# Boiling Saltwater, Freezing Saltwater

**Estimated Time: 30 minutes of experiment with several hours of checking water**

**SUMMARY**

Water is an amazing substance that regularly boils and freezes at temperatures that we can easily observe and recreate. However, saltwater has different properties than freshwater so adding salt to water changes how it behaves. Can you predict what will happen?

**WHAT YOU'LL LEARN**

- Salt added to water will make water boil faster and freeze more slowly.

| Materials Used | |
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| • Measuring cup<br>• Tablespoon<br>• Three bowls<br>• Pot and stove | • Freezer<br>• Salt<br>• Stopwatch<br>• Paper and markers |

**BOILING SALTWATER**

1. Using your measuring cup, add one quart (4 cups) of tap water to each of your three bowls.
2. To the first bowl add two tablespoons of salt, to the second bowl add one tablespoon of salt, and don't add anything to the third bowl. Stir in the salt and then put the bowls to the side.
3. While your bowls are reaching room temperature, make your predictions about how the salt will affect the boiling time of the water. Will the salty water take longer to boil than the fresh water or less time?
4. Take the bowl of fresh water and pour it all into the pot. Turn on your stove and start the stopwatch. Once the water reaches a rolling boil, stop timing and record the result. Pour out the water and let the pot cool while you make a graph to record our data.
5. When the pot is cool, repeat step 4 with the bowl containing 1 tablespoon of salt. After recording the data for that bowl, repeat step 4 again with the bowl containing 2 tablespoon of salt.
6. Looking at the graph with the data from all four experiments, what was the effect of adding salt to the water?

**BOILING SALTWATER**

7. Repeat steps 1 and 2 again to create three new bowls.
8. Make some predictions about the freezing rate of these bowls. Will adding salt make the water freeze faster or slower? Make a graph to get ready for recording data.

9. Place all three bowls into the freezer and close the door. Start your stopwatch and check the bowls every thirty minutes. When you see ice covering the top of a bowl (even if it isn't totally frozen) record that data. Make a graph of when each bowl froze over.
10. How did salt affect the freezing of water? Does adding salt make it take longer to freeze or a shorter amount?

**TIPS**

- The water is measured out all at once in steps 1 and 7 so that it can all reach room temperature. That's also why there is reflection time between pouring it into bowls and putting it the pot, and why it's recommended you let the pot sit for a bit between runs.