamp.com

https://www.thoughtco.com/adding-salt-increases-water-boiling-point-607447

Thoughtco.com

https://www.sciencing.com/sugar-affect-freezing-point-water-7194604/

sciencing.com

Hypothesis:

Control Experiment: the time it takes normal water to boil

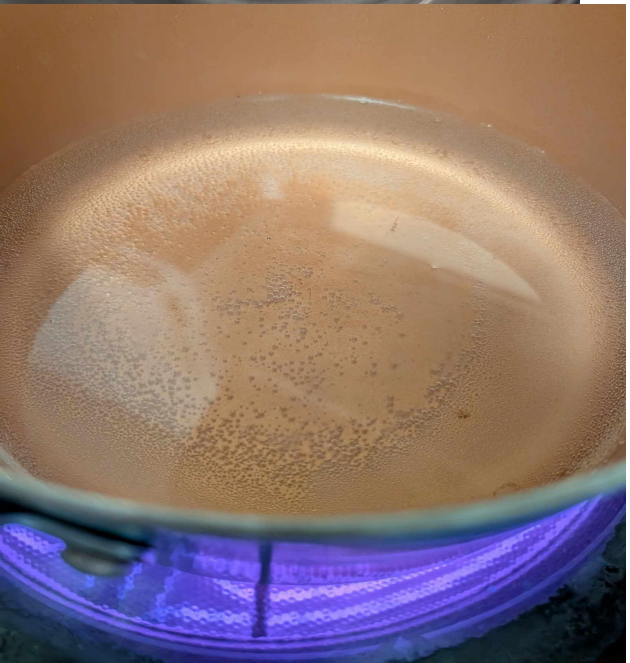
Experiment #2: If you add salt to water then the water will boil slower because it will raise the boiling point, but not the water.

Experiment #3: If you add sugar to water then the water will boil slower because it will increase the boiling point, but the temperature will stay the same.

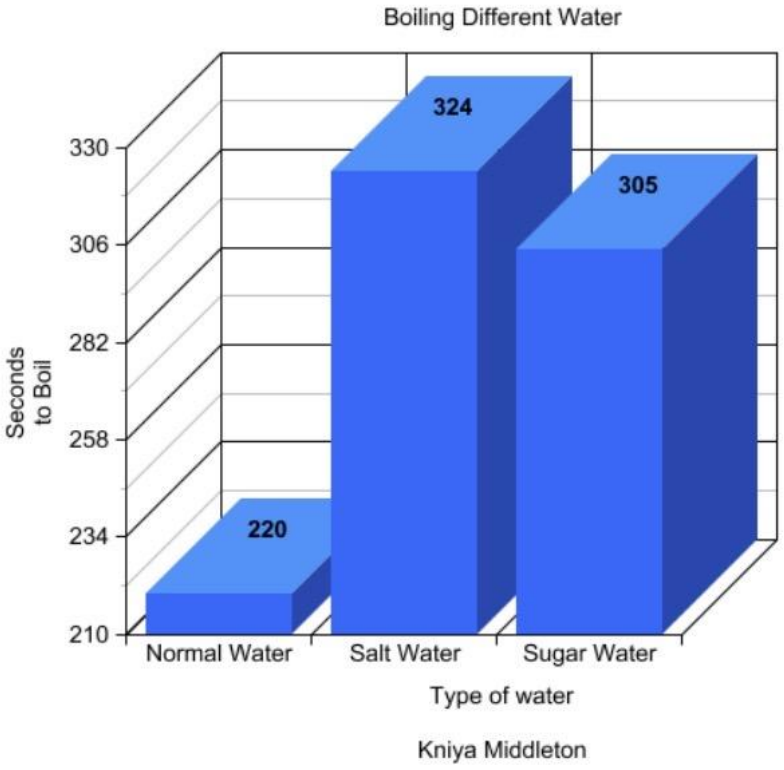
Sugar Experiment:

While doing the sugar water experiment, I thought that the sugar water was boiling super fast, but after some extra research and taking the temperature of the water, I realized that the sugar was letting out carbon dioxide before truly boiling. I had to redo the three trials to get the correct temperature.

Pictures:



Graphs:


Boiling Different Water
Seconds to Boil
330
306
282
258
234
210
220
324
305
Normal Water
Salt Water
Sugar Water
Type of water
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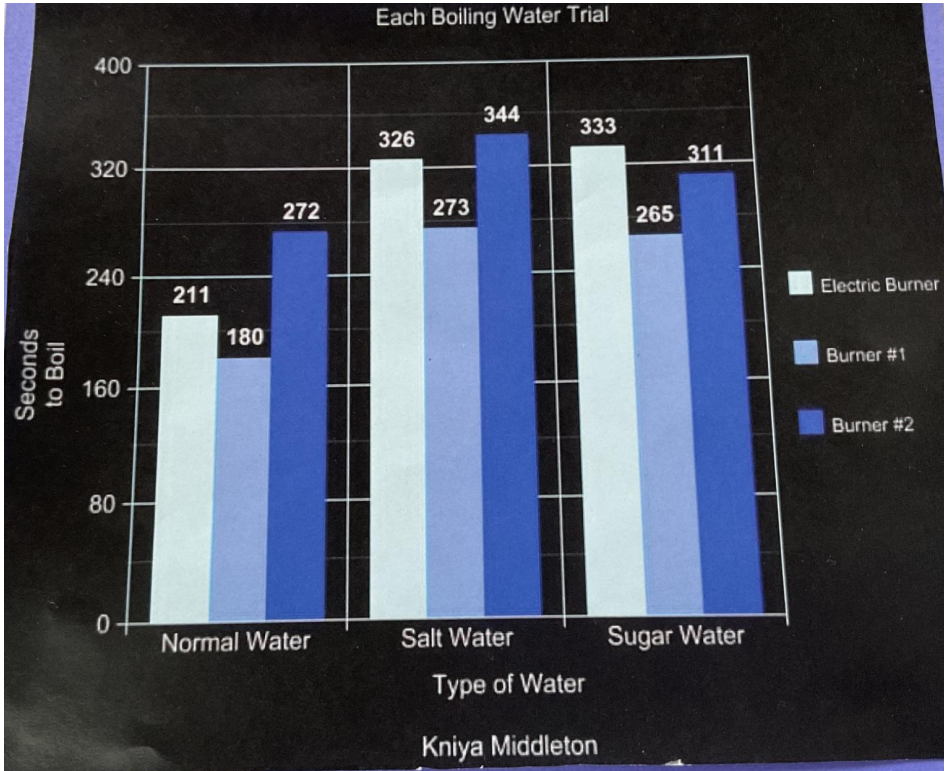
Each Boiling Water Trial
Seconds to Boil
400
320
240
160
80
0
211
180
272
326
273
344
333
265
311
Normal Water
Salt Water
Sugar Water
Type of Water
Electric Burner
Burner #1
Burner #2
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Chart:

Normal water	***3:31 (211 sec.)***	***3:00 (180 sec.)***	***4:32 (272sec.)***	***3:40 (220 sec.)***
Ex. 1	***5:26 (326 sec.)***	***4:33 (273 sec.)***	***5:44 (344 sec.)***	***5:24 (324 sec.)***
Ex. 2	***5:33 (333 sec.)***	***4:25 (265 sec.)***	***5:11 311 sec.)***	***5:05 (305 sec.)***